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A GROUNDED THEORY APPROACH TO EMERGENCY NURSES' ENGAGEMENT IN MANAGING EMERGING INFECTIOUS DISEASES: PERSEVERING THROUGH COLLAPSE VULNERABILITY

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A Grounded Theory Approach to Emergency Nurses' Engagement in Managing Emerging Infectious Diseases: Persevering Through Collapse Vulnerability

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A thesis submitted in partial fulfilment of the requirements

for the degree of Doctor of Philosophy

December 2017

CERTIFICATE OF ORIGINALITY

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LAM Kam Ki

ABSTRACT

Background

Emerging infectious diseases (EIDs) have been a major challenge for global public health authorities, creating an impetus for enhanced management planning. In EID management, hospital accident and emergency departments constitute pivotal public health organizations that on top of providing emergency care, are particularly relevant for initial screening, rapid detection of disease, and prompt isolation of suspected yet undifferentiated patients. During an epidemic, this extended role for emergency services gives prominence to their expanded role as an important part of the public health response, due to emergency nurses' close and frequent contact with emergency healthcare service users. Accomplishing this extended role requires emergency nurses to demonstrate their competence in responding to EID situations, with skills and knowledge in the areas of infection control and disease management. While several studies have been conducted on nurses' experience in an epidemic response, previous studies have not explicated the role of emergency nurses in EID management. This study serves as an avenue to provide empirical evidence on emergency nurses' involvement in the management of EIDs.

Aim

This study intends to develop a substantive theory to explicate the role of emergency nurses and the underlying processes involved in EID management in a clinical context.

Design

This study adopted a Straussian grounded theory approach to explicate emergency nurses' involvement in EID management. This research approach offers an effective way to understand the process of how emergency nurses engage in an epidemic response. Registered

nurses who worked on a fulltime basis in an accident and emergency department in Hong Kong were invited to participate. Part-time emergency nurses were excluded because their work during epidemics was not on a mandatory basis. A total of 26 emergency nurses from 12 accident and emergency departments were recruited through purposive sampling and theoretical sampling. Semi-structured, face-to-face, individual interviews were conducted. The transcribed interview data were analyzed through a series of coding procedures, which included open, axial, and selective coding. Various analytic strategies were adopted in the interpretation of data, such as the constant comparative method and memoing. A variety of techniques, such as member checks, audit trail, and frequent debriefing sessions, were adopted to establish the trustworthiness in the research process.

Findings

The grounded theory *persevering through the vulnerability* of *collapse* emerged from the data, which elucidates the process of emergency nurses' engagement in EID management, and interrelates the corresponding conditions, actions and interactions, and consequences within the phenomenon. The theory emphasizes the dynamic and interactive interplay between emergency nurses' practice and the context they are situated in during EID management. This theory is a composite of five major categories that provide details on the corresponding activities and interactions of emergency nurses: (1) encountering situations fraught with obstacles and challenges, (2) rehearsing for improvisation, (3) preserving professional duties and integrity, (4) withstanding the collapse of service provision, and (5) enhancing preparedness for imminent threats. Each of these categories represents a facet of the engagement process in the theory, identified as the facet of encounter, facet of navigation, facet of striving, facet of resolution, and facet of learning respectively. The major notions of the theory are discussed, indicating the importance of decision-making and clinical judgment

for emergency nurses engaging in EID management. In addition, adaptive capacity is another imperative attribute that empowers nurses as they engage in EID response. Nurses should be capable of adapting and adjusting their attitudes, behaviors, and work practices to handle unpredictable and evolving EID situations.

Conclusion

This theory advances the existing understanding of EID response from the perspective of emergency nurses. The findings have significant implications for possible strategies to renew and reinforce emergency nurses' competence and readiness to face future epidemic events. These implications not only indicate recommendations for nursing practice, education and policy, but also highlight that a collaborative effort should be made among emergency nurses, hospital administrators and policy-makers, to strengthen their capacity for EID preparedness and response.

PUBLICATIONS AND PRESENTATIONS

Lam, S. K. K., Kwong, E. W. Y., Hung, M. S. Y., Pang, S. M. C., & Chiang V. C. L. (2018). Nurses' preparedness for infectious diseases outbreaks: A literature review and narrative synthesis of qualitative evidence. *Journal of Clinical Nursing, 27*(7-8), e1244-e1255. https://doi.org/10.1111/jocn.14210

Lam, S. K. K., Kwong, E. W. Y., Hung, M. S. Y., & Pang, S. M. C. (2016). Bridging the gap between guidelines and practice in the management of emerging infectious diseases: A qualitative study of emergency nurses. *Journal of Clinical Nursing*, *25*(19-20), 2895-2905. https://doi.org/10.1111/jocn.13343

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Lam, K. K. S., Kwong, W. Y. E., Pang, M. C. S. & Hung, S. Y. M. (2016). Exploring the antecedents and nature of challenges in emergency nurses' practice in the course of an emerging infectious disease outbreak: A qualitative study. Submitted for the 7th International Infection Control Conference, 1-3 July 2016, Hong Kong.

Lam, K. K. S., Kwong, W. Y. E., Pang, M. C. S. & Hung, S. Y. M. (2015). Bridging the gap between guideline and practice in managing emerging infectious diseases: A qualitative study on emergency nurses. Proceedings of the 10th International Nursing Conference, 22-23 October 2015, South Korea.

Lam, K. K., Pang, M. C. S. & Hung, S. Y. M. (2015). A grounded theory study of the adaptive challenges for emergency nurses in emerging infectious diseases management. Proceedings of the Qualitative Methods Conference 2015, 28-30 April 2015, Australia.

Lam, K. K., Pang, M. C. S. & Hung, S. Y. M. (2014). The challenges emergency nurses encountered in responding to emerging infectious disease outbreaks: A qualitative preliminary study. Proceedings of the 17h East Asian Forum of Nursing Scholars, 20-21 February 2014, Philippines.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This study was conceived based on the notion that emerging infectious disease (EID) has been a major challenge for global health officials and constitutes a significant public health concern. This issue creates the impetus for enhanced global and regional epidemic planning particularly to foster competence in the response community, including healthcare professionals. This chapter provides an overview of relevant background information for this study. It begins with a synopsis of the study background. The involvement of different parties in EID management is discussed, highlighting the important role of accident and emergency departments (AEDs) and emergency nurses in an epidemic response. Emergency nurses' involvement in EID management is then summarized and examined, underlying the necessity of understanding such experiences. The chapter ends with an outline of the structure of this dissertation.

1.2 Threats from Emerging Infectious Diseases

Among the many challenges to public health, infectious diseases remain an underlying source of global concern that continues to garner considerable local, national, and international attention (Wong et al., 2012). Despite the astounding advancements in the efficacy of preventive and curative measures against infection, infectious diseases persevere as a major public health challenge jeopardizing the health of the global population (Fauci & Morens, 2012). Infectious diseases are the second leading cause of mortality worldwide, claiming more than 17 million lives each year (Morse, 2012). In addition to affecting

individual health, infectious diseases also impose various social disruptions. In fact, infectious disease accounts for approximately one-third of the total disease burden worldwide, indicating its major impact on quality and quantity of life (World Health Organization/WHO, 2004). Financial loss is another devastating consequence of communicable diseases. In addition to direct expenditures on disease management, the morbidity and mortality caused by infectious diseases could lead to a reduction in productivity, and could place an onerous burden on the global economy (Fonkwo, 2008). Given the tremendous public health problems caused by communicable diseases, ongoing efforts are being made by various governmental bodies and the healthcare industry to mitigate infectious agents. The effective eradication and control of certain infectious diseases, such as poliomyelitis and smallpox, fueled hopes that pathogens would be conquered globally with breakthroughs in vaccination and antimicrobial medications (de Quadros et al., 1992; Fenner, 1993). However, new strains of infectious agents are continuously and rapidly emerging, leading to perpetual challenges to the public health system (Fauci & Morens, 2012).

Owing to the consequences of international travel, accelerating globalization, and climate change, emerging infectious diseases (EIDs) have created an increasing impetus in recent decades for the reinforcement of infectious disease preparedness planning. This group of newly recognized infectious diseases and re-emerging infections, which present with an increased incidence and geographic range, represent the majority of recent large-scale public health emergencies (WHO, 2005a). These include the severe acute respiratory syndrome (SARS) outbreak in 2003, H1N1 influenza (swine flu) pandemic in 2009 (Leppin & Aro 2009), and Ebola virus disease (EVD) epidemic in 2014 (Chertow et al., 2014). Recently, a sharp spike in human infections from Middle East respiratory syndrome (MERS), a new strain of coronavirus, has been reported, posing a new challenge to the global healthcare

system and the capacity of institutions to handle outbreak management (Cowling et al., 2015). The increasing prevalence and intensity of infectious disease outbreaks in recent years showcase the profound impact of this impending public health challenge on communities and healthcare systems worldwide (Lam et al., 2016). Indeed, the current threat of infectious disease to public health is substantial, with the potential to mount a threat at any time and in any area. Without being alarmist, the EID threat to public health is apparently unpredictable and inevitable, on account of rapidly evolving and adapting infectious agents (Morse, 2012). Worse still, since immunity against these novel pathogens within the human population is minimal, EIDs could propagate rapidly within populations worldwide, resulting in large-scale public health emergencies (Fauci & Morens, 2012). With an increasing number of infected individuals, disease would have a wider geographical spread and pose a global threat of infection (WHO, 2005a). Undoubtedly, a timely and relevant response should be made to mitigate the impact of EIDs on the public.

1.3 Collective Responses to EID Management

As seen in the past, infectious disease outbreaks were mostly unpredictable, never coming at a convenient time (Fauci & Morens, 2012). Therefore, strategic planning for outbreak management should take place in advance to safeguard public health. Addressing the threat of EIDs would require the capacity of international, national, and local institutions to mount a collective response in terms of EID management.

1.3.1 International public health responses

An EID outbreak could exert a far-reaching impact and lead to global public health consequences (Fauci & Morens, 2012). Considering the new level of urgency in preventing

and controlling EIDs, the WHO revised and adjusted the International Health Regulations (IHR) in 2005. The revision is intended to facilitate collaboration and coordination among intergovernmental organizations and international bodies to address the public health risks of EID (Fidler & Gostin, 2006). The IHR offer an improved framework for governments worldwide to develop and strengthen their response capacities to manage a possible future outbreak of epidemic disease (Fidler & Gostin, 2006). Their core purpose is "to prevent, protect against, control and provide a public health response to the international spread of disease" without "unnecessary interference with international traffic and trade" (WHO, 2008a). From the IHR, operational principles and criteria are comprehensively established to address various aspects of public health policy, including surveillance, notification, information-sharing, consultation and public health response (WHO, 2008a). The IHR also assist in establishing collaborations between governments from different world regions to make a collective effort to address public health challenges. In case of an outbreak of EIDs, the governments of affected regions and countries would be responsible for conducting an ongoing and comprehensive assessment of the disease situation to evaluate the transmissibility, vulnerability, clinical severity, and geographical spread of the disease (Centre for Health Protection/CHP, 2014a). This public health information would be conveyed and disseminated locally and abroad to advocate for subsequent strategies to prevent and manage possible domestic outbreaks of disease (WHO, 2008b). In addition, cross-boundary public health cooperation would be established to plan and coordinate public health control actions to prepare for and respond to the emergence of an EID (WHO, 2008a).

1.3.2 Local public health responses

The sudden and rapid nature of infectious disease outbreaks highlights the importance of the healthcare system's capacity to respond to impending epidemics. Allied with this

growing attention on the management of EID is the involvement of local healthcare systems to put measures in place to prepare for and respond to prevailing epidemics. The WHO has formulated a preparedness checklist to improve healthcare facilities' capacity to meet challenges during an EID outbreak (WHO, 2009). The checklist portrays the structure of an incident command system, helping healthcare administrators to gain ground on efficient functioning in a hospital-based response to an outbreak. In pursuance of the IHR, local healthcare systems would establish a network of healthcare facilities, including public hospitals, private hospitals, professional medical organizations, and other non-governmental organizations (Ziemann et al., 2015). This network would coordinate the multi-sectoral collaboration of healthcare system units and departments in preparing for and responding to an EID event, in the aspects of disease surveillance, infection control, quarantine, treatment, and prophylaxis (Fidler & Gostin, 2006). Mechanisms would also be established to facilitate the mobilization of community resources to ensure an effective diversion to fulfill increased healthcare service demands (CHP, 2014b). It is expected that the capacity of healthcare institutions and organizations would be strengthened as a result of such an approach (WHO, 2005b).

The capacity to respond involves healthcare institutions and facilities not only drawing up contingency plans to meet the precautionary needs required in addressing potential public health emergencies, but also preparing frontline healthcare workers to respond to actual disease situations (Imai et al., 2008). Because of the high frequency and intensity of patient contact in healthcare delivery, frontline healthcare workers should display competence in infection control practices in order to monitor and prevent the spread of pathogens within healthcare facilities. Thus, guidelines and recommendations have been developed to foster healthcare workers' preparedness for EIDs (Hospital Authority & Centre for Health Protection, 2006). Again, it is anticipated that the recommendations and protocols

regarding infection control and disease prevention could equip frontline healthcare workers with practical knowledge and skills in EID management. However, the introduction of recommendations might not suffice to guarantee their proficiency, as it is reported that their awareness of and adherence to established epidemic guidelines could be insufficient (Gammon et al., 2008). Thus, it is worthwhile not only to fortify the EID management capacity of local healthcare systems, but also to strengthen the preparedness and performance of healthcare workers.

1.4 Nurses' Involvement in EID Management

The participation of nurses is an indispensable component of effective EID management. During epidemic events, frontline nurses constitute the major workforce responding to disease situations in diverse clinical settings, and their role in disease surveillance and infection control is of paramount importance in disease management (Baack & Alfred, 2013). Indeed, nurses' contributions in guaranteeing the implementation of standard infection control procedures and policy are prominent, and are considered to be one of the major duties of their daily practices (Baack & Alfred, 2013). The involvement of nurses in maintaining the standard of infection control practices in EID response is twofold: to perform standard infection control measures, and to check the standard of measures performed by others (Sopirala et al., 2014). This feature of nurses' practices highlights their unique position in epidemic management in hospitals.

Also, during an EID outbreak, nurses' efforts in environmental control are crucial. Because nurses are typically responsible for arranging furnishings and equipment within an emergency care setting, they are required to carefully consider appropriate environmental

control measures to reduce staff, patient and visitor risk of exposure to pathogens (Irvin et al., 2008). In addition, as nurses are usually responsible for assigning in-patient bed positions, they should remain prudent and attentive to patients' infectious status. This would allow nurses to devise appropriate plans for patient logistics, to reduce the spread of pathogens (Baack & Alfred, 2013). Thoughtfully designed operational workflow arrangements are also needed from nurses, to minimize the risk of germ transmission through direct contact, and to prevent healthcare-associated infections (Sopirala et al., 2014).

Moreover, nurses share case finding and quarantine duties during outbreaks, identifying and isolating patients with suspected infectious status for confirmation or diagnostic testing. Often, the initial identification and final decision on a patient's infectious status is made by physicians. However, the vigilance of nurses in assessing patients for infection signs and symptoms is of vital importance in the early detection of an infection, due to the prolonged, engaged, and continuous nature of nursing care (Sugerman et al., 2011). Taken altogether, the role of nurses in an outbreak response is irreplaceable, and their involvement in EID management is decisive in handling public health concerns.

1.5 The Role of Emergency Care and Emergency Nurses in EID Management

During the course of an EID event, accident and emergency departments (AEDs) take on a wider role, actively participating in planning and responding to public health threats from EID in addition to managing urgent illnesses and injuries. Apart from the distinguishing feature of emergency care in offering prompt intervention to patients in critical condition, the public health function of AEDs in assessing, monitoring, and promoting the health of community members is considered a longstanding priority in managing epidemics as part of

local EID responses (Rhodes & Pollock, 2006). Serving as the interface between the healthcare system and the community, AEDs are one of the primary destinations that constitute public health relevance particularly for initial screening, rapid detection, and prompt isolation of suspected yet undifferentiated patients (Blachere et al., 2009; Morens et al., 2004). Through monitoring the trend and frequency of local infection events in the population, epidemic-prone diseases can be promptly detected. For instance, AEDs in Hong Kong have implemented a central disease reporting policy to keep infective agents under close surveillance. Under the Prevention and Control of Disease Ordinance, there is a list of statutory notifiable diseases, with notification required by law once suspected or confirmed patients are identified (Centre for Health Protection, 2017). With such a notification system in AEDs, close monitoring and prompt notification of pathogen activity could be maintained, supporting the management of a large-scale EID outbreak.

The extended nature of emergency services in an EID event gives prominence to an expanded role for emergency nurses in a public health response, due to their close and frequent contact with emergency healthcare service users (Tam et al., 2007). To fulfill this role, emergency nurses should be able to demonstrate their ability to respond to disease situations, in terms of their skills, abilities, and knowledge of infection control and disease management. During an epidemic, emergency nurses' duties focus not only on providing emergency care services to the public, but also on public health responses to reduce the spread of disease (Shih et al., 2007). Thus, emergency nurses are often involved in the early detection of suspected infection and the implementation of proper procedures and protocols for infection control. In addition, emergency nurses must take careful consideration of the logistics required when transferring and isolating patients (Hammad et al., 2012). Initiating multidisciplinary coordination is another important responsibility of emergency nurses in facilities that serve patients who are suspected to be infectious (Baack & Alfred, 2013).

Given emergency nurses' crucial role in the management of prevailing epidemics, the overarching importance to promote their involvement in managing an infectious disease outbreak is highlighted.

1.6 Barriers to Emergency Nurses' Involvement in EID Management

Despite their important role in all spheres of a public health response to EID, emergency nurses might be unaware of the crucial responsibilities their position entails during an epidemic. Although healthcare workers recognize the necessity of their involvement in a public health response to an epidemic (Veenema et al., 2016), it is suggested that emergency nurses might be reluctant to become involved in initiating and implementing EID management infection control measures and interventions (Taira, 2013). Their reluctance could be due to their understanding of the scope of practice of emergency care. They might consider the life-saving practice of emergency care as their primary objective, and might regard the duty of risk mitigation and infection control as an additional obligation that is beyond their job description (Alexander & Wang, 2015). Such an attitude could impede their willingness to participate in the management of an epidemic event. This could consequently hamper the effective functioning of AEDs in an EID response.

Apart from their beliefs and attitudes towards EID management, another barrier to emergency nurses' involvement is associated with conformity to the infection control clinical practice standard. It is noted in the literature that emergency nurses have been non-compliant with guidelines and protocols intended to prevent the spread of EIDs in an emergency care setting, such as adherence to hand hygiene practices (Muller et al., 2015) and personal protective equipment (PPE) usage (Baduge et al., 2017). As mentioned above, previous

studies have revealed that limitations in time and resources were the major cause of any deviation in complying with these recommendations in practice (Muller et al., 2015). Interestingly, it was reported that the issue of nurses' non-compliance with guidelines could still occur, regardless of the availability of sufficient resources (Gammon et al., 2008). This suggests the existence of other factors that predispose their decision on whether to conform to protocol. Thus far, recent studies have not been able to address the reasons or offer an explanation for their behavior. This could lead to difficulties in devising appropriate strategies to address the non-compliance issue, directly affecting their role in EID management.

1.7 Deficiencies in Past Literature

Understanding emergency nurses' experiences and perceptions of disease management in epidemic events might help identifying and addressing the barriers to their involvement in EID management. To date, however, this area has only been examined in a way that is not sufficiently clear. Very often, the practices and readiness of emergency nurses in EID management are embedded in the understanding of disaster preparedness (Baack & Alfred, 2013). Whereas policy-makers and scholars have examined disaster preparedness in the lead-up to and aftermath of disastrous events, to what extent these findings also apply to epidemic events, which usually involve prolonged and uncertain progression, has not been obvious (Shih et al., 2007). Moreover, most studies in the field of disaster preparedness have only focused on organizational capacity during incident response, while far too little attention has been paid to the unique and expanded roles of individual healthcare workers, especially frontline nurses, in controlling and mitigating prevailing outbreaks (Smith & Hewison, 2012).

These knowledge gaps have been identified in the literature as a need for clarity about the readiness of frontline emergency nurses to participate in epidemic management.

In addition, the contextual characteristics of an emergency care setting, and their influences on emergency nurse' EID management practices, have not yet been comprehensively examined. While some research has been conducted to examine the challenges confronting nurses during epidemics (Cheong et al., 2007; Hope et al., 2011; Ma et al., 2011), most of these studies have been limited to a general care setting. There have been few empirical investigations of the nature of nurses' practice during an epidemic in an emergency care context. What is not yet clear is the extent to which nurses take part in public health responses to epidemics in an emergency setting. This constitutes a knowledge gap in understanding the interactions between emergency nurses and their specific working conditions, work settings, and job descriptions in AEDs.

Furthermore, very little is known about emergency nurses' roles while participating in EID management. As previously mentioned, emergency nurses' duties in risk mitigation and infection control are highlighted in the course of an epidemic event (Tam et al., 2007). However, emergency nurses' expanded role in the public health response to epidemic events has been covered in scant detail in previous studies (Lam & Hung, 2013). This deficiency in the literature could hinder the understanding of emergency nurses' perceptions of their roles in EID management, and create obstacles in addressing their needs. Consequently, the participation of emergency nurses in EID management could be hindered, affecting how they serve in a local public health response to an epidemic.

Moreover, while some qualitative studies have been conducted to explore the experiences and perceptions of nurses during an epidemic (Chung et al., 2005; Koh et al., 2012; O'Boyle et al., 2006; Shih et al., 2007), many were descriptive in nature. Largely

absent from the literature is a comprehensive understanding and explanation of the process and progress of how nurses interact with issues arising during their involvement in EID management. Considerably more research is required to theorize the phenomenon of nurses' involvement in EID management, which would support the establishment of an in-depth understanding of the relationships and interactions between nurses and the different contributing factors in the phenomenon. The deficiencies and knowledge gaps in the literature are detailed in Chapter 2.

1.8 Study Purpose

The purpose of this study is to develop a substantive theory to explain the role of emergency nurses and the underlying processes of their involvement in EID management in a clinical context.

1.9 Research Questions

The central question for the present study is "How are emergency nurses involved in EID management?" which is supplemented by the following sub-questions:

1. What are the major events of emergency nurses' involvement in EID management?
2. What is the experience of emergency nurses during their involvement in EID management?
3. How do emergency nurses interact during their involvement in EID management?

1.10 Study Objectives

The study objectives are:

1. To describe the situations and tasks facing emergency nurses in EID management.
2. To identify the strategies and resources of emergency nurses involved in EID management.
3. To discover the process of how emergency nurses are involved in EID management.
4. To develop a substantive theory explaining how emergency nurses are involved in EID management.

1.11 Study Significance

An immense body of evidence from the previous literature has indicated there is increased attention on assuring the preparedness of healthcare institutions and facilities to handle epidemic events (Fauci & Morens, 2012; MacIntyre et al., 2015; Smith & Hewison, 2012). There has been increasing emphasis internationally, in both policy and practice, on incorporating the participation of policy-makers, administrators, and healthcare workers in promoting the quality and standard of infection management and control (MacIntyre et al., 2015). With the nursing profession constituting the majority of the healthcare workforce, nurses are frequently tasked with fronting the epidemic response (Lam et al., 2016). In an outbreak, emergency nurses are on the front lines of infection prevention and disease management, and AEDs take on a significant role responding to public health threats from EIDs by serving as the interface between the healthcare care sector and the community (Sugerman et al., 2011). In addition, the AED differs from other areas of nursing due to the inherently dynamic and unpredictable nature of the work environment, which is fraught with

distractions and interruptions (Hammad et al., 2012). The complex and unique nature of the workplace environment has created an overarching priority to examine the features of emergency nurses' involvement in EID management. Yet, the empirical evidence of the context and content of emergency nurses' participation in EID management has been scanty and is long overdue. Detailed explications of the unique conditions of the AED environment and emergency nurses' actions in an actual clinical context should be addressed, to direct initiatives for a greater understanding of this area.

This study serves as an avenue to explore and understand emergency nurses' involvement in EID management in a practice context. It is believed that the present study's findings can offer both practical and theoretical benefits in the realms of public health and nursing. From a practical perspective, this study is expected to lend support to furthering emergency nurses' competence in epidemic management. The present study's findings offer relevant information concerning the context that emergency nurses are situated in during an epidemic. This provides new insights into possible strategies that reinforce their capacity and preparedness in the face of similar situations in future EID management. Understanding emergency nurses' behaviors during an epidemic could shed light on the development of appropriate education and training to enhance their preparedness for EID management, which in turn could facilitate the prevention and control of EIDs in a public health response. In addition, the present study's findings could assist healthcare administrators and policy-makers in evaluating the nature and quality of the service delivered by emergency nurses during EID outbreaks. This could help inform the establishment of plans and actions to promote positive healthcare outcomes, as well as strengthen infection control and disease management. It is anticipated that the present study's results would also offer insight into the establishment of government policies and plans to reinforce emergency nurses' role in local public health responses to EIDs.

On the other hand, from a theoretical perspective, the findings extend the boundary of existing knowledge on emergency nurses' perceptions and experiences in EID management. The substantive theory, constructed during the present study's research process, delineates the underlying processes and linkages of the phenomenon of emergency nurses' involvement in EID management. It can serve as a theoretical framework to explain and predict the attitudes and behaviors of emergency nurses, offering direction for further study in the investigation of the impacts, roles, and duties of emergency nurses during an EID event.

1.12 Definition of Terms

1.12.1 Emerging infectious disease

Emerging infectious disease (EID) refers to an infectious disease that shows an upward trend in incidence and prevalence in humans in the recent past or foreseeable future, in excess of the usual frequency in a given area or among a specified group of people over a particular period. These diseases could originate from both newly recognized and re-emerging existing infectious agents that present with increasing frequency and geographic range (WHO, 2005a).

1.12.2 Emergency nurses

This study defines emergency nurses as nurses working in AEDs who provide direct patient care and implement infection control measures. These comprise staff nurses, advanced practice nurses, and nursing officers who work in an emergency care setting. Nurses at the management level, including ward managers and department operations managers, are mainly responsible for a department's operations, with limited participation in direct patient care. However, their views are also solicited in data collection and taken into

account in data analysis through theoretical sampling to offer further perspectives. Information about the method and procedure for theoretical sampling is presented in Chapter 3.

1.12.3 EID management

Due to the different manifestations and presentations of an EID, the present study defines the term EID management, in the broadest sense, as the nursing interventions involved in countering the problems associated with the presence of EIDs. In addition, the presence of EIDs refers to situations involving general concerns over a single EID or multiple EIDs. The present study uses terms such as "outbreak", "epidemic", and "epidemic event" interchangeably, despite subtle differences, to describe the notion of EID that draws the attention of emergency nurses.

1.13 Summary

This chapter provides a summary of the background information on emergency nurses' involvement in EID management. Accordingly, the present study's focus is on emergency nurses' experiences during epidemic events. The perceptions and behaviors of emergency nurses in the course of their participation in EID management are under scrutiny. It is anticipated that the present study's findings will offer relevant information to understand the process of emergency nurses' involvement. In addition, the study's results will provide insights into strategies to reinforce nurses' preparedness, and the surge capacity of healthcare facilities, in the future management of EID events.

1.14 Dissertation Organization

The overall study structure takes the form of six chapters, including Study Introduction (Chapter 1), Literature Review (Chapter 2), Method (Chapter 3), Findings (Chapter 4-9), Discussion (Chapter 10), and Conclusion (Chapter 11). This chapter provides an overview of the present study's background, and offers a preliminary understanding of the issues related to the role of emergency nurses during epidemic events. Chapter 2 begins by laying out the current understanding of issues associated with infectious disease management from the literature. Chapter 3 is concerned with the methodology used for this study, including the research setting details, such as research design, participants, data collection procedures, and data analysis strategies. Chapter 4 to Chapter 9 present the research findings, focusing on the key themes that concern emergency nurses' experiences and the process of their involvement in EID management. The findings are integrated with relevant literature and discussed in Chapter 10. Chapter 11 addresses the study limitations, summarizes the findings and reiterates the study contributions, and concludes with the implications and recommendations for nursing education, policy and practice, and further research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents an integrative review of the literature on nurses' involvement in emerging infectious disease (EID) management. The review seeks to achieve a preliminary empirical understanding of the impacts of EID on nurses, and the components constitute their capacity to participate in EID management. The information regarding these issues is examined to indicate the central themes surrounding the phenomenon of nurses' participation in managing EID events. Limitations in the literature are thereby examined and the knowledge gaps are identified. This chapter is organized into four sections. The first section delineates the scope and the areas of the literature review. The second section overviews the evidence of the impact of EIDs on nurses. The third section summarizes the major components of nurses' preparedness in response to an epidemic event. The fourth section highlights the deficiencies in the literature, and underlies the knowledge gaps to underpin the significance of the present study.

2.2 Scope of Literature Review

The present study conducted an integrative review of the literature on nurses' involvement in EID management. The literature review was ongoing and continued throughout the research process in order to relate this study's background and findings to existing concepts and knowledge of emergency nurses' participation in EID management. The researcher initially decided to conduct a literature review of studies pertaining to emergency nurses only. However, it was noted there was a paucity of existing evidence that

placed emphasis exclusively on emergency nurses. Thus, there was no particular restriction on the specialty of nurses in the selection of studies, in order to gain a broad understanding of the phenomenon under study. This literature review intended to explore the existing knowledge of nurses' participation in the management of EID events. It is identified in the literature that the existing evidence is largely focused on the challenges nurses face during an EID event. In addition, although there was a paucity of studies directly addressing the factors affecting nurses' preparedness and competence to participate in EID management, a large number of qualitative studies had implied valuable information pertaining to such an area, through an exploration of the experiences and perceptions of nurses in an epidemic response. Thus, this literature review was divided into two main sections. The first section demonstrates the results from the existing literature regarding the impact of EIDs on nurses during their involvement in EID management. The second section illustrates the components pertaining to their capacity to overcome the challenges they face while participating in EID management, derived from the findings of existing qualitative studies.

2.3 Empirical Understanding of EID Management

This literature review emphasizes obtaining a fundamental empirical comprehension of nurses' involvement in EID management. The existing evidence mainly focuses on addressing the impacts of EID on nurses, and their capacity to respond to EID outbreaks, which are delineated in the following sections.

2.3.1 Impacts of EIDs on nurses

This section examines the existing knowledge of the impacts of EIDs on nurses in practice. The literature search was conducted in a variety of electronic databases, including

Medline, PubMed, CINAHL, and EMBASE, covering English language sources published from January 2003 to September 2016, using the following keywords: “attitude”, “challenge”, “communicable disease”, “emerging infectious disease”, “epidemic”, “experience”, “impact”, “infectious disease”, “nurse”, “nursing”, “outbreak”, “pandemic”, and “perception”. To enhance a broad understanding of the issues surrounding the impacts of EID on nurses, both qualitative and quantitative studies were involved in the review. To ensure the relevance of the studies selected for subsequent review and appraisal (Polit & Beck, 2010), eligibility criteria according to the focus of this review were identified as follows: (i) the target population was nurses; (ii) the settings were hospital-based; (iii) the phenomenon was related to infectious disease outbreaks or epidemic events. Articles were excluded in this review if they were not in English, not published in peer-reviewed journals, or did not involve nurses in the sample or as participants. A list of 581 articles was retrieved after the search. Twelve additional articles were identified through manual searching of journals. The titles and article abstracts were independently screened by the researcher. Articles identified to be potentially relevant and eligible for the review were retrieved, while three duplicate articles across databases were excluded. The subsequent set of 83 articles was comprehensively reviewed in full-text for relevance to the aims of this review. In addition, reference lists of the relevant studies and publications were scrutinized for relevant citations. Disagreements on the inclusion or exclusion of articles in the review process were resolved by discussion between the researcher and supervisors. Of the 83 articles, 30 were excluded based on the inclusion and exclusion criteria. Three articles were excluded due to ineligibility after assessing full-text. The remaining 50 articles were identified to have fulfilled the search criteria and served the aims of this review. Thus, these 50 articles were retrieved for data analysis. The results of the literature search and review have highlighted three major aspects

surrounding the issue, which are impacts on individual wellbeing, impacts on the individual capacity for work, and impacts on service provision.

2.3.1.1 Impacts on individual wellbeing

2.3.1.1.1 Vulnerability to infection. Much of the literature on the impacts of EIDs on nurses focuses on the adverse influence of disease on nurses' health and wellbeing. It is suggested from the literature that the major impact of an EID on nurses is associated with occupational exposure to infectious disease during the course of an outbreak. Findings from various studies have identified an elevated infection rate in nurses during EID events. For example, Booth et al. (2003) identified that nurses constituted the majority of cases in the severe acute respiratory syndrome (SARS) outbreak. A small-scale study by Wise et al. (2011) reported that nurses were significantly susceptible to influenza infection during the H1N1 pandemic in 2009. In addition, in a recent study (Olu et al., 2015) of Ebola virus disease (EVD) transmission in hospital workers, it was identified that over half of the infections occurred in nurses, despite the fact that they had previously been trained in infection prevention. Indeed, the threat to safety from EIDs is a concern for the majority of nurses. It is suggested that nurses' perceived occupational risk of EID exposure was high. Koh et al. (2005) compared the levels of risk perception of SARS infection in healthcare workers, and identified that nurses showed a significantly higher perceived risk of infection compared to healthcare workers in other disciplines.

Nurses' risk perceptions of contracting EIDs were affected by a variety of factors. For instance, in various studies, nurses considered physical exposure to patients with confirmed or probable infection to be the major risk factor for EID infection in the course of their work (Cheong et al., 2007; Imai et al., 2008; Tzeng & Yin, 2006; Wong et al., 2008). A possible explanation for the perceived risk of occupationally acquired infection among nurses, as

suggested by Loeb et al. (2004) in their study of SARS infection in critical care nurses, was that nurses are frequently engaged in high-risk patient care activities during routine clinical practice. These patient care activities, such as suctioning, nasogastric feeding, and intubation of infected patients, can put nurses at risk for infection. In addition, nurses' practice settings are considered to significantly affect their perceived occupational risk of infection. Emergency nurses were frequently cited to demonstrate additional perceived risks for contracting an infection (Parmeggiani et al., 2010). It is also reported that emergency nurses found themselves particularly vulnerable and susceptible to infections during an EID outbreak (Lam & Hung, 2013; Venkat et al., 2012). As suggested by Venkat et al. (2012), emergency nurses' perceptions were associated with the additional risk embedded in the practice of emergency care, in which they constitute the public health frontline of defense in the course of an outbreak. Indeed, the environment of accident and emergency departments (AEDs) is commonly considered a high-risk workplace, where emergency nurses are prone to outbreak exposure (Wu et al., 2013).

2.3.1.1.2 Work-related stress. A considerable body of literature has been published on nurses' EID management work-related stress. These studies suggest that large-scale outbreaks of infectious disease are often associated with elevated occupational stress levels in nurses. For instance, Wu et al. (2013) examined the psychological impact of the SARS epidemic on nurses in Mainland China, and identified that the nurses who participated in the management of SARS showed higher levels of occupational stress when compared to those without SARS exposure. In addition, the authors revealed that nurses' stress was associated with the workplace environment and working conditions. It was reported that nurses who worked in high-risk locations, such as SARS wards or AEDs, were prone to suffering from psychological distress. This group of nurses was also found to experience persistently high posttraumatic stress symptoms because of frequent workplace exposure to SARS (Wu et al.,

2013). Moreover, a recent study on emergency nurses' occupational stress during an outbreak of Middle East respiratory syndrome coronavirus (MERS-CoV) demonstrated that the experience of participating in outbreak management was considered a traumatic event because of their exposure to the disease. The results also showed that work-related stress from caring for MERS-CoV-infected patients was significantly associated with a substantial level of exhaustion and burnout among emergency nurses (Kim & Choi, 2016).

Apart from the stress resulting from exposure to communicable diseases, intense workloads during an EID event are also regarded as another primary source of job strain among nurses. It is commonly reported that nurse staffing levels are insufficient to address public need for healthcare services during epidemic events. Chan-Yeung (2004) suggested that the issue of frontline nurse understaffing in Hong Kong had further deteriorated due to the huge patient load during the course of the SARS outbreak. A similar situation was reported in a cross-sectional study by Vinck et al. (2011), in which the majority of frontline nurses and other healthcare workers underscored the problem of staffing shortages and high workloads during the H1N1 influenza pandemic. Moreover, understaffing was found to be associated with healthcare-associated infections and transmission during EID outbreaks (Stone et al., 2004). These findings in the literature suggest that participating in EID management could adversely impact occupational stress in nurses.

2.3.1.1.3 Stigmatization. Existing literature suggests that nurses often face stigmatization during EID outbreaks. It is reported that discriminatory attitudes towards nurses might exist and persist in communities during an epidemic due to public fears of contracting a communicable disease that is fatal, incurable, and highly contagious, such as EVD (McMahon et al., 2016). This finding was echoed in a study on the impact of the SARS outbreak on frontline healthcare workers, which reported that nurses experienced severe

stress that intensified with disconnection from the community (Maunder et al., 2003). In a study conducted by Koh et al. (2005), it was shown that nurses in Singapore were subjected not only to social isolation from communities, but also ostracism by their peers and families because of possible SARS exposure. Styra et al. (2008) used a survey to assess the various impacts of the SARS outbreak on healthcare workers in Canada, and also identified that nurses involved in EID management could be stigmatized by family members due to the fear of infectious disease. A comparative study of the perceived impacts on primary and tertiary healthcare workers by Wong et al. (2008) also reports that a sense of increased social isolation was reported by nurses at the time of an avian influenza pandemic in Singapore. These findings suggest that the social stigma of nurses and healthcare workers in other disciplines during an EID outbreak is a global and cross-cultural issue. In addition to social stigma, evidence suggests that nurses might consider deliberate withdrawal from social engagement during an EID outbreak, to avoid spreading disease (Nickell et al., 2004). The study reveals that a portion of nurses attempted to "self-quarantine" during the SARS outbreak by staying in hospital for a prolonged period after work in order to minimize the risk of transmitting the disease to household members and the public. Although self-quarantining could be an effective way to eliminate exposure to communicable diseases to significant others, nurses who adopt this method must endure the psychological impacts of social isolation, such as anxiety and depression (Rambaldini et al., 2005; Straus et al., 2004). The above evidence has highlighted the impact of EIDs on nurses, which includes adverse effects not only on their physical health and workload, but also on their socio-psychological wellbeing.

2.3.1.2 Impacts on individual capacity for work

2.3.1.2.1 Willingness to work. It is often assumed that nurses will stand fast and remain in their professional positions in a public health crisis. Indeed, several studies examining the stance of healthcare workers, in terms of willingness to work, have found they would be willing to remain in their posts in an epidemic event (Balicer et al., 2006; Koh et al., 2005; Styra et al., 2008; Tzeng & Yin, 2006). For example, Shiao et al. (2007) conducted a questionnaire study during the SARS outbreak and found that over 90% of the participating nurses perceived it was their responsibility to comply with their duty in caring for SARS patients. Damery et al. (2009) used a survey to assess the likelihood of nurses continuing to work during an influenza pandemic, and suggested that nurses' willingness to respond was grounded in their perceived obligation and responsibility to care for others, even in difficult circumstances. A number of studies have reported similar findings, indicating that nurses' willingness to work could originate from the recognition of their duty to work and care for others, with patient welfare outweighing their own (Imai et al., 2008; Wong et al., 2008). In addition, Martinese et al. (2009) evaluated the attitudes of nurses and other healthcare workers during an influenza pandemic, and identified that the work settings could be associated with their willingness to work during an influenza pandemic. The results suggest that nurses who were working and had worked in emergency departments showed a higher level of risk acceptance and demonstrated a greater willingness to work. The authors explained that the positive attitude of emergency nurses, despite the risk of exposure to disease, could be associated with their awareness of their role in response to an epidemic event.

However, discrepant evidence exists in the literature questioning the attitudes of nurses and other healthcare workers in an EID outbreak. Findings from several studies have

identified that a majority of healthcare workers were apprehensive about their safety, and would consider absenteeism as a method to minimize the risk of infection (Garrett et al., 2009; Nap et al., 2007). In their quantitative study, Imai et al. (2005) noted that a majority of nurses in Japan showed reluctance to provide service to patients with SARS, with more than a quarter even stating their intention to resign. Consistency was found in a recent study by Wong et al. (2008), in which approximately 70% of the nurses in the study were unwilling to look after SARS-infected patients. Previous research findings on healthcare personnel absenteeism also concluded that an absentee rate as high as 30% would be anticipated during a major public health event (Ofstead et al., 2017). Due to the adverse influence of a high nurse absentee rate on the normal functioning of healthcare service provision, planning should be done well in advance to mitigate the problem of nurse absenteeism in the event of an EID outbreak.

2.3.1.2.2 Competence at work. In order to promptly respond to the public health threat of EIDs, it is of paramount importance to ensure nurses' competence in responding to events surrounding an outbreak. Several studies have emphasized the importance of adequate training to equip nurses with the necessary knowledge and clinical skills for EID management. These studies have suggested that in an outbreak, nurses who were familiar with infection control were more capable of overcoming challenges, such as working in a stressful environment and communicating with patients and their families (Cheong et al., 2007; Hope et al., 2011; Ma et al., 2011). However, in terms of EID management, training provision by hospitals and knowledge acquisition by nurses might not necessarily be congruent. Ma et al. (2011) analyzed data from 21 intensive care units in 17 provinces in Mainland China, and found that although approximately 90% of nurses reported they had completed an infection control training program on influenza pandemic management, only one-third were confident in their knowledge and ability to handle an epidemic event. The

authors further elaborated that regular auditing of nurses' knowledge and skills in EID management should be implemented to assess the effectiveness of training programs on nurses' competence in an epidemic response. Cheong et al. (2007) also noted that healthcare institutions have properly addressed the essentiality of infection control concepts in clinical routines by offering nurses and other healthcare workers adequate and appropriate infection control training. Likewise, Cutter and Jordan's survey study (2004) indicated that the majority of hospital employees acknowledged the importance of infection control measures when taking precautions against disease. Ironically, despite consistency in valuing the relevance of infection control measures, Cutter and Jordan pointed out in the same study that frontline nurses' adherence to infection control recommendations in their daily practice was unsatisfactory. Previous studies have also identified that emergency nurses' compliance with precautionary measures was inadequate, despite the inherent hazards of disease exposure (Low & Wilder-Smith, 2005; Nichol et al., 2008). Nickell et al. (2004) pointed out that nurses' inadequate compliance with infection control measures could stem from the perceived inconvenience of adhering to the guidelines in their daily routines. Similar findings were reported from a qualitative study by Lam and Hung (2013), in which infection control measures were described as "troublesome" and "time-consuming" by emergency nurses.

In addition, the literature suggests that nurses' work-related self-efficacy should be taken into account to evaluate their capability of addressing public health concerns during an EID outbreak. Evidence in the literature suggests the existence of a strong association between occupational self-efficacy and proficiency in nurses' practical healthcare performance (Stergachis et al., 2011). In their study, Ko et al. (2004) discovered that frontline nurses with previous epidemic experience were more likely to report stronger occupational self-efficacy in EID management. Sugerman et al. (2011) agreed that the accumulation of experience across various EID outbreak scenarios would strengthen nurses' perceived

preparedness. Stuart and Gillespie (2008) provided an explanation that frontline nurses consider the skills and knowledge acquired from previous experience in handling infectious disease to be practical and clinical-based, enhancing their ability and confidence in handling subsequent outbreaks. These findings indicate that previous experience in managing epidemic events would enable nurses to develop clinical and perceived proficiency in EID management.

2.3.1.3 Impacts on service provision

2.3.1.3.1 Surge capacity. Healthcare facilities are required to build and sustain the capacity to serve an influx of patients and cope with increases in demand for healthcare services during an epidemic event (Lautenbach et al., 2010). While staffing and resources are the imperative components for addressing sudden surges and ensuring the smooth operation of service provision, a number of studies have indicated that hospital staff shortages are common during EID outbreaks. Chan-Yeung (2004) pointed out that the hospital understaffing issue among nurses and other healthcare workers significantly impeded the operation of healthcare service delivery during the SARS epidemic. In their cross-sectional study, Vinck et al. (2011) also identified the problem of staffing shortages during the H1N1 influenza pandemic, when the majority of frontline nurses and other healthcare workers were reported to be exhausted by excessive workloads and overtime work. Similar findings appear in a qualitative study exploring the experiences of emergency nurses during the H1N1 influenza pandemic, which imposed an enormous burden on emergency nurses (Lam & Hung, 2013). The findings also reveal that the general public regarded emergency departments as a platform to obtain information about the influenza outbreak, while emergency nurses considered that responding to these inquiries to be extra work in an emergency care setting.

Apart from the understaffing problem, several studies identified that hospitals were under-resourced in addressing the elevated demand for healthcare services. Recent evidence suggests that pandemic supplies, especially in developing countries, are inadequate due to budget limitations, leading to the occasional interruption of medical resources, such as personal protective equipment (PPE) provision. For example, Kilmarx et al. (2014) reported inadequate PPE supplies in Sierra Leone during the 2014 EVD outbreak. However, the problem of inadequate PPE provision confronting nurses and healthcare workers is not confined to developing countries; rather, such a situation has been identified in developed countries as well. In an investigation into pandemic planning and preparation, Rebmann and Wagner (2009) found that PPE availability in healthcare facilities in the United States was severely limited in the initial phase of the H1N1 influenza pandemic outbreak, putting frontline nurses and healthcare workers at risk of disease exposure and infection. In addition to PPE inadequacy, previous research has found that isolation facilities in healthcare institutions were insufficient to serve patients' increased needs during an EID outbreak. Hung (2003) examined the surge capacity of healthcare facilities in Hong Kong during the SARS outbreak, and found that aside from an acute shortage of PPE for frontline healthcare workers, there was also a paucity of standard isolation facilities and proper ventilation systems in several Hong Kong hospitals to properly serve the population's needs in a large-scale public health emergency. These findings highlight the importance of effective staffing and resources allocation during an epidemic event, to sustain healthcare facilities' surge capacity.

2.3.1.3.2 Information dissemination. Another important related issue in the literature concerns information dissemination within healthcare facilities. It is suggested that effective dissemination of outbreak information, such as outbreak progress and severity, the transmission mode of the infectious agent, and the corresponding infection control measures

and guidelines, would enable healthcare workers to develop the required psychological preparation for the disease situation, especially at the beginning of an outbreak when information availability is severely limited (Maunder et al., 2003). In their study on the experiences of nurses and healthcare workers participating in influenza pandemic management, Balicer et al. (2006) also revealed that effective communication of epidemic information within healthcare facilities could enhance healthcare workers' proficiency and confidence in disease management. Ko et al. (2004) drew a similar conclusion in their study, as the findings indicate that nurses who were provided with sufficient information demonstrated increased knowledge and self-efficacy in caring for SARS-infected patients. However, although the majority of healthcare facilities recognize the importance of timely information dissemination, evidence suggested that the amount of information provided to healthcare workers by healthcare facilities was excessive. For instance, a qualitative study by Lam & Hung (2013) revealed that a vast amount of information, which emergency nurses considered to be excessive and redundant, was circulated in the emergency department during the H1N1 influenza pandemic. In the same vein, in their study, Enanoria et al. (2013) identified rapid and frequent modifications to infection control guidelines and advice during an influenza pandemic. Such rapidly changing information led to confusion among nurses about the recommendations. In addition to information overload, it is suggested that information received by healthcare workers during an EID outbreak could be inconsistent, because of the different information sources. Inconsistency in information could lead to nurses and healthcare workers mistrusting all advice and updates, adversely influencing their judgment in making clinical decisions (Levin et al., 2007). This evidence highlights the importance of maintaining the effective communication of essential information during an epidemic event, while information containing recommendations and advice should be precisely selected from trusted sources.

2.3.1.3.3 Morale level. Previous research has examined the deterioration of nursing staff morale during an epidemic event. Several studies pointed out that nurses' morale was hampered due to the heavy workload and stressful work environment they experienced during EID management (Imai et al., 2008; Lam & Hung, 2012; Wong et al., 2008). Research has suggested that low morale among nurses could impede their willingness to work during large-scale public health emergencies (Harapan et al., 2017). Poor workplace morale is also associated with the likelihood of absenteeism among nurses (Damery et al., 2009). Offering financial incentives was considered an effective strategy to boost the morale of frontline healthcare workers in order to maintain a motivated workplace environment. Indeed, this method was widely cited in the literature as a means of motivation (Martin et al., 2013; Irvin et al., 2008). In their study, Ko et al. (2004) addressed the significance of offering financial incentives, highlighting that the reported morale among frontline nurses and healthcare workers in other disciplines would be improved with the provision of monetary compensation by their employer. As a result, the willingness of healthcare staff to work during the SARS outbreak would be strengthened, along with staff morale. In contrast, a qualitative study by Lam and Hung (2013) revealed that, instead of tangible rewards, the emergency nurses opted to receive recognition from the healthcare facility where they worked. In their study on nurses' attendance at work, Irvin et al. (2008) also noted that during a potential avian influenza pandemic, financial incentives were not an effective motivator for those who perceived a high occupational risk of disease exposure. Opposing views of financial incentive preferences could stem from the uniqueness of contextual culture in different work settings. Thus, healthcare facilities are recommended to maintain effective communication with employees in order to address their needs and preferences when devising plans to bolster staff morale.

2.3.2 Nurses' preparedness in response to an epidemic event

The review of literature in this section emphasizes nurses' preparedness to respond to an epidemic event. As mentioned in the previous section, an epidemic event would exert a profound and adverse impact on nurses. Considering that an EID outbreak could be both abrupt and unpredictable, it is therefore crucial that healthcare personnel, particularly nurses, be readily available to adhere to best practices in EID management, and fully prepared to cope with the corresponding impacts of EIDs before and during an outbreak. In seeking to generate text-based understanding of a phenomenon to provide a detailed description of the predominant issues identified from a body of literature, a systematic search and narrative synthesis of qualitative empirical studies was conducted to identify the core elements of nurses' preparedness in managing EIDs. Through examining the findings in published qualitative studies, which mostly consist of direct quotations from participants, the researcher in the present study obtained conceptual notions of relevant descriptions pertaining to the study phenomenon. This enhanced the researcher's sensitivity to possible events and issues that emergency nurses might face in the process of EID management (Popay et al., 2006). In addition, reviewing qualitative studies allowed the researcher to explore the boundaries surrounding the study phenomenon, which offered insights into the limitations and knowledge gaps in the existing literature. This allowed the researcher to reframe the research questions to address the particular aspects of the phenomenon under study (Strauss & Corbin, 1998).

The search of literature published between January 2003 and September 2016 was conducted in October 2016. Four electronic databases, namely Medline, CINAHL, BNI, and EMBASE, were searched using the following terms identified from the title, abstract, keywords or medical subject headings: "avian flu", "Ebola", "epidemic", "EVD",

"experience", "H1N1", "H5N1", "infectious disease", "influenza", "MERS", "Middle East respiratory syndrome", "nurse", "outbreak", "pandemic", "perception", "public health emergency", "qualitative", "SARS", "severe acute respiratory syndrome", "swine flu". To ensure the relevance of the studies selected for subsequent review, eligibility criteria according to the focus of this review were identified: (1) the targeted population should be nurses; (2) the context should be in a hospital setting; (3) the phenomenon should be related to infectious diseases or epidemic events; and (4) the study designs should be qualitative approaches. Articles were excluded if they involved healthcare professions other than nursing conducted in community care settings, or were written in a language other than English. Again, disagreements about the inclusion or exclusion of articles in the review process were resolved by discussions between the researcher and supervisors. Of the 178 articles, 166 were excluded based on the inclusion and exclusion criteria. After assessing full-text, five articles were further excluded due to ineligibility. The remaining seven articles were identified to have fulfilled the search criteria and served the aims of this review. Thus, these seven articles were retrieved for data analysis. The narrative synthesis resulted in nine codes for which three major themes were developed: personal resources, workplace resources, and situational influences. These themes had a consistent focus on nurses' preparedness in responding to an epidemic event, which became the overarching theme of the review.

2.3.2.1 Personal resources

2.3.2.1.1 Knowledge and skills. The knowledge and skills required to respond to an epidemic event were featured in several studies as the foundation of personal resources in developing preparedness to manage infectious diseases. Liu and Liehr (2009) found that knowledge of infectious diseases, in terms of disease manifestation and protective measures for preventing infection, was associated with the perceived and actual caring capabilities of

nurses to address patient needs in service delivery during an epidemic event. In other words, the nurses appeared to show a higher level of confidence and competence in caring for infected patients. In the same vein, the study by Shih et al. (2009) identified the necessity of sufficient knowledge of nurses' practices in their daily routines during outbreaks, particularly in the areas of the sources and modes of infection and infection control measures. In addition, O'Boyle et al. (2006) provided evidence that insufficient knowledge of disease agents and precautionary practices for infection control could elicit anxiety and panic in nurses. Although the actual level of knowledge deficit and the consequences for patient care were not indicated, the study reported that the individuals experienced an elevated risk of infection, with their perceived capability to prevent disease transmission among patients adversely influenced.

2.3.2.1.2 Previous experience. Of importance for nurses developing their preparedness for an epidemic event is the finding that previous experience in managing infectious disease outbreaks is an important component. Koh et al. (2012), Lam and Hung (2013), and Liu and Liehr (2009) found that nurses perceived themselves to be at a higher level of preparedness as a result of previous outbreak experience. Their improved preparedness was demonstrated in a variety of ways, including advanced knowledge and skill in meeting the complex health needs of infected patients (Koh et al., 2012; Lam & Hung, 2013; Liu & Liehr, 2009); a greater psychological readiness to cope with future epidemic situations (Koh et al., 2012; Lam & Hung, 2013; Liu & Liehr, 2009); and a heightened awareness of the standard of infection control practice, as shown by improved adherence to precautionary measures (Koh et al., 2012). Their improved preparedness might be a result of the corresponding training provided to nurses in responding to previous outbreaks, as well as their increased familiarity with infection control practices accumulated from experience in epidemic management. Another possible explanation, as reported by Koh et al. (2012), is that

the nurses had a higher level of risk acceptance of infectious disease as a result of previous experience in similar situations. However, it is possible that nurses with previous experience of epidemic events might tend to underestimate the seriousness of an impending outbreak. Arguably, although not explicitly addressed in these studies, there are hints in the findings showing the likelihood of this underestimation. Koh et al. (2012) reported that nurses might consider the Human Swine Influenza pandemic to be mild and to present with minimal severity as "it is just a normal new type of flu and you can just take a prescription for five days, then you'll recover" (p.199). It is apparent that the participant possessed an inaccurate impression of the disease, which might have led to a suboptimal attitude and practice in responding to the contagion. To understand the influence of previous outbreak experience on nurses' preparedness for future epidemic events, this particular area deserves further attention.

2.3.2.1.3 Professional value. A recurrent theme in the reviewed studies is a sense among nurses that their professional value would affect their preparedness. In these studies, a variety of terms were used by participants to describe the value, which included "responsibility to care" (Chung et al., 2005; Koh et al., 2012; Lam & Hung, 2013), "virtue" (O'Boyle et al., 2006), and "professional nursing role" (Shih et al., 2007). Lam and Hung (2013) and O'Boyle et al. (2006) both noted that the professional value of nurses regarding the duty of care is associated with the willingness to respond in an epidemic event. Similarly, Koh et al. (2012) reported that nurses viewed the nursing profession not merely as a job, but rather as a responsibility to serve the public that compelled them to report for work, despite the threat of contracting a contagious, potentially fatal disease. This willingness indicated nurses' greater risk acceptance in the course of an outbreak. Moreover, Chung et al. (2005) revealed nurses' concerns about the challenges of balancing their professional duty and personal safety in the hazardous working environment of an outbreak response, stating that

their intention to respond to a large-scale epidemic emergency could be adversely influenced. Shih et al. (2007) supported this view, noting that in addition to personal safety concerns, caretaker responsibility would also confront nurses in carrying out the responsibilities of their role, as they might possess the impression that they "need to sacrifice [themselves] even at the cost of losing all [their] family [and] children's future" (p. 174), leading to avoidance of the problem situation. These findings suggested that the nurses' professional values, despite being a major facilitator of their willingness and preparedness to work, could be prone to challenge during an infectious disease outbreak.

2.3.2.2 Workplace resources

2.3.2.2.1 Peer support. Regarding the workplace resources that were associated with nurses' preparedness, the importance of a supportive relationship between coworkers in the workplace environment is noted in four of the selected articles (Chung et al., 2005; Liu & Liehr, 2009; Shih et al., 2007; Shih et al., 2009). Chung et al. (2005) identified the fact that nurses were motivated by an atmosphere of "non-hierarchical team spirit" (p.515) across multiple disciplines in the workplace, which resulted in a greater intention to respond to an epidemic event, as a high degree of collegiality would be generated under such conditions. Respondents in Liu and Liehr's (2009) study also mentioned a similar perspective on peer support in terms of "the friendship on the battlefield" (p. 2886) to describe how staff worked together and supported each other in maintaining morale during an infectious disease outbreak. Shih et al. (2009) revealed that peer support among nurses commonly took the form of psychological support, such as verbal encouragement and appreciation. In addition to psychological support, tangible support was also cited in the study, in which nurses took the initiative to share each other's care burdens, to ensure the quality of care in the midst of an enormous workload on all fronts. Shih et al. (2007) also noted the cohesion among nurses in

striving for a high standard of care delivery, as they would share successful and unsuccessful frontline care experiences with each other, in order to improve the effectiveness and efficiency of the interventions provided to patients.

2.3.2.2.2 Effective leadership. The articles suggested that nurses' competence and preparedness for outbreak responses largely depends on the quality of workplace leadership that presents a particular combination of roles. One of the roles suggested by Chung et al. (2005) was that nurse leaders should serve as an adviser to guide practice, notably on issues that were inconsistent and unfamiliar to nurses, such as new guidelines on infection control and new interventions required when caring for infected patients. O'Boyle et al. (2006) also mentioned the prime importance of effective leadership in providing direction to nurses in managing an infectious disease outbreak, while the disease situation was embedded in uncertainty. In addition, Shih et al. (2009) reported the communicator role of nursing leaders, citing nurses' expectations of leaders in conveying the needs of frontline personnel to administrative levels or higher authorities. However, these articles identified inadequacies in nursing leadership and responsiveness during an epidemic event. These roles might not be adequately realized by nurse leaders, resulting in confusion and frustration among frontline nurses in the management of EID (O'Boyle et al., 2006; Shih et al., 2007).

2.3.2.2.3 Support from higher authorities. In addition to peer and leader support, the significance of resource provision in nurses' preparedness for outbreak management was emphasized in the reviewed articles. O'Boyle et al. (2006) and Lam and Hung (2013) underlined that provision of adequate resources and equipment during outbreaks was the fundamental responsibility of healthcare institutions. However, respondents in the study by Shih et al. (2007) commented that infection control material and personal protective equipment provided by authorities was insufficient. Given the vital importance of these

resources in daily practice for infectious disease management, quality of care was adversely affected, as cited by the nurses in the study. Moreover, Lam and Hung (2013) identified the inadequacy of support from administration with particular reference to staffing, highlighting the issue of staffing shortages in meeting increased service needs during pandemics. The authors further indicated that even if extra workers were occasionally allocated, the new staff were barely trained with the required skills in infection control practice, and thus, their capacity for infectious disease management was hampered. It is worth noting that the findings grouped in this theme indicate that the resources provided to nurses in infection outbreak responses were either unavailable or, where they were provided, were inadequate, despite their importance to nurses' daily practice.

2.3.2.3 Situational influences

2.3.2.3.1 Information availability. The importance of information on disease situations was evident in several studies, regardless of the type and scale of epidemic event. Chung et al. (2005) reported that the disease situation of an outbreak was embedded in considerable uncertainty, while relevant information about the infectious disease and the corresponding management, which included the nature of the pathogen, the mode of transmission, and the diagnostic test and treatment regimen, was not readily available to frontline nurses. According to the respondents, this continuance of uncertainty during an epidemic event induced confusion and insecurity in nurses, adversely influencing their feelings of competence and willingness to perform in outbreak management. This view was echoed by Shih et al. (2007), whose study indicated that nurses were worried about their capability to handle infectious patients, as the information imparted by the government and hospitals regarding policies and facilities to combat infectious disease was inconsistent, particularly at the beginning of an outbreak. A possible explanation for the continued

uncertainty was mentioned in both Lam and Hung's (2013) and Chung et al.'s (2005) work, which identified that there were frequent modifications to, and updating of, information on protocols and guidelines on responding to the new infectious disease. These frequent changes impeded nurses' understanding of the procedures and interventions required in the infectious disease outbreak response, consequently hampering their competence in epidemic management.

2.3.2.3.2 Disease severity. Given the substantial occupational risk of contracting an infection, one key situational factor that might have considerable impact on nurses' preparedness for outbreak response is the severity of the disease. It was reported in O'Boyle et al.'s (2006) and Koh et al.'s (2012) articles that an infectious disease with high severity could create anxiety and fear among nurses. Although these negative emotions might not necessarily result in a refusal to work, the nurses in the studies indicated that induced psychological disturbance at work might negatively affect their morale and attitude towards caring for infected patients. According to Koh et al. (2012), nurses' perception of the severity of an infectious disease mainly stemmed from the lethality of the disease in terms of death toll, as well as disease susceptibility with the number of confirmed cases of infection. In addition to nurses' judgment on the seriousness of the disease, Shih et al. (2009) noted that the media might portray a prevailing epidemic in a way that might exaggerate the situation, as "reporters repeatedly stressed the increasing numbers of deaths … rumors about the epidemic reported by the media soon spread throughout" (pp. 3394-3395). The authors revealed that along with nurses' knowledge and understanding on the severity of an infectious disease, their perceptions were largely influenced by messages disseminated in the mass media.

2.3.2.3.3 Public's perception of the diseases. In addition to nurses' perceptions of infectious disease, public perceptions would also influence their preparedness and actual work in outbreak management. With regard to public perception, the panicked response of the community to outbreaks of infectious disease was noted in four studies, which, from the respondents' perspective, delineated an overreacting public (Lam & Hung, 2013; O'Boyle et al., 2006; Shih et al., 2007; Shih et al., 2009). According to the articles, this tense atmosphere not only burdened nurses with added emotional stress, but also introduced a substantive workload into their practice. It is indicated in O'Boyle et al.'s (2006) study that a panicked public might affect healthcare service delivery, as people might "overwhelm the usual triage system for patient admission and flow and compromise work environment security" (p.354). In addition, Lam & Hung (2013) and Shih et al. (2007) reported that nurses had to perform extra work reassuring patients and their family members, and settling patient complaints about long wait times, on top of the already overwhelming patient care tasks resulting from increased patient attendance.

2.4 Summary of the Reviewed Studies

Previous studies have identified the potential impacts of EID events on nurses, offering insights into understanding the events and issues that nurses might encounter in the course of an epidemic event. It is discovered that the impacts may originate from a variety of sources, including personal resources, workplace resources, and situational influences. In this review, the nature of the disease was considered to be a major element constituting the impact of an EID event on nurses. Given the highly contagious nature of EIDs, it was reported in the reviewed studies that nurses might be concerned about the risk of disease exposure and infection at work. The infectiousness and virulence of an EID could further

adversely affect nurses' willingness to participate in outbreak management. These features of an EID could account for the social stigmatization and isolation of nurses, derived from the overwhelming dread of contracting an EID among communities. Apart from the nature of the disease and its particular situation, nurses' working conditions were found to be influential on their practice in managing an epidemic event. For example, it was identified that the demand for healthcare services increased profoundly during a pandemic, creating a stressful work environment and imposing additional job strain and workload. Another relevant notion identified in this review was workplace morale, which might be hampered in the course of an outbreak, and could consequently impede nurses' motivation towards their work. In addition, healthcare facility management style was found to be imperative in understanding the impact of EIDs on nurses. The literature showcased that nurses' perceived confidence and competence in managing an EID situation was associated with the training offered by healthcare facilities, while the surge capacity of healthcare services during an outbreak was mainly determined by the effectiveness of resources allocation, such as staffing and medical equipment. Moreover, the strategies adopted by healthcare facility management, in terms of information dissemination and communication with frontline healthcare workers, could influence nurses' adherence to recommendations and guidelines on infection control and disease prevention.

In addition, the literature review offers background information on the relevant concepts for exploring the components that constitute nurses' preparedness for participating in EID management. In a similar vein to the evidence on the impact of EIDs on nurses, the existing literature recognizes that the establishment of nurses' preparedness emanates from the interplay between personal factors, workplace conditions, and situational considerations. It is suggested in the literature that nurses' confidence in managing an outbreak would hinge on their knowledge and skills in infection control and disease management, which could be

acquired not only through education and training, but also through the accumulation of experience in handling similar epidemic events. While knowledge and skills can provide nurses with the ability to participate in EID management, nurses' professional values and work attitudes have been noted in this review to be important, in terms of their willingness to work during an EID outbreak. In addition to personal factors, the literature has also highlighted the importance of working conditions in terms of nurses' competence in managing an epidemic. According to the literature, relationships between colleagues at different hierarchy levels are key to developing a collaborative effort to cope with the challenges posed by EID outbreaks. Support from coworkers and assistance from higher authorities are regarded as the main determinants of their motivation and intention to work in the face of pressing frontline needs during an outbreak. Furthermore, in several studies, an epidemic disease situation was found to be associated with nurses' preparedness for managing epidemic events. For example, disease information that was provided to nurses would determine their understanding of the EID, and determine their familiarity with the correct disease management practices. In addition, disease severity, whether perceived by nurses or the public, can create a workplace environment that shapes nurses' willingness to be involved in EID management.

2.5 Knowledge Gaps in the Reviewed Studies

In the above review, the literature has conceptually sensitized the researcher to areas and aspects that warrant particular attention. In the review, the issues surrounding nurses' involvement in EID management suggest that the examination of their experience must include consideration of the practice context in which their work is situated. Accordingly, the context is constituted of the environment in which nursing care practice occurs, such as the

specific working conditions, work settings, and disease situations. This implication has shed light on the significance of understanding the experience and practice of emergency nurses in an outbreak.

Although there is a paucity of research on emergency nurses' involvement in epidemic response, existing evidence in the review suggests that the context of emergency care would forge their involvement in EID management in a unique manner. This could be because of the specific characteristics embedded in the emergency care work environment, such as the elevated risk of disease exposure during work, and the proximity of AEDs and communities. On account of the fact that much of the research has tended to consider nurses as a collective group of healthcare workers, the contextual elements in the emergency care setting, and their influences on emergency nurses' perceptions and experience in EID management, remain speculative. This constitutes a major gap in understanding frontline emergency nurses' practice in the face of the exceptional danger, risk, and hardship associated with EID management in AEDs. This research was conducted to fill this evidence gap, as one of the present study's major purposes was to elucidate emergency nurses' role and the underlying processes involved in their participation in EID management in an emergency setting.

Apart from the constituents of the emergency care context, there remain several aspects of emergency nurses' involvement in outbreak response about which relatively little is known. Despite a large number of studies conducted to examine nursing practice during the course of an epidemic, the nature of their extended and expanded role in EID management is not well understood. Previous studies have not treated nurses' interpretations and perceptions of their role in EID management in any detail. Consequently, this might lead to difficulties in obtaining an in-depth understanding of nurses' attitudes and behaviors during an epidemic

event, and become a barrier to addressing the antecedents or factors pertaining to their decision-making and work practices in an epidemic response.

Also, the interactions between emergency nurses and the practice contexts during EID management is still unclear. Most studies in the field have not dealt with the dynamic and interactive nature of nurses' participation in coping with their duties in EID management. Instead, the research to date has tended to consider the phenomenon as discrete events that are linear and static. What appears prominent in the review is the dearth of literature on the actual processes involved when emergency nurses participate in EID management, along with changes in disease situations over time. When the fundamental phenomenon of why and how emergency nurses participate in the issues and events pertaining to EID management is still unknown, existing research findings regarding their involvement appear to be isolated and inconsistent. It is the purpose of this study to identify the dynamic process of how emergency nurses are involved in EID management. By examining the perceptions, experiences, and behaviors of emergency nurses, this study aims to fill the knowledge gap concerning the processes emergency nurses serve in their roles, in the context of an epidemic response. The present study offers relevant information that contributes to the growth of available knowledge in this important area, underpinning the evolving nature of the processes behind the development of emergency nurses' capacity to serve in their extended EID management role. It is anticipated that issues hindering emergency nurses' practice during an outbreak could then be addressed, shedding light on the development of interventions that could effectively support emergency nurses in fulfilling their duties.

Furthermore, the review reveals that the vast majority of studies exploring emergency nurses' involvement in EID management have been descriptive in nature. Most studies of nurses' experiences in an epidemic have only reported findings depicting the difficulties they

encountered in practice and the associated outcomes, while several researchers have attempted to approach the corresponding abilities and strategies nurses have developed to cope with those challenges. However, none of the studies under review appear to derive the phenomenon theoretically.

2.6 Summary

To conclude this chapter, the literature identified the challenges facing nurses in an EID response. From the impact on individuals, it is found that healthcare personnel were unavoidably exposed to occupational hazards of nosocomial infection and demonstrated an increased infection rate. Psychological and emotional disturbances could be observed in healthcare workers as a result of an excessive workload. They would also experience social bias from their social network due to the potential for disease transmission. From the impacts on institutional functioning, the inadequacy of their willingness and readiness for work was revealed, with poor compliance with infection control measures. From the impacts on managerial capacity, the surge capacity of healthcare institutions has been challenged due to the inadequacy of resources. It was also discovered that information communication within healthcare institutions was suboptimal. In confronting the outbreak of disease, staff motivation had been undermined and low staff morale was reported. In addition, the synthesis of the literature generated three interplaying themes, which are personal resources, institutional resources, and situational influences. It is suggested that an effective outbreak response would require further effort in reinforcing the interplay between individual nurses, healthcare institutions, and governments, which included providing education and training to nurses regarding infectious diseases, fostering institutional assistance and support in an outbreak, and revising government policies and planning. In the literature, the determinant of

emergency nurses meeting the challenge of infectious disease has received less attention. Thus, in view of the profoundly significant role played by emergency nurses in infectious disease management, there is a need for future studies to describe the experiences and events as emergency nurses respond to EID events. This has highlighted the present study's significance and objectives in addressing a research literature gap in the progression of the process of emergency nurses' involvement in EID management.

CHAPTER 3

METHOD

3.1 Introduction

This chapter comprises two main sections that detail the present study's research method and design. The first section delineates the philosophical considerations in adopting grounded theory as the method of inquiry. In this section, the theoretical basis of grounded theory is introduced, and the justifications for employing grounded theory in the present study are discussed. This is followed with an explanation of selecting the Straussian approach in conducting the inquiry. The philosophical stance of the researcher, as well as the researcher's background in the research area, are then illustrated. The second section addresses the practical considerations of applying grounded theory in the present study. In this section, the research processes and procedures, such as sampling procedures, data collection strategies, and analytical processes, are reported. In addition, trustworthiness and ethical considerations in the present study are discussed.

3.2 Grounded Theory as the Method of Inquiry

In this section, the theoretical basis of grounded theory, which serves as the method of inquiry in the present study, is described. Also, the rationale for adopting this approach is presented. In addition, the selection of the Straussian approach of grounded theory is explained. The researcher's philosophical stance and background are then delineated.

3.2.1 Theoretical basis of grounded theory

This study adopted a grounded theory approach as the underpinning paradigm to explicate the experience of involvement in managing emerging infectious diseases (EIDs), as described by emergency nurses. Grounded theory has its roots in the qualitative research paradigm, which emphasizes the exploration of participants' perceptions and experiences in understanding a particular social situation or event about which very little is known (Fraenkel & Wallen, 2003). In the same vein, grounded theory attempts to uncover the involvement of individuals through the exploration and interpretation of their perspectives and meanings within a social phenomenon (Locke et al., 2014). More specifically, this approach supports the interpretation of roles and interactions among participants within the embedded realities of a phenomenon, where the circumstances are understood by individuals as a set of concepts (Mello & Flint, 2009). Therefore, the process of investigation within the grounded theory approach is embodied in the exploration of meanings and concepts held by participants towards a social situation. In other words, grounded theory intends to establish an understanding of human activities in a social phenomenon using conceptualization (Bryant & Charmaz, 2010).

The theoretical perspective of grounded theory stems from the interpretive paradigm of symbolic interactionism (Annells, 1996). According to Mead (1962) and Blumer (1986), the epistemological position of symbolic interactionism hinges on three fundamental postulates. First, from the symbolic interactionist perspective, individuals act towards objects in the environment, such as persons, inanimate objects, and events, based upon the meanings they attribute to these objects. Second, the meanings of objects are social products that emanate from social interactions between individuals. These meanings are embodied by means of symbols, including words and language, then circulate among individuals through

communication. Third, individuals modify and internalize the meanings conveyed to them to acquire interpretative understanding towards the objects. Individuals' behaviors then result, on the basis of their interpretations towards the objects they encounter in everyday life. These postulates highlight that a symbolic interactionist perspective emphasizes the "minded" and "reflexive" nature of individuals (Blumer, 1969, p.81), depicting that humans are purposive agents who are goal-oriented. Their behaviors and tactics are based upon their understanding or, in other words, conceptualization of events and situations they encounter (Chenitz & Swanson, 1986). Considering the interpretive process of humans in deriving meaning and deciding actions, it is suggested that individuals are constantly engaged in dynamic and iterative processes of social interactions that shape both meaning and actions (Charmaz, 2006).

In contrast with the deductive approach for theory building in the positivist paradigm, grounded theory is developed through abductive reasoning, which emphasizes the discovery of plausible explanations for a phenomenon from empirical data (Coffey & Atkinson, 1996). Grounded theory attempts to depict, elucidate, and conjecture the development of a dynamic social process stemming from the reality of the social world (Meleis, 2011). In addition to offering a theoretical understanding of the phenomenon of interest, this research approach is also considered to be appropriate to transcend abstraction and shed light into offering pragmatic solutions to social problems. Practical recommendations could be derived from the findings to solve problems that concern the participants (Strauss & Corbin, 1998).

In grounded theory, conceptualization is accomplished by eliciting from empirical data the meanings, variations, and patterns of participants' interactions under real-world circumstances (Charmaz, 2006; Glaser & Strauss, 1967; Strauss & Corbin, 1998). The empirical data is scrutinized at various stages of concept formation, concept development,

concept refinement, and concept integration (Strauss & Corin, 1998). For the focus of grounded theory, it is principally on the explanation of situational events and discovery of dominant social processes within a particular phenomenon (Strauss & Corbin, 1998). Considering that a situational event mainly concerns the ongoing activities of the participants involved, the grounded theory approach targets revealing the dynamic process of ongoing interactions among participants within context (Benoliel, 1996). In order to elicit the theoretical description of steps and stages, concepts are connected according to their characteristics and relationships, resulting in the revelation of antecedents, manifestations, and consequences of the process from the participants' perspectives (Charmaz, 2006). These interrelated concepts are subsequently formulated into a sophisticated network of well-developed categories, with orders and sequences derived from statements of relationships (Strauss & Corbin, 1998). Refinement of the network permits the establishment of theoretical boundaries for delimiting its scope, which consequently contributes to the development of an explanatory scheme of the phenomenon of interest (Morse & Field, 1996). This explanatory scheme is considered the end product of this research approach, which is a substantive theory (Glaser & Strauss, 1967; Lincoln & Guba, 1985; Strauss & Corbin, 1998). This mid-range theory can offer applicable analytic explanations of the phenomenon under study, as it is grounded in the data and emerges from the social context (Bryant & Charmaz, 2010).

3.2.2 Justifications for selection of grounded theory

Grounded theory is particularly useful in attaining the goal of this research, which is the exploration of the process of emergency nurses' involvement in the management of emerging infectious diseases (EIDs). This research method offers an effective way to understand the process of how emergency nurses engage in an epidemic response, as it permits the generation of rich data on emergency nurses' subjective experiences in this area.

A grounded theory approach offers deep insights into the dynamic nature of the process of emergency nurses' involvement, which little is known about. As mentioned in the previous chapter, the existing knowledge of nurses' participation in an infectious disease outbreak is noticeably linear and static, and largely emphasizes describing the scenarios they encounter at work. In order to understand the dynamic interaction of emergency nurses' involvement in EID response, grounded theory provides a means of discovering the key conditions, in terms of concepts and categories, that constitute the occurrence and development of the involvement process emergency nurses may experience in real-life situations. By adopting a grounded theory approach as the method of inquiry, the interaction process among emergency nurses can be captured, which contributes to the understanding of how they are involved in shaping their beliefs and behavior patterns in accordance with EID situations.

The method can also highlight the importance of the involvement context and sustain the view that the context, which is derived from the emergency nurses' appraisal of the situation while managing an EID, is fundamental to the understanding of events, participants' roles, and their interactions. This is of particular relevance for the present study, as the involvement context is ambiguous for emergency nurses due to the transitory nature of disease situations, which change from time to time and from disease to disease. Adopting grounded theory as the method of inquiry allows a remarkable insight into the understanding of key social influences and relationships pertaining to participants' interactions within the situational context. This would enhance the unfolding of the complexity and variety of the social context of emergency nurses' involvement in EID management.

As a research method, the ultimate goal of grounded theory, as mentioned previously, is to develop a substantive theory grounded in participants' experience. In the present study, the potential theory could be considered an interpretative framework to delineate the

attributes and patterns of emergency nurses' work practices in coping with issues emerging from an EID outbreak. Also, the theory could serve as an explanatory scheme that provides a means of explanation and prediction for the phenomenon of how emergency nurses are involved in EID management. These understandings and explanations might contribute to the development of pragmatic and practical plans with relevance to the nursing profession and future epidemic response, based upon this substantive theory. In other words, adopting grounded theory in the present study would be practicable in "paving the way for action and change" (Glaser, 1992 p.14). This indicates the appropriateness of the use of grounded theory in the present study to shed light on possible recommendations to improve emergency nurses' participation in EID management in a practice context.

3.2.3 Selection of grounded theory approach: Straussian approach

One important consideration in adopting grounded theory as the method of inquiry is the selection of an approach that best fits the nature of the research problem and research objectives. It is not the intention of this section to track the history of grounded theory development, or spark debates over the paradigmatic differences of different approaches. The focus would be on the development of grounded theory, the methodological characteristics of the main divisions of grounded theory approaches, and the advantages in employing the Straussian approach in the present study.

Grounded theory was initially systematized as a research method of inquiry in the publication of "The Discovery of Grounded Theory" in 1967, which was the collaborated effort of two American sociologists, Barney Glaser and Anselm Strauss (Glaser & Strauss, 1967). Their intention on developing this research method was to bridge the gap between theory and empirical research through the establishment of a theory that can be of pragmatic relevance in real-world situations (Glaser & Strauss, 1967). As its name implies, this research

method emphasizes that the theory is originated in and emerged from the reality of the participants being studied; in other words, the theory is "grounded" in the data (Aldiabat & Le Navenec, 2011).

The partnership between Glaser and Strauss ended several years after the book was published. After the separation, the two originators continued to develop and mature the grounded theory methodology, which consequently led to the emergence of two different branches. The Glaser's version of grounded theory, usually described as the Glaserian approach or classic grounded theory, emphasizes the objectivity and neutrality of a researcher in conducting a grounded theory research (Glaser, 2007). It is suggested in the Glaserian approach that a researcher must approach the field of inquiry with openness, and eliminate preconceptions before and during the research process. It is suggested that the Glaserian approach treats data as information separate from both participants and researchers, highlighting the natural emergence and neutral discovery of a theory (Mills et al., 2006). The Strauss's version of grounded theory, which is described as the Straussian approach or evolved grounded theory, is the collaborative work between Anselm Strauss and an American nurse researcher, Juliet Corbin. Unlike the Glaserian approach which intensely places emphasis on researchers' objectivity, the Straussian approach acknowledges researchers' interpretation and reflexivity in the understanding of a phenomenon being studied. In other words, the interpretive influence of researchers on the data is considered an inevitable component in understanding a phenomenon in a research process (Hallberg, 2006). In addition to the Glaserian and Straussian approaches, Kathy Charmaz has introduced a later version of grounded theory, namely constructivist grounded theory (Charmaz, 2006). This approach highlights that a phenomenon is being understood through the co-construction of concepts of participants and researchers, and the end-product of grounded theory is a

narrative which reflects the perspectives of both the participants and researchers (Hallberg, 2006).

In conducting a grounded theory study, the Glaserian approach (Glaser, 2007) and the Straussian approach (Strauss & Corbin, 1998) are the approaches that are most frequently used in offering a methodological framework for research. In the present study, the Straussian approach is employed and adhered to throughout the research process (Strauss & Corbin, 1998). There are significant divergences between the Glaserian and Straussian approaches with regard to the operational procedures in applying the research method. For example, the two approaches take different views on the issue of reviewing literature. In the Glaserian approach, researchers are advised to refrain from a literature review of the area under study before commencing research, to prevent contamination of the findings by the findings from the existing literature. It is claimed that this enables the theory to emerge exclusively from the data, without imposing researchers' personal preconceptions (Glaser, 1978). On the other hand, the Straussian approach suggests that researchers engage with the existing literature throughout the research process, as it would help direct the principal focuses of research and enhance the researchers' sensitivity in the research area (Strauss & Corbin, 1998). The Straussian approach permits the researcher to properly identify the knowledge gap in the field of study before commencement. This approach also facilitates establishing the study focus by delimiting the general problem area with the use of existing literature (Hickey, 1997).

The two approaches also diverge in their stances on the procedures of data interpretation. The Glaserian approach may not provide adequate or clear guidelines on the process of data analysis (Glaser, 2007). Instead, the analytic procedures are implicit and notional, with the implementation relying heavily on a researcher's sensitivity towards the data (Glaser, 1992). On the other hand, the Straussian approach offers analytical steps for

data analysis with the provision of a "coding paradigm" (Strauss & Corbin, 1998), described in detail in the subsequent sections of this chapter. Although there are criticisms that these steps are strict and complex (Glaser, 2007; Ng & Hase, 2008), the detailed framework of data interpretation supports the procedural operations of the data analysis process, which might help in establishing the plausibility and completeness of the findings while preserving the intertwined and dynamic nature of the theory (Becker, 1993; Wilson & Hutchinson, 1996). Indeed, it is mentioned by the authors that the set of analytical steps is intended to support the data analysis process, with researchers able to implement the steps with flexibility, instead of through strict adherence (Strauss & Corbin, 1998). Considering the divergent methodological stance of the two approaches, the present study adopts the Straussian approach, which is considered to be sufficient and appropriate in addressing the research questions and easing the research process.

3.2.4 Philosophical stance of the researcher

The researcher adopted a symbolic interactionist approach to guide the understanding of the phenomenon of emergency nurses' involvement in EID management. Adopting the symbolic interactionist perspective in the present study supports the examination of connotations and presentations of the interactional strategies emergency nurses employ in managing an outbreak. This enabled the researcher to explore in what way emergency nurses interact with the contexts, such as patients, colleagues, or disease situations, in the process of outbreak management. In addition, as symbolic interactionism places emphasis on the function of symbols in conveying, circulating, and creating meaning in the course of communication among individuals (Annells, 1996), particular attention is directed to uncover the symbolic meanings and metaphors used by emergency nurses in the data to identify specific cues that imply particular cognitive, affective, or behavioral interactions. It is

considered that this conceptual perspective offers a means of ascertaining the basic processes of how emergency nurses make sense of their experience throughout the process of their involvement. Consequently, this would facilitate the exploration of the discovery of the substantive theory underlying the process. Indeed, the symbolic interactionism is logically compatible with grounded theory in addressing the interactional processes behind a phenomenon under study (Bryant & Charmaz, 2010).

Also, the interpretive focus of symbolic interactionism provides a coherent framework in understanding emergency nurses' practice at work. As mentioned above, symbolic interactionism emphasizes the discovery of participants' interpretations and interactions within a phenomenon, highlighting the imperative nature of individuals' participation in experiencing a situation, articulating the meanings of divergent objects in the context, and deciding the actions to take with respect to the objects' meaning (Blumer, 1969). This theoretical orientation of symbolic interactionism delineates that participants in a phenomenon would, whether intentionally or unintentionally, engage in the interpretative process of conception and decision (Taylor et al., 2015). When this stance is applied in the present study, it would assist in clarifying the connections between emergency nurses' behaviors and the commands from hospitals and departments in managing EID. While emergency nurses practice and work within the context of the accident and emergency department, it is the interpretation of the individuals that determines actual behaviors in the face of an outbreak, instead of workers mechanically executing predetermined protocols and guidelines.

In addition to the discovery of the interpretative process of interactions among emergency nurses in the course of EID management, the perspective of symbolic interactionism also supports the identification of the influence of the sociocultural

environment on participants' experience and behaviors. Although symbolic interactionism emphasizes individual interpretation in making sense of a phenomenon, the relevance of recognizing the influence of the phenomenon's characteristics in the background is also accentuated. The different aspects of the phenomenon, referred to in grounded theory as conditions and situations, are considered to be influential in shaping how individuals interpret their environment (Annells, 1996). These contexts often constitute variations of individuals' perceptions and actions towards the phenomenon (Strauss, 1987). In the present study, one of the primary objectives is to capture the multifactorial constituents influencing emergency nurses' experience and their behavior patterns in managing EIDs, as this would contribute to understanding the dynamic and intertwined nature of the involvement process. Adopting symbolic interactionism as the philosophical stance in this research would enable a comprehensive understanding of the influence of the context, such as disease situation and work environment, on emergency nurses' involvement in managing an outbreak.

3.2.5 Researcher's background and experience in the research area

In order to ensure the resulting theory of the present study is grounded in the data, it is essential to address the researcher's background and experiences in the field related to the research area. Like other approaches of qualitative inquiry, the researcher is considered to be the major instrument in the research process (Denzin & Lincoln, 2003). Therefore, the researcher's personal and professional experiences in the field of inquiry could include preconceptions on the phenomenon of interest, which could influence the research process and products (Bowen, 2006; Ramalho et al., 2015). It has been asserted that these presuppositions pertaining to the area under study should be minimized or eliminated, to avoid imposing bias upon the research products and to ensure the natural emergence of the theory within the data (Glaser, 1992). However, this notion has been challenged, because it is

unlikely for researchers to completely eliminate their previously acquired knowledge of the research area and exclude their preconceptions and subjectivity throughout the research process (Meek, 2003; Sullivan, 2002; Weber, 2003). Indeed, a researcher plays an influential role throughout the entire research process, for example, on topic selection, sample recruitment, data collection, and data analysis (Mruck & Breuer, 2003). On the other hand, a researcher's personal and professional experience on the researched phenomenon could be considered favorable to the emergence of the theory (Clarke, 2005). Existing knowledge might offer the researcher increased awareness in identifying symbolic meanings within the data. These meanings are often implicitly embedded within the participants' language in the form of jargon, slang, and metaphors, which could be confusing without previous exposure to the study area (Morse, 1994). Thus, instead of disregarding and excluding a researcher's presence in grounded theory, emphasis should be made to critically apply the existing understanding to ensure the groundedness of the resulting theory (Thornberg, 2012).

In the present study, the researcher would unavoidably possess pre-existing understanding of the area of inquiry - how emergency nurses participate in epidemic events - because of the researcher's previous work experience as an emergency nurse participating in EID management. The researcher's familiarity with the field of emergency nursing and epidemic responses has advanced the researcher's sensitivity to subtle and nuanced ideas within the data. The researcher's previous experience has also promoted insights into situations and contexts where the phenomenon of interest occurs. In addition, the researcher's background has provided a comparative base for exploring and contrasting the concepts within the data. In sum, such prior experience and knowledge of the research area has consequently enhanced the conceptualization of the phenomenon and facilitated the emergence of a substantive theory grounded in the data. To improve the researcher's reflexivity and favor the research data over preconceived ideas and bias in the discovery of

the theory, various strategies have been adopted, such as employing constant comparison, using reflexive journals, and writing memos. These analytic strategies will be detailed in the subsequent sections of this chapter.

3.3 Grounded Theory and its Application to the Present Study

The following section illustrates the procedural operations of the implementation of grounded theory addressing the present study's research questions. In addition, ethical considerations in conducting this study are delineated to ensure that participant rights are protected throughout the research process. Strategies in enhancing the trustworthiness of the research process and findings are also described.

3.3.1 Settings

The study was conducted in Hong Kong for an array of distinctive characteristics in socioeconomic and historical features that show relevance to the general problem of the present study. As one of the most densely populated regions in the world, the overcrowded living conditions in Hong Kong put citizens at risk of rapid infection transmission. It is also suggested that the populous city is a potential breeding ground for new strains of pathogenic microorganisms (Kilbourne, 2006). In addition, as one of the world's busiest commercial and financial centers, the huge volume of passenger throughput in Hong Kong could exacerbate the spread of infections by provoking the global circulation of communicable diseases (Wong & Lai, 2003). Indeed, Hong Kong has been documented throughout history for its frequent involvement in large-scale EID outbreaks. For example, the earliest documented human infection of H5N1 avian influenza in the year 1997 (Peiris et al., 2007) and the Hong Kong flu pandemic in 1968 (Kilbourne, 2006) indicate that Hong Kong is susceptible to the

invasion of communicable diseases. Even worse, in the course of the severe acute respiratory syndrome (SARS) outbreak in 2003, Hong Kong was regarded as one of the main places of origin that was responsible for the global spread of the disease (Breiman et al., 2003). These facts underscore the necessity of strengthening the capacity of Hong Kong's healthcare system and the preparedness of its healthcare personnel for EID management. It is anticipated that the present study will offer practical insights into this aspect.

This study was conducted in an emergency care setting, with the practice environment confined to the accident and emergency departments (AEDs) in regional acute care public hospitals in Hong Kong. The public hospitals in Hong Kong which are managed by the Hospital Authority are assigned into seven hospital clusters based on geographical locations, namely, Hong Kong East Cluster, Hong Kong West Cluster, Kowloon Central Cluster, Kowloon Eat Cluster, Kowloon West Cluster, New Territories East Cluster, and New Territories West Cluster. Since the range of services of each hospital cluster is established with the consideration of the specific healthcare needs within the same geographical setting, the operations of hospitals and the scope of healthcare service delivery could vary from cluster to cluster (Hospital Authority, 2018). It was anticipated that there would be diversity among the AEDs in terms of practice patterns, managerial policies, and patient populations. As mentioned previously, context is of paramount importance in influencing the interpretation process of participants in making sense of situations, and the variations in attributes of the research sites would support capturing the manifestations of the phenomenon of interest in a comprehensive manner (Creswell, 2013). In other words, more perspectives could be considered in exploring the process of emergency nurses' involvement in managing EIDs by soliciting information from emergency nurses in multiple emergency care settings.

3.3.2 Participants and eligibility

Participants were selected and recruited by considering their knowledge of the research area: emergency nurses' involvement in EID management. The researcher recruited nurses who were keen to share their views and experience in epidemic response, and were willing to express themselves (Morse & Field, 1996). Registered nurses who worked on a fulltime basis in an accident and emergency department in Hong Kong, and who could understand and communicate in Cantonese, were therefore invited to participate. Part-time emergency nurses were excluded from the study because their work during epidemics was on a voluntary, not a mandatory, basis. Emergency nurses with different levels of experience and ranking were invited, to offer multiple perspectives in exploring the phenomenon of their involvement in epidemic response. By doing this, it enables the richness and variation of the manifestations of the phenomenon to be captured (Strauss & Corbin, 1998). Emergency nurses who were eligible to participate were invited. A total of 26 emergency nurses from 12 local AEDs participated in the study. Details of the participations' demographic characteristics are presented in Chapter 4.

3.3.3 Sampling

3.3.3.1 Sampling strategies

Upon commencing this grounded theory study, it is of paramount importance for the researcher to remain open to the data in unfolding the attributes and patterns of the phenomenon under study (Hansen, 2009). Thus, the selection of participants in sample recruitment should start with eligible individuals who are "information-rich" and willing to express their views, as this supports the gathering of primary insights into various events and issues at the beginning of a study (Patton, 2002, p. 264). Therefore, a purposive sampling

method was employed as the initial strategy for the participant recruitment process. This technique is a non-probability sampling method, in which the selection of individuals to participate in a study would hinge on the researcher's judgments on the richness and relevance of information in relation to the research area (Streubert & Carpenter, 1995; Yin, 2011). In the present grounded theory, this technique permitted the selection of emergency nurses on the basis of their knowledge, perceptions, and experiences in the course of EID management, which contributed to the vastness and richness of the data (Creswell, 2013). The first 10 participants were recruited using a purposive sampling method to offer an overall description of events-based situations from their experience in managing EIDs.

Apart from the above-mentioned 10 participants who were purposively sampled, the other 16 consecutive participants were chosen on the basis of a theoretical sampling strategy. Theoretical sampling is a systematic and cumulative participant recruitment method, which is considered the major impetus to the progression of data collection and analysis process in the development of a substantive theory (Glaser, 1998, p.157). In theoretical sampling, researchers would proceed with concurrent data collection and data analysis, and take into account the emerging concepts in the data to determine subsequent areas for further exploration (Glaser, 1978; Morse & Field, 1996). Thus, participant recruitment principally depends on the researchers' evolving understanding of the phenomenon of interest, in terms of the outcomes of the data analysis (Glaser & Strauss, 1967; Morse, 1994). The sampling method emphasizes delimiting individuals or events to explore the properties and dimensions of concepts arising from the data analysis (Bryant & Charmaz, 2010). This is of particular importance in a grounded theory study, in which the discovery of the attributes and patterns of emerging concepts would help to advance the comprehensiveness of the developing theory (Stern, 1996).

Therefore, the initial participant recruitment was conducted and targeted to generate broad descriptions to illuminate emergency nurses' experience in EID management. As the concept emerged from the data, the researcher acquired insights into the phenomenon and developed sensitivities to guide further subject recruitment and data collection. This process marked the transition of the recruitment strategy from a purposive to a theoretical sampling method. This allowed the collection of data to be concentrated on relevant aspects, and enabled the necessary in-depth investigation into the phenomenon with each additional piece of data (Strauss & Corbin, 1998). For instance, although this study mainly targeted frontline emergency nurses' experiences in managing an epidemic outbreak, participants at the managerial level (ward managers and department operation managers) were also invited, because of the relevance of the influence of administration style on frontline emergency nurses' practice that addressed in the emerging concepts in the data. These findings had driven the directions for theoretical sampling, and thus the perspectives of administrators and managers were solicited to promote an understanding of the phenomenon. Another example of the application of the theoretical sampling strategy was the recruitment of emergency nurses who worked in a hospital which had been designated an infectious disease center. From the descriptions of the first 10 participants, it was recognized that patients with suspected EID infection from other hospitals would be transferred to the AED of the infectious disease center after preliminary assessments, suggesting the possibility of a unique set of practices and experience of emergency nurses in the AED of the infectious disease center. Thus, emergency nurses who worked in that hospital were invited to participate in the present study. The detailed information and procedures on data collection and data analysis are illustrated in later sections.

3.3.3.2 Sampling procedures

As mentioned previously, participant recruitment was exclusively orientated to emergency nurses. Emergency nurses who were potentially eligible for the present study were identified from multiple sources, such as the researcher's personal network, colleagues' recommendations, and participants' recommendations. In the initial phase of participant recruitment, potential participants were largely identified among previous co-workers of the researcher. As new concepts emerged with data analysis and participants with particular attributes were to be investigated, the researcher solicited suitable participants by seeking recommendations from acquaintances and colleagues, who were provided with a list of the criteria defining the characteristics of a required individual. In addition, participants who joined the study were asked for referrals of eligible individuals, especially when the subsequent recruitment targeted those with similar backgrounds. For example, at the request of the researcher, a participant (P4), who had described the unfavorable working environment of the AED she worked in, introduced another emergency nurse (P8) in her AED to join the study to offer more information on the influence of different workplace aspects on emergency nurses' practice in managing EIDs.

The researcher attempted to contact eligible individuals in personal networks, either by email or by phone, to inquire about their inclination towards participating in the study. For those with whom the researcher was not acquainted, the researcher sought assistance from the persons who had offered the recommendation, asking them to obtain verbal consent from potential participants by providing contact information, such as an email address, to the researcher. The researcher provided information on the study to eligible individuals for their consideration, and to establish further communication with those who agreed to participate. The information provided to potential participants included the research study background,

purpose, data collection procedures, and consent process, which was condensed into an information sheet (see Appendix I). A consent form was also delivered to the participants, asking them to indicate their willingness to voluntarily participate by signing the form (see Appendix II). The researcher then collected the consent forms, mainly on the dates indicated for data collection. Data collection was conducted afterwards in the form of face-to-face interviews. The interview procedures and arrangements are illustrated in later sections.

3.3.3.3 Sample size

Like other qualitative studies, there are no specific standards for the exact number of participants required to conduct a grounded theory study. As mentioned by Creswell (2013), the sample size of grounded theory studies often ranges from 20 to 30. However, aside from the number of participants included in grounded theory research, the concept of theoretical saturation is the criterion for consideration in deciding sample size. Theoretical saturation is an important indicator for the analytic procedures, marking the comprehensiveness of concept development (Strauss & Corbin, 1998). It also indicates the completeness and coherence of a developed theory that is ample in addressing the research question (McCraken, 1988). Achieving theoretical saturation also features a comprehensive inclusion of concepts, properties, dimensions, and relationships in the phenomenon of interest (Baker et al., 1992). According to Strauss and Corbin (1998), theoretical saturation in a grounded theory research study can be considered to be reached when there is no additional relevant information that has emerged from the data analysis, and the concepts and categories are amply unfolded to showcase patterns of properties and dimensions. Additionally, the relationships among categories within the developed substantive theory should be properly established and validated if theoretical saturation is to be achieved. In the present study, the repetition of concepts and categories continued to occur after the collection and analysis of

data from 26 participants, while no additional concepts or categories were yielded. Also, the substantive theory was considered to be adequately developed after discussions between the researcher and supervisors. Theoretical saturation was contemplated to be reached at this point, and thus the selection and recruitment of participants ceased. The findings and the substantive theory emerging from the data are presented in Chapter 4 to Chapter 9.

3.3.4 Data collection method and procedure

3.3.4.1 Data collection method

In the present study, data were collected through individual face-to-face interviews. Conducting in-depth interviews is considered to be the most frequently used data collection method in qualitative studies (Winpenny & Glass, 2000). Conducting interviews enables the researcher to obtain detailed and specific empirical data from participants' narratives, in which aspects that require further elaboration can be probed. It is also suggested that interviews, if conducted properly, would support the extraction of participants' personal experiences and perceptions. This enhances and advances the in-depth exploration of concepts and meanings concealed in their conversations (Mason, 2002). Considering that grounded theory and symbolic interactionism emphasize understanding the meanings that are conveyed and circulated in the language used by participants involved in a phenomenon (Annells, 1996), conducting interviews is considered to be appropriate in capturing participants' conceptual notions. Hence, interviews were utilized in this grounded theory study to elicit participants' views and opinions.

Interviews are an interactive and flexible method that allows researchers to gather information from participants' narratives and conversations (Mason, 2002). In-depth information, especially concerning personal experience and perception, can be adequately

extracted through interviews (Fontana & Frey, 1998; Mitchell & Radford, 1996; Mullen, 1985). By allowing uninterrupted speech and interested attention on the part of the interviewer, interviews can effectively aid in understanding individuals' thoughts and actions under certain circumstances (Fontana & Frey 1998; Mitchell & Radford, 1996). One of the main rationales for using interviews in this study was their interactive and generative potential (Mason, 2002). The interview approach allowed areas of interest to be probed as they arose to unearth relevant data and add depth and detail. In attending to each participant's unique interpretation of practice over the course of EID management, each interview provided a different narrative eliciting a range of theoretical insights.

The interviews were semi-structured, with participants guided by non-directive and open-ended questions to stimulate their thoughts and opinions on aspects related to the phenomenon of inquiry. Instead of using the same set of questions in an interview guide, the researcher reviewed the nature and focus of the questions and amended the guide to enable in-depth exploration of areas of emerging concepts that warranted further attention. In the early stage of data collection, the interview guide mainly targeted broad topics related to emergency nurses' everyday practice experiences in the course of an epidemic. With the progression of the research process, the question guide developed to focus on aspects that required further elaboration. Examples of the interview guides used in two interviews (P2 & P25) are attached in Appendix III.

3.3.4.2 Data collection procedure

Data collection was conducted from November 2014 to January 2016. Once verbal consent was obtained from eligible individuals, meetings were arranged with each participant to conduct face-to-face interviews. Interviews were arranged at a location according to the participant's preference. Several participants opted to conduct interviews in a conference

room near their department, while some preferred to have the interview held outside of the hospital. Thus, a number of interviews were conducted in locations such as discussion rooms in public libraries or interview rooms at the researcher's university. In addition, two interviews were conducted in recreational areas near the participants' homes, as they wanted to share their thoughts in a comfortable and relaxed manner. In such cases, participant privacy and confidentiality were maintained by confirming there were no other people at that location at the time of the interview. The length of each interview ranged from 55 minutes to three hours.

Prior to each interview, the researcher, who also served as the interviewer, allocated time for non-interview dialogue, such as introductions and the study background, covering the study scope and purpose. Written informed consent was obtained from participants before the commencement of each interview, and participants were reminded of their right to withdraw from the research and the right to confidentiality. Consent for making an audio-recording of the interview was also explained and obtained. In comparison with taking hand-written notes, the use of audio recording in interviews is recommended, as it could facilitate participant observation and provide detailed information for subsequent analysis (Zhang & Wildemuth, 2009). In addition, the researcher sought participant approval for gathering basic demographic information for the purpose of referencing and supporting data analysis. The demographic characteristics of participants are presented in Table 4.1. The information sheet and consent form used in this study are attached in Appendix I and Appendix II.

In each interview, the researcher attempted to stay responsive and reflective and maintain a conversational and dialogical tone to stimulate spontaneous responses from the participants. Minimal interruption and framing were ensured to encourage the participants to articulate their opinions within the boundaries of the phenomenon under investigation. In

terms of applying the interview guide, the questions were designed to begin with broad and general topics with minimal predetermined directions, to ensure that participants were able to speak their mind without restriction. Interview probes were used to follow up abbreviated areas from the dialogue and stimulate the participants in offering information with as much detail as possible. This could encourage participants to further elaborate on their views and opinions, and clarify ideas and notions that were implicit (Barriball & While, 1994). Additionally, asking follow-up questions supported the discovery of variations and patterns in participants' perceptions and behaviors (Lincoln & Guba, 1985). The interview probes took the form of neutral and nondirective follow-up questions, such as "Can you tell me more about that?", "It appears to me you are saying [term of phrase], is that correct?", or "Do you always act/feel this way?" To ensure that the concepts emerging from the interview data were free from the researcher's personal preconceptions, the researcher endeavored to eliminate preconceived biases regarding the phenomenon of interest by putting aside assumptions and expectations of participants' perspectives, and remaining non-judgmental of the data throughout the research process (Stern, 1996). By doing so, it warranted that the meanings and concepts emerged from and were grounded in the data (Strauss & Corbin, 1998).

In addition to messages and cues embedded in conversation, awareness and sensitivity towards non-verbal communication between the researcher and participants was maintained in the course of the interviews. Thus, field notes were taken to document observations and impressions after each interview. The case-based field notes primarily recorded non-verbal cues from participants' expressions, which included their emotions and gestures during the interview. The researcher's reflections on feelings about the participant and interview were also described in the field notes. It is suggested that field notes are a relevant data source to supplement the interpretation of embedded meanings in participants' dialogue (Bryman & Bell, 2003; Lofland & Lofland, 1984; Mulhall, 2003). Incorporating field notes in the data

analysis could support an in-depth understanding of the participants' experience and perceptions. Moreover, the field notes were included in the audit trail of the present study, serving to portray the progress of how concepts or categories emerged from the data and providing transparency to the research process (Byrne, 2001).

3.3.5 Data management

Before analyzing the data collected from the interviews, the materials were required to be processed to promote their usability in interpretation. After the interviews, information from multiple sources was gathered, including the audiotaped interviews, field notes, and participants' demographic characteristics.

To preserve the data's original characteristics and meanings, the audiotaped interviews were transcribed verbatim for later data analysis. Apart from the dialogue, interjections and significant pauses during interviews were recorded in the transcription to supplement the textual materials with participants' sentiments, which assisted the researcher in better capturing the meaning of participants' expressions (Morse & Field, 1996). Once a transcription of an interview was completed, the interview script was checked against the audiotaped interview to confirm the completeness and accuracy of the transcribed information.

The field notes, as mentioned above, could provide important information in illuminating abstract and implicit areas within the data (Mulhall, 2003). Relevant non-verbal communications of participants, including emotions and gestures, were recorded in the transcription alongside their dialogue to connect the verbal and non-verbal information in data interpretation. In terms of the researcher's insights, the field notes are about the impressions of meaning and the characteristics of participants' experiences in EID

management. The reflective information was assigned as the "profile" of each participant, and constantly compared to that of others to retrieve properties and dimensions regarding the phenomenon under study. The details of the data analysis strategies and constant comparison are presented in the next section.

Basic participant demographic data were also gathered to support data analysis. In a grounded theory study, participant demographic characteristics might shed light on areas that warrant particular attention, which then offer direction for further theoretical sampling (Strauss & Corbin, 1998). Also, the researcher often took note of participants' demographic data when performing data analysis, in an attempt to identify similarities and variations in their notions and actions towards the phenomenon. For example, the present study identified that emergency nurses' years of work experience were seemingly related to certain work practices, such as adherence to infection control measures. Findings of the present study are presented in Chapter 4 to Chapter 9.

3.3.6 Data analysis

Data analysis in grounded theory is a process in which researchers develop a conceptual understanding of the phenomenon under study (Morse & Field, 1996; Steeves & Kahn, 1995). During data analysis, the meanings and concepts of interview data are interpreted from the participants' perspectives. The comprehension of the research area is advanced with the discovery of properties, connections, and dimensions of the concepts emerging from the data (Morse & Field, 1996). In grounded theory, a major characteristic of the data analysis process is its iterative nature, in which data analysis and data collection are sequential and proceed simultaneously and concurrently (Strauss & Corbin, 1998). In other words, data collection and analysis are conducted in parallel, with data collected in the interviews informing the analytic processes to generate findings, and additional data

collection driven by the emerged understanding from the new findings (Yin, 1989). These intertwined and interactive processes enable researchers to develop sensitivities towards the data and acquire a conceptual grasp of the underlying meanings embedded in participants' dialogues (Wilson & Hutchinson, 1996). The summary of the concurrent procedures of data collection and analysis is presented in Figure 3.1.

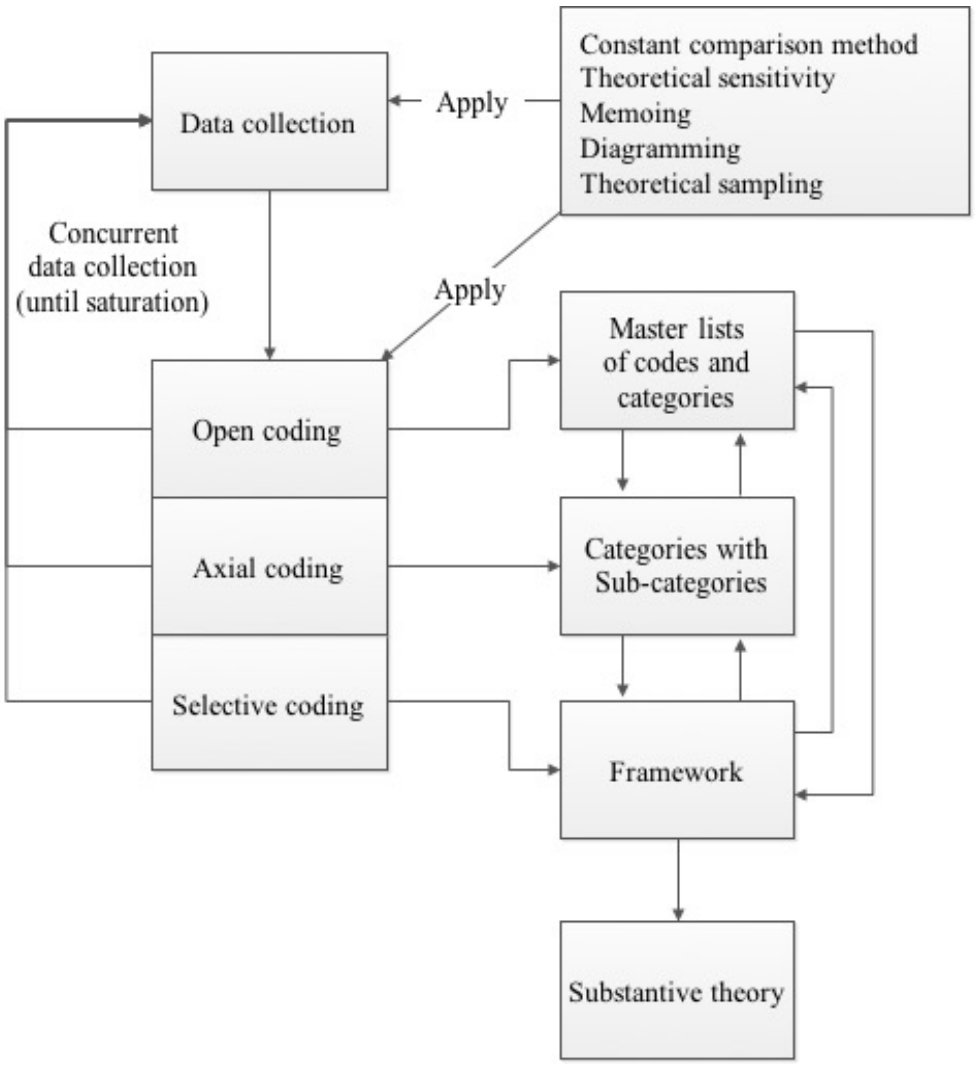

Figure 3.1 Summary of concurrent data collection and analysis procedures

3.3.6.1 Analytic strategies

The present study adopted a variety of analytic strategies to facilitate the conceptualization and organization of data, and hence enhance the quality of findings throughout the data analysis process.

3.3.6.1.1 Constant comparative method. The constant comparative method is the central analytic strategy frequently adopted in grounded theory to develop concepts and generate categories through the comparison of data (Glaser & Strauss, 1967; Taylor et al., 2015). Indeed, it is suggested that comparison is of paramount importance in the analytic process of empirical data, particularly in the exploration of patterns and variations within a phenomenon (Dye et al., 2000). This analytic method was an ongoing and continued procedure, in which every new piece of data, such as a statement, an action, or an opinion, was scrutinized by comparing it with previously emerged concepts to address their consistencies, similarities, and differences. Possible connections and relationships between the new piece of data and the prior data were then identified and integrated as extensions of the emerged concepts. Continuing this process of data comparison resulted in modifications and assimilations of the emerged concepts, which replenished the dimensions and refined the properties of the existing categories and framework (Throne, 2000). In this study, the constant comparative method was adopted throughout the data analysis process to facilitate the development of theoretical properties of categories. For instance, a provisional code emerged from the participants' narratives of their involvement in EID management was preliminary labeled as "willingness to work". Additional data from subsequent interviews about the perceived sense of commitment among participants was compared with the code "willingness to work", which modified and evolved the concepts into a new category entitled "upholding professional integrity". In addition, a piece of data related to a participant's

decision to resign in the face of an outbreak was compared with the category of "upholding professional integrity", which offered new information shedding light on the patterns and variations in participants' experiences and behaviors during EID management.

3.3.6.1.2 Theoretical sensitivity. Theoretical sensitivity in grounded theory refers to the ability of a researcher to discern the implicit and embedded meanings contained within the data and retrieve the relevant concepts for developing a theoretical framework. In other words, it describes the researcher's insights into and awareness of the data in the research process (Bryant & Charmaz, 2010). It is important for a researcher to develop the quality of theoretical sensitivity in conducting a grounded theory study, as this attribute is allied with a variety of activities in the research process, such as theoretical sampling and constant comparison (Strauss & Corbin, 1998). The importance of a researcher being theoretically sensitive is highlighted in the process of data analysis, as the interpretation of data in differentiating the pertinent components of the research area is largely intuitive and perceptive (Corbin et al., 2014). In the present study, the researcher attempted to develop the ability of theoretical sensitivity through multiple means. One of the most imperative sources is literature. As illustrated in the previous chapter, the literature on nurses' preparedness for EID management was reviewed. The literature offered the researcher theoretical and operational clarity of relevant concepts from nurses' perspectives, and provided a rich background of information to foster awareness and familiarity with the study focus. This facilitated the researcher's reflections on nurses' personal and professional experiences regarding the concepts that emerged from the data, and supported the researcher in developing sensitivity towards the phenomenon under study (Corbin et al., 2014). Another source of sensitivity was generated during the analytic process, with the researcher continuously interacting with the data (Corbin et al., 2014). The illuminations acquired from the data interpretation allowed the researcher to eliminate biases and preconceptions towards

the phenomenon of interest, as well as acquire insight and recognition regarding the subtleness within the data (Throne, 2000). In the present study, the researcher maintained a skeptical attitude towards the preliminary and provisional findings, and remained open to further elaboration and amendment of the findings in the course of data analysis. This process continued until the theory explaining the process of emergency nurses' involvement in EID management emerged and was refined.

3.3.6.1.3 Memoing. In grounded theory, drafting memos is an important activity throughout the data analysis and the entire research process (Birks et al., 2008). Memos are the analytical ideas and thoughts of a researcher regarding the meanings within the data, which might describe or explain the relationships among the emerged concepts and categories (Strauss & Corbin, 1998). Memo drafting was performed whenever there were subsequent analytical ideas that came to light. In this study, memos were often drafted during data analysis, while concepts and categories were constantly compared. In order to capture the researcher's thoughts and ideas, a reflexive journal was maintained to record the researcher's conceptual or methodological grasp of the research process. The researcher occasionally reviewed the reflexive journal to compare ideas and thoughts at various stages of the research process so as to address the need for alignment and refinement of the findings, which enabled the existing concepts and categories to further emerge and evolve (Birks & Mills, 2011).

3.3.6.1.4 Diagramming. Apart from drafting memos, drawing diagrams was considered an imperative analytic tool to facilitate the interpretation of the data. The use of diagrams, such as flow charts and concept maps, is a method to elicit conceptual relationships among concepts and categories that are abstract and implicit (Corbin & Strauss, 1996). By drawing diagrams, the theoretical meanings and concepts that emerged from the data were

showcased in a concrete manner, enhancing the discovery of the interconnections among various findings, and promoting the conceptual organization of the network of categories (Strauss & Corbin, 1998). In addition, drawing diagrams could facilitate the communication of the results of the data analysis among the researcher and supervisors, and help illustrate the flow of concepts. Indeed, diagrams and figures were used and demonstrated throughout the research process (see Figures 3.1, 3.2, 3.3, 4.1, 4.2 and 4.3) to illustrate the evolving stages of data analysis. For instance, the various conditions mentioned in the coding paradigm (Strauss & Corbin, 1998) were connected and presented in the form of a figure, in which the arrangement of categories was stimulated through considering the relationship between the different conditions.

3.3.6.2 Coding procedures

Coding is the fundamental analytical technique in the process of developing a substantive theory (Strauss & Corbin, 1998). The coding process is a combination of technical procedures that involves defining, sorting, organizing, and refining data (Throne, 2000). Coding offers a foundation for the naming of concepts that emerge from the data and contributes to the establishment of an indexing system of data (Smith & Biley, 1997). The coding process results in a list of terms and themes that are conceptually sorted and grouped into categories to display the connections of concepts in the data (Glaser, 1978). The ultimate goal of coding is to develop a network of well-developed concepts and categories that comprehensively identify the nature of the phenomenon under study, and properly explain the establishment of facts and circumstances related to the phenomenon (Charmaz, 2006). In the present study, the coding procedures adhered to the Strauss and Corbin (1998) framework of coding, which was divided into three phases, namely, open, axial, and selective coding. Although presented separately, these phases were often intertwined and proceeded

concurrently (Strauss & Corbin, 1998). The Straussian version of coding techniques was considered to be notably practicable in data interpretation because of the detailed procedural analytical steps it delineated (Becker, 1993; Wilson & Hutchinson, 1996). A detailed description of the implementation of the coding framework, as outlined by Strauss and Corbin (1998), is presented in the following paragraphs.

3.3.6.2.1 Open coding: discovering categories. Open coding is the beginning step into the data coding process. In this phase, data are reduced into discrete parts of manageable units and coding information (Miles & Huberman, 1994). The units and information are compared for similarities and differences and conceptualized to identify relevant codes and categories. In grounded theory, these codes and categories are considered the basic building blocks of a substantive theory, offering insights into the associated properties and dimensions of the phenomenon under study (Egan, 2002). In the present study, open coding started immediately after the first interview and continued in a concurrent manner with the subsequent interviews. Each interview transcript was read and scrutinized multiple times by the researcher to generate a general and preliminary understanding of the content. A "profile" was then developed for each interview and interviewee to outline the overall context and storyline within the data (Coffey & Atkinson, 1996). The textual content of the transcript was examined line by line to identify every possible meaning embedded within the data to ensure comprehensive coverage of the concepts (Strauss & Corbin, 1998). Through line-by-line analysis, codes were developed from particular phrases, sentences, or paragraphs, which captured significant concepts that presented participants' perceptions and behaviors during incidents from their experience of EID management (Morse & Field, 1996; Pope et al., 2000). The generation of in vivo codes, which were descriptive labels generated from participants' own words and terms in the transcripts, were highlighted during the coding process at this stage. The use of in vivo codes could ensure the key elements of the concepts

within the data were precisely described and documented by the codes, without preconceptions or biases from the researcher (Morse & Field, 1996). These codes were recorded in the margins of the transcripts alongside the original sentences or paragraphs.

To determine the interconnections of the codes and to reveal patterns in the data, questions were asked of the data to explore the associated properties and dimensions, such as "What is going on here?", "Who are the actors involved?" or "How do they define the situation?" (Strauss & Corbin, 1998, p.77). Indeed, asking questions was a technique that was adopted throughout the data analysis process. For instance, with the in vivo code "applying a nurse's common sense in practice", questions were raised such as "How did the emergency nurses define 'common sense'?", "What was the purpose of applying such 'common sense'?", "How did they develop this sense?", and "Did other emergency nurses use this term, 'common sense'?" In addition, the connections among the codes were established by adopting the constant comparative method, in which the codes were compared for similarities and differences to identify variations in the data. This facilitated the discovery of ranges and diversities of concepts, and supported the exploration of general patterns of conditions, interactions, and consequences of the phenomenon under study embedded in the data (Strauss & Corbin, 1998). Through the discovery of the relationships and connections among the codes, categories were created by grouping codes that shared similarities in analytical features. In other words, codes that were conceptually connected in terms of meaning, context, or condition were congregated into categories (Bryant & Charmaz, 2010). The categories represented concepts at a higher level of abstraction than the codes, which conveyed further clarification and specification of the data (Strauss & Corbin, 1998).

3.3.6.2.2 Axial coding: relating categories. After discovering the categories and elucidating their theoretical properties and dimensions, the categories were consolidated by

addressing the relationships within and among the concepts in the stage of axial coding (Strauss & Corbin, 1998). In this phase of data analysis, categories were constantly compared and contrasted with existing and subsequent data, and then sorted according to their conceptual similarities with one another. The constant comparative method enabled the researcher to reveal the relationships among categories, which supported the establishment of linkages and connections of categories and their subcategories. With the establishment of networks among categories and subcategories, the explanatory descriptions of the dimensions and specifications of the schemes of categories were consolidated. This offered a greater explanatory power of the patterns within the data than did the segregated codes and provisional categories (Strauss & Corbin, 1998). For example, the category "encountering situations fraught with constraints and challenges" was identified to represent the conditions faced by emergency nurses in EID management. Through constant comparison, the category was noted to be conceptually related to four subcategories, which were "fraught with resources constraints", "fraught with threats of infection", "fraught with ubiquitous changes", and "fraught with lingering uncertainties". These subcategories further delineated the category's dimensions and properties, and offered theoretical descriptions of the specifications of the constraints and challenges encountered by those who participated in EID management. Category and subcategory naming was decided on the basis of heading relevance in representing the concepts embedded within the categories. Terms that were abstract and explanatory were frequently used to succinctly capture the implicit and conceptual meanings within the data on the phenomenon under study, which was emergency nurses' involvement in EID management (Strauss & Corbin, 1998).

To establish complete and comprehensive patterns within a phenomenon, the various dimensional ranges of situations pertaining to the study phenomenon were to be identified. In the process of axial coding, Strauss's approach to grounded theory data analysis offers a

coding paradigm as a conceptual analytic tool to facilitate the determination of relationships among concepts and categories (Strauss & Corbin, 1998). The coding paradigm assists the researcher in understanding the antecedents and manifestations of a category by contextualizing the phenomenon and revealing the structure and process surrounding it. For the development of a substantive theory, it is of paramount importance to discover the structure of the phenomenon of interest, as it constitutes the conditions and circumstances in which events and issues within the phenomenon have incubated and unfolded. In addition, uncovering the process allows the researcher to evaluate the participants' actions and interactions over time when dealing with the phenomenon, while facing such events or problems (Strauss & Corbin, 1998). Indeed, the coding paradigm's major function is to promote the integration of structure and process to advance the understanding of the complexity of the phenomenon of interest and to develop a substantive theory. The coding paradigm consists of four major components, namely, phenomenon, conditions, interactional strategies, and consequences (Strauss & Corbin, 1998, p. 96). The conditions can be further divided into contextual conditions (issues that represent the time, place, and duration the phenomenon is situated in), causal conditions (issues that contribute to the occurrence of the phenomenon), and intervening conditions (issues that alter the influence of causal conditions on the phenomenon) (Strauss & Corbin, 1998, p. 131). The linkages between the structure and process in a coding paradigm are delineated in Figure 3.2.

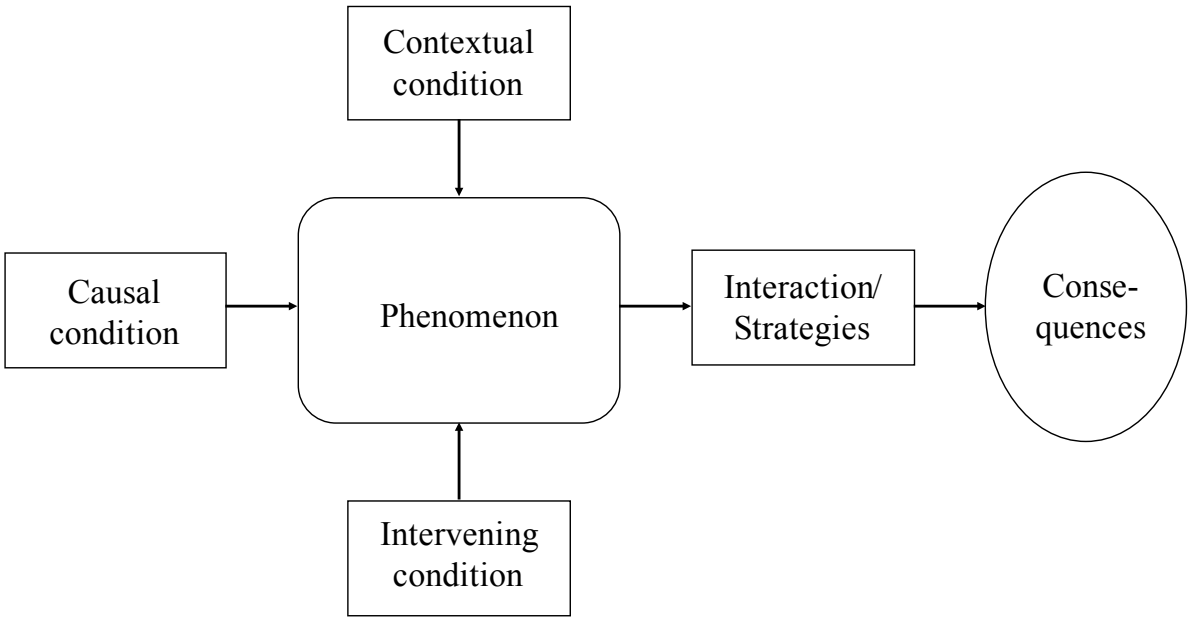

Figure 3.2 Linkages between the structure and process in a coding paradigm

In the present study, the coding paradigm served as an effective analytic device to contextualize the phenomenon of emergency nurses' involvement in EID management and organize the logic of relationships among the emerged concepts and categories. However, as was suggested by Corbin et al. (2014), the paradigm was applied merely as an aid to facilitate the process of data analysis. Instead of strictly adhering to the paradigm and forcing the data to fit the analytical tool, the researcher maintained an open mind to the concepts and ideas that emerged from the data and remained theoretically sensitive to relevant insights and concepts throughout the data analysis process.

3.3.6.2.3 Selective coding: Identifying core category and refining the theory. Selective coding is a sophisticated level of coding that emphasizes integrating and refining categories (Strauss & Corbin, 1998). In the course of selective coding, concepts and categories continued to be constantly compared to each other to determine relationships and reveal

patterns. The goals of such a process were to establish theoretical connections among categories and integrate them into a unified substantive theory (Stern, 1996). For the integration of categories, it is of primary importance to address and identify a core category (Fagerhaugh, 1995). The core category embodies the central concept of a research study and underpins the main theme surrounding the phenomenon under study. In other words, a core category possesses analytical power that captures the essential aspects and salient issues of the study phenomenon (Mullen, 1985). As outlined by Strauss (1987), several criteria should be considered in selecting a core category: first, the core category must be connected with other major categories; second, it must recur in the data on a regular and consistent basis; third, the name of the heading used to describe the core category must be adequately conceptual and sufficiently abstract; fourth, the core category must be able to explain the central proposition of the data and the associated variations; fifth, the explanation offered by the core category must be logical and consistent; sixth, the core category must contribute to the engendering of explanatory power of the substantive theory. A core category may emerge out of any kind of concept or categories, such as a condition, a strategy, or a consequence. It was also suggested that a researcher may develop a new category that was named with terms or phrases of a higher abstraction level. This permits the core category to capture the conceptual idea that subsumes other categories and commits to the central storyline of the study phenomenon (Strauss & Corbin, 1998). Towards the later stage of this present study, the core category accounting for emergency nurses' involvement in EID management evolved out of the data. This was named *persevering through the vulnerability* of *collapse* and was considered to represent the central theme and to capture the phenomenon's essential aspects.

After determining the core category, other relevant categories were related to the core category based on their theoretical connections. This further developed the core category's

properties and dimensions, which clarified and consolidated the provisional substantive theory (Morse & Field, 1996). At this stage of coding, the analysis was orientated to delimiting and refining the overarching substantive theory (Strauss & Corbin, 1998). In order to refine the theory, the researcher was required to review the structure of the provisional theory for internal consistency and logic. The category properties were also revised for modifications, such as replenishing inadequate categories or trimming insignificant categories. In addition, the scheme was validated in the process of refinement to evaluate whether the abstraction surrounding the scheme fits the incoming data (Strauss & Corbin, 1998). For the validation, instead of conducting deductive testing of the relationships or the scheme, the substantive theory was compared and contrasted against the raw data to verify the analytical and explanatory power of the scheme on salient issues within the phenomenon of interest (Strauss & Corbin, 1998). Through such a refinement process, it was anticipated that a consistent, logical, comprehensive, and precise substantive theory was built.

To promote the process of integrating and refining the theory, the coding paradigm was applied in the process of selective coding. As mentioned previously, the use of the paradigm facilitated the establishment of theoretical relationships among categories. This also applied when the core category was identified and the other categories were subsumed and integrated to form a substantive theory (Strauss & Corbin, 1998). In addition, the paradigm offered a framework to systematically and schematically organize the theoretical orders of the categories within the scheme, supporting the theory's development in a logical and comprehensive manner (Böhm, 2004). In the present study, the application of a coding paradigm was complemented with the use of diagrams, in which the storyline within the phenomenon was analytically and conceptually illustrated (Strauss & Corbin, 1998). The core category *persevering through the vulnerability of collapse* is illustrated by the use of the coding paradigm in the following figure (see Figure 3.3), in which the related phenomenon,

conditions, interactional strategies, and consequences are depicted. The core category and the related categories are discussed and illustrated in Chapter 4, when the resultant substantive theory is presented.

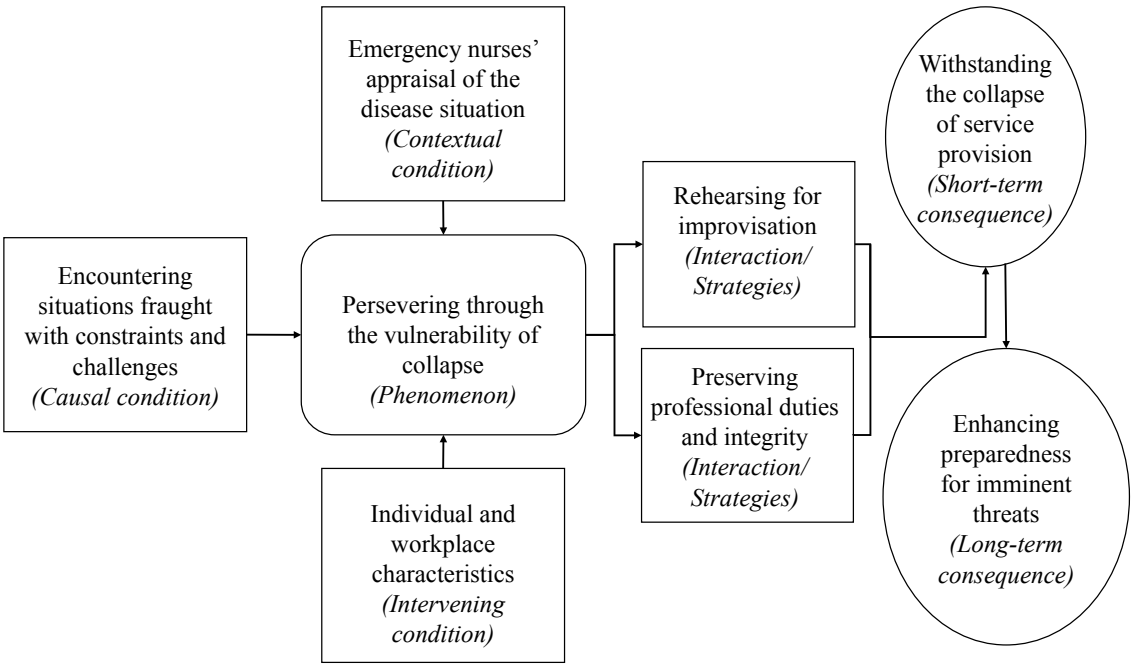

Figure 3.3 Application of the coding paradigm in relating the categories

3.3.7 Ethical considerations

With the submission of a detailed proposal, ethical approval was obtained from the Human Ethics Committee of the Hong Kong Polytechnic University (see Appendix IV). Throughout the study, proper procedures were followed to protect participant rights and maintain ethical standards (Homan, 1991).

First, the principle of voluntary participation was addressed in participant recruitment. During the recruitment process, potential participants were informed that their involvement in the study was voluntary. In addition, potential participants were informed that they were free to refuse and had the right to withdraw at any time without penalty. To facilitate potential participants' understanding of the nature of their participation, the researcher provided them

with an information sheet (see Appendix I) describing the nature and content of the research, including the researcher's identity, study purpose, and the nature of involvement of their participation. The provision of necessary information about the study allowed potential participants to consider becoming involved in the research without coercion. In addition, they were provided with opportunities to discuss their participation with the researcher, and were encouraged to ask questions about the study for clarification. By providing such information during the recruitment process, the rights of potential participants to self-determination were respected. Written informed consent (see Appendix II) was obtained from those who agreed to take part. Permission to audio-record the face-to-face interviews was also granted by participants.

Second, the principle of nonmaleficence was maintained throughout the study process, notably during the data collection phase. Although there were no harmful consequences envisaged in the course of study participation, unpleasant memories or feelings might be recalled during the interviews, which would warrant particular attention and careful preparation on the part of the researcher. For example, before the commencement of each interview, participants were informed that they were free to refuse to answer any question during the interview. Also, the researcher maintained awareness by observing participants' emotions during the interview, to ensure the process was conducted with a minimal amount of psychological or emotional discomfort for participants. All 27 interviews were conducted and completed in a calm and harmonious manner, with none of the participants demonstrating signs of physical or emotional discomfort.

Third, the study guaranteed participant confidentiality. To protect their identity and anonymity, they were assigned unique codes to replace and mask personal information, as well as information about their hospitals and departments. Names, locations, or other

identifiers mentioned in the interviews were also masked or deleted. In addition, the data were protected and secured to prevent the disclosure of participants' personal information. For example, the notebook computer containing the digital recordings and transcribed documents was protected with a passcode and secured in a locked safe to prevent unauthorized access. Additionally, the documents will be destroyed seven years past the publication date of this study.

3.3.8 Trustworthiness

To ensure the rigor and logic of the theory-building process in the present grounded theory study, the plausibility of the findings and the consistency of the research procedures should be adequately addressed and enhanced (Gibbs, 2007). As suggested by Lincoln and Guba (1985), the term "trustworthiness" is frequently adopted to evaluate the quality and rigor of naturalistic inquiry, which consists of four criteria, namely, credibility, transferability, dependability, and confirmability. In the present study, various strategies and techniques were adopted to establish these issues in the research process.

Credibility relates to the extent of congruence of the research findings with the phenomenon under study (Merriam, 1998). This criterion addresses whether the findings of a naturalistic work were plausible or believable (Creswell, 2013). Indeed, it was suggested that ensuring credibility is of paramount importance in establishing the trustworthiness of a qualitative study, and therefore the strategies to address this issue warranted particular attention (Lincoln & Guba, 1985). As was suggested by Goulding (1998), the credibility of naturalistic work can be judged by verifying with participants the relevance and adequacy of the findings to their experience. To bolster the credibility of study findings, member checks were used to validate the data with the participants. The researcher provided participants with transcript copies and the diagram that summarized the major concepts and categories, and

encouraged them to review the information and discuss their opinions of the researcher's interpretation. Ten participants were successfully contacted and their comments on the research findings were solicited. The participants agreed that the transcripts matched their words and their meanings were appropriately captured in the data. In other words, they considered the content of the findings to be consistently connected with their EID management experiences. Another strategy to establish credibility was performed by incorporating peer scrutiny to review the research process and findings. Feedback and comments obtained from colleagues could offer insights into strengthening the connections among the concepts in the data and refining the structure of the developed theory (Shenton, 2004). Throughout the research process, regular and frequent debriefing sessions were convened by the researcher to discuss the inquiry approach and the presentation of the findings, to examine the appropriateness of the data interpretation. Comments from peers also engendered alternative perspectives in analyzing the data. In addition, preliminary study findings were presented at conferences and submitted to scholarly journals over the duration of the study, to solicit feedback from other academics on the structure and content of the inquiry.

Transferability refers to the adequacy of findings of a research study to apply in other social situations (Merriam, 1998). When applied to the present study, this criterion implies that the substantive theory developed in explaining the process of emergency nurses' involvement in EID management should demonstrate theoretical applicability to other emergency nurses facing similar situations. In order to transfer the findings and theory beyond the specific context and situations described in the present study, the boundaries should be clearly marked to delimit the application of the findings in other social situations (Denscombe, 2014). This was achieved by providing a detailed description of the present study's situational information. As suggested by Shenton (2004), information on the study's

contextual background, including the brief summary of the emergency care practice environment in Hong Kong, the number of emergency nurses involved in this study, the data collection methods employed, and the time period in which data collection was conducted, was clearly described and delineated in this chapter. This would provide information for readers or researchers to determine its appropriateness when attempting to apply the study findings to other settings. Another strategy to extend the transferability of this grounded theory's findings was the use of theoretical sampling. The sampling method enables the diverse coverage of variations and patterns of the nature of the study phenomenon to be captured in this grounded theory, contributing to the exploration of possible diversities within the data that enhance the findings' level of abstraction. This could extend the explanatory power of the emerged concepts and categories of the theory, and bolster the transferability of the findings (Bakir & Bakir, 2006).

Dependability is associated with the stability or consistency of the data over time and over conditions, representing the quality of the various stages and processes of a research study (Shenton, 2004). This criterion concerns the logic of the processes within the entire study, including the procedures for designing and conducting the research. The processes within a study, such as data collection, data analysis, and theory development, should be transparent and explicit, to demonstrate the feasibility of future researchers being able to repeat the study (Lincoln & Guba, 1985). In order to establish dependability in this study, the major tactic included the implementation of an inquiry audit to allow scrutiny of the research steps (Miles & Huberman, 1994). Before commencing the data collection process, the research design was scrutinized by an independent review panel in the doctoral confirmation process. The feasibility of the research design and its implementation were reviewed in the confirmation. Amendment and modification of the research design were addressed according to suggestions from panel members prior to the data collection and data analysis procedures.

Moreover, research seminars were convened on a regular basis throughout the research process. A detailed description of the research content and operational procedures was presented in the seminars. This information was presented with the use of various diagrams (see Figures 3.1, 3.2, 3.3, 4.1, 4.2 and 4.3) and tables (see Tables 4.1 and 4.2). Provision of such information enabled a transparent description of the researcher's activities, clarifying the present study's research path of theory generation (Lincoln & Guba, 1985).

Confirmability entails the extent of neutrality of an inquiry in terms of the degree to which the findings were derived from the data (Tobin & Begley, 2004). This criterion emphasizes the quality of the findings of a naturalistic work, which addresses the importance of the researcher guaranteeing that the study results were grounded from participants' experiences and ideas, instead of the researcher's predispositions and preconceptions (Miles & Huberman, 1994). Confirmability is examined by evaluating whether the results could be corroborated by other researchers (Baxter & Eyles, 1997). In this study, reporting of audit trails was employed to establish this criterion. Creating and reporting audit trails offered a detailed methodological and analytical description to allow the researcher to depict visible evidence of the course of the inquiry process (Bowen, 2009). In the present study, the audit trails were maintained in the form of field notes, consisting of raw data, methodological notes, analytical steps, and summaries of the theoretical scheme. This information was integrated into the inquiry audit and presented in seminars. Also, a reflexive journal was maintained to record the conceptual and methodological grasp on the development of theory in the present study. The journal substantiated the development of concepts, categories, and relationships among the categories and within the substantive theory, shedding light on the process in which the findings emerged from the data (Byrne, 2001).

3.4 Summary

This chapter has elucidated the use of grounded theory in achieving an understanding of the process of emergency nurses' involvement in the management of EIDs. The theoretical basis and characteristics of grounded theory, and the procedures and considerations for the application of this research methodology were also addressed. Moreover, the ethical considerations and trustworthiness of the present study were illustrated. The next chapter will present the study findings, delineating the resulting substantive theory that accounts for the study phenomenon.

CHAPTER 4

THE SUBSTANTIVE THEORY: PERSEVERING THROUGH THE VULNERABILITY OF COLLAPSE

4.1 Introduction

The involvement of emergency nurses in emerging infectious disease (EID) management as a process of engagement was set to encompass the various constraints and challenges of an evolving EID situation. These challenges elicited the actions that emergency nurses performed to meet those challenges, constituting the core concept of the substantive theory in this study. This series of social interactions and activities during an epidemic event had been defined to be the core category and was described as *persevering through the vulnerability of collapse.* The conceptualization of the core category emphasizes the dynamic and interactive nature between emergency nurses' practice and the context they were situated in during EID management. In this chapter, the nature of the core category and the structure of the substantive theory are delineated.

4.2 Demographic Characteristics of Emergency Nurses

A total of 26 emergency nurses from 12 local accident and emergency departments (AEDs) participated in the study: 12 were males and 14 were females. Most of the participants were at the rank of staff nurse or registered nurse (RN). Two participants were at the rank of advanced practice nurse (APN), two were at the rank of nursing officer (NO), one was a ward manager (WM) and another was a department operations manager (DOM). The participants had 10.6 years of nursing experience on average and 8.2 years' experience working in an AED. Participant demographic characteristics are outlined in Table 4.1.

Table 4.1 Demographic characteristics of participants

Participant	Gender	Age	Ranking	Years of nursing experience	Years in AED
P1	M	25-30	RN	7	4
P2	M	25-30	RN	7	4
P3	M	25-30	RN	2	1
P4	F	30-35	RN	9	5
P5	F	25-30	RN	5	3
P6	M	45-50	NO	20	15
P7	F	20-25	RN	1	1
P8	F	30-35	RN	9	6
P9	M	20-25	RN	1	1
P10	F	25-30	RN	6	3
P11	M	20-25	RN	3	2
P12	M	20-25	RN	3	2
P13	M	30-35	RN	15	13
P14	M	30-35	APN	12	9
P15	M	25-30	RN	5	3
P16	M	45-50	NO	20	20
P17	F	35-40	RN	15	15
P18	F	30-35	RN	10	4
P19	F	35-40	RN	10	2
P20	M	35-40	RN	15	15
P21	F	35-40	APN	15	15
P22	F	25-30	RN	6	5
P23	F	45-50	WM	25	20
P24	F	35-40	RN	15	13
P25	F	35-40	RN	9	7
P26	F	50-55	DOM	30	25

4.3 The Core Category: Persevering Through the Vulnerability of Collapse

Persevering through the vulnerability of collapse is the core category in the present study, and is considered to be the cornerstone underpinning emergency nurses' experience of engagement in disease management during an epidemic event. As mentioned in the previous chapter, the selection of the construct *persevering through the vulnerability of collapse* as the core category was based on multiple considerations, such as the frequency of the appearance of the construct in the data, and the tendency of the construct to imply further insights or

knowledge. More importantly, *persevering through the vulnerability of collapse* offers logical and consistent explanations for the processes and facets of emergency nurses' engagement in EID management, representing the complex social processes involved in the phenomenon of how emergency nurses engage in EID management. Thus, the construct *persevering through the vulnerability* of *collapse* was identified as the core category of the substantive theory in this study. As the core category, the construct of *persevering through the vulnerability of collapse* links up with other emerged concepts and categories in this study, and portrays the patterns and variations within the study phenomenon. While the core category depicts the central theme of the phenomenon of emergency nurses' engagement in EID management, emergency nurses' strategies in the engagement process are a composite of five major categories that provide details on emergency nurses' corresponding activities and interactions: Encountering situations fraught with obstacles and challenges, Rehearsing for improvisation, Preserving professional duties and integrity, Withstanding the collapse of service provision, and Enhancing preparedness towards imminent threats. The core category and interrelations between the subcategories are illustrated by the coding paradigm in Figure 4.1.

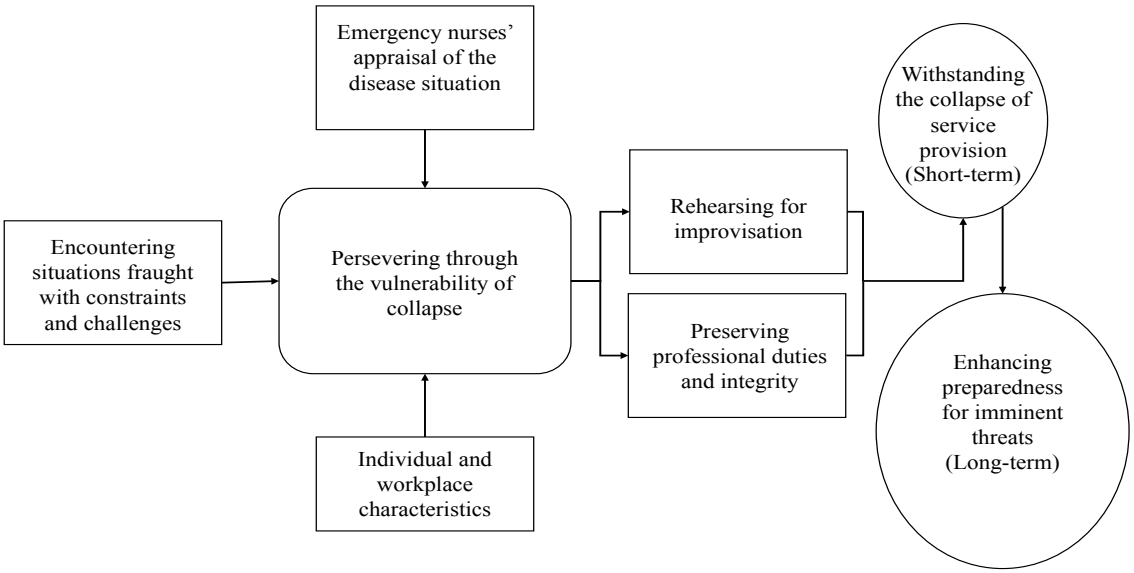

Figure 4.1 Emergency nurses' engagement in EID management

Within the substantive theory, each category represents a facet of the engagement process. The five facets are identified as Facet of encounter, Facet of navigation, Facet of striving, Facet of resolution, and Facet of learning. The term "facets" is used instead of "stages" to highlight the coexisting nature of each phase of emergency nurses' participation in EID management. The consideration here is that the progression of the engagement process in the present study is not a linear sequence that signposts the completion of tasks in each phase. Instead, the process is a dynamic development of emergency nurses' engagement in the management of EIDs. The progression of the process is characterized by the emergence of new sets of mission and mandate that the nurses devoted efforts to accomplishing, in addition to those already existing. Thus, the term "facets" is used as it can genuinely capture the evolving nature of the engagement process. These five facets are illustrated in detail separately in Chapter 5-9. The process of engagement among emergency nurses in EID management is presented in Figure 4.2. The relationships between the core category, the related main categories, and the facets of the engagement process are presented in Figure 4.3.

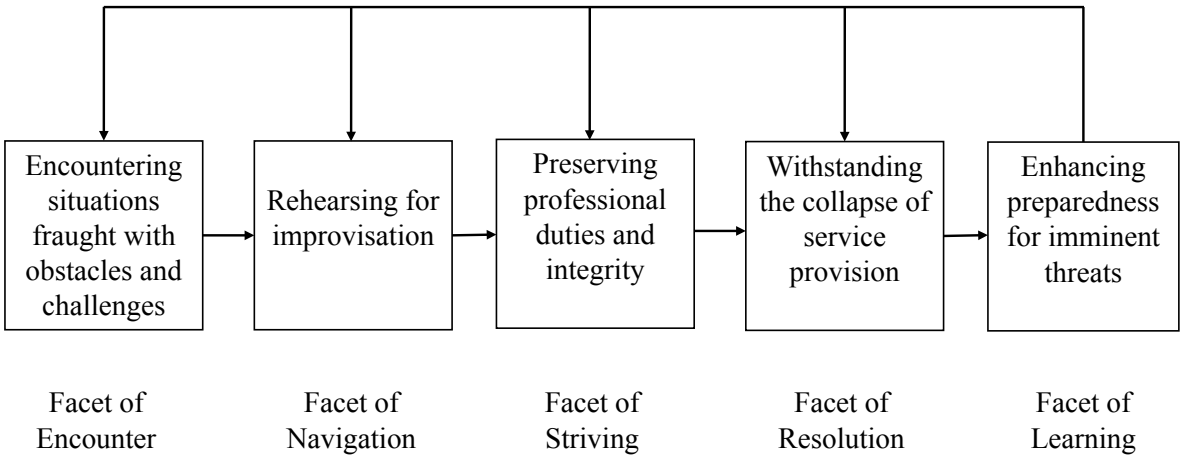

Figure 4.2 Five facets of Persevering through the vulnerability of collapse

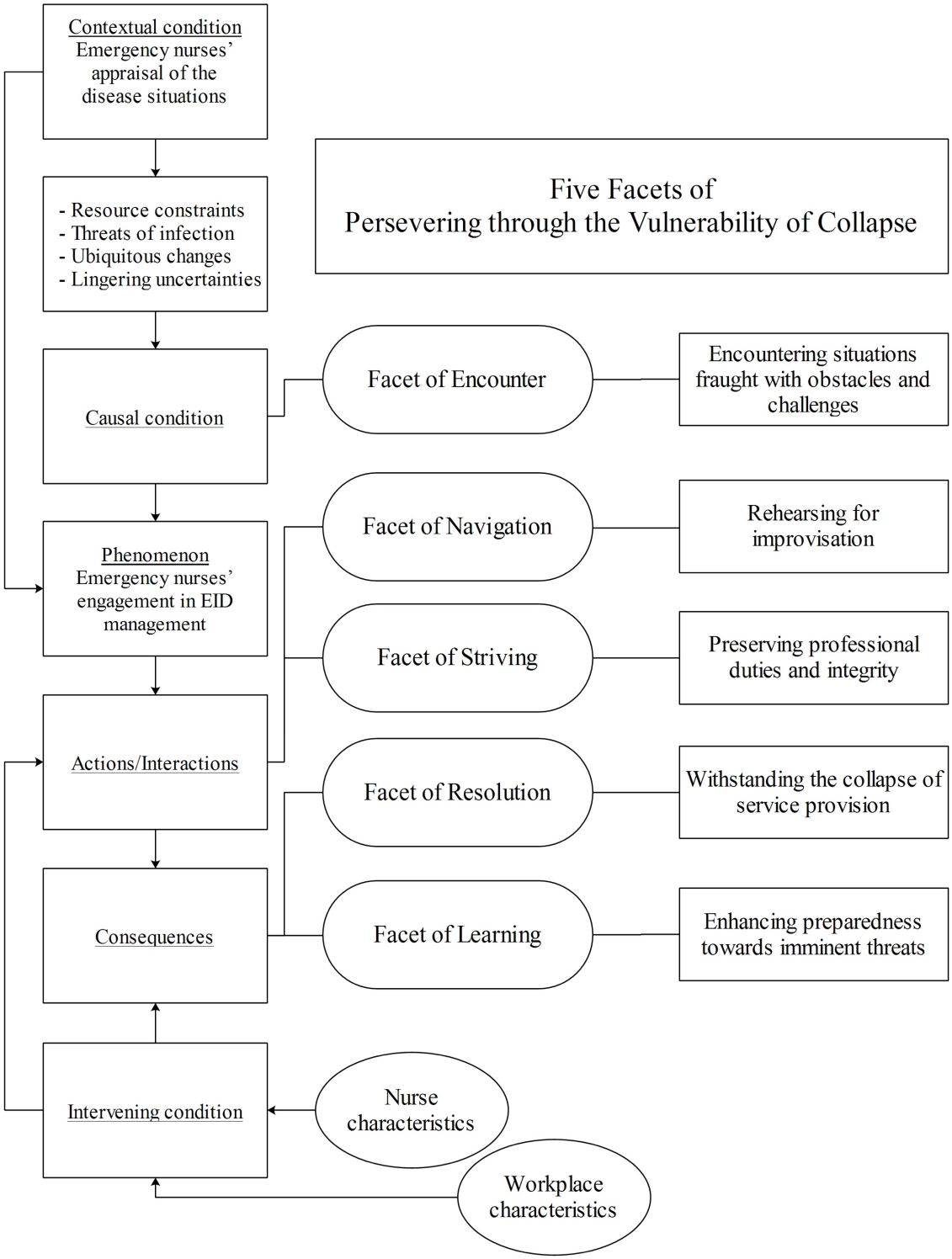

Figure 4.3 The relationships between the core category, related categories, and the facets of the emergency nurses' engagement process

It warrants particular attention that the core category *persevering through the vulnerability of collapse* offers important information regarding the context emergency nurses are situated in during the course of an EID outbreak. In the description of the circumstances facing emergency nurses who are engaged in EID management, the term "collapse" was utilized by the majority of participants when depicting their plight. The term vividly portrays that during an epidemic, the emergency nurses encountered situations that were fraught with constraints and challenges. For instance, a participant used the terms "collapse" and "chaos" to conceptually describe the hardships at work:

> "As an emergency nurse, instead of helplessly watching the 'collapse' of the accident and emergency department because of the challenges and difficulties of an outbreak, I would rather play my part and try my best to prevent a collapse. All of my fellow colleagues work together and do whatever it takes to maintain and support service delivery in the midst of chaos." (P10)

In addition to the circumstances facing emergency nurses in the process of engagement in EID management, the core category *persevering through the vulnerability of collapse* conveys participants' perseverance in the course of an EID outbreak. The data revealed that the ultimate goal of the majority of participants was to continue to serve steadfastly in their role and maintain emergency care service delivery, despite the difficulties and challenges. The participants also suggested that this intention to pledge their efforts in EID management was widely shared by other emergency nurses in their workplace. Discussing this issue, a participant stated the goal of emergency nurses' work in an epidemic in an explicit manner and highlighted her determination to serve in their role as an emergency nurse:

> "We work together towards a common goal, that is, to ensure the smooth and efficient functioning of the department in the face of an elevated number of complex tasks

during an epidemic. Otherwise, not only would emergency care service delivery be hampered, but the safety of patients and the community would be endangered." (P19)

The core category offers information that the process of EID management evolves with a range of factors in the practice context, which collectively forges the actions of emergency nurses delivering emergency care during the EID management process. An account of these categories in a sequence, with illustrations of the nature, ranges, and styles of their strategies and the corresponding consequences, is presented and explained in detail in the following sections.

4.3.1 Tasks involved in EID management

Engagement of emergency nurses in EID management is understood as a dynamic phenomenon in which the individuals situated within interact and socialize to generate a similar set of attitudes and behaviors towards their practice. Therefore, it is crucial to denote the experiences correlated to the circumstances, and the nature of events that emergency nurses encounter when managing EID, in order to describe and delimit the phenomenon of their engagement in EID management.

When asked about their general views on EID management, most of the emergency nurses in this study characterized its nature in AED as "gatekeeping", with nurses urged to remain vigilant against various communicable diseases, notably those newly emerged. A participant with experience in handling a previous influenza pandemic vividly highlighted nurses' pivotal responsibility in EID management by stating they were "the parts of an embankment to prevent a flood of infections in the hospitals and the community". To the participants' understanding, participating in EID management mainly consists of tasks and practices correlated to three main duties, namely disease surveillance, infection prevention,

and patient logistics. A participant who worked in the AED of a hospital that had been designated an infectious disease center highlighted emergency nurses' important role in triage and said:

> "To handle those newly identified infections, I think the most crucial intervention is the initial triage assessment. A quality triage assessment can block the spread of communicable diseases in hospital. In contrast, a poorly executed triage assessment can be disastrous, opening the door to spreading pathogens to the public." (P19)

Similar comments were stated by another participant, who said that nurses' role in disease surveillance was irreplaceable:

> "As the first point of clinical contact, nurses are the vanguard in handling EID regardless of our assigned positions. We are sensitive to signs and symptoms of new infectious diseases, and we know the next steps in handling patients with suspected infectious status." (P9)

In addition to remaining vigilant to the signs and symptoms of potential EID infection, the participants mentioned that their duties in infection prevention were also an important practice area in EID management. Participants stated that infection prevention not only included implementing infection control measures in patients, but also maintaining a hygienic environment in the AED. A participant described their duty of infection prevention as follows:

> "To prevent the spread of disease, we have to know what precautions to take, and what infection control measures to perform. Besides applying infection control measures on patients, we have to be aware of infection control in handling dead bodies, or disposing of infectious wastes." (P16)

Another emergency nurse further elaborated on nurses' role in environmental cleansing and disinfecting as part of EID management:

> "We do care about the environment of the AED, like the linens, the equipment, the stretchers and the curtains. Everything that comes in contact with patients should be disinfected, and we nurses have to ensure this is appropriately handled, in a meticulous manner." (P12)

Emergency nurses' EID management tasks not only include the detection and prevention of infection, but also patient logistics. This involves allocating patients in the AED in terms of their infectious status, and streamlining the admission of suspected infectious patients to isolation wards. This participant added that patient logistics is a challenging task during an infectious disease outbreak:

> "For patients with signs and symptoms of EID infection, we have to place them in the AED in appropriate areas in order to maintain a certain distance away from 'clean' patients and minimize the risk of disease transmission. If patients require hospitalization, coordinating patient admission is one of the most tedious duties. We have to identify isolation beds for patients who are confirmed or suspected to have an infection; if there are no beds for the patients, they will stay in the AED and then accumulate." (P12)

It is revealed from the participants' descriptions that the majority of tasks that emergency nurses are responsible for handling in response to an EID event are associated with the minimization of infection risk. Although most nurses valued the importance of the proper implementation of risk reduction guidelines and infection control measures, a number of nurses questioned whether it was appropriate for them to be assigned those tasks in managing

EID. A common view amongst participants was that emergency care practice should focus on managing patients with life-threatening conditions, and implementing first aid and emergency medical treatment. To participate in managing issues and circumstances associated with EID was regarded as "extra work", which was, from the participants' perspectives, beyond the domain of emergency nursing practice. For instance, a participant with experience in coping with different episodes of an EID event noted that:

> "Participating in EID management tends to shift the focus of emergency care from rescuing lives and providing relief, to disease prevention. The functions of the AED in emergency care seems to be compromised." (P16)

Another participant, asked his impression of handling EID in their everyday AED practice, stated:

> "EID management often dominates the practice of our care. For example, if a patient came to the AED because of a heart attack, the first thing we have been asked to do is not to provide care for the patient's condition, but to verify his or her infectious status in terms of those new diseases (EIDs). It is as though EID management has overridden our genuine practice of emergency care." (P13)

In terms of the tasks and issues involved in EID management, participants' comments highlight that their duties would involve disease surveillance, infection prevention, and patient logistics. Emergency nurses generally contended that these tasks, which emphasized the minimization of infectious risk within departments, were considered additional to their perception of their regular job specialties.

4.3.2 Emergency nurses' appraisal of the EID situation

While disease surveillance, infection prevention, and patient logistics seemingly resemble the routine duties that emergency nurses implement on a daily basis, participants did point out the differences between EID management and routine practices, stating that their work in EID management would be greatly and frequently influenced by the disease situation. A nursing officer with extensive experience in handling EID shared his experience during a period that saw sporadic cases of avian influenza infection, as follows:

> "Not long ago, there were cases of avian flu in Mainland China. We had to stay vigilant and be more alert, we started to gown up, with full PPE (personal protective equipment) at work. Then there were imported cases of confirmed avian flu infection locally, and at that time we knew we had to be prepared to deal with the disease. Recently, there have been no new cases of avian flu infection and now we can be less tense and relax a little bit." (P6)

It is identified from this participant's narrative that EID situations not only influence emergency nurses' precautionary practices, but also affect nurses' attitudes and alertness levels in managing EID scenarios.

4.3.2.1 Response levels

In their appraisal of disease situations, emergency nurses' perspectives and beliefs were constituted by various factors and conditions that shape their understanding of the context they are situated in. A major consideration for the participants in defining the disease situation originated from the response level of the government response system. This system, which envisages a three-tiered response level (Alert, Serious, and Emergency), is a part of the preparedness plan announced by the Hong Kong government to depict epidemiological

scenarios. The response levels are established based on the assessment of the outbreak risk of an EID and its impact on human health and healthcare organizations (Hospital Authority & Centre for Health Protection, 2006). The response level will determine the corresponding response measures to an epidemic event, including the incorporation of precautionary measures in standard practice and the reduction of non-urgent and non-emergency medical services, to cater to different EID scenarios where necessary. The majority of participants commented that the response level for an EID is the most influential aspect in defining a disease situation. For example, one participant described how the progress of the EID disease situation could alter their practice as follows:

> "Whenever there are changes in the disease situation, for example, the alert level has been stepped up to Serious this month, there have been some corresponding modifications to our practice in workflow and disease prevention. For example, we are now required to gown up with full PPE when we are working. We are asked to assign patients who are suspected to be infectious to new locations. We have to distribute masks to the AED attendants and the family members, and there is another set of procedures in admitting infectious patients into isolation wards." (P4)

The above narrative illustrates that the response level is an important component when emergency nurses are appraising the situations they encounter during EID management. Indeed, the response level clearly signposts the progress of an EID and strongly influences emergency care delivery and emergency nurses' routine practice.

4.3.2.2 Novelty of the EID

In addition to response levels that could act as an indicator of a disease situation, the participants revealed that their appraisal of the situated circumstance would incorporate their

individual understanding of a particular EID scenario. For example, participants suggested the novelty of an EID could affect their appraisal of a disease situation. Although the term "emerging infectious disease" has been coined to signify that this disease group has newly appeared, emergency nurses' familiarity with an epidemic event could vary from disease to disease. One participant referred to her personal experience in the management of the Ebola virus disease during the epidemic event's global outset as follows:

> "The Ebola virus disease is new to us, we do not know much about the disease, we cannot predict how much worse the disease situation will be, we do not know how high the risk is that we will be infected. Not long ago there was a local outbreak of H7N9 avian influenza. It was also regarded as an emerging infectious disease, but there had not been much reaction from our staff. Perhaps it is because we knew that the avian influenza was limited to poultry-to-human transmission, and it was easier for us to identify suspected cases and take the necessary precautions. After all, it is an influenza, and we know a lot about influenza, even though it is a new type. But for Ebola, there was no similar disease that we had come across before. It is how much you know about the disease that matters." (P18)

From the remarks of the above participant, it is revealed that the Ebola virus disease outbreak was regarded as a novel challenge to emergency nurses because of a lack of understanding and clarity on the nature of the disease and the severity of the threat it posed. Indeed, this view was echoed by another participant, who recalled the unprecedented hardships from emergency nurses' participation in management of the severe acute respiratory syndrome (SARS) pandemic, while facing the threat from Ebola virus disease:

> "Those new infectious diseases (EIDs) have been unsettling for us. The Ebola virus disease is a typical example. We have no idea what we can do for patients. And we do

not know what we can do for ourselves. If one day Ebola was going to plague our community, I am afraid it would become a situation similar to that of SARS: we did not know what we were supposed to do, we did not know whether we were protected from infection." (P17)

This participant continued to underline that both the SARS pandemic and Ebola virus disease outbreak shared similarities in their novel nature, creating panic among emergency nurses:

> "The disease situations of SARS and Ebola virus disease are quite similar, while we are full of doubts and worries when we are facing the diseases at work. We could not say for certain the route of disease transmission and the consequences of infection. With these diseases, the situations are full of unknowns, creating an atmosphere of fear among the staff in the AED." (P17)

This reveals that the novelty of an EID could influence emergency nurses' understanding and experience of their participation in an epidemic event. Study participants indicated their difficulties in coping with EIDs with which they were unfamiliar. Concerns were also expressed about the risk of handling a new infectious disease while nurses only had limited knowledge of the nature of the disease, including the mode of transmission and the consequences of infection.

4.3.2.3 Severity of the EID

Another important consideration for participants in their appraisal of EID disease situations is associated with the severity of the disease. The participants' understanding of the severity of an epidemic was mainly determined by their impressions of the impact of the disease on the public. The majority of participants stated that the foremost position of the AED in healthcare service provision allowed them to recognize the havoc caused by EIDs in

the community, and therefore they were able to realize and appraise the disease situation in their everyday work. One of the major elements that determines the severity of an EID and its impact on the general public was associated with the lethality of the disease, which, in other words, was the deadliness of the disease in terms of human death toll. A nursing officer who had experienced the immense hardships at the time that SARS wreaked havoc around the globe remarked that some emergency nurses fled in panic during the outbreak, because of the high mortality rates among infected patients. As he said:

> "At the time of SARS, some of our colleagues requested to be reallocated to other departments instead of staying in the AED, while the disease had triggered the resignation of some nurses in our department. They thought the SARS was deadly because the mortality rate from infection is high. Therefore, they wanted to leave, as they perceived that the disease situation had become perilous and deplorable." (P6)

In addition to an EID's fatal consequences among the human population, the participants also highlighted that in appraising the severity of the disease situation, they would take into consideration the infectiousness of the disease. According to the participants, the infectiousness of a disease was characterized by the scale of the spread of disease with reference to the magnitude of infections in the population. In their accounts of disease transmissibility, the majority of participants agreed that an EID's disease situation would be regarded as serious if there was a widespread outbreak of the disease that infected a large number of people. While assessing the transmissibility of an EID, along with obtaining information on the number of infected patients, emergency nurses would also assess the disease's infectiousness based on the mode of disease transmission. A nursing officer indicated how she made sense of the transmission route of different EIDs while understanding their infectiousness as follows:

> "The mode of transmission is an important part of the nature of a disease that one has to understand in order to deal with it. For example, if I am to compare Ebola with SARS, in my personal understanding, the latter will be more devastating. It is because SARS could spread through an airborne route, while Ebola transmission is restricted to direct contact. Therefore, the risk of contracting SARS would be higher and so it is comparatively more infectious." (P16)

Regarding the participants' narratives, the severity of an EID was not determined by either mortality or incidence figures alone. Instead, the combination of both its deadliness and infectiousness were considered by emergency nurses when evaluating an EID situation. A participant offered an explanation for the uniqueness of SARS, stated that it was a devastating EID because it demonstrated both high lethality and transmissibility:

> "For swine flu (H1N1), it spread very fast among the population but it was usually not lethal, it was just like the common flu with the usual mortality rate. For avian flu (H7N9), it was deadly, but the risk of infection is relatively low, as the probability of human-to-human infection has remained minimal. However, SARS was different. It was both a deadly and highly infectious disease." (P6)

Apparently, the severity of an EID was regarded as important for emergency nurses in appraising the disease scenario they were facing. It was revealed that both the deadliness and the infectiousness of a disease were crucial for individuals to acknowledge and recognize a disease situation.

4.3.2.4 Proximity to the EID

It was also suggested by the majority of participants that the proximity to an EID would influence their understanding of the disease situation. Participants referred to this

feature as the geographical nearness of the impact of an epidemic event. There were some suggestions that proximity to an EID outbreak would influence their understanding of the seriousness of a disease situation, which sometimes superseded the mortality and morbidity of an EID. For instance, a nursing officer, who were interviewed at the time the Ebola virus disease outbreak was confined to the West Africa region, expressed her view that the threat from the disease was reasonable without inducing apprehension, because of the considerable geographical distance of the outbreak from their region:

> "Although the Ebola virus disease is a deadly disease with a high mortality rate, it is still far away from us as there are fortunately no reported cases in Hong Kong. The disease is limited to West Africa, which is far away from us. We will still remain vigilant in the future and need not panic about the disease situation at this moment." (P16)

This view was echoed by another participant, who commented on the scenario of Middle East respiratory syndrome (MERS) as follows:

> "I think the infection control precautions for MERS should be stepped down, because the outbreak has long been limited to countries of the Middle East. There have only been sporadic cases." (P1)

Interestingly, another participant expressed her views on the MERS epidemic in the opposite manner, after the epidemic struck South Korea and spread in close proximity to Hong Kong:

> "We have to pay special attention and be extra cautious about MERS, because it is coming near us and could hit us at any time." (P19)

From the information provided by the participants, it is recognized that their understanding of an EID event could vary, depending on the disease's impact from a geographical perspective.

4.3.2.5 Complexity of the EID situation

Together with the novelty, severity, and proximity of an EID, participants also underlined that complexity was a significant feature in defining an epidemic situation. From the participants' perspectives, an EID situation becomes complex if multiple diseases have emerged and have been brewing simultaneously. There were some suggestions that the EID situation had been complex all along, since multiple EIDs have continually coexisted in the human population. As one participant put it:

> "EIDs have always been here around us. They are always here. It is just the trend of the infection that differs from time to time; that is, a strain of EID is dominant at this time, then another strain will take its place and become dominant later." (P15)

Even worse is what was reported by participants as a common situation in their daily work, which was the dominance of multiple EIDs concurrently. The comment below illustrates the complexity of the circumstance that emergency nurses encountered, with the presence of three different strains of EID. The particpant, a department operations manager, used a mahjong metaphor to describe the disease situation as follows:

> "At this particular moment, an outbreak of a large-scale infectious disease is already 'ready hands' (on the verge of breaking out), and waiting for three tiles (triggers). In front of us, there are the Ebola virus disease, Middle East respiratory syndrome, and H7N9 avian influenza waiting to strike." (P26)

Participants' narratives clearly identify the fact that the disease situation encountered by emergency nurses during their involvement in disease management was comprised of intertwined scenarios of various EIDs. Such scenarios were regarded by the participants as the constituents of the complexity in understanding an EID situation.

4.3.3 Mediating features in emergency nurses' engagement

This section delineates the mediating features that influence or alter the ways in which emergency nurses interpret and behave within the engagement process of EID management. In the present study, it was found that emergency nurses' engagement in EID management was influenced by two major intervening conditions: the nurses' characteristics and the workplace characteristics. These two characteristics were found to mediate the emergency nurses' actions and interactions with events and tasks during EID management, as well as the manifestation of the consequences of their engagement. In other words, these mediating features and intervening conditions contributed to the variations in the emergency nurses' responses and the corresponding outcomes in the course of EID management.

4.3.3.1 Nurse characteristics

The characteristics of individual emergency nurses were found to be influential on the way they define and understand working conditions and organizational contexts, by which emergency nurses largely determine their cognition and responses. Among the various characteristics, the clinical experience of individual emergency nurses was considered to be one of the major features defining participants' engagement in EID management. Practical work experience in previous epidemics was further underpinned by participants to strongly modify emergency nurses' attitudes and behaviors during an epidemic event. Participants habitually differentiated the level of experience of emergency nurses in terms of seniority,

dichotomizing this into senior and junior levels. They often referred to emergency nurses at a higher rank, such as advanced practice nurse or nursing officer, as senior, while newly graduated nurses were regarded as junior. Interestingly, within these two extremes, participants would describe themselves as “comparatively senior” or “comparatively junior”, which depended on their self-perception of their familiarity with the tasks in their day-to-day AED routines. It was revealed in the findings that “senior” emergency nurses demonstrated greater proficiency in infection control concepts and measures, an elevated willingness to educate and mentor colleagues in handling EID-related issues, and a strengthened awareness in identifying subtle clues about patients’ conditions. These differences in senior emergency nurses’ capacity had modified and influenced the outcomes and consequences of their engagement in EID management. For instance, senior emergency nurses were suggested to be more adaptable than junior nurses in coping with resource and facility constraints, and were eager to contribute to establishing a supportive work environment.

Apart from clinical experience, individual work attitude was considered another important feature that altered emergency nurses’ cognition and actions during the management of EID outbreaks. The influence of work attitudes was particularly prominent in situations that involved actual or potential conflicts. The attitudes of emergency nurses, according to participants’ descriptions, involved their views on job satisfaction, work ethic, professional responsibility, and organizational commitment. In the findings, it was revealed that participants’ work attitudes were closely connected with the strategies and tactics they adopted in dealing with issues arising from EID outbreaks. For instance, emergency nurses who possessed a strong sense of commitment and mission towards the community often showcased an elevated level of willingness to work during an EID outbreak, despite the occupational risk of infection. They also demonstrated a reinforced tendency to offer assistance to colleagues and to collaborate with others in fulfilling job duties. As a result of

their intention to deploy the utmost effort in EID management, many of these participants reported the enhancement of personal preparedness in subsequent epidemic events, as well as the establishment of cohesive work environments. In contrast, participants who presented with comparatively lower levels of job satisfaction and perceived sense of duty were hesitant to engage in active participation in an epidemic response because of the potential hazard associated with EID management to their personal health. This group of participants also showed a suboptimal level of risk acceptance to the risk of infection. Consequently, their personal readiness for future epidemics was impeded.

4.3.3.2 Workplace characteristics

In addition to emergency nurses' personal characteristics, participants' descriptions underlined the influence of workplace characteristics on their coping methods during an EID outbreak. As mentioned previously, the availability of facilities in hospitals and AEDs could affect hospitals' capacity to meet healthcare service demands during an outbreak. These facilities, which included isolation rooms, hand washing stations, hospital beds, and waiting areas, were closely associated with the practicality of emergency nurses being able to implement required infection control measures. Participants from hospitals with sufficient facilities reported better willingness and ability to adhere to accelerated infection control guidelines when compared with those who worked in insufficiently equipped hospitals and AEDs. However, several participants from hospitals with inadequate facilities demonstrated their adaptiveness by sorting out task priorities and sequencing them to address service needs efficiently.

Another workplace characteristic that influences and mediates emergency nurses' practice centers on hospital and AED leadership style. All participants agreed that administrative and management support was of paramount importance in combating

epidemics. For instance, administration and management play a key role in disseminating EID information to employees. They are also responsible for ensuring the safety of staff who are involved in EID management, by providing adequate protective equipment and implementing proper preventive measures. Some participants acknowledged the efforts of management, and commented that administrators were responsive and proactive in facilitating frontline emergency nurses in fulfilling their duties. The positive influence of administration and management support was demonstrated in multiple aspects of the emergency nurses' practice, such as improved risk acceptance, enhanced guideline compliance, and more streamlined workflow and logistics arrangements. However, several participants also alluded to the notion that the administration and management in their hospital failed to accommodate the needs of frontline staff, which induced frustration among emergency nurses and created difficulties for them in maintaining the normal functioning of emergency care service provision.

The AED workplace culture was identified by participants as an intervening condition that was particularly influential on the workplace environment. Participants divided their descriptions of workplace culture in AEDs into "supportive", "blaming", and "alienated". Participants in supportive work environments reported that they received practical advice and tangible assistance from colleagues, promoting the development of competence and preparedness for future outbreaks. Colleagues in such an environment tended to motivate each other with encouragement and acknowledgments. However, participants who worked in a workplace culture of blame stated that their colleagues adopted a hostile attitude towards each other, while those who made mistakes were blamed and stigmatized as "trouble-makers". Emergency nurses in such work environments were reported to have lowered self-esteem and depleted confidence in their everyday work in the AED. Participants who described the workplace culture in their department as alienated pointed out that

communication between colleagues was limited, as everyone attached importance to their own duties only. Staff working in a culture like this seldom took the initiative to assist by picking up the workload of others. These findings reveal that emergency nurses' actions and interactions with colleagues vary from department to department, due to variations in workplace culture.

4.4 Summary

In this chapter, the nature of the core category *persevering through the vulnerability of collapse* and the structure of the substantive theory are delineated. In addition, the various conditions and factors that could influence emergency nurses' understanding of context and their corresponding behaviors are showcased in the findings. Taken together, these findings suggest that emergency nurses take an array of factors into account in their appraisal of an EID disease situation. The response level was considered one of the most prominent determinants for emergency nurses in their understanding of an EID situation. Meanwhile, the participants also mentioned that their understanding would be grounded in their impressions and interpretations of the infectiousness, severity, proximity, and complexity of an EID situation. In addition, the findings delineate that the characteristics of nurses and workplaces could influence emergency nurses' attitudes and behaviors in the course of EID management.

CHAPTER 5

FACET OF ENCOUNTER: ENCOUNTERING SITUATIONS FRAUGHT WITH CONSTRAINTS AND CHALLENGES

5.1 Introduction

The first facet of the process of emergency nurses' engagement in emerging infectious disease (EID) management concerns the constraints and challenges encountered in a clinical context. As mentioned in the previous section, emergency nurses were engaged in EID management, which unfolded along with an evolving disease situation. In such a context, it is important to preface the emergency nurses' experiences and perceptions of their encounters during the tasks associated with EID management, which constituted emergency nurses' actions, interactions, and strategies on a daily basis. These experiences and perceptions comprised how emergency nurses characterized the tasks they encountered, and how they understood those issues in their everyday practice. From the participants' descriptions, their experience and perceptions of engaging in EID management encompassed a range of issues, and they collectively portrayed their engagement in EID management to be fraught with constraints and challenges. These issues, which created a profound impact on their daily practice, were multifaceted and can be listed as follows: Fraught with resource constraints, Fraught with threats of infection, Fraught with ubiquitous changes, and Fraught with lingering uncertainties.

5.2 Fraught with Resource Constraints

A recurring theme in the interviews was a sense among participants that emergency nurses' workload drastically increased with the emergence of an EID. All of the nurses

reported that EID management would create an additional workload on top of their already heavy workload. The source of the increased workload was mainly the increased patient attendance in the AED. A nurse described her understanding of the reasons behind the increased patient attendance as follows:

> "While there was an announcement of an EID or there was an outbreak of a new disease, patient attendance would suddenly increase. People just rushed to the AED for a checkup, for fear they had contracted the new disease. They were so nervous that many of them just showed up with very mild symptoms." (P17)

From participants' descriptions, the increased number of patients in attendance created a snowball effect that further expanded emergency nurses' workload. For example, increased patient attendance in the AED would require careful consideration of the emergency nurses in deciding where patients were placed in the department, in order to prevent the spread of disease from suspected infectious patients within the department. A nurse described the decision process to assign patients in the AED in a manner to reduce the risk of disease transmission as follows:

> "Because some people might be infectious, we have to decide a suitable location for every single patient in our department, so there would be a certain distance between each patient to reduce the risk of pathogen circulation. This is what we have to do on top of handling newcomers (patients)." (P12)

This participant further commented on the snowballing workload due to increased patient attendance, stating that the workload of frontline emergency nurses would further increase if patients with suspected infectious status were required to be admitted for further

management, but the hospital isolation facility was not enough to meet the demands for patient admission:

> "It is most laborious for our work that some patients with symptoms would have to be admitted to the ward. Normally, these patients would require being admitted to wards with an isolation room, to minimize the risk of disease transmission. However, the bed status of medical wards is limited, and in wards with an isolation facility, even less. There would be more and more patients requiring admission, and those who were not able to be admitted would be stuck in the AED department. We have to take care of these patients, which is really problematic." (P12)

Indeed, insufficient facilities to serve the needs of suspected infectious patients were frequently cited by participants as an EID management issue. In addition to insufficient isolation rooms in the wards to meet patient admission requirements, the isolation facility within the AED was frequently mentioned by participants as inadequate. A nurse who worked in a hospital revealed that the isolation facility within the AED she worked in was so limited that the only room with an isolation facility was the resuscitation room:

> "The area of our department is not very large, and there is only one installed negative pressure room, which is the resuscitation room. If there is an infectious patient occupying the room, we would have less resuscitation room for patients in critical condition. Sometimes we must share the negative pressure room by dividing it into several partitions with sliding doors." (P10)

With insufficient isolation facilities in the AED, emergency nurses frequently encountered situations in which they had to assign suspected infectious patients to non-isolated areas within the department, which could breach infection control recommendations. In these

situations, nurses had no choice but to do their best to reduce the risk of disease transmission by adapting their own strategies. As one nurse shared:

> "There were situations where we were not able to allocate an isolation room for patients with infectious risk. We could only arrange the patients in corner areas with fewer people, and wait for an isolation room. But it is just an area with fewer people but not isolated. Sometimes there would be other people coming across the area, and we could only put a curtain around the patient's bed. This is what we can do… at least better than doing nothing." (P15)

In addition to isolation facilities, short staffing was identified as another major resource constraint facing emergency nurses in the management of EID. In fact, human resources shortages were a constantly pressing issue for healthcare service providers. The workload from managing EID was creating additional pressure on an already tight human resources supply. Discussing the staffing shortage issue, a participant said:

> "Manpower in the department is already tight, all of us were already exhausted. While there was an upsurge in patient attendance during an EID event, sometimes we only had one staff member to handle the responsibility of two. Not to mention the situations when there are staff who take sick leave." (P13)

Another nurse also mentioned that staff taking sick leave during an EID event would create a "vicious circle" that further depleted the department's human resources for emergency nurses managing EID:

> "When there was insufficient staff and increased patient numbers, the workload of every nurse drastically increased. This might be harmful to staff health, as the workload could overload our capacity, both physically and psychologically. The staff

become exhausted and burned out. This is how staff members get sick and call in sick." (P3)

From his experience in handling EID, a nursing officer summarized that EID management is fraught with resource constraints:

> "The workload is large, because the number of patients in attendance has drastically increased. There is no vacancy in the ward, and patients all get stuck in the AED. In a situation where one advances whilst the other falls behind, staffing is insufficient. This might adversely influence the department's operation and our practice, especially during the night, when there is even less staff." (P6)

5.3 Fraught with Threats of Infection

The majority of participants perceived that engagement in EID management entailed a significant health risk to frontline emergency nurses. In managing EID, the threat to emergency nurses' health due to infection risk could be intense. They further emphasized that the risk of infection for nurses working in the AED would be comparatively higher than for those working in other departments. The participants perceived that the AED is the "first-line of the frontline" in confronting an EID, which induced a risk of infection among departmental staff. The following remark made by a participant from his experience of the SARS outbreak was pertinent:

> "We were even unable to be sure of our own safety. When there was an outbreak, the accident and emergency department would be responsible for the first line of defense,

making us subject to the risk of infection. We were terrified and worried about our own health." (P3)

In addition to personal health, the health of significant others was another concern for emergency nurses participating in EID management. They mentioned they might become a "source of infection" and transmit pathogens to family members they were in daily contact with. A nurse described the concerns as follows:

> "If I am infected while handling patients who are infected, I would become the source of infection and bring pathogens to my family. I don't want to be infected, and I don't want to infect my family." (P1)

Among the nurses who identified an elevated risk of infection, most stated that their department and hospital had implemented various strategies to protect them from infection, such as providing PPE and vaccination. However, the participants doubted the effectiveness of these measures. For example, a nurse expressed that she was not very confident about the effectiveness of PPE in protecting her from Ebola virus disease:

> "I cannot be sure if I am 100 per cent protected from Ebola infection with the PPE we are provided. In the news reports, healthcare workers in other countries would have PPE that looks like a spaceman suit that seems to provide better protection, and what we are provided is far less sophisticated." (P18)

In addition, a nurse stated her reasons for refusing to be vaccinated, even as she was required to participate in managing EIDs. Interestingly, it should be noted that she had never received any vaccinations before and her opinion was merely from her perception, which is as follows:

> "First, to my knowledge there is no vaccine available that is effective at protecting us from a new infectious disease. Second, people could become infected and get sick even if they were vaccinated, so I don't see the point of getting vaccinated. Third, the side effects of vaccination are quite intense and I don't want to go through that when I am healthy and feeling alright." (P9)

5.4 Fraught with Ubiquitous Changes

Emergency nurses' work situations were subject to abrupt changes in association with EID progression, which constituted barriers to disease management. The most frequently encountered change was the alternating disease situation. As described by participants, while multiple types of EID might appear all at once, emphasis on disease management constantly changed with the dominating disease at a particular period of time, causing nurses difficulties in orientation towards the respective circumstances. Confronted with threats from multiple diseases, this participant shared her experience in managing Ebola virus disease in the presence of other types of EID:

> "Different kinds of newly recognized infectious diseases come at once and the disease situation changes frequently. Not long ago, the "new SARS" (Middle East respiratory syndrome) had dominated, but then it changed to the avian flu. Most recently, Ebola virus disease takes its turn." (P19)

The provision of information was an important source of guidance for emergency nurses to identify their work duties and practices during the course of EID management. Commenting about the dissemination of EID information, a nursing officer summed up her experience in disease management with the following remark:

> "All along in the management of different kinds of EID, the information we received from the department changed too rapidly, almost every day. Information about the disease is largely indefinite and incomplete." (P6)

As guidelines and practices mainly focus on disease management, targeting disease surveillance and infection control, practices would be changed and implemented according to the types of prevalent EID and the progression of an EID outbreak. More stringent infection control guidelines are established to tie in with elevated incidences of EID infection and prevent nosocomial infections. Although the majority of participants valued the relevance of these accelerated infection control measures in protecting healthcare personnel and patients against EIDs, changes to required measures and procedures when handling patients with suspected infection status were frequent, leading to difficulties in adoption and execution. The difficulty, as described by a nurse, was that their adjustments could hardly meet the amendments:

> "There are usually no major changes in practice, but only subtle changes, which are so frequent and rapid that when I am in the middle of adjusting to the changes, the situation has already changed." (P10)

Although most participants agreed that changes were necessary for effective disease management, some participants with higher ranking indicated there were difficulties in promoting the new measures in practice, due to a reluctance to accept change among some of their nursing colleagues. As one advance practice nurse commented:

> "Once there are changes in the existing guidelines, no matter whether it's new infection control measures or isolation policies… some staff would hold onto their

existing practices and beliefs about those guidelines… which caused difficulties in implementing the changes." (P21)

5.5 Fraught with Lingering Uncertainties

One of the most wrenching issues facing emergency nurses in EID management was the uncertainty surrounding the situations they were facing. Indeed, participants described the emergency care environment to be inherently embedded with uncertainty, casting significant doubt for them in responding to impending infectious disease emergencies. For example, a junior nurse said:

> "One can never predict what types of patients will appear. As their infectious status remains unknown, we are unsure about the actions that should be taken for them." (P9)

Another emergency nurse echoed a similar opinion on the uncertainties concerning patient infectious status, stating that she was not only uncertain about patients' infectious status, but would be likely to be infected without even being able to identify the origin of the infection:

> "The most pitiable thing is, that I am in contact with many different patients a day, and if I found myself infected with the new disease (EID), I would wonder who was the one who infected me. Actually, this really happens in practice. The pathogens cannot be seen or touched, one would not be able to tell if one is being infected if there are no symptoms, unless you go for a checkup." (P17)

The issue of uncertainty not only concerns junior nurses in the emergency department, but also senior nurses. A participant with over 20 years' experience in emergency nursing reported the following thoughts about the unpredictable nature of the work environment:

> "There would be no fixed routines in our practice, as the events we face would never be fixed. Peculiar situations just come all of a sudden, and all we can do is improvise, playing it by ear." (P16)

Uncertainty could also originate from a lack of understanding and clarity about epidemic EID situations. The majority of participants mentioned that information on emerging and unforeseen diseases, particularly at the early stages of an outbreak, was ambiguous and confusing. A participant reported his experience from a previous SARS and H1N1 pandemic, in which information about the newly recognized diseases was grounded in 'nothing more than hearsay'. Another participant described a similar experience, indicating that the manifestation of uncertainty was from confusion over information about the disease. The nurse remarked:

> "The disease information about newly-identified EIDs seems to be delayed and incomplete. It is not standardized across departments, adding confusion to the situation." (P14)

Uncertain circumstances could impose considerable hardship on emergency nurses in building preparedness when responding to EIDs. Some participants felt that their readiness for EID management, in anticipation of potential outbreaks, was adversely affected. A nurse who participated in managing the SARS outbreak made the following remark:

"The disease situation was completely a mystery in the first few months before the SARS outbreak. We knew nothing about the infection and had no idea how to handle it. We were lost and caught up in panic." (P3)

5.6 Summary

Emergency nurses' perceptions of EID management represented four categories, namely, fraught with resources constraints, fraught with threats of infection, fraught with ubiquitous changes, and fraught with lingering uncertainties. These categories indicate that the emergency nurses' experience of EID management was characterized and understood as encountering situations fraught with constraints and challenges.

CHAPTER 6

FACET OF NAVIGATION: REHEARSING FOR IMPROVISATION

6.1 Introduction

This facet delineates how emergency nurses thrived in uncertainty and change in various areas of their practice. Uncertainty and change are unavoidable components of emergency nurses' practice in the course of emerging infectious disease (EID) management, in the face of which they cannot act on their duties in a well-planned and systematic manner. The section below presents how the participants described their strategies in addressing uncertainty and change while engaging in EID management.

6.2 Rehearsing for Improvisation

Emergency nurses were required to improvise appropriate decisions and actions according to the events. In this circumstance, everyday duties posed challenges to their physical, emotional, and psychological capacity to adapt. The comment below illustrates how an experienced emergency nurse responded to untoward incidents when engaged in EID management:

> "Various unexpected issues that demand our action come all of a sudden, and we are unable to stop or control them. At this moment, it is time to examine our ability to stand the test of these challenges. It tests our leadership, our problem-solving skills, and our ability to improvise. In addition, it challenges our critical thinking skills and decision-making abilities. These are all crucial as we work in the accident and

emergency department, especially in the midst of unpredictable and unforeseen events." (P16)

This view was echoed by another participant, who indicated that technical solutions were inadequate and unavailable for emergency nurses to handle unexpected issues while engaged in EID duties. The participant remarked that it was crucial to identify alternatives and respond to issues on an impromptu, rather than on a prepared basis:

> "It could be chaotic and problematic in managing EID. We are not able to predict what is ahead waiting for us to handle. Things can happen in a way that is poles apart from what is written in the protocol." (P14)

This participant went on to share his experience in an incident during the period of the Ebola virus disease outbreak, while a patient with suspected infection displayed uncooperative and aggressive behavior:

> "There was once a suspected Ebola case transferred to our department via ambulance. According to the guidelines, when the ambulance arrives, a doctor and a nurse should gear up with PPE and get in the ambulance to undertake a quick initial assessment of the patient to see if there are any obvious signs of Ebola infection. If infection is unlikely, the patient will be treated in our department. In the case of clinical signs of infection, the patient should be transferred to the infectious disease center in another hospital. However, the suspected case was moved out of the ambulance before the initial assessment was made, without reason or notice. The patient had travelled to West Africa and developed signs of infection, therefore we considered him to be high risk and arranged an isolated room for quarantine purposes. But then the patient started to be uncooperative and aggressive, perhaps because of communication

problems, as the patient was from an ethnic minority and there was no interpreter available at that moment. Suddenly he turned violent and assaulted our staff and we had to subdue and restrain him, while we had no time to gown up in PPE. At that time, we were so helpless and we were afraid of being infected. The guidelines and protocols did not mention what we could do in this situation, and we had to count on ourselves." (P14)

This incident showcased a situation emergency nurses encountered while engaging in EID management of an unpredictable and unexpected event, as described by some participants, that "stirred up troubles". Instead of following established protocol, emergency nurses were required to prepare and equip themselves with skills and strategies to improvise and adapt in such a situation.

6.2.1 Lingering uncertainties

Uncertainty was regarded as a major challenge emergency nurses encountered in managing EIDs, leading to ambiguity in understanding the disease context in which their work was situated. Emergency nurses also casted doubt on whether their prior knowledge and skills in managing infectious diseases were appropriate to be implemented. To resolve uncertainty, participants portrayed their strategies as "Addressing the situation" and "Equipping for the impending battle", as illustrated in the following sections.

6.2.1.1 Addressing the situation

Some participants expressed the belief that the most pertinent way to resolve uncertainty was to obtain relevant information to address any erratic situations. As mentioned in the previous section, gathering up-to-date information was considered by participants to be a crucial component for emergency nurses to acquire a general picture of the nature and

progress of an EID scenario, enabling them to orientate themselves to the circumstances. A participant highlighted the importance of obtaining relevant information when gaining familiarity with an EID scenario as follows:

> "It is of the utmost importance that you know what is happening. As long as you understand the situation, you realize the problem. You have to acquire the latest information and maintain an up-to-date understanding of the situation." (P16)

According to the participants, disease information was mainly provided by international or regional governments or other related organizations, such as the World Health Organization, Department of Health (Hong Kong), or Centre for Health Protection (Hong Kong). After collecting and collating disease information announced from these organizations, hospitals and their departments would be responsible for compiling the information and disseminating it to staff. The circulation of disease information for emergency nurses was often done through email. For email information delivery, most participants agreed that the information was detailed and useful. However, it was revealed that workload was considered to be an obstacle for emergency nurses in accessing the information. As one participant said:

> "There is a large amount of information from a variety of sources that I receive from email, but I just do not have the time to check and read it. You may say we can check it during our mealtime, but after working the whole day through we really need a break and to relax, instead of checking email and reading disease information or updates." (P13)

In addition to email, disease information was also disseminated in the AED to nursing staff during nursing shift handovers. The majority of participants stated that information obtained from the shift handover was more relevant and effectively conveyed than when using email.

This participant suggested that it was an inclusive and interactive way for information delivery:

> "Information, including disease situations and guidelines, is covered in shift handover. The information is clear with summarized key points. Sometimes if there was a near miss, such as incorrect TOCC taking (travel, occupation, contact, and clustering), the charge nurse would raise the issue for sharing, so we could learn more about the situation." (P9)

Although most participants agreed that information dissemination through email and during shift handover was widely adopted as the main way to share information and communicate, some identified problems with the information delivery process, which inhibited them from appropriately addressing the disease situation. The major issue associated with information dissemination, especially the use of email, was the concern over information overload. Study participants offered an explanation for this problem, suggesting that it was the frequent renewal of information about the disease situation and practice guidelines that created confusion. Concerns regarding information overload were widespread among participants. As one participant put it:

> "There is room for improvement of information dissemination, which is about the quantity. Too much information is offered to us, especially related to the disease and protocol for response. Perhaps it is because there are multiple infections circulating in the public, and information is required to be renewed to match the disease situation." (P2)

Another participant, when asked about the influence of being overloaded by excessive information, said:

> "If I am to receive hundreds of emails about EID management, I am sure I will be overloaded. And then, I will just skip all the information, even if I have no idea about what to do in an EID scenario. Therefore, the lesser the clinical experience of the staff, the more the impact that information overload would induce, which might finally lead to inefficacy and ineptitude." (P13)

The same participant, who had more than 10 years of work experience in AED, shared his actions in handling information overload as follows:

> "If I receive the information, I will remain selective in screening the relevance of the information. I will only pick up and read information sent from reliable sources or organizations, such as the WHO (World Health Organization) and CHP (Centre for Health Protection). For other email, if there was nothing special in the heading, I will directly delete it even before reading the content." (P13)

Another concern raised by the participants was about the quality of the information, as some of them pointed out that the information they received was not standardized. Participants stated that the information provided by their colleagues, which included disease information, infection control guidelines, and patient logistics protocols, was sometimes inconsistent, leading to confusion. Although they worked in two different hospitals, these two participants held similar opinions about the inconsistency of the information they received. One of the participants, who was relatively new to the emergency care context, described the problem as follows:

> "Actually, the information provided by my department was not always consistent. As a junior staff member, I will seek advice from senior members when I come across issues that I am not clear about. However, their answers could be different and

inconsistent. For example, for the single room isolation of a patient, some people challenged my decision, although I had already asked other staff members for advice and I was just following their recommendations." (P10)

Similar issues arose not only with junior emergency nurses, but also with those who were more experienced. This participant with 10 years of AED work experience commented:

"The information could sometimes be regarded as 'hearsay'. Perhaps one staff member had said something about the disease, then others started to discuss and circulate the information. However, no one had confirmed the creditability or sources of that piece of information. The information might be distorted, exaggerated, or even misleading. However, we do not have an official and standardized source for obtaining information, and therefore hearsay persists among staff." (P20)

While facing issues such as information overload and inconsistent information, participants highlighted that personal alertness and vigilance were also required in addressing the situations they were facing, instead of depending entirely on provided information. In their everyday work, emergency nurses served as gatekeepers who were closely connected to the community, which helped provide clues as to the disease trend and progress and allowed them to reveal the development of the general disease situation. The comment below illustrates how a participant recognized the outbreak of H1N1 influenza through engaging in routine practice:

"You know about the disease situation and progress at work, especially if you are the triage nurse. There was a large number of patients attending AED and eight out of 10 had similar flu-like symptoms, you would then realize and be able to tell, there was something wrong, it was the influenza that was causing this. Then you read the news,

and took note of the announcement from the Department of Health about recent outbreaks, and you would be alert as to what you had just come across at work. So, you started to pay attention to the outbreak-affected regions, the mortality rate and the prognosis. You experienced it and sensed it. This sense did not merely improve your alertness, but also provided you with the whole picture of the outbreak, including the severity, the magnitude and the extent." (P17)

The experience of the above participant highlighted that in addition to factual information, emergency nurses would also gather their own first-hand information through everyday practice, which assisted them in addressing the situations they encountered.

6.2.1.2 Equipping for the impending battle

Participants referred to EID management amidst uncertainty as analogous to a "battle", implying that it was an immense hardship for them and they were required to prepare beforehand and be well-equipped to conquer the battle against EIDs. It was suggested by the participants that they had to equip themselves with relevant knowledge and skills, in order to bolster their readiness both theoretically and practically, to respond to an epidemic event. For instance, one participant, who had extensive experience in emergency care and EID management, suggested that holding the relevant knowledge of an EID was a basic necessity for their participation in an outbreak response:

"Sometimes there are junior colleagues making mistakes in simple tasks while handling EID cases. The main reason is that they are not familiar with this type of knowledge. I often ask them to do some infectious diseases revision. This is basic for emergency nurses. For example, being able to identify the signs and symptoms of an EID is the most important task in EID management, but if the nurse did not have the

related knowledge, how can one differentiate infected patients from the others?" (P17)

A nursing officer also pointed out the importance for emergency nurses to possess relevant knowledge of EIDs, and precautionary skills for developing practical and psychological readiness while participating in epidemic responses, as follows:

> "To participate in managing an outbreak, a competent emergency nurse should have fundamental knowledge of the related infectious disease, such as the pathology and transmission routes. With a basic understanding of the disease, it allows you to figure out how to take precautions, how to facilitate patient care, and how to instruct and give advice to other staff. Also, in terms of the psychological aspect, having the right knowledge could help staff feel at ease at work." (P16)

Indeed, engaging in EID event management required emergency nurses to demonstrate proficiency in a variety of skills and techniques. With respect to precautionary skills, participants on the whole displayed consistency, and agreed that emergency nurses must have the particular skill set of emergency nursing and infection prevention to maintain infection control standards over the course of care delivery. The participants reported that this specific skill set, which included but was not limited to clinical assessment skills and precautionary measures, enabled them to accomplish various unforeseeable tasks in an effective and proper manner while engaged in EID management. An advanced practice nurse highlighted the necessity of emergency nurses to develop the skill of rapid and accurate clinical assessment for patient surveillance as follows:

> "An accurate primary assessment is the basic skill an emergency nurse should have, especially at the initial triage. It is very important for us to really learn and be

> proficient in this skill, because on some occasions, we only have a few seconds to make a triage decision. For example, imagine I am the triage nurse, and you are a patient walking towards me. While you are walking, I am already assessing your condition, from your gait, your power, your posture, and your breath. Combined with a patient's past health history, vital signs, and chief complaints, I will have a preliminary picture of their condition. Treatment could then be initiated if needed." (P21)

Considering the importance of obtaining pertinent knowledge and skills, there was a variety of sources for emergency nurses to receive relevant education and learn the required techniques for engaging in EID management. The participants commented that their hospitals and departments provided education to staff through workshops and drills. The workshops mainly sought to raise awareness of the disease situation and refresh staff skills and knowledge through demonstrations, usually conducted in the classroom. Drills were usually performed in the form of simulations of epidemic scenarios, to rehearse a large-scale outbreak response. These drills, as described by the participants, offered opportunities to AED staff to familiarize themselves with the process and procedure of managing epidemic events, which were not certain but likely to occur. One participant shared her experience of an Ebola drill, commenting as follows:

> "There was an Ebola drill in our department not long ago. We participated in a simulation for the admission of a patient with confirmed Ebola infection into the AED. It started from the very beginning, from receiving a phone call from the ambulance for the admission of the Ebola case, to triage, to the treatment and arrangement. Staff were assigned to different roles in the drill, such as triage nurse and nursing officer in-charge. We involved our staff in the drill, as it is part of the

> training in the management of a possible Ebola outbreak. They can learn and reinforce the importance of infection control through the drill. They will know how to manage this kind of contingency if they really encounter such an issue in the future." (P16)

Indeed, participants agreed that conducting training in a simulated environment offered a platform to assist emergency nurses in preparing for an epidemic event, and in enhancing their performance to respond to an EID scenario. Yet, the participants highlighted that it was also necessary for emergency nurses to accumulate clinical experience to establish their readiness and proficiency in EID management, which was irreplaceable, and would not be possible by only doing drills and receiving instruction. As asserted by the participants, prolonged engagement in clinical settings offered a benefit to emergency nurses, because clinical wisdom could only be developed by immersing themselves in the substantial aspects of everyday practice. The comment below illustrates a participant's opinion on the significance of accumulated clinical experience on establishing readiness in managing an unanticipated situation:

> "In the management of EIDs, there are enormous unexpected issues that one might have no idea about how to handle, unless one had accumulated clinical experience or there were others who could share their own experience. It would be difficult for a junior emergency nurse, who had never come across similar issues in reality, to figure out a solution, even if he had attended workshops or drills before. Only if he had actually experienced this type of issue before, could he identify the possible difficulties that might emerge. Then he would have learned from the experience and be ready to handle similar situations in the future." (P22)

The above narrative suggests that learning by practical experience might offer a good scope of training for emergency nurses engaging in EID management, while the essence of tacit knowledge and clinical wisdom could be nurtured throughout the process.

6.2.2 Ubiquitous Changes

As mentioned previously, emergency nurses were subjected to a work environment constituting frequent and abrupt changes in different aspects of emergency care provision during EID management. To address the diverse needs arising from the evolving context of practice, emergency nurses are requested to display flexibility in embracing change and transitions, depending on the situation. Their actions and tactics in accommodating the changes are underlined in the participants' descriptions as "Acclimating to the evolving circumstances" and "Navigating the new roles and job descriptions". A detailed account of these categories is given in the following sections.

6.2.2.1 Acclimating to evolving circumstances

As indicated previously, the development of an EID situation could wield enormous influence on the implementation of precautionary measures. Among the various indicators depicting the progress of an EID situation, the enacting of the three-tier response level was regarded by participants as the most decisive consideration for their hospitals and departments in stepping up the requirements for routine infection control practice. Stringent infection control recommendations were established to tie in with the exacerbation of the disease situation. For example, one participant shared his experience of the changes in infection control measures after the activation of "Serious Response" of the three-tier response level system, in response to confirmed local H7N9 avian influenza cases, as follows:

> "We are required to gear up with full PPE at triage after the response level has been elevated from Alert to Serious. We are provided with new guidelines and recommendations for handling patients with a travel history to the affected areas. Before the Serious level activation, we used to document patient's travel history only for reference, but now we are required to isolate those who have presented with symptoms. For the others attending the AED, we would ask them to put on a surgical mask, even though some of them may not present with any symptoms of influenza-like illnesses. Not only the patients, we also have to instruct the people who accompany the patients to put on masks." (P9)

Most participants valued the relevance of these accelerated infection control measures in protecting both healthcare personnel and the public from EIDs. However, the changes also impacted emergency service delivery. Some participants did not feel confident about their readiness to adhere to the guideline changes due to lack of practice, although instructions were provided. They commented that there were distinct differences between the new recommendations and the practices they had been accustomed to following, which caused additional complications in successfully implementing the new recommendations. One participant expressed concerns about adhering to the updated PPE guidance in an Ebola response, depicting an example of the challenges emergency nurses might encounter in terms of guideline changes:

> "There are new recommendations on the standard of the PPE kits for use in handling patients with suspected or confirmed Ebola infection, including a new gown, thicker gloves, additional rain boots, and an extra hood. It is different from the one we are used to using when dealing with other infectious diseases. Not only the equipment, but also the methods and sequences in equipping and removing the gear are totally

> new to us. Although we have been told and taught in workshops how to utilize the new PPE, it is still difficult for us to be readily familiar with the new recommendations without an opportunity to practice." (P17)

In delineating their strategies to address the need to adopt the new recommendations and adapt to the practice changes, most participants who were less experienced in EID management valued the opportunity to approach senior colleagues for advice. They regarded the assistance of senior colleagues as helpful and practical, as their advice would have originated from previous experience in similar situations. As one participant described it:

> "The advice from senior colleagues is very helpful. Their advice could help me make decisions on issues such as where and how to handle suspected infectious patients. I can be more certain about my decisions, and feel more confident about following new guidelines." (P10)

Indeed, it was stated from the participants' comments that junior emergency nurses were willing to adopt new guidelines and recommendations. The above participant continued to offer an explanation for her willingness as follows:

> "There are enormous changes in practice to meet the new challenge from EIDs. As we are new to the issue and not yet experienced in handling these types of situations, we must follow the guidelines, so that we know what to do to protect ourselves and others." (P10)

For the more experienced emergency nurses with previous experience in EID management, it was revealed that some might be reluctant to adopt new recommendations, as they might insist their original set of knowledge and practices was adequate in meeting the needs of other epidemic events. As an advanced practice nurse commented:

> "When there are changes in practice, some colleagues who are more experienced might question the need for the changes, because they had experienced different episodes of EID outbreaks, and they thought that what was applicable before should be adequate for use in a new situation. They might insist on following their original set of practices, and challenge the necessity of the new practice. It is difficult to ask them to accept a new practice while they insist on following the existing one. But I understand it could be difficult for them to adhere to new guidelines, as they are already occupied with the original practice." (P21)

In discussing this issue, some participants suggested that it was of paramount importance for emergency nurses to value both their experience and the new recommendations. They might develop a tailored set of practices through integrating the new recommendations into their experience, enabling them to adapt to the novel needs of EID management. One participant illustrated his experience in adapting to the changes in routine as follows:

> "In handling a new situation, coping with new challenges, your experience is always invaluable. However, it is important to understand the core intentions embedded in the new guidelines and recommendations, and combine what I have learned with the new knowledge. I would filter the new guidelines and apply them alongside my original set of practices, as long as those guidelines do not violate the basic principles of what I have established from my clinical experience. It is the essence of the new guidelines that I should take into account, but not rigidly adhere to any recommendations." (P14)

One participant shared a similar view, and expressed the belief that both calibration and experimentation were crucial in adapting to a new practice. She said:

> "When there were new recommendations for practice, the first thing I do is study and make some revisions. I would be able to understand the rationale of the new practice, then I will learn it, absorb it and reinforce my set of practices. After that, I will try to implement what I have learned into practice and see if everything goes smoothly, without violating any principles. If so, a new and improved set of practice is acquired and I would apply it at work." (P25)

With regard to the implementation of new measurements and protocols, participants had underlined the significance of calibration, in which new guidelines and recommendations were scrutinized, selectively extracted and adjusted to fit the particular situation in practice. The comment below illustrates how a participant described the process of calibration:

> "Learning from new guidelines and recommendations is like peeling an onion - you peel off something layer by layer. What is left behind is something that could be incorporated into clinical practice. We should understand that what we have learned or adopted formerly is valuable, and what we are doing now is renewing it to fit the situation. We do not have to do everything by the book. Instead, we should adapt to the process, and adapt to the situation." (P26)

From the above narrative, it is emphasized that adaptiveness is an important feature for emergency nurses to easily accommodate themselves to a new disease situation and respond to a novel epidemic event.

6.2.2.2 Navigating the new role and duties

In facing an EID event, the AED scope of practice would be broadened with more emphasis on infection prevention and control, on top of the usual life-saving practice of emergency care provision. Although all participants acknowledged the importance of AEDs

and emergency nurses' responsibilities in an epidemic event response, some encountered difficulties embodying the extended role in practice. Some participants commented that the responsibilities and duties of their role as an emergency nurse had changed when they were engaged in EID management. They suggested that adjusting to the altered role was challenging, because there was a lack of clarity surrounding their role and orientation in the midst of an epidemic event. For instance, one participant, who was relatively new to the emergency care setting, expressed concerns about articulating the role expectations that accompanied the responsibilities of an emergency nurse in the H7N9 avian influenza scenario, as follows:

> "In the course of EID management, I have a feeling that I am not working in an AED. I formerly expected that the role of an emergency nurse was to triage patients according to their conditions and offer care to those who were in critical and urgent need. But now my role has changed all of a sudden and I am mainly assigned to duties on infection prevention. It is true that the guidelines and measures for disease prevention and infection control have been put in place, but the problem is, I personally am not yet in place." (P12)

In addition to the comment from the junior emergency nurse above, participants familiar with the emergency care context, with considerable experience in multiple episodes of EID management, echoed his view. For example, one participant, who had participated in the management of a variety of epidemic events for more than 10 years, indicated a shift in the traditional role of AEDs and emergency nurses, from offering life-saving services to disease prevention and risk aversion while confronting a large-scale EID outbreak:

> "I think our role as an emergency nurse becomes extended when there is a major outbreak of EID. We used to handle critical patients or participate in catastrophic

> events; or if not all patients were critical, at least we offer treatment and relief for their complaints. At the time of an epidemic, our duty is extended to infection prevention. It could be challenging to combine these two responsibilities. I think our first priority should be on treating the patients, and I expected there would be others to assist and work with us on infection control, so as to allow us to stay focused on our primary task. However, it seems that the responsibility of infection control and disease surveillance is shifted to us." (P14)

According to participants' descriptions, the extended role and imposed duties not only created ambiguity in their role orientations and scope of practice, but also provoked conflicts over the standard of care. A number of participants revealed that the change in emphasis of emergency practice had posed an appalling dilemma at work. One of the most remarkable examples, as mentioned by some of the participants, was associated with the handling of patients with a suspected Ebola infection, while emergency nurses were requested to minimize, or even withhold, interventions on these patients. As one participant put it:

> "Our hospital is not the final destination for patients with suspected Ebola infection because there is a designated hospital for this group of patients. Therefore, we are asked to minimize interventions, which might include CPR (cardiopulmonary resuscitation), on these patients, to reduce the risk of disease spreading in our department. We are advised not to perform CPR on these patients, even if they go into cardiac arrest and the cardiac monitor shows asystole. I think we should still save patients if it is necessary… I mean, we do not have a black-and-white definition of which situations we must perform or withhold CPR in." (P16)

On this topic, a participant who served as a department operations manager and was regarded as being in a higher management position, offered an explanation for the instruction of

minimal intervention in suspected Ebola cases. She highlighted the importance of maintaining an open mind while facing a significant change in work practices, in the following way:

> "Ideally, we should do everything we can for patients, and this is what we always do in AEDs. However, we should also consider the outcomes and consequences of our actions and interventions. For patients with Ebola, resuscitation might not do much good for them while at the same time, it might subject our staff to a risk of infection. There are various issues we have to consider when making a decision, and therefore we have to be flexible and remain open on these grounds, rather than sticking to the same old rut all the time." (P26)

A few participants agreed that working adaptively and flexibly was the essential attribute of emergency nurses in navigating their altered role in accommodating evolving needs during EID management. They generally acknowledged and displayed an acceptance of the extended role, and endeavored to cultivate adaptiveness and assimilate the duty and responsibility of infection prevention into their regular work practices. As one participant put it:

> "Sometimes one should allow changes to take place and show openness towards the changes. Now, I can say the practice of infection control has seemingly integrated as a usual component into my emergency care practice, regardless of the alert level and disease situation. It is a process that takes time." (P13)

Together, these results suggest that accepting the changes in their role and practice was challenging for emergency nurses. In addressing the duties and responsibilities embedded in

their extended role, it was important for emergency nurses to demonstrate critical thinking and the ability to be adaptive.

6.3 Summary

This facet of navigation described how emergency nurses orientate themselves for EID response in an uncertain and changing context. To cope with the uncertainties surrounding a disease situation, nurses attempt to gather information from a variety of sources to acquire a general picture of the EID scenario. They then prepare themselves with relevant skills and knowledge to enhance their readiness to respond to the EID event. In handling the evolving work environment, nurses demonstrate the flexibility to embrace changes in their practice, roles and duties.

CHAPTER 7

FACET OF STRIVING:
PRESERVING PROFESSIONAL DUTIES AND INTEGRITY

7.1 Introduction

This facet underlines the actions and tactics emergency nurses adopt in preserving the principles of healthcare service and fulfilling their duties with a sense of commitment and integrity while engaged in emerging infectious disease (EID) management. As mentioned in the previous sections, during an epidemic, emergency nurses were placed in perilous situations fraught with constraints and challenges. In this section, participants delineated their continuing endeavors in performing their duties and serving the community, in the face of mounting tensions and undue hardships experienced while managing an epidemic. The participants' strategies to maintain their professional duties and integrity while participating in EID management can be divided into several subcategories: Individuals, Co-workers, and Operations, which capture the various domains of their experience and behaviors in a difficult working environment. These are presented in the following section.

7.2 Individual Aspect

In this subcategory, participants' concerns about their personal capacity to fulfill their responsibilities to meet the imminent challenges of participating in EID management are compiled and depicted. In their accounts of the issues surrounding their capacity at an individual level, three prominent themes were identified: "Preventing infections and the spread of disease", "Upholding professional integrity", and "Maintaining resilience amid adversity", representing their actions and strategies for the purpose of preserving professional duties and integrity.

7.2.1 Preventing infections and the spread of disease

Ensuring personal safety was regarded to be of utmost concern by participants, given that the working environment in the emergency care context was perceived as fraught with significant and continuous health threats. It was apparent from the participants' descriptions that they were concerned about their health and worried about contracting an infectious disease at work. Apart from valuing the importance of maintaining physical wellbeing, the participants also highlighted that staying healthy and staving off infections throughout the course of EID management was the decisive element that allowed them to stand fast in their posts and take up their responsibilities in disease management. A participant commented that emergency nurses should take responsibility to ensure personal safety in the face of an epidemic event, so as to be fully engaged in EID management and effectively deliver healthcare services. He said:

> "We should always be responsible for taking care of ourselves. When there are any early symptoms of infection or sickness, those are signs that indicate I am getting sick. I would take extra precautions at work because if I really fall ill, I will become a new patient who is in need of care instead of providing care. That will make me a new burden in an already tense situation." (P3)

To combat EIDs, participants valued the necessity and importance of implementing infection control measures and PPE for personal safety and protection. As pointed out in the previous sections on the health risks and threats embedded within the central challenge of engaging in EID management, participants implied they lacked confidence that infection control measures and PPE could protect them from infection. On the contrary, these views in fact underlined their unmet expectations about the effectiveness of those self-protection measures, which were considered a last resort they could only rely on in the face of EIDs. This participant

shared his opinion on self-protection while participating in EID management, and stated that the use of infection control measures was indispensable to protect emergency nurses from infection during care provision:

> "For emergency nurses, adopting infection control measures is the golden strategy we can take to address occupational risk at work. There is a higher risk for us to be infected working in the AED than for colleagues who work in other departments. It is inevitable and there is no room for fear. What we can do is to stick to those infection control measures and carry through to the end." (P11)

However, although the participants realized the importance of adhering to infection control measures in tackling EID infections and preventing the spread of disease to others, some stated they were unable to comply with the recommendations at all times, because there were constraints impeding them from conforming to the measures' standards and requirements. In describing the barriers, participants reported that proper adherence to the standards in the infection control guidelines could be cumbersome for routine patient care. A participant commented that:

> "The new recommendations are surely bothersome, I am required to wear full gear PPE before approaching patients with a suspected infection. If an isolated patient has a fever and requires medications, I will have to take off the PPE right after leaving the isolation room, get the medication required, and put on the PPE again before entering the room. Doing so is not difficult, but troublesome." (P11)

Some participants further expressed that there was difficulty in complying with the recommendations, particularly when they were in charge of admission triage. For example, one participant stated:

> "The guidelines require us to perform hand hygiene every time after triaging a patient. However, it is impossible, definitely impossible. There are always so many patients queuing for triage assessment, I am not able to spare the time to clean my hands in between, even though hand washing or sanitization facilities are all around." (P4)

Many participants identified the enormous workload that resulted from the patient upsurge as the primary obstacle impeding emergency nurses from following the infection control guidelines laid down by administrators. They explained that the guidelines had added extra tasks to the prevailing intense workload. When depicting the challenges with hand hygiene compliance during peak workload periods, a participant described it as follows:

> "You just do not have the time to clean your hands properly. It might only take a minute for hand washing, but when there are too many tasks requiring you to finish at once, every minute counts. I would rather spend time on other more important work." (P7)

This view was echoed by another participant who pointed out that they were compelled to compromise on the standard of infection control practices because of a variety of limitations in the workplace:

> "I am not able to stick to the infection control guidelines at all times because there are many constraints that hinder me, such as workload, staffing, resources, and the feasibility of the guidelines. It was out of no choice that those measures were breached. I understand that I should adhere to the recommendations regarding infection prevention and for self-protection, but it is difficult to accomplish that in practice." (P15)

Despite the difficulties in adhering to standardized infection control practices, participants revealed their strategies to prevent infections and control the spread of the EID. Several participants stated they would remain vigilant in infection control practice if an elevated risk of infection was anticipated. For example, one participant described how he assessed the infectious status of patients as follows:

> "An opinion on patients' infectious status would be formed from the initial assessment. For patients who had no relevant travel and contact history for the disease, the infection risk should be minimal. For patients who had a recent travel history to outbreak-affected areas or who presented with laborious breathing, we would be particularly cautious and more meticulous in following infection control practices." (P9)

Another participant stated that she would adhere to precautionary measures more closely when performing high-risk nursing procedures:

> "The situation requires us to choose between options, and we opt to pay more careful attention to infection control instructions in high risk procedures. For example, we will be more cautious about hand hygiene after performing sputum suctioning, and would put PPE and a face-shield on, regardless of how busy we are." (P4)

The above narratives reveal that participants might decide their level of compliance with the infection control standard, and selectively perform precautionary practices based on the perceived risk of the likelihood of being infected in the course of care delivery. Their risk perception mainly hinged on their judgment as to whether patients were possibly contagious, or the nursing tasks were regarded as a high-risk procedure.

7.2.2 Upholding professional integrity

Professional integrity has always been considered an indispensable core value to the nursing profession, even in the midst of very difficult circumstances. In their accounts of events surrounding professional integrity, the participants emphasized that continuous efforts had been deployed to achieve consistent standards of professional and ethical conduct while engaging in EID management. The participants' intention to uphold their professional integrity and fulfill their duty of care was showcased in their descriptions. One participant described duty of care as the primary responsibility that emergency nurses were expected to take on when serving patients. During the interview, which was conducted at the time of the Ebola virus disease outbreak in the United States, the participant said:

> "The outbreak seems to be getting worse, as we receive information from our department and from the news everyday about how serious the recent disease situation is. However, we should always stick to our position in combating the disease. It is the task and duty that a nurse should have expected. For the Ebola outbreak, although the disease is new to me, I knew I would be involved in similar situations of infectious disease outbreak from the day I joined the profession." (P12)

This participant further elaborated on his continued commitment, explaining that it was his motivation to adhere to high standards of professional integrity that supported his willingness to work during an EID outbreak:

> "I am after all a member of the common folk, not saint, and I am not saying that I possess a noble sentiment of devotion to the sick, like Florence Nightingale. Honestly, being a nurse is how I make a living. But I personally believe that as a member of the nursing profession, I should fulfill a certain level of professional integrity; which

means that I would not allow myself to flee if there was a serious local outbreak. Whether it is a contribution to the public or a responsibility to my profession, it is all about doing the right thing for the common good." (P12)

Despite the intention to serve the public and meet patient needs, certain situations could pose a concern for emergency nurses in terms of practicing with professional integrity during EID management. Some participants pointed out that their willingness to participate in EID management was hampered due to the challenges of balancing duty of care with personal health concerns and family responsibilities. In other words, the view was expressed that the main challenge faced by participants in EID management was the dilemma between professional and personal integrity. Indeed, in balancing between these seemingly competing intentions, the participants indicated the difficulties in keeping with the principles of professional conduct during a large-scale EID outbreak, which struck at the root of their willingness to participate in an epidemic response. Elaborating on this issue, a participant said:

"Nursing is a meaningful job. However, in addition to my job, I am also obligated to take care of my family. At the time of an unprecedented infectious disease outbreak, one has to balance the needs of both sides. If I choose to work unconditionally, I might have less time to spend with my family members at a critical time like that. Even worse, I might carry the infectious disease from the workplace and spread it to my family members. In addition, how about if I am unfortunate enough to be infected by the deadly disease, I might be worried about how my family members would sustain their livelihood. The welfare of my family and me would be at stake, let alone my being able to help others. After all, it is human nature to be concerned about one's

> welfare in the face of danger. At a crossroads under such a circumstance, it is necessary to strike a balance between these conflicting interests." (P3)

According to participants, in balancing competing interests, the emergency nurses arrived at different decisions and outcomes. It was revealed from participants' descriptions that in the face of a serious epidemic event, some emergency nurses might decide to resign from their hospital job or request a transfer to another department and unit that they perceived to be less dangerous in terms of infection risk. In addressing this issue, a participant shared his experience in the management of the SARS outbreak, when he witnessed colleagues attempt to avoid becoming involved in the battle against the SARS outbreak:

> "There were quite a number of my colleagues who asked for a transfer to a different unit, because they thought they would be subjected to infection if they continued to work in the AED. Some of them even gave up their job and have since left the nursing profession." (P6)

The narrative above portrayed the actions of some emergency nurses, reflecting their attitude towards the duty of care. This participant, who had opted to stay in his original position during the SARS outbreak, set forth his thoughts and explained the reason behind his decision as follows:

> "Honestly, it was financial considerations that prevented me from leaving. Nursing was just a job to me, I worked and I was paid. If I left, I would have no income at all and would not be able to make a living. (P6)

He continued to describe his experience during the SARS outbreak and expressed his thoughts on how he balanced his family responsibilities and nursing duty as follows:

> "The outbreak of SARS was very serious at that time, and I told my colleagues in a joking manner that they had to help me claim the compensation allowance if there were any mishaps leading to my death. Honestly, it was not totally a joke, because at some point I did really mean it. At least, if I was infected and passed away, there would still be money to raise my daughter and pay for her schooling. She was only five at the time of the outbreak." (P6)

The participants' descriptions highlighted that the emergency nurses had experienced real fear, which was substantive and immersive, of the EID. However, although emergency nurses were confronted with an unprecedented and perilous situation, some continued to struggle and display their determination to uphold their high standards of professional integrity, despite the hardships. A participant, who demonstrated the willingness to serve the public in an epidemic, offered an explanation for his strong commitment in this way:

> "Although financial considerations are indeed an important factor, I do believe there are other elements that prompt my colleagues to stand firmly to their role in combatting an EID outbreak. To me, it is the sense of purpose in life that matters. Perhaps the sense is from my religion, which embodies a sense of mission and dedication. Maybe I have incorporated these beliefs into my work attitude. I think my decisions and behaviors in terms of duty and willingness of work are largely influenced by that – it is something that is out of the materialistic level." (P3)

The participant had attempted to illustrate the influential nature of people's attitudes and beliefs towards work in determining their willingness to adhere to their obligated duty and integrity.

7.2.3 Maintaining resilience amid adversity

As previously indicated by participants, the EID menace had been a longstanding challenge to the general public and to healthcare service providers. Amid adversity, emergency nurses could be subjected to various stressors that created distress and uneasiness. Maintaining resilience was an important attribute for emergency nurses to restore themselves to their previous physical and psychological condition without adverse impacts, and return to optimal status in the prolonged and persistent process of EID management. Indeed, it is revealed from participants' descriptions that emergency nurses were prone to a variety of adverse impacts while delivering care. One of the most commonly reported issues was a sense of frustration in the course of care delivery and EID management. Addressing the experience of engaging in the management of an epidemic event, a number of participants expressed frustration with their failure to achieve performance targets and goals of care, which hampered their self-esteem at work. For example, one participant felt that his goal in alleviating the dire EID situation had not been effectively established, regardless of his earnest endeavor to control the spread of infection in the community:

> "We have tried our best to implement precautionary measures at work, because we would like to help reduce the number of infections. However, from my observation, the effects of our effort are minimal. Reducing the number of infections is my goal as an emergency nurse, or more accurately, the goal of the entire healthcare system. However, that becomes our wish now. No matter how hard I try, I can do nothing to improve the situation because I am only a nurse working in an AED. This issue has made me quite frustrated sometimes." (P12)

In addition to unattainable goals, several participants remarked that it was common for emergency nurses to experience a sense of powerlessness and lack of control in the

workplace, due to resource constraints that prevented them from pursuing the appropriate and proper course of action. Speaking about this issue, a participant explicitly referred to her feelings of powerlessness and despair during the EID response, while the best interests of patients were not adequately respected:

> "I always have a feeling that I am abandoned at work because I have to face the challenges all by myself. Because of that, at some point during patient care, it was as though I could only witness patients suffering, instead of helping them. This is mainly due to resource shortages, such as hospital beds and staffing. For example, many patients are held up in our department because of the shortage of vacant beds in other units. It is a pity to see these patients, who are mostly older people, stay and suffer in our department. They are thrown in some corner area in the department and left unattended. Even their basic needs and human rights, such as requesting a bedpan for urination, are being neglected. I feel so guilty towards these patients, for not being able to fulfill such basic needs. This is a substantive problem that has existed for a long time, but after all these years the problem is still there without any improvement, because staffing is always insufficient. This is not going to change, even if I were to be promoted and was at a higher rank. No matter how hard I tried, all efforts ended in vain." (P4)

The above narrative from two participants revealed that emergency nurses could experience frustration and despair while managing EID, which was cited as the primary factor contributing to their psychological distress. In addressing the issue, a variety of strategies, both evasive and adaptive, were reported by the participants. One of the methods participants reported was to tolerate or deny such psychological uneasiness. As one participant said:

> "I know it is a futile effort in the end and I am already used to it. I just do what I am asked to do, take care of my own business, and that will do." (P8)

Another participant, who expressed her frustration with not being able to address patients' basic needs, restated that she had considered resigning from her job, because her goal of serving people in need was thwarted:

> "I have always thought of resigning from work, and the thought is substantive. I am not just going to resign from working in this department - I would like to leave this profession. I am so exhausted to see that the situation remains unchanged, regardless of the efforts I have made. I am so disappointed at myself, perhaps because I am passionate in my work. I know I am serious and devoted to my work. Unfortunately, I will never make it, since I take it too seriously." (P4)

Apart from taking evasive strategies to cope with psychological distress from work, some participants suggested strategies to maintain resilience during the course of EID management, and restore optimal psychological condition after encountering unsettling situations. For example, this participant stated that she used to remind herself to address issues instead of targeting individuals:

> "The psychological stress at work is intense, but one should always find a way out. This is part of the job, and I will try not to recall unpleasant incidents. Patient safety is the most important concern for us. If this is not breached, everything will be fine. I am quite an optimistic person, and I think there are many things at work that are just part of our duty, and we do not have to take them personally." (P10)

Commenting on strategies to maintain resilience in the course of the hardships of managing EIDs, the following participant displayed a proactive and positive attitude towards the

psychological stress and pressure of unmet goals, demonstrating her emotional reserve with a strong will and mind in addressing difficult situations:

> "I will never think that my efforts are wasted in vain, nor stop being passionate about my occupation. No. Never. Because the results and consequences of one's efforts cannot be judged immediately. I understand some problems at work seem to be unresolvable, regardless of how hard one has tried. Even so, I will not be frustrated. Instead, I will maintain my momentum and keep trying. I will learn from what I encounter and try to identify alternatives. Difficult situations often show improvement step by step, as long as I am not frustrated and keep alive the hope that the difficulty will be settled." (P17)

Engaging in such an unending battle in EID management requires emergency nurses to develop resilience to cope with and respond to the disruption, which portrays their understanding of the ability to restore themselves to optimal condition with minimal adverse influence and side effects.

7.3 Coworker Aspect

In addition to personal capacity, participants valued collaborating with co-workers and working as a team when facing an epidemic event. In this subcategory, which includes three themes: "Protecting each other", "Promoting learning atmosphere", and "Assisting each other's duties", the participants' considerations and actions using a team effort to respond to an EID event are illustrated.

7.3.1 Protecting each other

In addition to personal safety, the participants also expressed concern for each other's wellbeing, as well as the wellbeing of colleagues and other healthcare workers, protecting each other from adverse consequences in the course of EID management. Most participants indicated that the health of co-workers in the AED, including nurses, physicians, healthcare professionals from other disciplines, and support staff, was at risk during an EID event regardless of their job description. As previously mentioned, the participants remarked that the AED work environment was fraught with threats that could jeopardize the health of staff, notably frontline workers. Commenting on this issue, a participant described the situation as follows:

> "We are on the frontline, which means we are in danger. Because when there was an outbreak, we will always be at the forefront of defense against infectious disease. I am concerned about my own health, and it worries me even more that colleagues around me get sick one by one every day." (P3)

In addition to emotional involvement concerning the health of colleagues, the above participant further depicted the problem from a practical perspective, explaining that when an increased number of staff fell ill, it could set off a vicious circle, and the health of other colleagues would be adversely affected:

> "Staffing is already tight during an epidemic, and if there were more staff who took sick leave, the situation would become even worse. When there is a staffing shortage, the current staff have to cover the duties of those who are ill, with less support. This might end up exhausting a staff member, or one would not be able to implement high quality infection control measures under such constraints. In consequence, more staff

will get sick and take sick leave from work. The problem would continue to snowball in the AED. It is actually a vicious circle." (P3)

Some of them, especially the nursing officers and advanced practice nurses, clearly indicated that protecting staff is one of their major responsibilities during an epidemic event. For example, this advanced practice nurse highlighted her intention to protect her colleagues against infection, which she regarded as the primary objective during an outbreak. She said:

"During the time of an EID outbreak, the most important task for me is to ensure and confirm the safety of my colleagues. I cannot afford to leave a single colleague behind." (P21)

Discussing the issue of co-worker safety, this advanced practice nurse emphasized that in the course of EID management, staff safety was of the utmost importance. While acknowledging that the workplace was fraught with uncertainty, and that she might face challenges in prioritizing the importance of tasks in an unpredictable situation, she continued to restate her responsibility to ensure the safety of her colleagues, even during a time of unpredicted emergency, as follows:

"Even if there were a patient who presented with a critical condition and required immediate treatment, I will always be concerned about the safety of my staff first, before any interventions, no question about that. To be honest, I cannot control whether a patient could be saved or not. When a patient needs treatment, we give the treatment, and that is it. However, for my colleagues, as a charge nurse, I am the one to assign who is to approach and take care of the patient, and thus I have the responsibility to ensure my colleague's safety, as I am the one to make the decision. If my decision could subject a staff member to possible threats, I have the responsibility

> to minimize the risk and ensure my staff will not be infected during the treatment process. I have to make sure that my staff will be safe after completing the task." (P21)

It is clearly illustrated from the above narrative that protecting colleagues was a common intention among the participants. Unfortunately, when discussing the actual interventions or strategies to prevent colleagues from being infected, many nurses in this study displayed feelings of powerlessness, and stated that reminding each other to pay attention to suspected cases and adhere to infection control measures was the only action they could take, as the risk of infection was embedded in their practice and could barely be eliminated. As one participant said:

> "To help prevent each other from getting infected, we mostly rely on reminding each other. For example, when I notice a patient displaying symptoms of an EID infection, I will report the issue to my colleagues immediately and describe the clinical manifestations, so they could take corresponding precautionary actions. I wish I could help alert my co-workers so they could be more alert and take extra care in handling suspected cases." (P2)

Emergency nurses at a higher rank, such as nursing officers and advanced practice nurses, would attempt to protect their staff by providing them with adequate training in a timely manner. The advanced practice nurse who emphasized the responsibility to protect colleagues implied that training would be given to staff who were at a basic-rank level through to managerial positions:

> "Training on infection control and precautionary measures would be offered to a wide range of staff in our department, regardless of their rank and position. For example,

> our department operations manager might carry out inspections in clinical areas and that might subject her to the risk of infection. Therefore, I would invite her for infection control training so she knows how to protect herself. Also, there would be some plaster technicians coming to our department for patients who require treatment, and training was provided to them as well, so their risk of infection would be reduced by taking precautionary measures. Actually, I have just finished a training course for the hospital porters in our department. I have to ensure that all staff working in this department are well protected." (P21)

Taken together, these findings suggest that the participants were not only concerned about their own personal health, but also about the safety of their colleagues and co-workers. Although obstacles were identified in minimizing the risk, the participants' efforts were reflected in the actions of staff nurses in reminding each other of possible high-risk patients, and the plans of the charge nurses in offering precautionary training to all staff.

7.3.2 Fostering a supportive atmosphere

Amid the adversity and hardships of managing an epidemic event, teamwork is a crucial element for a healthcare institution or unit to effectively exploit the abilities and functions of individual staff. To enhance cohesion and teamwork, participants highlighted the importance of establishing a workplace that nurtured and sustained staff growth and development. In discussing this issue, some participants described their divergent views on the working atmosphere of their departments, which differed strongly from place to place. For example, this participant described the work atmosphere in the AED as harmonious, with individuals who were willing to support each other in participating in EID management:

> "The work atmosphere in my department is supportive and harmonious, and everybody is ready to work closely and collaboratively. We can always rest assured that we can count on each other, because everyone is willing to offer their unwavering support to colleagues in need. We consistently work together towards the goal of improving the quality of care and controlling the spread of disease, and that helps create a supportive work environment." (P9)

The narrative reveals that a supportive work atmosphere would assist staff in feeling content while engaged in EID management. Conversely, some participants felt that their working environment was stressful and full of tension, which influenced workers' emotions and attitudes in an unhealthy manner. As one participant said:

> "It is essential to maintain positive workplace conditions. For instance, in my department, colleagues lose their temper a lot when encountering difficulties at work, then they start to complain to each other about the hardships they face. I understand it is important for them to vent their feelings and views during this difficult time of EID management, but this could influence other colleagues and end up affecting our emotions in the same way." (P2)

The participant's description highlighted an issue with the workplace that a culture of blame could poison the working environment and create a hostile atmosphere in the department, eroding trust among colleagues. Indeed, several participants shared their experience that many of their colleagues were emotionally charged in the face of challenges, because of their deep fear of the consequences of making mistakes at work. In addition to a fear of criticism or accusation, the consequences of committing an error in the workplace would often result in negative perceptions among co-workers and directly impact the reputation of the staff member in question. This fear was more commonly recognized by participants who were

relatively inexperienced in engaging in an EID response, compared to those who were experienced, as those who were relatively inexperienced were less confident about whether their skills and knowledge were adequate to perform tasks in disease surveillance and infection control. To create a supportive work atmosphere, efforts to tackle a rampant culture of blame were remarked on by some participants, notably those who were higher in seniority. These participants highlighted the importance of being non-judgmental towards colleagues, and stated that this could help colleagues to learn and grow from their mistakes. The comment below illustrates how a participant helped colleagues replenish their confidence at work through encouragement and recognition:

> "Colleagues who have made mistakes are usually regarded as incompetent or mediocre by others. Once they encountered difficulties and made mistakes, other staff might do nothing but keep judging and discouraging them. These colleagues, who felt they were being spurned by their co-workers, became even more unconfident and fell prey to self-doubt, leading to failure in completing other tasks. Actually, some of my colleagues are victims of this vicious circle. However, from my personal experience in working with these colleagues, I have realized that they are not as bad as they had been described. They have their strengths and potential that has not yet been explored. I then tried to encourage them when I worked with them, by acknowledging and emphasizing their strengths and showing my appreciation for their efforts. They became more diligent and attentive afterwards and their performance has started to gradually and consistently improve, because they are restoring their self-confidence and self-esteem. To me, it is like I have pulled them back from the bad cycle and paved the way for a good cycle of growth. I am able to help them because I would not judge them solely on the results of their performance, but also on their motives and

> intentions. This is all about trust and encouragement in rebuilding their confidence." (P25)

The above narrative has displayed the importance of co-worker support in reviving nurses' self-confidence and self-esteem and improving their performance. In addition, establishing a workplace that facilitates learning was also valued by the participants as beneficial to sustain the growth and development of emergency nurses' capacity to fulfill their duties managing an EID. Almost all participants agreed that experience sharing from experienced colleagues was one of the most effective ways to help foster their knowledge and preparedness in EID management, as clinical knowledge could only be acquired through practical work experience. Although several participants commented that sharing experience could sometimes be impeded due to workload, most, regardless of their seniority and ranking, showed their willingness to share their experience with others to enhance teamwork. As this nursing officer put it:

> "Clinical experience is crucial in our everyday work, especially in handling unprecedented events, such as a large-scale EID outbreak. Therefore, it is necessary for me to share my experience with colleagues, especially those who have never come across this type of situation before. I often share my previous experience of epidemic response in workshops and training sessions, while I offer case sharing from my personal experience. I would like my colleagues to be able to learn from what I have encountered and act accordingly, if they face a similar situation in the future." (P6)

Another participant further explained how he passed down and paid forward the clinical knowledge he had learned from others to new colleagues, maintaining this collective wisdom among his co-workers:

> "When I was new in AED, it was my colleagues who shared their experience and taught me how to make things work. They shared what they faced and how they managed an issue in the course of EID management, and I integrated their wisdom to assist me in making decisions. My experience not only originates from my own practice, but also from the accumulation of others' experiences, which they in turn shared with me. Therefore, now I am the one to share my experience with others to smoothen and facilitate their work. I am responsible for passing the torch to new staff members and other colleagues." (P14)

These findings suggest that a learning atmosphere was the product of the collaborative work of unit staff, in which they would be responsible for fostering positive work practices and for promoting the growth of their colleagues.

7.3.3 Assisting in each other's duties

On top of the characteristics of a workplace with a flourishing teamwork culture, participants' descriptions revealed the actual collaborative work of emergency nurses in a teamwork environment. Some participants highlighted that they were used to offering assistance to each other, because that was regarded as a work practice that remained prevalent among emergency nurses. The participants further emphasized that the practice of "covering for each other", which describes actions that emergency nurses performed while filling in for a fellow worker's essential duties, was necessarily required in the course of an EID event. As mentioned by the participants, it was because in the management of an epidemic, they often encountered challenging situations and an ever-expanding workload that exceeded their personal handling capacity, and required collaboration and mutual support from colleagues to cope. One participant commented:

> "To my understanding, the AED is a unit that requires staff to flexibly fill in and cover others' positions. For example, although each emergency nurse is assigned a particular position during a shift, once one is unoccupied at the position, he or she should always be ready to offer help to colleagues who are in need, instead of saying that is none of one's business." (P11)

According to the participants, the actions to cover for colleagues usually took the form of hands-on support in helping them complete their work and fulfill their duty. For example, this participant said:

> "Our unit is often busy and we always work together as a team, helping and supporting each other by filling in for each other's positions. For example, if the treatment cubicles were heavily overloaded with acute patients while the walk-in clinic was not that busy, the nurse who was assigned to the walk-in clinic would go to the treatment cubicles to see if there was anything he or she could do to help." (P5)

In addition to helping fellow workers with their duties, participants mentioned their intention to cover for colleagues by correcting each other's mistakes by advising and reminding each other. As this participant put it:

> "Some colleagues could be careless or forgetful from time to time, so there would be something missed or overlooked in their practice: perhaps they forgot to fill in the patients' TOCC (travel, occupation, contact, clustering) information, or they assigned a suspected infectious case to an incorrect area. In such cases, we might remind the staff member about things he or she had omitted, and try to fill in the gaps as much as we can. We will cover for each other, as we always work as a team in the AED." (P12)

As mentioned previously, in the course of an epidemic the workload of individual emergency nurses was already considerably heavier than usual. While struggling with the workload, it was surprising to note that most participants showed a willingness to offer assistance to colleagues in fulfilling their duties, on top of their own responsibilities. A variety of considerations were yielded from participants' descriptions of their willingness to offer help filling in for co-workers, and one of the most cited opinions was their intention to ensure the smooth running of their institution and department during an EID event. Some participants also suggested that their efforts to cover for co-workers were made for the sake of the patients so as to enhance the quality and standard of care, while others believed that their practice of offering assistance to colleagues would result in reciprocal help when they themselves encountered difficulties. A participant who demonstrated strong eagerness to cover for another staff member explicitly underlined that her motives in assisting with others' duties were driven by the primary goal of working for the mutual benefit of different parties, including herself, her colleagues, the department, and patients. Her opinion is as follows:

> "I think if I am the one who was overwhelmed by the workload, I would be in desperate need of help from my colleagues. Therefore, I will try to offer my help to others when they are in need. Sometimes we should put ourselves in other people's shoes. For example, if I am assigned to be responsible for the treatment area, if there are not many patients requiring wound dressing or suturing, I will go to other areas in the department to see if I am needed. If we work together and complete our tasks together, I guess it would be more desirable than seeing others suffering while I have leisure time. I would rather work hard and take rests together with my colleagues. Moreover, I think it would benefit the patients in our departments if I were to offer help to my colleagues, because it could help improve the effectiveness of our work and shorten patient waiting time. There might be fewer complaints from patients, and

> the functioning of our department could be improved. To conclude, I am trying to do something to help establish a win-win situation, which is beneficial to the staff, patients, and the department." (P18)

A number of participants suggested that assisting with colleagues' duties and covering for them was self-directed or self-assigned. They would take up another's work on their own initiative when they realized there were gaps that required coverage. Moreover, some participants pointed out that charge nurses often asked them to cover for and relieve fellow workers. The abovementioned participant continued to share her observations as follows:

> "Not every nurse is willing to take the initiative to fill in for others. The willingness varies from person to person or from time to time. Therefore, sometimes the charge nurse would reassign staff to help colleagues who were overwhelmed at work. Actually, there are no rules guiding who and how to fill in for others, and it is decided solely by the charge nurse." (P18)

According to this theme, the participants explained how they assisted with each other's duties through a collective effort in addressing difficult situations, when nurses' personal capacity in service provision was overwhelmed. Assisting with each other's duties could be complementary and supplementary to the staff and the departments.

7.4 Operational Aspect

Preserving hospital and department functioning was cited by participants as another imperative component of their tasks while participating in EID management. In this subcategory, four intertwined themes emerged from participants' descriptions, which are

"Filtering the suspected", "Facilitating workflow and logistics", "Prioritizing tasks to cope with resource constraints", and "Establishing communication with different parties".

7.4.1 Filtering the suspected

Serving as a healthcare institute's gatekeepers, participants highlighted the pivotal role of emergency nurses in identifying possibly contagious patients. The majority of participants accentuated their responsibility and duty in disease surveillance and notification while participating in the EID response. They highlighted that filtering the suspected cases and preventing the spread of disease from unattended patients was one of the most essential tasks for emergency nurses to accomplish in emergency care provision during an EID event. Moreover, the participants remarked that the consequences of overlooking a possibly infectious case could be problematic and detrimental. For example, a participant shared her experience in the aftermath of making an inaccurate judgment of an infectious patient's status, when her colleague mistakenly omitted the implementation of required disease prevention measures as follows:

> "Once there was a patient who presented with signs and symptoms of EID infection, but our colleagues were not sensitive enough to detect those traces. A staff member later identified this patient, and there were many different steps and procedures to undergo to reduce the risk of the disease spreading. First, we had to inform the physician who was responsible for that patient. Because the physician decided to transfer the patient to the infectious disease center, which is designated for patients with suspected EID infection status, we were required to inform different parties for the arrangements in transferring the patient. Also, contact tracing had to be done and colleagues who had been in contact with the patient were asked to perform a series of

checks, such as chest X-rays and lab tests. Some might even be given prophylaxis." (P19)

To effectively determine patients' infectious status, the participants were provided with a set of criteria, designed by the Centre for Health Protection (CHP) to identify patients who presented with suspicious signs of an infection. These criteria included the patient's recent TOCC history. However, although all participants acknowledged the fact that these criteria could provide essential information for epidemiological investigation and had been proven to be effective in identifying clinical and epidemiological links in patients, a number of them found it difficult to implement the TOCC assessment for patients, because the criteria were often vague and broad, creating difficulties in application and limiting the relevance of the assessment in determining patients' infectious status. Commenting on the TOCC criteria, one of the participants said:

> "For the TOCC assessment, patients' travel history is really difficult to take accurately. At the time of an EID outbreak, we were asked to obtain travel history from patients and arrange designated isolation rooms for the patients who had a recent travel history to an infected area. However, EID events, such as swine flu and avian flu outbreaks, used to occur in Mainland China and get worse in Guangdong Province. Hong Kong is part of Guangdong Province, and it was really confusing to determine patients' travel history. Even if we excluded Hong Kong from the infected area in taking the TOCC history, it was still problematic to obtain the information, because it is very common for patients to go to Mainland China, and eight out of 10 patients in the AED would report with a positive history. Should we isolate all of these patients according to their TOCC criteria? It is impossible." (P18)

In view of the problems associated with using the TOCC assessment, some participants remarked that, on top of the TOCC criteria, they might consider integrating other means of assessment in evaluating a patient's infectious status. A number of nurses alluded to the notion of the application of clinical wisdom, while mentioning how clinical experience could assist in determining a patient's infectious status. As this participant said:

> "I think deciding whether a patient is infectious or not really depends on the nurse's clinical experience. If the nurse has encountered patients with different presentations and manifestations, he or she would be able to determine and differentiate the signs and symptoms of infection at a glance and take a guess. This could provide one with a great deal of useful information on the determination of risk, and further precautionary measures could be implemented accordingly." (P15)

However, although clinical wisdom and experience might be able to assist emergency nurses in screening suspected cases, most stated they were not able to assure the appropriateness and correctness of their judgment. Thus, several participants stated that they might rather presume a patient infectious, even one who only presented with minimal signs. They claimed it was because they decided to play it safe and not take the risk of omitting an infectious patient. For instance, one participant said:

> "Sometimes we do prefer severity to leniency, so that infectious cases are more likely to be detected. Perhaps deep in our hearts we knew the risk of that patient was minimal, but to play it safe, we would highlight the patient's risk before he was proven noninfectious." (P9)

This view was echoed by another participant, who employed precautionary measures at a higher standard than what was required in patient screening. The participant explained that this could help minimize the risk of spreading disease:

> "The infection control measures requirement for contact precaution and airborne precaution are different, but sometimes I will decide to use a higher standard, even when that was not required in that situation. In handling unknown patients, I would rather do the extra work than take the risk. Also, regardless of the reason for a patient to attend the AED, no matter whether it is for a finger cut or an abdominal pain, the first thing I am concerned about and will do is take their temperature to see if they are feverish, which indicates an infection." (P13)

Despite the plans used by participants to screen suspected infectious patients, a number of participants stated that to detect suspected cases was a challenging task during an outbreak, because of the considerable increase in patient attendance in the AED. Among those in attendance, there were a variety of patient types that emergency nurses were required to screen for infectious risks, which created complexity in fulfilling their gatekeeping duties. For instance, this participant offered information about the different types of patients in the AED:

> "The number of patients in attendance would increase drastically if there was an outbreak of infectious disease. For these, there were patients with different manifestations and reasons for attending our department. Some were really sick and presented with the signs, symptoms and epidemiological links of the disease, while others came to seek medical advice because they presented with general symptoms of influenza-like illness, but had become panic-stricken by the disease situation. There was also another group of patients, who attended our department only because of

psychological or emotional factors, without signs or risks of an infection. They come to us seeking psychological reassurance, or for a regular checkup." (P3)

The participants' narratives indicated the nature and strategies of how emergency nurses identify and filter infectious patients among AED attendees, suggesting that it was a duty requiring a set of clearly defined criteria and the incorporation of clinical wisdom and experience.

7.4.2 Ensuring efficient workflow and logistics

In managing the imminent threat of EIDs, the participants' descriptions indicated their endeavors in ensuring efficient operational workflow and patient logistics. According to participants, it was a daunting task for the emergency nurses to maintain the smooth operation of AEDs, because of obstacles they encountered at the time of an epidemic event. For instance, a number of participants indicated the futility of the new guidelines in easing staff workflow and patient services. The majority of participants perceived that hospital administrators had merely adopted stopgap measures in tackling workflow issues, instead of considering and providing comprehensive solutions for an effective and efficient workflow. One participant vividly described the existing workflow arrangement as a "piecemeal approach" - "treat the head when the head aches, treat the foot when the foot hurts" (P2). This sentiment was echoed by another participant, who pointed out the lack of discretion in workflow planning as follows:

"A new ward was opened to handle the patient surge caused by EIDs. For the workflow arrangement and ward guidelines, there was next to no planning by the administrators on feasibility before application. Various problems arose after implementing those guidelines, including staff reallocation and patient logistics. This

could have been avoided if the flows and guidelines were planned more precisely." (P6)

When asked about barriers to applying the recommended guidelines to optimize staff workflow, a common view among participants was that the guidelines were idealized and impracticable in real-life situations. One participant stated that administrators were unable to evaluate the feasibility of the guidelines, unless they could "be here and experience how poorly the workflow guidelines were designed" (P6). Another participant pointed out that although considerable efforts had been pledged in formulating hypothetical guidelines, they were no more than a paper exercise without the consideration of possible obstacles in real-world situations:

> "The planned guidelines could be extremely comprehensive, but once they were to be applied in clinical settings, unexpected flaws and limitations emerged that could only be discovered by frontline staff. Maybe there is a need to balance theory and practice in clinical settings, and this is the difficulty we are facing." (P3)

In delineating their strategies to adhere to the recommendations on staff workflow and patient logistics, which were perceived to be impractical and unrealistic, the majority of participants stated they would approach senior colleagues for advice, on account of their previous experience in similar situations. However, instead of taking every action to abide by those guidelines, several participants mentioned that they used to feign compliance with new guidelines and protocols by complying overtly, but covertly opposing the implementation of such workflow changes. For instance, a participant pointed out that he considered adopting the guidelines for new workflow and logistics reengagement to be an empty gesture without practical relevance, performed because of orders from administrative superiors:

> "The guidelines are always perfect, but humans are not. Therefore, there would be some circumstances where those requirements and regulations were not able to be addressed in practice, regardless of our efforts. For example, the guidelines require that all patients with a fever put on a surgical mask. However, there are perhaps some patients presenting with a fever who require oxygen therapy at the same time. The guidelines suggest that the surgical mask should be applied over the oxygen mask to prevent blocking the oxygen flow and patients' inhalation, but I think there would be air leakage around the surgical mask, which would breach the rationale for using it. Although I understand the problem of applying a surgical mask outside of an oxygen mask, as we are told by supervisors to strictly follow the guidelines, I will still adhere to the guidelines and pretend I do not realize the problem. I will just put on a show for the charge nurse to see, so that I will not be blamed." (P13)

In bridging the gap between guidelines and practice in EID management, participants underlined the importance of frontline nurses' participation in formulating clinical guidelines and recommendations, instead of only involving senior level administrative personnel. It was anticipated by participants that the involvement of frontline staff would enhance the practicality and workability of protocols to meet the needs of emergency care service in the course of an EID event. The following nursing officer shared her experience of being involved in guideline development:

> "Usually, frontline nurses would be involved in the discussion to formulate new sets of guidelines to address the practical needs of frontline staff. For example, we were asked for suggestions and comments on locations in the department to place protective gear, medical equipment, and consumables to be more user-friendly and time-effective for all frontline staff. The hospital administration has shown the

intention of enhancing the practicality of the guidelines, and therefore there is no excuse for our frontline staff not to adhere to the suggestions and recommendations." (P16)

However, a participant who was at the rank of staff nurse argued that the opinions of frontline staff nurses were seldom entertained by the administration. As she put it:

"The development of protocols for workflow and logistics changes might involve frontline nurses, but basically those who are at the rank of advanced practice nurse or above. We are seldom involved in devising those guidelines. The hospital administration and our supervisors inform us about the amendment, and our duty is to follow the instructions and orders." (P22)

These results in this theme suggest there were numerous obstacles impeding participants' actions to ensure the smooth operation of emergency service provision.

7.4.3 Prioritizing tasks to cope with resource constraints

As pointed out in the previous sections, making do with finite resources in the event of a major EID outbreak was one of the duties frequently cited by participants. To preserve the smooth operation of emergency service provision, the majority of participants stated that it was necessary for them to decide how priorities should be followed when coping with an increased workload and limited resources. To determine the priority of nursing tasks, participants revealed there was a range of considerations that influenced emergency nurses' decisions on work sequences. A common consideration among participants in prioritizing and sequencing care delivery was associated with patients' clinical condition. Indeed, the majority of participants emphasized that setting priorities according to patients' conditions had always been the core function of emergency care. Discussing this issue, a participant

mentioned that the physical condition of a patient was the main concern for her in setting the priority for care:

> "Patients' conditions are always our primary consideration in delivering emergency care. If a patient's vital signs are unstable and require immediate action, we offer our help immediately, and that is it. For patients who present with minor or mild symptoms, I will allow them to wait if there are no foreseeable risks for deterioration, even if they present with a TOCC history. Prioritizing care is not only about completing a task of infection control, to me it is the patients' safety and interests that I care about most." (P18)

On the other hand, some participants highlighted the importance of including the concept of infection control for consideration in the course of an epidemic. They underlined that decisions on sequences and orders of care would mainly depend on whether a patient was suspected to be infectious. It was revealed that participants opted to manage patients presenting with signs of infection and who were suspected of being infectious, as soon as possible, because of the intention to reduce the risk of spreading the disease within the departments. Discussing this issue, a participant commented:

> "To determine the order of priority for work assignments, the likelihood of a patient being infectious is one of the major considerations. In this situation, deciding the order of priority should not only focus on a single patient, but also on the patient's influence on the general public. If there was an infectious patient attending the AED, the longer the time they waited, the higher the risk of the infection spreading to others. For example, if a patient was confirmed with an airborne infectious disease, such as multidrug-resistance tuberculosis, I will not only approach the patient at once, but I will also ask the doctors and other staff to allow the patients to receive his or her

> treatment first, so as to transfer the patient out of our department to somewhere with a higher standard of infection control as soon as possible. Therefore, the consideration is not merely about a patient's clinical condition, but also about the common good." (P16)

From the above narratives, the contrasting views of the two participants on according priority to service provision displayed the different approaches that participants adopted in deciding the importance and urgency of care delivery. Apart from patients' clinical manifestations and the possible risks of disease spread, it was identified by some participants that their decisions about work sequence hinged on facilitating the effectiveness of service delivery. They offered an explanation for their selection, and highlighted the necessity of promoting the smooth running of the department in times of resource and staffing constraints. One participant shared her experience of prioritizing and sequencing the order of care while managing the new H7N9 influenza infection, as follows:

> "Patients with suspected infectious status (H7N9 bird flu) might be given a higher priority for treatment and admission, because I want to guarantee the smooth workflow of emergency care service, without any bottlenecks. The condition of these suspected infectious patients might not be the most critical, but they are often 'upgraded' and managed first. This is done to vacate isolation facilities, such as an isolation room, and ensure the availability of these facilities to meet the needs of other infectious patients. Also, there is a great deal to clear up after handling an infectious case. Therefore, they are often transferred out of the department as soon as possible. It is just a way to enhance smooth workflow, by making allowances for the epidemic situation." (P22)

Participants' descriptions of their experiences indicated the benefits of prioritizing tasks in handling the various demands that emerged while managing an epidemic. However, participants also admitted that prioritizing nursing duties would inevitably impede the quality and standard of care. Some suggested that tasks they perceived to be of lesser importance or urgency when compared to the management of critically ill patients and infectious patients, such as basic nursing care duties, were often downgraded or omitted as a result of their setting priorities. Discussing this issue, some participants explained that the strategy of sequencing tasks was adopted with a sense of expediency. They added that it reflected how emergency nurses manage resource constraints and workloads on the fly. Commenting on their preferences for task priority, a participant emphasized that, instead of violating the quality of nursing care, this was the result of an acceptable compromise between the standard and efficiency of care delivery and service provision:

> "I will use the term 'compromise' to describe how I lower the priority for certain basic nursing tasks because I am not going to give up my code of conduct in practice. Instead, I just attempt to meet an acceptable standard with bottom lines. Although my practice perhaps is not the most proper, I will try to meet the basic requirements in all possible ways." (P22)

This view was echoed by another participant, who admitted to having previously compromised the standard of infection control practice, but maintained the minimum standards and requirements:

> "It is difficult to properly adhere to infection control guidelines for every single case, because there would be occasions when one might not be able to perform the full set of infection control measures at once. However, I will always ensure that I at least fulfill the basic requirements, such as using a surgical mask or wearing disposable

> gloves. I allow myself to do so not because I am lazy, but rather out of concern for saving time for treatments and procedures that are more important and urgent, rather than rigidly following the guidelines. Therefore, I would not say it is a violation of rules, but a compromise." (P18)

It is revealed from the narratives that in addition to setting priorities, the participants also considered preserving the required standards of care in an acceptable manner. Considering the acceptable bottom line regarding compromising care standards, there was a common understanding among the participants that it was acceptable to simplify and streamline the steps in performing a procedure, while omitting the procedure was regarded as inappropriate and a violation of professional conduct. The comment below illustrates how a nursing officer streamlined a basic nursing care procedure with the goal of preserving quality of care, without abandoning duties in the face of the pressure and workload of an EID outbreak:

> "While taking care of patients who are waiting for bed vacancies, I might ask the patients' family to assist me or my colleagues in certain simple daily tasks, such as changing a patient's diaper. I could therefore spare manpower for other work. Take feeding patients as another example, if a patient was accompanied by family members, I will ask them to help the patient to eat, instead of feeding the patient myself. Another similar issue comes up when administering medication. If the situation allows it, I will perform the whole task, from giving the medicine to the patient and preparing a glass of warm water, to assisting the patient in taking the medicine. But if it is busy, I can only distribute the medicine to the patient and ask other staff to help the patient take the medication. Still, I would not omit any tasks, but just simplify or streamline them." (P6)

In addition, this participant further emphasized there were nursing tasks that should be strictly adhered to at all times, and should not be deployed to others:

> "There are some tasks that we should always perform strictly without allowance or flexibility, such as the aseptic technique, or the proper procedure when checking medications. As professional nurses, we are responsible for completing these procedures strictly. They should never be done casually." (P6)

This theme illustrates the strategies adopted by participants in deciding how to prioritize and sequence nursing duties during an EID event. This indicates that streamlining and simplifying nursing care procedures were their preferred tactics for finding a balance between their duties and the resource constraints they faced.

7.4.4 Establishing communication with different parties

Apart from interacting with co-workers and patients, participants noted that establishing effective communication with other parties constituted an important portion of emergency nurses' work in maintaining the smooth day-to-day operations of the AED. During an epidemic, participants stated there was increasingly frequent contact between emergency nurses and other departments and units to coordinate admission arrangements for patients. Despite cooperative efforts among emergency nurses to facilitate patient logistics and admissions, participants frequently mentioned concerns about cross-departmental collaboration. Most participants said that staff from general wards might be overly vigilant against EIDs. A nursing officer who was responsible for arranging patient admissions offered a vivid example to illustrate his views about the conflicts in admitting patients to wards:

> "A pediatric patient attended our department and claimed that he had been playing with poultry, while his mother explained that he had chased a chicken without

> touching it. However, the staff in the receiving general pediatric ward were so anxious about whether the patient had been infected with the avian flu, they kept challenging our decision, asking us irrelevant questions such as how fast the chicken was running. They were just over-exaggerating, making every admission complicated and creating unnecessary trouble." (P6)

In addition, participants revealed that controversy could arise as a result of a divergence in understanding of the admission guidelines between AED staff and staff from general wards. Several participants claimed that staff from other departments had queried and even disputed their judgments on whether a patient should be admitted to an isolation ward or to a general ward. This participant shared his experience when he tried to admit a noncontagious patient to a general ward:

> "I once had arranged admission for a non-infectious patient who previously had been suspected for infection. Although the patient was confirmed to be clean (non-infectious), the staff from the receiving medical ward had become very sensitive, challenging the admission criteria in our department and refusing to receive the patient. Finally, we had no choice but to admit the patient to an isolation ward, but the nurse in the isolation ward once again challenged the decision and claimed that the patient should not be regarded as infectious. Actually, I doubt that it is the intention of staff in other departments to make things difficult for us and for patients." (P14)

In addressing contentious issues regarding guideline comprehension and implementation, some participants emphasized the importance of organizational support. They emphasized that seeking assistance from hospital administration was the most effective strategy to resolve conflicts between departments. For example, one participant valued the efforts of the department manager in coordinating and communicating with other departments:

> "It is important to achieve consensus among departments in managing EIDs. We would give feedback on our difficulties or arguments to the manager, and she would voice our opinions to the authorities and attempt to negotiate on our behalf. We can see her efforts in helping frontline staff." (P9)

However, while some participants appreciated the support they received from management, for others, managerial responsiveness did not meet their expectations, nor did it resolve competing clinical judgments across collaborating departments. A participant offered the following opinion:

> "The administration seldom communicates with the frontline. They only approach you when you have complained. Even if they notice the problems we face, they are not going to help us. Seeking help from them always ends in vain." (P8)

Also, the majority of participants indicated that it was necessary to maintain communication with the infection control teams in the course of EID management. Most participants agreed that the role of the infection control teams was crucial in offering advice on specific arrangements in handling patients with suspected or confirmed infectious status, particularly at the beginning of an EID outbreak, when there was limited available information about the pathogen in question. However, several participants commented that asking for advice from the infection control teams might not always result in constructive feedback, because the teams might fail to provide a concrete answer to their inquiries about issues associated with EID management. As one participant said:

> "We are used to seeking advice from infection control teams for special arrangements in handling infectious patients. Most frequently we would enquire whether a patient should be admitted to an isolation ward or to a general ward. However, after we report

> the patient's condition to them, they usually repeat the words from the guidelines and protocol without giving us any concrete suggestions, asking us to make a decision by ourselves according to the guidelines. It is not really helpful, as I expected something more confirmative, rather than answers modeled on the guidelines. It seems they tried to shirk their responsibilities by only providing an official reply to dismiss our questions." (P14)

In addition to staff from other departments and units, the general public was another party involved in the process of service delivery. According to participants, it was common for patients and their family members to seek out health information from AED emergency nurses during an EID outbreak. The majority of participants recognized that it was their responsibility to provide health information to the public. Nevertheless, some participants lacked confidence in addressing those queries due to, as previously mentioned, information insufficiency and their lack of familiarity with the details of a particular EID. For example, this participant, an advanced practice nurse with extensive experience in EID management, expressed concerns about answering rhetorical questions from patients as follows:

> "During an outbreak, patients and their family members kept on asking questions about the EID, perhaps because they were worried about the disease situation. For example, during the course of the swine flu pandemic, a few patients and their family members asked whether it was safe for them to be prescribed and treated with Tamiflu, as they had heard that the medication might be accompanied by serious side-effects. Some continued to ask about the pathogen's genetic structure and other complicated microbiological knowledge. If I was unable to provide a satisfying answer, they appeared to call my competence and qualifications into question. Even

so, I would still attempt to address their queries as much as I could, because I understood they were panicking." (P14)

Apart from responding to queries by patients and their family members, participants offered knowledge and advice on precautionary measures during their interactions with the community. Participants stated that they reminded patients and others in the AED to adhere to basic infection control measures, such as putting on surgical masks and maintaining hand hygiene, in order to prevent disease spread within the departments. As this participant said:

> "We remind all patients and their relatives to put on a surgical mask when they come to our department, to control the spread of disease from people whose illness is undetected. There might be some patients who refuse to comply with this regulation and take off their masks. We try to explain the risk of infection, and our intention to safeguard the health of the community, to these patients. Fortunately, patients usually listen to us and comply with the requirements." (P9)

From the narratives in this theme, it was revealed that whereas emergency nurses went to their colleagues and the infection control teams for advice on EID control, the general public would in turn seek advice from nurses.

7.5 Summary

Emergency nurses' attitudes and actions fulfilling their duties during the hardships of EID management are portrayed in this facet of striving. The nurses emphasized their personal capacity when engaged in an epidemic event, delineating their attempts to prevent infection and the spread of disease, uphold their professional integrity, and maintain resilience amid

adversity. In addition, they valued the importance of working as a team to cope with the actual tasks at hand and the related difficulties of managing such tasks, which is presented as protecting each other, promoting a learning atmosphere, and assisting in each other's duties. Moreover, in this facet the nurses' efforts at sustaining the smooth functioning of healthcare delivery during an epidemic event was also highlighted, in which the importance of screening for suspected infectious cases, facilitating workflow and logistics, prioritizing tasks to cope with resource constraints, and establishing communication with different parties were emphasized.

CHAPTER 8

FACET OF RESOLVING: WITHSTANDING THE COLLAPSE OF SERVICE PROVISION

8.1 Introduction

This chapter highlights the short-term consequences of emergency nurses' interventions on healthcare service provision in emerging infectious disease (EID) management. These consequences involve three categories: "Conforming to guidelines and protocols for care delivery", "Adapting to resources constraints", and "Receiving tangible support from hospital administration". These outcomes constitute the fourth facet of emergency nurses' engagement process in EID management, which was coined the Facet of resolving. The facet of resolving depicted how emergency nurses develop a sense of control and confidence in service provision during EID management.

8.2 Conforming to Guidelines and Protocols for Care Delivery

As pointed out in previous chapters, emergency nurses highlighted the existence of guideline-practice gaps in infection control and disease management during an epidemic event. Despite the infeasibility of certain measurements in dealing with EID management, several study participants managed to adhere to the guidelines and protocols. This desirable outcome was achieved by their intentions and actions to actively participate in planning and revising the guidelines in practice and through drills. For example, one advanced practice nurse shared her experience in providing feedback on the implementation of new guidelines to the department and hospital administration as follows:

> "Every time after a guideline is applied or a drill is conducted, issues regarding the newly introduced recommendation are addressed. It is the time to make comments and put forward suggestions to enhance the practicality of the guidelines. Also, the issues we identified and reported on would be shared with other departments, therefore our participation does not only benefit our own department." (P21)

However, some participants reported that the problem of guideline-practice gaps existed all along in the course of an epidemic event. It was suggested by participants that the impracticality of undertaking new guidelines for EID management was left unaddressed, despite the fact that both frontline personnel and hospital administrators were aware of the problem. As a result, emergency nurses were subjected to breaches of the guidelines and protocols in EID management, and unable to regulate their own performance according to the new standards and benchmarks. For example, one participant, who indicated previously that he would "put up a show" when asked to adhere to guidelines that were impractical, described his experience as follows:

> "There are always various difficulties and conflicts once a guideline is introduced or modified to meet evolving needs during an outbreak. At first, we would report the problems we faced to our supervisor for possible improvements, but most of the time those issues remained largely unaddressed, with negligible or no amendments. After realizing that our feedback was considered worthless, we gave up on our efforts to improve the guidelines. Rather, we would pretend to adhere to those guidelines to others' faces, but act to the contrary." (P13)

8.3 Adapting to Resources Constraints

Balanced resources and facilities provision and allocation was the result of the efforts of emergency nurses to adapt to resources and facility constraints. Although in the previous sections, most participants mentioned that resource shortages and facility insufficiencies were the major hindrances they encountered in EID management, some were able to identify alternate ways to cope with such limitations. They managed to fill the gaps that existed between human resources and facility shortages and public demand for healthcare services, and maintain the normal functioning of emergency care service provision by prioritizing and sequencing routine tasks and sharing each other's duties. Although the human resources and facility shortages problems continued to linger, the strategies and tactics devised by participants in dealing with the expanded workload during an epidemic event enabled them to adapt to such constraints and overcome the challenges. Discussing this issue, a participant pointed out that the remedy for resource deficiencies was nurses' diligence and determination at work:

> "We end up being able to cope with the difficulties of manpower shortage and facility insufficiency by our hard work in striking a balance between service provision and resource inadequacy every time we face an outbreak. Undoubtedly, this kind of situation would be likely to occur and affect our usual practice, but we will overcome the challenges as long as we set our minds to it. It involves a transition from working to adhere to rules, to the ability to allocate limited resources in an adaptive manner." (P16)

Unfortunately, there were some participants who were unable to adjust to such situations, which resulted in diminished care quality. Several participants held the firm belief that it was solely the responsibility of healthcare facility administration to resolve the resource shortage

problem, while the efforts of frontline personnel were of minimal help in meeting the needs of the public for emergency care services. As one participant put it:

> "In meeting the need of patients during an EID outbreak, to address the shortage of hospital beds is a problem, to address the shortage of doctors is another problem, and to address the shortage of nurses is the most serious problem. These problems originate from a single reason, which is the poor budgeting and planning of administration and management. While you are working in a department where even blankets and quilts could be out of stock during the winter, it is absolutely impossible to offer effective and quality healthcare service to the public, despite our best efforts." (P20)

8.4 Receiving Tangible Support from Hospital Administration

Throughout the study, participants' opinions have highlighted the crucial role of hospital administration and management in providing appropriate support while managing EIDs. It was frequently emphasized by participants that hospital administrators were mandated to demonstrate proactive and responsive leadership when providing assistance to frontline personnel. Most participants reported that there were various channels for them to communicate with administrative and managerial supervisors in their departments and hospitals, such as staff meetings and electronic forums. However, it was revealed that the effectiveness of such platforms could vary from hospital to hospital, depending on the leadership and management style of the individual hospital administrators. Some participants stated that the management of their hospital provided frontline staff with tangible support to address workplace deficiencies in managing EIDs. For example, one participant said:

> "Our department and hospital have kept an eye on the problems we faced in the course of EID management, and they have listened to our voices and aspirations. Although the situation might not have improved immediately, they have maintained communication with us on the progress of different measures to mitigate the adverse impacts of the outbreak on service provision and care delivery." (P9)

In contrast, several participants emphasized their grievances about the leadership style at their hospital. They commented that the establishment of those communication platforms was nothing but a token gesture, because the hospital management only listened to staff views without taking any action in response. As one participant put it:

> "Even though there are platforms for us to express our opinions and point out the problems in service provision, the hospital administrators have never responded to our complaints. Their replies are always superficial and perfunctory; they listened but did nothing." (P20)

8.5 Summary

In this facet, the emergency nurses explicitly identified that withstanding the collapse and sustaining the normal functioning of service provision of the AED was the primary goal and intended outcome of their engagement in combating EIDs. The major components that characterize this facet include conforming to guidelines and protocols for care delivery, adapting to resources constraints, and receiving tangible support from hospital administration.

CHAPTER 9

FACET OF LEARNING:
ENHANCING PREPAREDNESS FOR IMMINENT THREATS

9.1 Introduction

Apart from the influences on service provision, the building and strengthening of individual preparedness for impending epidemic events was considered another important consequence of emergency nurses' engagement in emerging infectious disease (EID) management. Throughout their participation in epidemic response, participants had shown a collective will and continuous effort to enhance their readiness to respond to imminent EID threats, and consequently managed to advance the necessary capacities and nurture suitable conditions to deal with subsequent EID outbreaks. The consequences were twofold: the first was described as, "Cultivating individual capacity for outbreak response", and the second, "Nurturing cohesive working environments". These two outcomes collectively comprise the final facet of the process of emergency nurses' engagement in EID management, namely, the Facet of learning. When compared with the category, "Withstanding collapse of service provision" illustrated earlier, which focused on the rather direct and immediate effects on healthcare facility functioning, this category places emphasis on the progressive and momentous development of personal readiness and abilities as the consequence of participants' actions and interactions during the course of an epidemic response. In other words, participants in this facet embraced the experience of EID management participation as a resounding opportunity for learning and professional growth.

9.2 Cultivating Individual Capacity for Outbreak Response

As mentioned in the previous sections, participants displayed considerable efforts during the engagement process in EID management. Apart from dealing with their day-to-day tasks and fulfilling their nursing duties, most participants considered the challenging nature of EID management as an opportunity to replenish and consolidate their knowledge and skills in infection control and disease prevention. Citing the experience in the management of SARS as an example, one nursing officer described the changes in emergency nurses' work practices handling patient care and infection control as follows:

> "Before the SARS epidemic, many of us were used to not wearing surgical masks at work. Even if we wanted to do so, the masks provided by the department were those made from paper-thin materials, which provided minimal protection from environmental pathogens. However, our practice has changed after the SARS outbreak. In hospital, it has now become the norm to wear surgical masks once entering patient care areas. It is now strange for staff not to wear a surgical mask at work." (P6)

The same participant continued to describe significant changes in working practices among emergency nurses, notably the implementation of infection control measures. He said:

> "During the time of the SARS outbreak, we had to frequently remind colleagues to remove and discard their used disposable gloves after handling a patient, and switch to a new pair of gloves before performing treatments on another patient. To date, we are familiar with these instructions for proper glove use. We no longer have to remind our nurses about the proper usage of gloves, as it is now part of our usual practice." (P6)

This nursing officer offered an explanation for the changes in work practices, highlighting the consequences of an EID outbreak on the development of awareness and new practices among emergency nurses in infection control and disease prevention:

> "After the havoc brought about by various EID outbreaks, the concepts and practices of infection control have already been integrated into our day-to-day work. They are embedded in the nursing culture. These practices are built and assimilated into our everyday work, just like brushing your teeth every morning. These practices display our attitude towards future outbreaks, which is, we will maintain constant vigilance in the surveillance, prevention, and control of EIDs." (P6)

On top of improvements in work practices and the strengthening of awareness of infection control, participants stated they had consolidated certain skills to enhance their proficiency in fulfilling their duties during an epidemic event. For example, the majority of emergency nurses in this study reported that their experience in EID management had reinforced their senses and skills to rapidly generate a preliminary impression of patients' infectious status and clinical condition. In other words, they were more sensitive to patients' clinical presentations, especially those that hinted at the existence of EID infection. This sensitivity was often referred to as "nurses' common sense" and "nurses' instinct" by the participants, which showcased their belief that the sense would develop spontaneously with the accumulation of clinical experience in handling infectious patients. One participant described the sense as follows:

> "If you worked long enough in the AED, you would be able to sense the problems just by taking a glance at the patient. You would have a gut feeling about the patient. This is an intuition of nurses, which would gradually develop with your accumulated

experience. Experienced nurses are able to identify the slightest clues as to what problems a patient had." (P21)

This view was echoed by another participant, who agreed that such intuition was developed through prolonged involvement in clinical practice during an EID outbreak. She shared her experience of how her "nursing intuition" had helped in the detection of a possible infectious patients as follows:

> "It was during the time of the H1N1 influenza pandemic, and patients with a recent travel history to Mainland China were suspected to be infectious. In one case, a patient who presented with signs and symptoms of infection was sent to our department from a nursing home, and the staff in the nursing home claimed that the patient had no recent travel history to Mainland China. While I helped the patient put on a patient identification bracelet, I realized that there was another bracelet on his wrist, with information written in Simplified Chinese. I thought there was something wrong, so I contacted the patient's son for confirmation, and finally discovered that the patient had recently been admitted to hospital in Mainland China. It reminded me that I must stay alert at all times as a nurse." (P19)

9.3 Nurturing Cohesive Working Environments

Another positive consequence of the engagement of emergency nurses in EID management was the establishment of a cohesive work environment. As mentioned previously, participants supported and helped colleagues by shouldering each other's duties to more effectively deal with the ever-increasing workload during an outbreak. This practice offered a resounding opportunity for team-building, which consequently created favorable

conditions to develop a mutual help network and teamwork culture within the AEDs. A participant shared his experience in combating the SARS outbreak together with colleagues in the AED, and stated that the experience had fostered greater teamwork and cooperation among staff. As he put it:

> "Going through such hardship as the SARS outbreak and overcoming all obstacles has brought us closer together. We work together as a team and we have each other's backs. The experience has built a positive working environment and created a supportive culture in the workplace." (P6)

In contrast, several participants remarked that morale and teamwork within their departments were weakened, both during and after an epidemic event. The participants revealed that certain emergency nurses attempted to tackle the problems originating from EID outbreaks in a passive and negative manner, with initiatives for filling in for colleagues' duties and devising infection control recommendations considered redundant. Such an attitude, which was comparatively common among senior nurses, had hindered other nurses' willingness to participate and contribute in an outbreak response, and hampered teamwork and collaboration among staff in the AEDs. One participant commented:

> "Some of my colleagues tried to avoid mistakes by caring for themselves alone and working to the rules. I thought that was the typical 'do less, err less' attitude, which has been a long-standing issue in the healthcare system and nursing profession. Once I attempted to persevere with the standard of care and maintaining the quality of infection control measures, such as reminding colleagues to adhere to the recommendation of droplet precautions and maintaining a minimal distance of one meter between patients, it could have resulted in me being labelled a trouble maker. Some colleagues might have thought that I was just exaggerating trivial issues. I have

since learned not to create trouble, to work to the rules, and to mind my own business." (P21)

9.4 Summary

This final facet of the engagement process of EID management captures emergency nurses' experience in the latter phases of an epidemic event, when there are signs indicating that the threat posed by an EID is on the wane. This includes cultivating individual capacity for outbreak response, and nurturing a cohesive working environment.

9.5 Overall Summary of the Findings

Findings presented in Chapter 4 to Chapter 9 have addressed the process of emergency nurses' engagement in EID management, delineating their experiences and responses during the process. The findings revealed the core category *persevering through the vulnerability of collapse*, which elucidates the phenomenon of emergency nurses' engagement in EID management, and interrelates the corresponding conditions, actions, interactions, and consequences. These conceptual relationships lead to the development of a substantive theory on how emergency nurses experience and respond in an epidemic response. In their appraisal of a disease situation, the nurses' understanding of the context they were situated was associated with the response level announced by the government and their perceptions of the disease in terms of novelty, severity, proximity, and complexity. At the facet of encounter, the situations emergency nurses faced in their practice during EID management reveal four interrelating categories of constraints and challenges, which were described by the nurses as fraught with resource constraints, fraught with threats of infection,

fraught with ubiquitous changes, and fraught with lingering uncertainties. At the facet of navigation, four categories described nurses' actions and strategies in addressing uncertainty and changes: addressing the situation, equipping for the impending battle, acclimating to the evolving circumstances, and navigating the new role and duties. In the facet of striving, the nurses' behaviors were at the individual, coworker, and operational aspects. The individual aspect was categorized as preventing infections and the spread of disease, upholding professional integrity, and maintaining resilience amid adversity. For the coworker aspect, it consisted of protecting each other, fostering a learning atmosphere, and assisting with each other's duties. In the operational aspect, the subcategories were filtering the suspected, ensuring efficient workflow and logistics, prioritizing tasks to cope with resource constraints, and establishing communication with different parties. The consequences of nurses' actions and interactions were delineated at the facet of resolving and the facet of learning. The facet of resolving consisted of three subcategories: conforming to guidelines and protocols for care delivery, adapting to resources constraints, and receiving tangible support from hospital administration. The facet of learning was categorized into cultivating individual capacity for outbreak response, and nurturing a cohesive working environment.

CHAPTER 10

DISCUSSION

10.1 Introduction

The purpose of this chapter is to provide a synopsis of the research findings and to present a discussion of the findings in the context of the existing literature. Also, the theoretical contribution of the findings and the substantive theory are highlighted. The chapter begins with reviewing and discussing the emergent theory through comparison with relevant literature and evidence to evaluate the conceptual details of the theory. Next, an elucidation of the facets within the process of emergency nurses' engagement in emerging infectious disease (EID) management is illustrated, through discussion of the selected concepts discovered in this study with reference to the existing literature.

10.2 A Theory of Emergency Nurses' Engagement in EID Management

Employing a grounded theory approach, this study specifically examines the process of engagement in EID management, based on the experience of emergency nurses. Throughout, the category *persevering through the vulnerability* of *collapse* has emerged and is remarked on in the findings as a recurring motif that underpins the central theme of the process. The theory of emergency nurses' engagement in EID management is therefore developed around this core category as a means of understanding how emergency nurses make sense of and interact with the circumstances surrounding the management of EIDs. This theory proposes *persevering through the vulnerability of collapse* as the essence of the emergency nurses' experience, which portrays the underlying situation, nurses' behavior, and the dynamics of the EID management engagement process. To recapitulate, emergency

nurses encounter situations fraught with obstacles and challenges at the initial facet of their participation, navigate uncertainty and changes in the work environment, strive to maintain a professional service, manage to resolve problematic workplace issues, learn through the process, and develop capacity towards imminent EID threats. Like any theoretical model explaining human behavior, the present study's emergent theory does not attempt to describe every nuanced detail of emergency nurses' experience during epidemic events. This substantive theory intends to propose the common processes and linkages surrounding the phenomenon of emergency nurses' engagement in EID management. The following discussion places emphasis on portraying and explicating the central notions and dimensions of the substantive theory.

10.2.1 The notions in the core category: Persevering through the vulnerability of collapse

Persevering through the vulnerability of collapse is the core category of the substantive theory of this study, serving as the plot line of the process of emergency nurses' engagement in EID management, and articulating the underlying situation, nurses' behavior, and the dynamic involving nurses in such circumstances. As derived from the actual language of the emergency nurses in the interviews, the core category accentuates the background of the underlying situation facing emergency nurses during an EID event, referring to it as a *collapse vulnerability*. The notion is found to be a complex concept involving three dimensions: vulnerability of personal wellness, vulnerability of professional integrity, and vulnerability of service delivery. The dimension of vulnerability of personal wellness concerns the EID threat to emergency nurses' well-being. As indicated in the data, the nurses recognized the occupational risk of infection during an epidemic that could harm their physical health. They also addressed work stress in the course of EID management as a source of tension and frustration that could impede their emotional and psychological

wellness. The dimension of vulnerability of professional integrity refers to the widespread hardships challenging their professional obligations that emergency nurses must endure during an EID event. While engaging in EID management, there is a dilemma between the sense of duty and personal safety, and the nurses struggled with such a dilemma. The vulnerability of service delivery concerns the pressures resulting from the service demand upsurge, which exceeds the existing capacity of accident and emergency departments (AEDs), in an EID event. In this situation, emergency nurses are confronted with the difficulties of maintaining the normal functioning of service delivery.

The term *collapse vulnerability* also outlines the dynamic nature of the interactions between nurses' behavior and the underlying situation. It underpins the tension that exists between emergency nurses' determination to forge ahead amid adversity to maintain a safe and stable workplace, and the devastating impact of an EID event that triggers the collapse. Such a confrontation creates a critical tipping point, in which the emergency nurses and the AEDs are teetering on the edge of collapse. Conversely, this tipping point also highlights an important opportunity for both nurses and AEDs to thrive in the face of calamity, and strengthen personal capacity and institutional preparedness for imminent threats and impending hardships.

In terms of the nurses' behaviors, their perseverance is indicated in the core category. As explained by the emergency nurses in the present study, the term *persevering*, which is used to describe their behaviors, conveys multiple messages. First, the term implies that nurses recognize the difficult circumstances they face during an EID event. Also, it suggests that nurses continue to endure the resulting pressure throughout the process of their engagement in EID management. Third, nurses evince their fortitude and commitment in contributing to mitigating the possible adverse impacts of EIDs. Last but not least, in the face

of hardship, the nurses spare no effort and exert themselves to the utmost to tackle the various challenges they face, and overcome devastating conditions.

This section presents the main features and dimensions that are embedded in the core category, which are evident throughout the process of emergency nurses' engagement in EID management. Additionally, the facets within the process would be further elucidated.

10.2.2 Central notions in the substantive theory

10.2.2.1 Decision-making and clinical judgment

The process of engagement depicts the manifestation of a wide range of cognitive and behavioral activities among the emergency nurses. As presented in the findings chapter, the emergency nurses displayed the iterative practice of decision-making and clinical judgment in identifying the best possible strategies and actions that are suitable in addressing issues arising during EID management. One prominent example of the application of decision-making and clinical judgment was showcased when they attempted to tackle the issue of resource constraints during an EID event. In EID management, emergency nurses frequently find themselves in situations in which resource matching, such as human resources allocation and facility provision, is inadequate to meet public need for AED healthcare services. In such circumstances, nurses realize the infeasibility of requesting that hospital administration provide immediate assistance and resources to deal with the issue, and they decided to consider alternatives to remedy the situation. For instance, one of the most frequently adopted alternate solutions was to prioritize work to optimize the utilization of time, staffing, and facilities. Apart from identifying alternatives, emergency nurses are required to make decisions to determine priorities and sequences for working on tasks. In deciding priorities, the emergency nurses make impartial and rapid judgments based on their clinical reasoning.

As indicated in the findings, formulating such clinical judgments involves not only the consideration of immediate cues and information, but also the capacity of emergency nurses to appraise the urgency of various tasks, and to estimate the possible consequences of their decisions on patient outcomes or service delivery. Taken together, these findings on the prioritization and sequencing of tasks serve as an example of how emergency nurses incorporate clinical judgment into practice for solving problems during EID management.

There is a consensus in the literature that clinical decision-making and clinical judgment are imperative components of nursing practice (Hoffman et al., 2009; Thompson et al., 2013). Previous studies have underpinned that the quality of nurses' judgments is associated with a wide range of patient outcomes, such as the prevention of pressure injury (Fossum et al., 2011; Searle & McInerney, 2008), the utilization of physical restraints on patients (Hamers et al., 2004; Möhler & Meyer, 2014; Shanahan, 2011), and the judgment of a patient's condition (Arendts et al., 2013; Ashcraft & Owen, 2014; Shanley et al., 2011). Owing to the AED's busy environment, it is suggested that emergency nurses are habitually responsible for frequent decision-making and clinical judgments in practice (Cioffi, 1998; Evans, 2005; Gerdtz & Bucknall, 1999; Smyth & McCabe, 2017). Such comments are in accordance with the present findings, in which emergency nurses are involved in judgments and various decision-making tasks during an epidemic event, such as prioritizing tasks, determining patients' infectious status, and evaluating the likelihood of the spread of infectious diseases. In such circumstances, nurses' capacity to make sound and prompt judgments is put to the test on a daily basis. The literature on nurses' decision-making processes has highlighted several important attributes, which includes knowledge base, clinical experience, cognitive ability, and critical thinking ability (Odell, 2015; Smyth & McCabe, 2017). In the present study, these factors may explain why emergency nurses with higher seniority have comparatively greater confidence in decision making. However,

although the majority of experienced and senior emergency nurses in this study expressed confidence and familiarity with clinical decision making, the quality and adequacy of their judgments is not guaranteed or evaluated. While previous experience in handling similar tasks in practice is undoubtedly relevant in informing clinical reasoning and decision making, overdependence on personal experience might bias nurses' judgments, which might predispose them to experience unanticipated or adverse events (Croskerry et al., 2012; Odell, 2015). Instead of directly applying previous experience to similar scenarios in the present, recommendations from the literature remark on the importance of the careful consideration of available information in interpreting and analyzing encountered scenarios, before confirming a clinical decision (Smyth & McCabe, 2017; Thompson et al., 2013).

Although nurses' clinical judgments are well acknowledged in the literature and are recognized as a crucial component of effective nursing care, prior studies have seemingly underestimated the relevance of nurses' decision-making in infection control and prevention. Owing to the complex nature of an EID situation, EID management requires nurses to handle novel decision-making tasks, such as screening suspected infectious patients and balancing conflicting values, which are delineated in the findings of this study. Previous studies of nurses' EID response practices have largely concentrated on examining their participation from a functional perspective, evaluating their performance in terms of guideline adherence, such as compliance with infection control practices (Abdella et al., 2014; Wolfe et al., 2016) and utilization of personal protective equipment (PPE) (Casanova et al., 2016; Kang et al., 2017). While evaluating nurses' compliance with infection control measures is undoubtedly relevant to assess their performance in EID management, these findings could be inadequate in drawing a conclusion as to whether their participation in EID management is effective. What is less clear are the reasons behind their lack of compliance, and the factors that predispose their decisions on whether to conform to the protocols. Indeed, it is suggested in

the literature that compliance with guidelines and recommendations might not guarantee desirable outcomes in nursing practices, as theoretical information from guidelines could be unreliable when applied in an actual clinical context (Thompson et al., 2013). On account of the uncertain and changing clinical situation typical of an epidemic event, taking a normative and task-orientated approach to understand nurses' performance in EID management is insufficient. Instead, an empirical and people-orientated approach that takes into consideration how nurses judge and decide whether to adhere to high standard infection control measures is recommended, in order to address the root causes of their accustomed behaviors in infection control and disease prevention.

Although the present study's primary focus is not to examine the decision-making process of emergency nurses engaging in EID management, the findings reveal the importance of individual emergency nurses' decision-making on service delivery during an EID event, despite the availability of clinical guidelines.

10.2.2.2 Adaptation and adjustment

Another imperative component of emergency nurses' engagement in EID management is their capacity to adapt and adjust to different workplace situations. The present study's findings yield rich data regarding the complexity of the work environment that emergency nurses are situated in during EID management. It is revealed in the findings that the scope of practice of emergency nurses during an epidemic event is characterized by change and uncertainty, with previous experience and strategies possibly inadequate to address challenges encountered during service delivery. Participants vividly showcased their experiences in facing the difficulties in adjusting to the altered work context while managing EID, which challenged their pre-existing value, role, and practice of emergency care. Instead

of resolving problems through applying existing practices, emergency nurses are required to act flexibly and adapt to uncertain and changing situations during EID management.

This particular type of challenge that emergency nurses encounter during EID management was defined in the seminal work of Heifetz et al. (2009) as adaptive challenges. In contrast with technical problems that present with clear origins and concrete solutions, adaptive challenges occur where there are conflicts between entrenched beliefs that are implicit and unfamiliar to the people involved, requiring individuals to adjust their thoughts and behaviors in order to adapt to a new situation (Corazzini et al., 2014). Whereas technical problems could be solved through hierarchical management strategies, such as the implementation of managerial procedures or resources allocation, the solutions to adaptive challenges are not readily available, and require the individuals involved to change the way they adapt to circumstances in order to thrive anew (Heifetz et al., 2009). According to the findings in the present study, the key theme concerning the fundamental reason behind these challenges stems from the disparity in the emergency nurses' espoused perspectives towards emergency care, with the need for adaptation and the adoption of altered values, priorities, and practices during EID management. Such issues facing emergency nurses in EID management contain decidedly major elements of adaptive challenges.

However, despite the diverse perspectives in addressing technical problems and adaptive challenges, the issues arising from healthcare settings, especially in managing large-scale public health emergencies, are often complex and intertwined with both technical and adaptive elements (Dames, 2007). This might lead to difficulties for individuals in maintaining preparedness to respond in complex circumstances, as well as in addressing effective management strategies (Corazzini et al., 2014). It is anticipated that through identifying the adaptive components of the challenges, the findings could provide insight for

future EID management planning, highlighting the importance of offering assistance to facilitate frontline personnel in their adjustment to value, role, and practice towards work, in order to streamline the adaptation process and adopt new practices. With an understanding of the nature of the challenges surrounding EID management, the findings could provide alternative views on the challenges, and offer insights for improving emergency nurses' ability to tackle challenging problems, resulting in an improvement in the quality of care amid future infectious disease outbreaks.

For frontline nurses, despite the importance of adaptation and adjustment in addressing the adaptive challenges arising from uncertainty and change, the scope of the existing literature often places emphasis on the leadership landscape in developing the capacity to tackle adaptive challenges. While the role of an organization's leaders and managers in addressing adaptive challenges is highlighted, frontline personnel are often considered to be followers who carry out adaptation and adjustment initiated by the leaders (Heifetz & Linsky, 2002; O'Connor & Fiol, 2006). Undoubtedly, the participation of administration and management is of imperative importance in resolving adaptive challenges. However, this study's findings highlight that the leader-follower identity are not necessarily defined by an organization's hierarchy and structure. According to the present study's findings, emergency nurses often participate in devising and initiating strategies with the intention of alleviating problems arising from service delivery during an EID event. Instead of acting as passive recipients or followers, emergency nurses have a key role to play in overcoming the adaptive challenges they face in the course of EID management. In fact, their participation has initiated changes and promoted alternatives in addressing challenges that could not be resolved through the intervention of management or administration, such as prioritizing tasks to cope with resource constraints, and navigating their new roles and duties during an EID outbreak. On account of the importance of collective efforts by both

management and frontline staff in addressing adaptive challenges during an epidemic or other public health crisis, an integrative approach combining both individualistic and hierarchical approaches to problem-solving should be considered. By doing this, the development of comprehensive and effective strategies to speed the progress of required transition and transformation in healthcare facilities facing challenging situations can be promoted.

The findings suggest that experienced nurses might be more resourceful at managing conflicts and uncertainties than nurses with less clinical experiences, which signifies the association between clinical experience and adaptation. In this context, there are similarities between the opinions expressed by the participants in this study and those described by Pretz and Folse (2011). These authors explained that experienced nurses might have developed a structured knowledge base through the accumulation of clinical experience, which helps them adapt to novel situations. As implied in this study's findings, the participants took into account their clinical experience in responding to problematic issues during their engagement in EID management, which suggests the relevance of tacit knowledge in clinical judgment; that is, knowledge based on individual experiences and insights. Indeed, nurses' decision-making processes frequently involve the interaction of tacit and explicit knowledge (Kothari et al., 2012). It became evident throughout the participants' descriptions that the application of tacit and explicit knowledge is one of the most decisive parameters of their ability to adapt in managing an epidemic event. Although there is mounting emphasis in the literature of the adaptive capacity of healthcare facilities and systems, recent studies have suggested that the individual adaptive capacity of workers at the forefront of healthcare delivery is increasingly important for organizational effectiveness in coping with contingencies and changing situations in large-scale healthcare emergencies (Rumsey et al., 2014). The findings of this study offer insight into strategies to empower the adaptive capacity of frontline emergency nurses in responding to public health events. To promote the development of individual

adaptive capacity, strategies to develop and transfer tacit knowledge among emergency nurses should be taken into consideration in formulating measures to enhance their preparedness for imminent EID outbreaks and other large-scale public health emergencies.

10.3 The Engagement Experiences of Emergency Nurses in EID Management

Referring to the findings, the engagement of nurses in EID management is a dynamic process consisting of five main facets, namely, the facet of encounter, the facet of navigation, the facet of striving, the facet of resolution, and the facet of learning. The different emphases at each stage are discussed in detail in terms of their components and characteristics. A visual description of the process is provided as below, which is reproduced from Figure 4.2 in Chapter 4 (p.94).

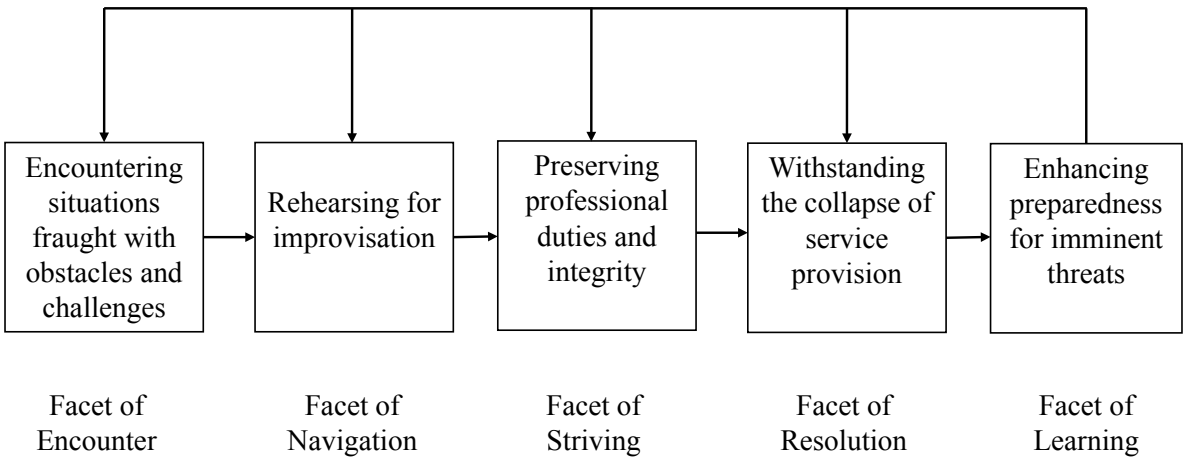

Figure 4.2 Five facets of Persevering through the vulnerability of collapse

10.3.1 Facet of encounter: Encountering situations fraught with obstacles and challenges

The emergency nurses' engagement process in EID management embarks on the facet of encounter, which depicts the nature of the challenging situations they encounter in the initial engagement. This facet begins with nurses' collective consciousness regarding the instabilities and vulnerabilities of their circumstances during an epidemic event. In this facet, the possible obstacles to emergency nurses' engagement in combating EIDs are uncovered. The major obstacles facing nurses under such circumstances are mainly due to infection risk, resources shortages, workplace changes, and uncertainties surrounding the situation. These impediments in the everyday practices of emergency care delivery are the fundamental sources that constitute the tasks and issues facing emergency nurses, and compel them to engage in EID management.

The challenging situations described by the emergency nurses in this facet of the process of engagement are largely in line with those of previous studies. As mentioned earlier in the literature review chapter, previous studies have highlighted the various challenging issues facing nurses during EID outbreaks (Balicer et al., 2006; Cava et al., 2005; Lam & Hung, 2013). These issues often pertain to workplace susceptibility and resources constraints, which nurses are used to encountering and handling in their everyday practice. Worse still, the changes and uncertainties in the emergency care setting during an epidemic have worsened those issues, and pose unique challenges and obstacles to nursing practices. Indeed, change and uncertainty are the inevitable challenges facing nurses and other healthcare workers, as they are bound by the nature of healthcare, creating hesitation and fear and affecting their performance and quality of care delivery (Paulus et al., 2008). During an epidemic event, the healthcare environment is often intertwined with urgency, uncertainty, and change, which requires marked effort from healthcare workers to seamlessly maintain

healthcare system operations (Cranley et al., 2012; Lipsitch et al., 2009). Arbon et al. (2013) also reported similar results in their study on nursing practices during large-scale public health emergencies, highlighting the hardships and struggles nurses endure between bouts of uncertainty and volatility as first-line responders under disastrous circumstances. These findings suggest that nurses are situated in an insecure and unsettled circumstance during their participation in EID management. Emergency nurses in the present study are reported to have encountered a similar insecure situation during EID management. They were unable to acquire sufficient clinical information to devise appropriate responses in EID management, which confounded their attempts to implement routine practices. As indicated in the findings, they developed a sense of anticipated crises in the face of an EID event, which created considerable doubts and anxiety as to their personal wellness and competence in managing an EID. On the other hand, this sense of crisis has fostered nurses' awareness of the severity of the disease situation, enhancing their vigilance against EIDs. It is suggested in the literature that when healthcare workers underestimate the severity of a public health event, it could result in laxness in handling any issues (Balicer et al., 2006; Cava et al., 2005). Thus, the findings shed light on the importance of maintaining an optimal level of risk perception and crisis awareness among nurses during an EID event, to promote their alertness and prudence at work but without triggering panic.

10.3.2 Facet of navigation: Rehearsing for improvisation

In this facet of the process of engagement, emergency nurses attempt to plan and implement strategies to address the difficulties originating from change and uncertainty in the workplace. Although the occupational risk of infection and deficiency of resources pose considerable challenges to nurses in aspects of personal wellness and service delivery, these issues are comparatively explicit, in that nurses are able to establish goals and strategies to

articulate the problems. Workplace change and uncertainty are considered implicit in nature from the emergency nurses' perspective, as they are required to orientate themselves to a situation to address the objectives of their actions, and devise tactics to resolve pertinent issues. Thus, emergency nurses' focus at the facet of navigation is on orientation.

To address uncertainty, emergency nurses attempt to obtain information regarding an encountered situation, which involves information about the disease and specific guidelines in response. Acquiring precise information during an EID event is essential for nurses, enabling them to obtain relevant facts, such as disease identification, management, and prevention. Also, effective information provision could strengthen nurses' capacity in offering health promotion and health education in the community, which would help quell public fears (Stirling et al., 2015). Despite the importance of the expeditious provision of epidemic information, the emergency nurses in the present study pointed out that the disease information they received could be excessive and non-standardized, creating confusion and conflicts for them in practice. The problem of information overload during epidemics is in fact reported in previous studies (Caley et al., 2010; Lam & Hung, 2013), indicating the need for healthcare facility administration and management to review and revise the effectiveness of current information dissemination strategies and systems. Also, healthcare administrators should not merely disseminate information among nurses across services, but also streamline information appropriately in order to facilitate its integration into routine practice.

In addition to obtaining information from official sources, nurses in this study reported that they would gain an overall impression of a disease situation through observation and clinical encounters, as they would evaluate a disease situation according to the number of patients who presented with symptoms and the severity of the disease. While such a strategy is seemingly useful for nurses in obtaining first-hand information on an EID event, this might

result in inaccurate estimations of the disease situation and adversely influence their awareness of the situation (Goodband et al., 2014). For instance, in their study, Sridhar et al. (2016) reported that healthcare workers might underestimate their likelihood of Ebola infection, because the incidence and seriousness of infection is comparatively lower from their practice experience than infections quoted in the existing data. Consequently, this might undermine their awareness of the disease. Therefore, healthcare facilities should maintain communication with nurses and other frontline healthcare workers to facilitate a more precise estimation of the magnitude of an EID situation. Due to the uncertainties surrounding the workplace environment and the rather provisional and unconfirmed information regarding a given disease situation, emergency nurses are unable to articulate the skills and tactics required to handle relevant EID management tasks in a fully rehearsed manner. The findings in the present study reveal that emergency nurses would uphold improvisational responses in part with limited available information to support their decision-making and practices. These improvisational responses are essential for nurses to expediently address unpredictable or unexpected events in the course of EID management.

Following along with uncertain situations are the changes required to respond to such situations. In the findings, these changes involve the changes in the situation, the changes in the information provided, and the changes that nurses should accordingly be making. Indeed, it is repeatedly cited in the literature that changes in the workplace always create tension for an organization's stakeholders, including those who decided to initiate the change, and those who were required to implement the change (Daiker, 2013). Changes in the general clinical context of EID management would have considerable impact on nurses' usual practice, expectations, and work practices. A change of environment might induce structural changes in the workplace, which might require nurses to change from a well-adapted and accepted behavior or working style to a new and unfamiliar practice. These changes might induce

insecurity and create further uncertainty among nurses (Corazzini et al., 2014). The changes might also pose challenges to nurses' practice, as workplace changes often involve possible increases in workload and the likelihood of mistakes being made during practice (MacIntyre et al., 2015). This might possibly explain the reluctance of some nurses in the present study to accept the changes in different aspects of emergency care provision during EID management. As indicated in the findings, some nurses showed their willingness to acclimate to change despite the possible difficulties, as they realized the importance of change in meeting new EID management challenges. However, it was reported that inadequate time and opportunity was allocated to allow them to adjust their practice and incorporate the changes into their practice. This finding is in keeping with previous studies, showing that changes made within healthcare facilities might not always be in line with the ability of healthcare workers to adjust. Discrepancies may exist between the expectations of hospital administration on the renewal of existing practices, and the actual preparedness and capacity of workers to adopt the new practices (Thygeson et al., 2010). It is suggested that a prudent approach, sensitive to the overall readiness of nurses in learning new practices or standards, should be employed by healthcare facility administrators to enable adequate training for nurses.

In addition to practice, the role of emergency nurses in the present study was perceived to be subject to change, in which the role they served during EID management was not commensurately aligned with their expectations. The emergency nurses suggested they are uncertain and confused about their roles in the course of EID response. The nurses perceived that their duty, responsibility, and domain of practice are subject to change, from a focus on life-saving emergency care to risk-aversion infection control. The findings also demonstrated that emergency nurses would participate in a combination of activities when managing an epidemic event on top of emergency care, such as environmental control measures or identifying patients with suspected infectious status. Taken together, the findings

showcase the problem of role ambiguity among nurses, in that they are doubtful and insecure regarding blurred and overlapping boundaries in the roles and duties required for EID management, and they are also insecure about the blurred and overlapping boundaries of their overall roles and duties in the workplace. Consistent with these findings, previous studies have underlined the problem of role ambiguity among nurses in acute hospital settings, remarking on the adverse influence of unclearly articulated professional identity on clinical performance and professional attitudes (Jones, 2005). In addition, it is identified in the literature that role ambiguity is considered by nurses to be a major stressor in a clinical context, which is associated with depleted job satisfaction, higher levels of burnout, and higher levels of nursing turnover (Jones, 2005; Tunc & Kutanis, 2009). To alleviate the strains and conflicts of the nursing role, it should be noted that measures should be considered to reduce nurses' uncertainty about their conception of their role. Clear role definition and job descriptions could be offered to nurses, describing the nurses' central role in different settings and reminding them of their expanded duties in times of need (Jones, 2005; Loftus & McDowell, 2000).

10.3.3 Facet of striving: Preserving professional duties and integrity

After obtaining a basic grasp of disease situations and articulating the matters pertaining to change and uncertainty in the workplace, emergency nurses devise and implement interventions to cope with the actual tasks at work and the related difficulties in the management of such tasks. In this facet, emergency nurses' primary goal is to effectively serve in their role as competent and professional emergency nurses during the management of EIDs. As implied by the phrase used in this category, nurses struggle to maintain high quality nursing care in the management of EIDs, and to sustain the standard of their moral principles as a professional nurse. The efforts of the nurses in the present study are demonstrated at

three different levels, in which emphasis is placed on individual, coworker, and operational aspects. These three intertwined and dynamic levels represent the progress of nurses' efforts in overcoming challenging EID management situations. Although there are no discrete boundaries between each level of behavior, it is observed that their focus on EID management starts with their own responsibilities and duties and extends to the concerns of co-workers, and then expands to the smooth functioning of the department. In this facet, a variety of the characteristics and virtues of nurses are revealed, supporting their diligence and efforts to preserve their professional duties and integrity amid the hardships of EID management.

10.3.3.1 Individual aspect

In the first level, nurses attempted to manage EIDs themselves, upholding personal responsibility in combating an EID outbreak through preventing the spread of infections. In order to prevent the spread of disease, the nurses mentioned the importance of adopting infection control measures to prevent becoming a host of the infectious disease, or to prevent the spread of disease from patient to patient by implementing nursing care. Although it is reported in the findings that nurses use infection control measures and equipment to prevent infection, their confidence in these measures and the practicality of these measures have limited their usage and effectiveness. One of the issues identified by nurses is the effectiveness of PPE in infection protection, as some nurses are unsure about the effectiveness of the equipment in protecting them against disease. Indeed, the literature reports that healthcare workers could be in doubt about the effectiveness of PPE and infection control measures in protecting them during an EID outbreak, especially when the origins and disease transmission route surrounded the disease remained unclear in the beginning of an outbreak (Speroni et al., 2015). As mentioned in the findings, nurses would consider PPE and

protective measures as the last resort of protection in combating EIDs. Therefore, ensuring the safety and effectiveness of infection control measures is important in improving nurses' sense of security during their participation in EID management.

In addition to confidence in the implementation of infection control measures, workload was an obstacle that adversely influenced the application of infection control recommendations and measures in EID management. Nurses in the present study indicated that the AED's busy working environment during epidemic events would not allow time for frontline nurses to fully complete infection control measures, and similar results are reported in both local and overseas studies of nurses in acute care settings during epidemic outbreaks (Amodia et al., 2017; Lam & Hung 2013, Matthew-Maich et al., 2013; Ploeg et al., 2007). These findings suggest that the workload is considered by nurses to be the most influential factor affecting their compliance with infection control guidelines and recommendations. This could result in a significant depletion of infection control compliance in settings where nurses' workload is heavy. Thus, it is suggested that infection control measures should be streamlined to facilitate their adoption by frontline nurses. One recommendation is the use of alcohol hand-rub to facilitate nurses in maintaining hand hygiene, which saves nurses' time in going to fixed handwashing facilities and is proven to be effective at facilitating nurses' hand hygiene practices (Al-Tawfiq et al., 2013). Another suggestion to streamline infection control measures is the utilization of disposable equipment whenever possible, to save time in environmental disinfection, especially in triage areas where patient turnover is rapid and frequent (Veater et al., 2017).

Apart from preventing the spread of infection, upholding professional integrity is another important concern among nurses who are involved in EID management. In the face of hardship, nurses struggle to attain consistent standards of professional and ethical conduct

in fulfilling their nursing role and meeting their commitment to serve the community. However, in some cases, their willingness and intention to fulfill their commitment, along with their sense of mission, could be challenged by the occupational risk of infection and the health threats originating from the disease. Numerous previous studies have investigated the association between nurses' willingness to report for duty in a large-scale public health emergency (Arbon et al., 2013; Balicer et al., 2006; Ip et al., 2015; Koh et al., 2005; Styra et al., 2008; Tzeng & Yin, 2006). The results also revealed that the risk of infection and personal safety concerns are the major factors preventing them from participating in a response to a disastrous event. For example, Ip et al. (2015) suggested the nursing workforce was depleted during previous influenza pandemics because of nurses' absenteeism. Also, Arbon et al. (2013) suggested that emergency nurses might be unwilling to report to work due to concerns about personal and family safety during a major disaster event. These findings show that the competing values of professional responsibility and personal welfare have put frontline nurses into a dilemma with their values and beliefs being challenged, requiring their adjustment or adaptation. Under such challenging circumstances, some nurses in the present study have valued financial considerations as a factor that might cause them to remain in their position in an EID outbreak, despite the health threat, which might provide some insight into the possibility of offering financial incentives to encourage nurses to report for duty and remain in their position during an EID outbreak. In addition, as the health of family members is also a major concern as mentioned in the findings, institutions might consider offering vaccinations not only to staff, but also to their family members, to alleviate their health concerns and improve their willingness to work.

Maintaining resilience is another important notion revealed by the participants. The findings obviously revealed that the nurses found an EID outbreak could be a stressful event, especially if it claimed the life of a healthcare worker. Thus, it is important for nurses to

maintain resilience and be able to quickly return to optimal status during the prolonged and persistent process of EID management. Indeed, it is reported in the literature that a disastrous event or large-scale public health emergency could induce intense emotional and psychological impacts, such as frustration and anxiety, in nurses (Kim & Choi, 2016). In addition, nurses might experience moral distress while involved in EID management, as they might feel guilty and powerless about not being able to help patients in the face of a disease with high mortality. This is also reported in other studies, which state this might result in job dissatisfaction and burnout among nurses (Biddison et al., 2014).

In addition to moral distress, compassion fatigue was another issue facing emergency nurses caring for patients during a large-scale public health emergency. This term refers to the negative repercussions of intentions and behaviors to help suffering patients in the course of a traumatic event (Figley, 1995). In their study, Laposa et al. (2003) indicated that emotional distress from compassion fatigue was one of the main causes leading to the turnover of emergency nurses. Consistently, a similar finding was reported in Swatzky and Enns's study (2012), which had a similar setting (Canada) and population (emergency nurses). In addition to resignation, an alternative response by healthcare personnel was to move from a frontline acute care setting to positions or departments where less direct patient care was involved (Beck & Gable, 2012; Yoder, 2010). Moreover, the standard of care might also be adversely affected. For example, a study reported that participants with high levels of compassion fatigue might try to avoid contacting and caring for patients in order to prevent further unpleasant secondary trauma, resulting in reduced initiative to help patients in need (Dominguez-Gomez et al., 2009). However, moral distress and compassion fatigue among nurses involved in EID management is seemingly overlooked in the literature, perhaps because the patient traumatization and suffering is less noticeable when compared to that of patients who have been in an accident or natural disaster. Thus, it is important to reinforce

strategies to help address these problems, and support nurses in being resilient in the face of adversity. In addressing this problem, nurses' attitudes play a major role, as the findings suggest that nurses could feel guilty and powerless due to their inability to maintain patient care standards. From the literature, it is observed that nurses might be setting unattainable targets because of their passion to help, possibly because of an overestimation of the healthcare worker role and function (Sung et al., 2012). The literature also suggested that this situation is particularly common among junior nurses, who are less experienced at handling loss and sadness in a clinical setting (Rueden et al., 2010). Therefore, support should be given to staff who have difficulties in overcoming moral distress at work, such as offering counselling or mentoring to frontline staff who are reported to be experiencing problems.

10.3.3.2 Coworker aspect

Apart from an individual perspective, emergency nurses have worked together, making a concerted effort to support each other while engaging in EID management, by working collaboratively as a team. Protecting each other against the threat of infection was considered a primary concern for the nurses in the present study. The findings of the present study indicated that most of the emergency nurses expressed the intention to shoulder the responsibility to ensure their colleagues' safety in an EID event, and followed through with actions. Additionally, this sense of responsibility is dominant among clinical nurse leaders, such as advanced practice nurses and nursing officers, in the present study. In the nursing literature, the indispensable role of clinical leader has been highlighted, as their leadership behaviors are associated with staff nurse satisfaction and retention (Bormann & Abrahamson, 2014). The clinical nurse leaders play a particularly important role during large-scale public health emergencies, as their decisions and judgments inform the direction of nursing practice in such events (Veenema et al., 2016). In the findings of this study, it is revealed that the

clinical nurse leaders were responsive to the safety needs of staff nurses by taking the initiative and offering training to colleagues to instill the required knowledge and skills for infection prevention. In contrast to the response of hospital administration and management, which was often delayed or passive, the prompt and expeditious response of clinical nurse leaders could be explained by their actual participation on the frontlines of EID management, where they were able to articulate the health threats in the workplace environment. Therefore, clinical leaders are in a pivotal position to serve as a communication bridge between hospital administration and frontline nurses. To facilitate communication across departments during epidemics, the duty of clinical nurse leaders as collaborators should be reinforced and promoted.

Another important component of emergency nurses' engagement in EID management is the establishment of a team working environment. In the present study, nurses demonstrated their efforts to foster a cohesive and supportive work environment and create a learning atmosphere through experience sharing and clinical mentoring, where their collective goal of preserving AED functionality in an epidemic event could be achieved. Such a well-established common goal enables healthcare workers to position themselves in the workplace and assist in realizing expectations regarding their work and practice (Bender, 2016). Although the goal of care provision and service delivery is often explicit and clear in its emphasis on the wellbeing of patients and communities, a healthcare facility's collective goal could direct the style and strategies used to achieve such targets (Moore et al., 2015). Establishing a consensus around a common goal is therefore a promising, yet challenging, task for a healthcare facility, as that would determine its work culture and the motivation and job satisfaction of its workers (Dawson et al., 2014; Zhang et al., 2014). In the present study, several nurses pointed out the existence of a blame culture, which individuals were blamed for mistakes or deviations that occurred. In such a stressful and strained work environment,

nurses might demonstrate hostility towards other coworkers to prevent themselves from being targeted in a quarrel. Some might attempt to minimize their participation in practice to avoid making mistakes. In the literature, it is suggested that such a culture of blame is a common phenomenon in acute healthcare settings (Gabriel, 2015). Findings from a cross-country study conducted by Wagner et al. (2013) stated that a culture of blame might be more prevalent in clinical areas where the workload is laborious. Also, they revealed that a blame culture could precipitate from the pressures exerted on frontline healthcare workers in terms of performance standards expectations and requirements. A blame culture in a healthcare setting often results in adverse impacts on various aspects of the workplace, including job satisfaction (Leggat et al., 2010) and turnover rate (Zhu et al., 2014). Also, it might inhibit healthcare workers from reporting errors and misses in their work, which could result in considerable consequences for patient safety (Kroll et al., 2008). Thus, it is important for healthcare facilities to sustain a fair and no-blame workplace culture, especially in times of major public health emergencies, to avoid further accumulation of stress and tension in workers.

On the other hand, several emergency nurses in the present study described the work atmosphere in their departments as helpful and harmonious, with the cultivation of a supportive culture. The findings offer several characteristic of a supportive workplace culture, including a non-judgmental practice among staff members and emphasis on a task instead of an individual in appraising staff performance. These features showcase an opposite stance to that of a blame culture. In addition, the practice of sharing and learning was mentioned by nurses as another feature of a supportive workplace, facilitating the sustained growth of individuals and engendering ongoing improvements in both staff and departmental performance. In achieving such a desirable workplace culture, the nurses in the present study indicated the role of senior and experienced staff members in sharing their experience and

knowledge with colleagues. Indeed, the importance of experience sharing was highlighted in the literature, which was shown to promote knowledge transfer (Pretz & Folse, 2011). In addition, tacit knowledge, which was clinical wisdom that is difficult to learn from books or in the classroom, could be transferred to junior staff, helping bring their insights into similar situations in the future (Kothari et al., 2012). It is reported in the literature that in general, nurses would welcome and be willing to share their experience with colleagues. However, workload is a major obstacle hindering their ability to spare time to share knowledge and experience. As nurses could endure intense physical and psychological stress and pressure during a large-scale public health emergencies, devising strategies to foster a supportive work atmosphere and promote a positive workplace culture warrants special attention.

In addition to experience sharing, nurses have also contributed to the development of a teamwork culture by covering for each other in fulfilling their duties. As mentioned in the findings, nurses would offer tangible help in EID management to colleagues, such as hands-on assistance in completing tasks, and checking for and correcting others' mistakes. Their actions in assisting colleagues in their duties is self-directed, with nurses taking the initiative to handle others' work when they realized there were gaps in practice that required coverage. The nurses commented that such actions are considered the norm in nursing practices. In other words, helping co-workers is considered by nurses to be a part of the workplace culture. In the literature, consistent results are identified, revealing that offering assistance was common among nurses, particularly in acute care settings, which suggests that nurses consider themselves to be working as part of a team (Gabriel, 2015). In addition to a common and collective goal, the nurses mentioned a more pragmatic rationale behind their intentions to help each other, which is their expectation of reciprocal help when they themselves encounter difficulties and require assistance from others. Wagner et al. (2013) suggested that help from colleagues is the primary source of assistance sought, as colleagues are readily

available and could offer tangible and timely assistance and advice. Although administration and management could also provide assistance, their actions could be considered by nurses as bureaucratic and delayed, which might not be of immediate help in solving problems in a clinical setting (Azar et al., 2016). However, as individual staff nurses' efforts are limited, it might not suffice for them to address the fundamental reasons for problems occurring in a clinical setting, notably during an EID event that is characterized by uncertainty. Thus, hospital management and administration should be responsive in promptly identifying and responding to the needs of frontline staff.

10.3.3.3 Operational aspect

In order to effectively address the duties required to maintain an AED's smooth functioning during an EID event, nurses in the present study devised different strategies and tactics to accentuate their duties in disease surveillance and notification in managing EIDs. Identifying infectious patients is considered a task of utmost importance for emergency nurses, as it is related to the occupational health risk of infection among staff, and the spread of disease in hospital and in the community. As mentioned in the findings, emergency nurses are provided with a set of criteria to evaluate the infectious status of patients. These criteria include a patient's recent travel, occupation, contact, and cluster (TOCC) history, which is a set of recommended criteria to assess patients' epidemiologic link (Centre for Health Protection, 2014). However, emergency nurses in the present study pointed out that in practice, there could be hindrances to implementing these criteria, as the criteria might not be specific enough in certain instances. For instance, the nurses indicated the difficulty in determining a patient's travel history because of the vague geographic boundaries between Hong Kong and Mainland China. Thus, the nurses reported that instead of relying entirely on the TOCC criteria, they would exercise prudence in determining the possible infectious status

of patients by incorporating their clinical experience and observations into the assessment, delineating the importance of nurses' decision-making and clinical judgments (Thompson et al., 2013).

Another hindrance facing emergency nurses in their attempt to screen suspected patients is an increased AED attendance during an epidemic event, which complicates the screening process. As reported by the nurses, a considerable portion of those in attendance are driven to the AED because of intensified public apprehension about a disease, with the situation at its worst in the early phases of a major EID outbreak. Indeed, serving as the interface between the community and the hospital, AEDs are often considered by the public as the primary destination for accessing healthcare services (Hoot & Aronsky, 2008; Morens et al., 2004). However, according to the nurses' descriptions, the upsurge in the number of patients attending AEDs could affect nurses' acuity in determining infected patients. Also, increased numbers of patients could pose a further challenge to emergency care service delivery, already tense due to EID management. In fact, Guttmann et al. (2011) reported in their retrospective cohort study that the busy working environment of an AED with prolonged waiting times would be associated with negative patient outcomes, such as a longer length of hospitalization and higher chance of short-term deaths. In order to alleviate emergency nurses' workload to facilitate effective patient screening, public and private sectors should work collaboratively to divert the flow of patients to AEDs. For example, an established framework has been developed in Singapore to incorporate primary care clinics to manage influenza patients (Ministry of Health, 2014).

In ensuring efficient operational workflow and patient logistics, nurses in the study frequently mentioned the difficulty of applying recommended guidelines to optimize workflows, due to the impracticality of those protocols. The nurses stated that their intention

and willingness to adhere to the recommended guidelines on workflow, patient logistics, and infection control were hampered because of the infeasibility of the guidelines in an actual clinical context. The results illustrate that the guideline-practice gaps can be accounted for by inadequate provision of corresponding administrative and organizational support, in terms of human resources, facilities and policies, after the launch of the guidelines. These findings are consistent with those in the literature showing that transferring guidelines into clinical practice is greatly influenced by the practice environment, including the availability of resources and leadership responsiveness (Graham et al., 2004). In fact, the perceived impracticality of the guidelines was repeatedly cited by participants, who highlighted the fundamental shortcomings of administrative leadership in showing responsiveness to the concerns about environmental constraints in the workplace. These findings are in agreement with those of May et al. (2014), who reviewed the factors affecting the performance of nurses in implementing clinical practice guidelines in the literature. Their review summarized the results from the studies of Ploeg et al. (2007) and Yagasaki and Komatsu (2011), which identified that adherence to guidelines by nurses could be adversely influenced, and the applicability of integrating guidelines was impeded by constraints within clinical settings. The limited applicability of guidelines, as reported in the present study, could be explained by the top-down planning approach commonly adopted in various healthcare organizations for guideline formulation (Mintzberg 2012). This top-down approach refers to a strategy of decision-making that only involves senior level administration (Meslin, 2009). Without the participation of frontline personnel, imposed guidelines and policies often deviate from their expectations and capacities, and limit their uptake into frontline workflow (Ploeg et al., 2007). Therefore, the need for subsequent evaluation of processes and outcomes in terms of guideline implementation is highlighted, so as to examine the feasibility of guidelines in existing situations.

As mentioned previously, emergency nurses are committed to completing different tasks at work by establishing priorities across multiple duties in order to cope with resources constraints. The nurses prioritize and sequence healthcare tasks based on various considerations, such as patients' clinical manifestations, possible risk of the spread of disease, or the effectiveness of service delivery. It is suggested that workplace priority setting is a crucial nursing skill due to limited staffing, time, and resources. Through setting priorities, effectiveness in handling day-to-day duties is enhanced (Chan et al., 2017). For nurses to prioritize tasks, it is important for them to possess the ability to plan and organize their work. Their decisions are based on assessing the value of the tasks, in which they make prompt and practical estimations of whether a task requires immediate attention by predicting the possible consequences of immediate and delayed actions.

In EID management in an emergency setting, a major characteristic of setting priorities, as reported from the findings, is that the decision is not static, but is rather a dynamic endeavor often requiring emergency nurses to change and update their schedules and sequence of tasks. Apart from the notably changeable and unpredictable nature of emergency care practice, which could alter emergency nurses' sequence of care, epidemic events have introduced novel concerns and considerations for nurses in prioritizing the sequence of care. In such a context, nurses' decision-making on their work priorities could be further complicated by balancing between the need for risk minimization of infection control and the espoused duty of providing life-saving treatment (Källberg et al., 2017). As these two duties are both imperative for emergency practice during an epidemic, emergency nurses could be confused in determining and sequencing their associated tasks. This indicates that emergency nurses must be flexible in handling and prioritizing tasks. Also, they should acknowledge the changed goals and objectives of their duties in a changed or particular

situation (Chaffee & McNeill, 2007). By doing so, emergency nurses would be able to adjust to changes in priorities and adapt to a changed context.

In the present study's findings, it is noted that prioritizing emergency nurses' duties could to a certain extent impede the quality and standard of care, as the nurses would be required to establish a compromise between the standard and efficiency of care delivery. Although the emergency nurses' endeavor in maintaining service provision in an acceptable manner is highlighted, the content of acceptable practice might vary from nurse to nurse, which would come down to the preference of individual nurses (Cherry & Jacon, 2016). While prioritizing tasks forms an indispensable part of emergency nurses' practice during EID management, baselines and benchmarks for the standard of care should be established and conveyed to nurses, to maintain the standard of care when they attempt to do a trade-off between efficiency and the standard of practice (Lakanmaa et al., 2014).

Communicating with different parties is another important component of emergency nurses' role in the EID management, as effective EID response requires the collaboration of different parties. However, nurses in the present study are confronted with problems in establishing a consensus on infection control guidelines with other departments, which can lead to difficulties in admitting patients to general wards or to an isolation ward. In part, this is one of the reasons causing patients to be stranded in the AED, further increasing the work burden of AED staff and greatly affecting their routine practices. The issue of stranded patients might not only affect AED functioning, as extra staff are required to care for these patients. It can also lead to delayed treatment of these patients, which might jeopardize their condition and prognosis.

There is no doubt that divergences in interpreting the admission criteria are not the only cause of patients being stranded in AEDs. In fact, insufficient hospital beds serving an

upsurge in patients during a mass casualty event or public health emergency is another (Abir et al., 2013). However, there has been very little published research on the controversies associated with the admission criteria between AEDs and other hospital wards and departments. Further work is required to take admission criteria into account in finding a solution for stranded patients in AEDs. This problem of inconsistent admission criteria could be related to insufficient communication between different healthcare facility departments, where staff in AEDs or other departments are unclear about the instructions for handling patient admissions. In this respect, healthcare facility authorities should be involved in addressing this cross-departmental issue. As reported in the literature, it was found that collaboration between different departments could be inefficient due to the bureaucratic structure of healthcare institutions, as well as the complicated steps involved in amending the practices of multiple departments (Kim, 2015). Thus, it is suggested that hospitals should streamline their procedures and establish communication channels among different departments.

In addition to communication between different departments, nurses in the present study also mentioned that communicating with the public is another significant duty in EID management, as emergency nurses are regarded by the public as a source of information about the disease situation. Although health education is an integral part of nursing, emergency nurses might be overwhelmed by the workload in providing such health education to the public. Thus, it is suggested that inquiry counters could be set up to allow the public to obtain information about EIDs and the disease situation, giving emergency nurses time to focus on their already heavy clinical workload.

10.3.4 Facet of resolution: Withstanding the collapse of service provision

This facet delineates the consequence of emergency nurses' diligence and struggles to resolve problematic issues in the workplace while engaging in EID management. In the findings, the emergency nurses explicitly identified that withstanding the collapse and sustaining the normal functioning of service provision of the AED was the primary goal and intended outcome of their engagement in combating EIDs. In this facet, patterns and variations of the actual outcomes of the nurses' actions were revealed, suggesting the potential influence of nurse and workplace characteristics on the process of their engagement in EID management.

10.3.4.1 Conforming to guidelines and protocols for care delivery

Being able to adhere to guidelines and protocols is considered by emergency nurses to be one of the intended outcomes of their work, despite the difficulties faced in the workplace. Instead of rigidly adhering to the guidelines, the nurses in the study attempted to participate in the modification of impractical guidelines in order to achieve such a desirable outcome. On the other hand, nurses who demonstrated less willingness to adjust to change reported that a persistent challenge remains in tackling guideline-practice gaps. These findings are an example of how individual characteristics could intervene emergency nurses' decision-making and problem-solving in the process of engagement in EID management. Also, it is suggested in the findings that nurses who are willing to embrace change at work are comparatively more adaptable and resourceful in coping with adverse situations. A possible explanation for this might be that nurses who display a willingness to change might probably be able to afford greater autonomy in clinical encounters, which grants them the ability to adjust according to situational needs (Oreg et al., 2011). This view is supported in the literature, which underlines that solutions to adaptive challenges in an organization often

require changes in its employees' attitudes and practices (Corazzini et al., 2014). Unfortunately, not all nurses are readily available for change. Previous research has suggested that nurses might show considerable reluctance to change due to the concern over the impact of change on workload and routines (Calvin et al., 2007; Gurd & Gao, 2016; Oreg et al., 2011). Indeed, the process of change within the workplace usually results in uncertainties and instabilities (Corazzini et al., 2014). Therefore, it is recommended that amendment and modification of policy and guidelines should be carefully planned and considered, to avoid unnecessary and abrupt changes within the workplace. For changes that are essential, measures and strategies should be devised to support nurses throughout the process.

10.3.4.2 Adapting to resources constraints

Another intended outcome of the emergency nurses' sustained effort in maintaining functional operation of care delivery pertains to the adaptation to resource constraints. As indicated in the findings, it is suggested that achieving this outcome requires emergency nurses to make unremitting endeavors in for the allocation of limited resources, such as time and manpower. Also, the importance of emergency nurses' willingness to work collaboratively as a team, play different roles in maintaining service provision, and share each other duties when facing limited resources, is emphasized. These findings highlighted the importance of establishing a supportive work culture in adapting to resources constraints during an outbreak of EID. More importantly, the findings suggested that a supportive work culture not only promotes the ability of individual staff member to handle emergencies in response to infectious diseases, but also the capacity of a healthcare facility to coordinate the surge in operational and resource needs. Indeed, developing and deploying this surge capacity is crucial for a healthcare facility to meet an unexpected upturn in demand for care

services when there are emergencies and disasters (Hick et al., 2014). However, previous research findings into surge capacity have placed emphasis on tangible factors pertaining to the continuity of operations of an organization, such as the availability of response plan and supply chain distribution (Kelen & McCarthy, 2006). On the other hand, the influence of intangible resources on surge capacity, such as work culture and staff morale, is often overlooked (Hick et al., 2014). The findings of the present study offer insight into the importance and prominence of intangible resources of a healthcare facility in the establishment of surge capacity, suggesting an area for future research.

10.3.4.3 Receiving tangible support from hospital administration

This outcome underlines the expectation of emergency nurses to maintain effective communications with hospital administration. As was mentioned in the findings, frontline nurses often consider managerial support as an obligation of hospital administration to offer tangible and constructive assistance. However, not all emergency nurses are able to receive supports from their manager as expected, even though they have spoken up to ask for assistance from the higher levels. This finding reveals the variations of administrators' leadership style in the actual clinical context, highlighting the essentiality of responsive management for emergency nurses' engagement in EID management. In accordance with the findings, previous studies have demonstrated that managerial support is an important attribute closely related to staff turnover rates and retention (Choi et al., 2013; Lam & Hung, 2013). However, despite the imperative for responsive leadership, it is reported that hospital management is commonly passive and insensitive to the needs of frontline healthcare personnel, resulting in inconsistent quality of care and performance standard (Raup, 2008). Indeed, previous studies have indicated hospital administration and management are used to be passive and avoidant when confronted with issues arising from the frontlines, as their

mindset is from real-world clinical matters (Horwitz et al., 2008; Malloy & Penprase, 2010). It is suggested in the literature that effective management requires a proactive stance, with management taking the initiative to actively seek feedback for improvement from frontline staff, especially on occasions where individuals are undertaking an unstable and laborious change process (Raup, 2008).

10.3.5 Facet of learning: Enhancing preparedness towards imminent threats

Emphasis in this facet is placed on the progressive and momentous development of emergency nurses' preparedness to manage an EID event in the future. Compared with the facet of resolving, which highlighted the outcomes and consequences of emergency nurses' efforts to resolve challenges and constraints faced during EID management, this facet focuses on how emergency nurses seize the opportunity to enhance clinical learning and professional growth through the engagement in EID management.

10.3.5.1 Cultivating individual capacity for outbreak response

During EID management, emergency nurses are able to replenish and consolidate their knowledge and skills in care delivery, especially on issues pertaining to disease management and infection prevention. In addition, the emergency nurses stated that their mindset is strengthened in perceiving and responding to challenges during times of hardship. In accordance with the present results, previous studies have demonstrated that the personal capacity of nurses is enhanced after responding to large-scale public health emergencies, in terms of knowledge, skills, attitudes, and confidence (Baack & Alfred, 2013; Hammad et al., 2012; Lam & Hung, 2013). A possible explanation for this might be that the experience of participating in EID management offered an opportunity for nurses to adjust their knowledge and understanding when facing challenges. Throughout the process of engagement, as

described in this study, emergency nurses are able to orientate themselves within a disease situation and check their understanding and technical knowledge of EID management against actual norms presented in practice. Individuals could also calibrate their initial perceptions of values and beliefs that fit with the actual clinical context. This could enhance the renewal of individual nurses' attitudes towards an actual EID event, which they eventually assimilate as an integrated part of their belief and practice.

Apart from knowledge and beliefs, their engagement in EID management presents nurses with opportunities to apply and practice the tactics and skills learned through workshops and training sessions in infection control and disease prevention. This enables nurses to experiment with the skills and mindsets they need in problem-solving, allowing them to feed experiences back into their work practices and modify their procedural knowledge in a practice context. As a result of such experimentation, both cognitions and behaviors of emergency nurses are modified, and the nature and quality of their response during EID management is enhanced. For instance, the nurses described the establishment of "nurses' common sense" in practice, which represents the calibrated beliefs and knowledge in care provision. The "nurses' instinct" is another example, which describes how the nurses develop an advanced skillset of rapid patient assessment. Indeed, it is suggested in the present findings that the establishment of such "nurses' common sense" and "nurses' instinct" among the emergency nurses in the management of clinical tasks is the consequence of such calibration and experimentation. In other words, these skills and abilities are acquired by the emergency nurses through prolonged and engaged clinical practice. Since these explanations on the establishment of such calibrated attributes and skills among emergency nurses remain at the provisional and preliminary stage, more research on this area needs to be undertaken before the association between skill experimentation and ability acquisition is more clearly understood.

10.3.5.2 Nurturing cohesive working environments

In addition to establishing personal capacity, developing a cohesive working environment is considered another intended outcome of emergency nurses' endeavor in the engagement of EID management. It is revealed in the findings that a cohesive working environment would nurture and foster a mutual help network within the AED that favors care delivery and service provision. According to the emergency nurses, such a mutual help network in a cohesive workplace could facilitate their efficiency in handling tasks in practice, as staff would offer support and assistance to one another to deal with the increased workload during an epidemic event. As mentioned previously, a cohesive workplace is a decisive factor that could affect the surge capacity of a healthcare facility during events that induce abrupt increases in service demand (Dawson et al., 2014). In addition, a cohesive work environment would enhance healthcare workers' job satisfaction and patient outcomes (Zhang et al., 2014). These evidences highlight the importance of maintaining a cohesive working environment.

In accordance with the present findings, previous studies also indicated that nurses' relationships with their peers might improve after overcoming major hardship events (Moore et al., 2015). A possible explanation for these results may be the establishment of bonding during concerted efforts to tackle challenges, in which staff demonstrate solidarity in their resolve to address challenges posed by a disastrous situation. To nurture a working atmosphere in outbreak response, it is crucial for clinical leaders to establish a reciprocal supportive relationship among coworkers, and to encourage a collaborative effort to pledge continued commitment to achieving common goals (Northouse, 2010). Such an effective leader-coworker relationship, according to the Leader-Member Exchange Theory (Mahsud et al., 2010), would be more likely to be established when clinical leaders are sensitive and

responsive to the needs and concerns of team members, demonstrating mutual trust and respect within the workplace environment. This leadership style, which emphasizes motivation and communication, is commonly referred to in the literature as transformational leadership (Vinkenburg et al., 2011). While the conventional leadership style in nursing has usually adopted an autocratic approach that stresses control and power-orientation (Bass & Bass, 2009), this review might shed light on an effective alternative leadership style in the management of large-scale public health emergencies.

However, discrepancies are reported from the literature and in the findings of the present study, which reveal that morale in the workplace weakened after major public health events (Imai et al., 2008; Wong et al., 2008). As was mentioned by the emergency nurses in the present study, colleagues could be agitated and defensive when confronted with challenges at work, adversely affecting overall teamwork practices in the workplace. Several previous studies also reported that relationships among staff members were jeopardized after a large-scale public health emergency (Imai et al., 2008; Robinson, 2009; Wong et al., 2008). Indeed, a disastrous epidemic event is a stressor to healthcare workers, particularly nurses, posing health threats and work pressures affecting their attitudes towards work or their emotions (Lam & Hung 2013, Matthew-Maich et al., 2013; Ploeg et al., 2007). However, previous studies have indicated that upper management could easily overlook staff morale, as workplace atmosphere was difficult for those on the outside to recognize (Ives et al., 2009; Lam & Hung, 2013). In order to facilitate the establishment of a cohesive workplace, clinical leaders, such as advanced practice nurses and nursing officers, should be sensitive to the ambiance of the workplace and offer interventions if required.

10.4 Summary

The discussion in this chapter delineates the meanings and representations of the core category, *persevering through the vulnerability of collapse,* by elucidating the underlying situations, behaviors, and dynamics for emergency nurses engaging in EID management. The theory's major notions are highlighted, indicating the importance of decision-making and clinical judgments by emergency nurses while engaging in EID management. In addition, adaptive capacity is another imperative attribute that empowers nurses while engaging in EID responses. Nurses should be capable of adapting and adjusting their attitudes, behaviors, and work practices to cope with unpredictable and evolving EID scenarios. The key elements of emergency nurses' five facets of the EID management engagement process are compared with relevant literature and evidence, demonstrating that previous studies often emphasize hospital or AED operations during an epidemic. As a result, the importance of personal capacity, such as clinical decision making, critical thinking, and workplace cohesion have often been underestimated. Overall, the discussion reveals the structure of the substantive theory of the present study and connects the theory with the existing literature and current understanding of EID management.

CHAPTER 11

CONCLUSION

11.1 Introduction

This concluding chapter begins by addressing the research questions posed in Chapter 1. This is then followed by a discussion of the main limitations of this study. In addition, implications and recommendations for nursing practice, policy, and nursing education are described. Finally, there are suggestions about further theory development and research.

11.2 Addressing the Research Questions

As mentioned in the introduction, the present study aims to address a broad research question, which concerns how emergency nurses are involved in emerging infectious disease (EID) management. The present study has generated a substantive theory that elucidates the process, facets, and structure of the abovementioned phenomenon. This theory is a composite of five major categories that provide details on the corresponding activities and interactions of emergency nurses: (1) encountering situations fraught with obstacles and challenges, (2) rehearsing for improvisation, (3) preserving professional duties and integrity, (4) withstanding collapse of service provision, and (5) enhancing preparedness towards imminent threats. These activities and interactions further constitute a dynamic process concerning emergency nurses' engagement in EID management, which consists of five main facets: (1) the facet of encounter, (2) the facet of navigation, (3) the facet of striving, (4) the facet of resolution, and (5) the facet of learning. As the ultimate findings of the present study, the theory has successfully accomplished the study objectives by describing the situations and tasks facing emergency nurses in EID management, identifying the strategies and resources

of emergency nurses engaged in EID management, discovering the process of how emergency nurses engage in EID management, and developing a substantive theory that explains how emergency nurses engage in EID management.

11.3 Limitations

The present study is subject to a few limitations. The most important limitation relates to the facets within the theory of emergency nurses' engagement in EID management. With regard to the theory of engagement, there are no discrete boundaries between each facet, as it is not a linear or static process. Instead, the theory is an intertwined and dynamic course of events and actions depicting emergency nurses' engagement in managing EIDs. Although the naming of the facets has portrayed the central themes regarding emergency nurses' experience under a specific circumstance that might signpost the development of the process, comprehensive directions indicating the progression of the theory are unavailable. This might result in difficulties in separating the facets from the continuous spectrum of the theory, affecting the likelihood of examining the facets in a discrete and separated manner.

Another limitation involves the timing of the investigation. Because the present study focused on the process of emergency nurses' engagement in EID management, the ideal sequence to conduct data collection would be embarked on at the initial phase of an outbreak, and would then continue throughout the entire course of the outbreak. By doing this, the experiences and perceptions of emergency nurses could be solicited in a fresh and vivid manner, and the changes in social context could be captured with the progression of the outbreak. However, this approach was not possible, because there had been no recent local EIDs outbreaks at the time of data collection. Data collection in the present study was then conducted by soliciting participants' views from previous experiences in EID management.

Indeed, the findings highlight that the non-sequenced approach, which was adopted in the study, is the preferred option for data collection, as it revealed that emergency nurses' engagement in EID management was not only confined to the peak periods of an EID outbreak, but was also an integral component of everyday practice.

Despite these limitations, it is believed that the present study's findings would make an important contribution to an exploration of nurses' role and the underlying processes involved in their engagement in EID management in an emergency care setting.

11.4 Implications for Nursing Practice, Education, and Policy

The present study's findings have significant implications for possible approaches and strategies to renew and reinforce emergency nurses' competence and readiness in the face of future epidemic events. These implications not only indicate recommendations for nursing practice, education, and policy, but also highlight that a collaborative effort should be made among emergency nurses, hospital administrators, and policy-makers to strengthen capacity in EID preparedness and response.

11.4.1 Personal education and training

Education and training are the integral constituents of nurses' preparedness and competence in outbreak management. Although key knowledge and skills in public health and infection control are integrated as a compulsory part of most current nursing curricula (Wu et al., 2009), the present study's findings point out that emergency nurses are frequently assigned to new roles and are required to perform unfamiliar tasks during an epidemic event, which might well be beyond the scope of their previous practice. For instance, they are

required to shoulder the responsibility of public health surveillance in the course of an EID event, including case ascertainment and contact tracing, which could be perceived by emergency nurses as an extra duty outside of their usual domain of practice. In order to strengthen emergency nurses' capacity in subsequent epidemics, education and training should be provided to equip them with the relevant skills, knowledge, and attitudes required for effectively serving in their role and acting accordingly in the unprecedented circumstances of an EID outbreak. Training and education in hospital preparing nurses for EID management often emphasizes updating the technical skills required to implement infection control measures, such as hand hygiene practices and personal protective equipment (PPE) use (Ellingson et al., 2014). What might have been overlooked is training and practice in the acquisition and augmentation of emergency nurses' abilities in terms of decision-making and problem-solving. The importance of such abilities is highlighted in the findings. Thus, apart from technical skills, educational and training outcomes should place equal emphasis on developing nurses' cognitive skills, such as critical thinking, calibration, and prioritizing, and on preparing them with the capacity to process and apply knowledge in chaotic and complicated conditions. In addition, emergency nurses' interpersonal skills should be strengthened, to facilitate the establishment of a cohesive work environment that supports healthcare workers in persevering in the face of the intense stress of managing an EID.

To cultivate emergency nurses' problem-solving and interpersonal skills, typical approaches for technical skills training might not suffice to instill tacit knowledge that is intuitive and implicit in nature. Instead, interactive teaching and learning methods could be a more effective approach than formal classroom teaching. Hence, to facilitate the learning process, carefully designed educational programs covering outbreak response skills should be established. The findings in the present study advocate a number of areas to guide

educational approaches to teaching and training delivery in order to facilitate emergency nurses' knowledge acquisition in EID management. For instance, coaching could be considered as an effective development technique to assist emergency nurses in setting appropriate workplace goals and enhancing personal competence in practice, equipping nurses both practically and psychologically for impending EID situations. Indeed, coaching and mentoring have increasingly been applied in the business sector to aid employees in achieving their full potential and improving their performance around specific skills (McNamara et al., 2014).

Moreover, training sessions should be modified to improve outcomes to instill knowledge and transfer skills among emergency nurses. As the importance of previous experience in managing EID outbreaks is highlighted in the findings, instead of involving hospitals or departmental management and administrators, inviting experienced frontline emergency nurses who have experience in previous EID outbreak episodes to design the content of training sessions and skills workshops could be considered. This approach could promote experience sharing between senior and junior nurses, and offer an interactive platform to strengthen the readiness of less experienced nurses, and to shape their beliefs and values in an appropriate way helping them prepare themselves for future epidemic events. For outbreak management, simulated drills of EID outbreak scenarios might also be of use in mapping and modeling events. This would strengthen nurses' preparedness and competence in dealing with future epidemic events by creating a virtual experience of an emergency response (Hsu et al., 2006).

This study's findings indicate that clinical decision-making is an imperative component of emergency nurses' practice during an epidemic event, pointing to the need to strengthen their ability to form sound and reasoned judgments under difficult conditions. As

was indicated in the findings, emergency nurses tend to rely on personal experience and advice from colleagues to inform their decision-making, describing this approach to problem-solving as “common sense” and “work practice”. This problem-solving practice is particularly prominent among nurses when the situations they encounter are fraught with change and uncertainty. These findings are suggestive that the acquisition and application of evidence-based knowledge in clinical decision-making is not a common strategy among nurses. Due to the benefits of employing evidence-based practice in nursing to improve patient outcomes and healthcare quality (Melnyk et al., 2014), there are a number of important changes that should be made to foster a professional culture, through the integration of research evidence to inform optimal nursing practices in EID management. A reasonable approach to handle this issue could be to encourage nurses to participate in research activities and to share evidence-based knowledge. A practical strategy could be the establishment of a research link-nurse system in emergency care settings. Indeed, the relevance of the role of link nurse has been suggested in various clinical areas, such as palliative (Heals, 2008) and diabetes care (Hui et al., 2016), underpinning its significance in advancing clinical effectiveness in patient care.

However, although the concept of infection prevention and control link nurses has been adopted in a wide range of clinical settings, their duties are often limited to being a coordinator of information dissemination (Sopirala et al., 2014). There is a current lack of exposure among link nurses to research activities (Ward, 2016). Thus, continued efforts are needed to facilitate link nurses in emergency care settings, notably those responsible for infection control and prevention, to appraise research findings and, if feasible, conduct clinical research. Also, seminars and journal clubs could be held on a regular basis for link nurses to disseminate research findings and evidence-based knowledge of the latest knowledge and skills for combating EIDs. This might promote the translation of research

knowledge into practice, and reinforce nurses' confidence and autonomy in clinical judgment and decision-making. In addition, to achieve these types of desired outcomes, aligned research training in nursing programs should be promoted to equip nurses with evidence-based practice in clinical practice.

11.4.2 Administrative assistance and support

During an epidemic event, assistance and support from hospital administration is one of the most important determinants of the preparedness and competence of the nursing workforce, as well as the preparedness and competence of workers in other healthcare disciplines. The findings maintain that nurses would be expected to encounter unanticipated challenges, such as staffing shortages and inadequate facilities, when responding to an EID event, with adverse impacts to their practice only mitigated by institutional action. In the absence of adequate support and action from hospitals, not only would the quality of healthcare service delivery be hampered, but nurses' incentives and intentions to work could also be hindered (Filice et al., 2013; Shih et al., 2007). Since the findings have highlighted major shortcomings in institutional support offered to emergency nurses during epidemic events, hospitals should adapt and accentuate strategies to support nurses and other outbreak responders to better equip them to handle pressing needs on the frontline. One of the main drawbacks indicated from the findings is the inadequacy of essential resources, such as human resources and isolation facilities, which remained unresolved in past outbreaks. In order to establish effective strategies to optimize resources allocation during a public health emergency, a summit made up of experts in public health preparedness was conducted and the concept of resource triage was introduced (Barnett et al., 2009). One of the major recommendations suggested at the summit is that resources triage should ensure meticulous identification of priorities in maintaining core healthcare services, while cancelation or

postponement of elective procedures could be an option for consideration. Through this approach of re-prioritizing resources allocation, the surge capacity of hospitals during major EID events could be reinforced, to meet expanded demand for healthcare services by the public. The standard of nursing practice could also be maintained with the sufficient provision of human resources and equipment.

Developing strategies to bridge the guideline-practice gap is another critical issue identified in this study. As suggested by the findings, customization of the recommendations and guidelines for frontline nurses' immediate needs is important. This study sheds light on the need to involve experienced frontline nurses, who are specialized in the field of emergency nursing, as representatives in policy and guideline planning. Their involvement in the planning process could provide practical information allowing policymakers to better tailor the protocols and ensure they are compatible with current practices (Batcheller et al., 2004). Also, the participation of frontline leaders could improve the efficiency of guidelines, by means of appropriate modifications, to address the actual needs of frontline healthcare workers in clinical situations (Matthew-Maich et al., 2013). In addition to practicality, the maintenance of cross-departmental consensus among healthcare personnel on guideline interpretation and operations was also indicated as an important component of efficient implementation. It is therefore necessary for healthcare service administrators to ensure that guidelines are disseminated effectively to staff, in conjunction with relevant reference materials.

The findings in this study highlight the need to strengthen cross-departmental communication to ensure a complete understanding of terms and instructions and the consistent implementation of guidelines. Other studies have indicated that the dissemination of information over the course of infectious disease outbreaks could be chaotic, because

information provided by administrators was both excessive and inconsistent (Lam & Hung 2013). Therefore, healthcare administrators should not only disseminate information to service personnel, but also appropriately streamline guidelines to facilitate their integration into routine practice. This is because the findings indicate that routine nursing practices might be susceptible to negative effects from the introduction of new guidelines. It may be worthwhile to regularly monitor the feasibility and usefulness of the guidelines. Regular monitoring is crucial for hospital management and administrators to track the progress of guideline implementation, and to assess whether the intended positive outcomes have been achieved (Grol et al., 2013). A clinical audit, as incorporated in a number of healthcare systems, might serve the purpose of quality monitoring. This method has been proposed as an efficient and effective means of assessing the quality of practice and promoting quality improvement (Pedersen et al., 2014). However, healthcare professionals might be unwilling to participate in an audit, because they may perceive the process as critical and faultfinding (Bowie et al., 2012). To ensure smooth audits, their purpose and procedures should be clearly articulated to frontline personnel to avoid any misconceptions.

In addition, ensuring appropriate systems, platforms, and support for managerial communication should be another important priority for administrative and managerial consideration. As the study findings indicate, there is ambiguity towards EID disease situations and emergency nurses' responsibilities during EID events. This might adversely influence their orientation to the circumstances, therefore, establishing effective communication is an imperative need during EID response. The findings of the present study underpin the necessity of developing platforms that ensure two-way communication between hospital management and frontline nurses, so that nurses can obtain updated information about the disease along with recommended practices for EID management. More importantly, channels that allow frontline nurses to provide feedback and exchange ideas with upper

management on changes in departmental policies and clinical practices should be maintained, in order to address possible issues pertaining to guideline-practice gaps in an actual clinical context.

11.4.3 Government policies and planning

The development of emergency nurses' preparedness and hospitals' surge capacity for outbreak response would require the government to demonstrate significant foresight in outlining coherent plans and policies on existing challenges and difficulties. It is underlined in the findings that the existing index and scale classifying the severity of EIDs are inadequate to address the disease situations facing emergency nurses in epidemic events. As stated in the findings, the current international classification scheme, namely the World Health Organization (WHO) global phase of pandemic alert (WHO, 2009), only reflects the severity and progress seen in an influenza pandemic. There is an absence of a consensual categorization system for other EIDs, which has resulted in uncertainty and discrepancies in assessing the risk and seriousness of non-influenza EID events. A key policy priority should therefore be to devise a well-established alert system, which could accommodate disease situations for various EIDs. Such an alert system could offer essential information regarding the evolving picture of different EID events at the local, national, and global level, providing guidance to healthcare facilities and institutes in preparing a response to EIDs. Frontline healthcare workers, especially emergency nurses, could then appraise a disease situation with improved clarity, which might reduce their uncertainty, contributing to improved alertness and vigilance towards possible EID outbreaks. Apart from establishing a new classification scale for EIDs, collaborative efforts from local government are required to devise strategies to enhance information dissemination in uncertain times of EID outbreak to effectively reduce uncertainty. For example, the establishment of an information server platform to

systematically coordinate information sharing among government agencies, healthcare facilities, and non-government organizations is recommended (Wen et al., 2015). Future evaluative research may focus on other existing promising interventions to improve information dissemination.

To maximize nursing input into the outbreak planning process, local and national government agencies might consider involving experienced nurses in managing infectious disease outbreaks in upper-level policymaking positions, as well as in decision-making and action plan formulation (Smith & Hewison, 2012). With the involvement of experienced nurses in outbreak planning, the input and opinions of the nursing taskforce, representing the largest professional group in the healthcare industry, could possibly be considered in the policy making process (Shih et al., 2007). Moreover, the participation of experienced clinical nurses in epidemic management strategic planning could provide an alternative perspective and bottom-up approach to response planning, ensuring that issues concerning frontline responders would be articulated and ultimately accommodated (Hayward, 2003).

11.5 Implications for Further Research

In addition to implications for practice, the findings of this study demonstrate important implications for research. By providing a theoretical understanding of the process of how emergency nurses engage in EID management, and offering valuable information about the conditions influencing their behaviors in coping with their duties during an epidemic event, this substantive theory links the process with the antecedents and outcomes involved in emergency nurses' participation in EID response. This might shed light on developing effective interventions to address suboptimal practices and improve current

nursing practices during an epidemic event. For instance, as protocol changes are identified in the findings to be the major barrier to infection control compliance among emergency nurses, interventions on streamlining the changes could be considered and further tested, with the use of this substantive theory as a theoretical framework to guide the investigation.

Another possible area of future research would be to extend the present study to nurses in other hospital settings, such as infection control units and out-patient clinics, to expand the understanding of nurses' engagement in EID management in different work environments. In addition, further research could also be conducted to explore the inter-professional dynamics of EID management among healthcare workers, such as physicians and support staff, in an emergency care setting. This could offer a more comprehensive understanding of inter-department interactions and inter-professional teamwork during an EID event. Furthermore, as mentioned previously, one of the present study's main limitations could be associated with the timing and sequence of data collection, as its collection of data in a non-sequenced approach might have affected the exploration of the association between emergency nurses' behaviors and evolving EID situations. Thus, longitudinal studies could be considered, to capture detailed changes and the progression of nurses' experiences and perceptions over time during a large-scale EID outbreak.

11.6 Concluding Statement

Engaging in EID management is an indispensable and challenging task for emergency nurses. To enhance the readiness of emergency nurses in EID response, it is imperative to understand how nurses experience and respond during EID management. The present study's findings offer a clear description of the process emergency nurses participate in during EID

response. The theory of *persevering through the vulnerability* of *collapse* identified in this study, consisting of the facet of encounter, facet of navigation, facet of striving, facet of resolution, and facet of learning, can be considered a robust explanation of the processes through which emergency nurses engage in EID management. It is hoped that the findings and the theory will advance existing understanding of EID response from the perspective of emergency nurses. Based on these insights, health policies and regulations that support and recognize emergency nurses' engagement in EID management will be enhanced. Also, training and education regimes on skills, attitudes, and adaptive capacities that are relevant to the management of EIDs will be promoted.

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APPENDIX I

Information Sheet (English)

INFORMATION SHEET

Nursing challenges in meeting with emerging respiratory infectious disease in accident and emergency department setting in Hong Kong

You are invited to participate in a research study conducted by Mr. Lam, Kam Ki, who is a post-graduate student of the School of Nursing in The Hong Kong Polytechnic University.

The purpose of this research is to gain an understanding of the emergency nurses in Hong Kong about their perceptions and actions to emerging respiratory infectious diseases. It is hoped that this study will provide relevant information for the management planning of infectious diseases, and hence improving the quality of care.

Your participation will involve participating in an interview, lasting approximately one hour. You will be encouraged to give opinions and comments regarding emerging respiratory infectious diseases. Interviews will be audio recorded to ensure accuracy of information. You have every right to withdraw your consent to participate at any time.

Your participation in this research study is voluntary without payment of any kind. The researcher will do everything to ensure the safety of participants. You may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study. Your identity will not be revealed at any circumstances in this study. All personal information will remain confidential and will be identifiable by codes known only to the researcher. Information provided will only be assessed by authorized research personnel.

If you have any questions or concerns about this study or if any problems arise, please contact the Principal Investigator Mr. Lam, Kam Ki on telephone number 27667881 or the Chief Supervisor of this research study Prof. Pang, Mei Che Samantha on telephone number 27666409.

If you have any complaints about the conduct of this research study, please do not hesitate to contact Ms Kath Lui, Secretary of the Human Subjects Ethics Sub-Committee of The Hong Kong Polytechnic University in writing (c/o Research Office of the University) stating clearly the responsible person and department of this study.

Thank you for your interest in participating in this study.

Lam, Kam Ki
Principal Investigator

APPENDIX I

Information Sheet (Chinese)

研究簡介

敬啟者:

本港急症室護士對新發現呼吸性傳染病的感受及其對應行為研究

現誠意邀請閣下參與由香港理工大學護理學院博士研究生林錦祺主導的研究項目。該項研究之目的在於探討本港急症室護士對於在各種新發現傳染病的感受，與及他們在工作間處理該種疾病的行為。是次研究可以幫助於傳染病爆發期間制定合適措施，從而提升護理服務質素。

若閣下同意參與研究，將會被安排進行一個歷時約為一小時的面談訪問，屆時研究人員將鼓勵閣下就新發現傳染病抒發感受及表達意見。在面談過程中，訪談內容將會被錄音，以確保資料的妥善紀錄。如在面談期間感到不安，可隨時中斷面談或退出是項研究。

在研究訪談過程中，閣下將以自願性質參與，不會收到任何形式之報酬。另外，研究人員將致力保障參加者不受任何物理傷害或利益受損，參加者可以於任何時間就任何原因選擇退出研究項目或拒絕回答任何問題。參加者將不會因而遭受任何形式的不良後果或對待。在整個研究過程，參加者的姓名將會被匿名化，一切有可能洩露參與者身份的資料亦會受嚴格保密。參與者提供的所有資料將會絕對保密，並只供相關研究之人員用作純粹研究用途。

如對研究方式、內容有任何疑問，或需要進一步的資料，請與研究項目負責人林錦祺(電話 27667881)或主要研究指導老師彭美慈教授(電話 27666409) 聯絡。

若閣下對是項研究有任何不滿，可以書面方式聯絡香港理工大學人事倫理委員會祕書(經香港理工大學研究事務處)。請於信中清楚列明該項研究之負責人及相關部門。

感謝閣下有興趣參與此項研究。

研究項目負責人

林錦祺

香港理工大學護理學院博士研究生

APPENDIX II

Consent Form (English)

School of Nursing

The Hong Kong Polytechnic University

CONSENT TO PARTICIPATE IN RESEARCH

Nursing challenges in meeting with emerging respiratory infectious disease in accident and emergency department setting in Hong Kong

I _____ hereby consent to participate in the captioned research conducted by Mr. Lam, Kam Ki. I understand that information obtained from this research may be used in future research and published.

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I understand I can withdraw my consent to participate at any time without penalty of any kind. I consent voluntarily to be a participant in this study.

I acknowledge that I can contact the Principal Investigator Mr. Lam, Kam Ki on telephone number 27667881 or the Chief Supervisor of this research study Prof. Pang, Mei Che Samantha on telephone number 27666409 for any questions or concerns about this study.

Name of participant _____

Signature of participant _____

Date _____

Name of researcher _____

Signature of researcher _____

Date _____

APPENDIX II

Consent Form (Chinese)

香港理工大學護理學院

研究同意書

探討本港急症室護士對新發現呼吸性傳染病的感受及其對應行為

本人_____同意參與由香港理工大學護理學院博士研究生林錦祺負責執行的研究計劃。我理解此研究所獲得的資料可用於未來的研究及學術交流。我已閱讀並清楚明白以上研究之資訊。任何關於研究內容之問題亦已清楚表明及經研究員答覆。我理解我有權利於研究過程中提出問題，並在任何時候決定退出是次研究而不會受到任何不當的待遇或被追究責任。本人是自願參與是次研究項目。如對是次研究有任何疑問，本人可與研究項目負責人林錦祺(電話27667881)或主要研究指導老師彭美慈教授(電話27666409) 聯絡。

參與者姓名: _____　　研究員姓名: _____

參與者簽署: _____　　研究員簽署: _____

日期: _____　　日期: _____

APPENDIX III

Interview Guide (P2)

1. Please tell me about some of the kinds of situations that you encounter in your practice during an EID event.

2. Please tell me about some of the tasks you are responsible to handle in your practice during an EID event.

3. Are there any difficulties regarding the engagement in EID respond?

4. How do you manage the difficulties?

APPENDIX III

Interview Guide (P25)

1. Please describe your experience in the engagement in EID management.

2. What are your goal(s) in the engagement in EID respond?

3. What are the processes in attaining the goal(s)?

4. How do you attain the goal(s)?

APPENDIX IV

Ethical Approval

To	Pang Mei Che (School of Nursing)		
From	KWONG Wai Yung, Chair, Departmental Research Committee		
Email	hsenid@	Date	06-Nov-2013

Application for Ethical Review for Teaching/Research Involving Human Subjects

I write to inform you that approval has been given to your application for human subjects ethics review of the following project for a period from 25-Nov-2013 to 25-Jan-2016:

Project Title: A grounded theory study of how emergency nurses meet with the challenges of emerging respiratory infectious disease

Department: School of Nursing

Principal Investigator: Pang Mei Che

Please note that you will be held responsible for the ethical approval granted for the project and the ethical conduct of the personnel involved in the project. In the case of the Co-PI, if any, has also obtained ethical approval for the project, the Co-PI will also assume the responsibility in respect of the ethical approval (in relation to the areas of expertise of respective Co-PI in accordance with the stipulations given by the approving authority).

You are responsible for informing the Departmental Research Committee in advance of any changes in the proposal or procedures which may affect the validity of this ethical approval.

You will receive separate email notification should you be required to obtain fresh approval.

KWONG Wai Yung

Chair

Departmental Research Committee

REFERENCES

Abdella, N. M., Tefera, M. A., Eredie, A. E., Landers, T. F., Malefia, Y. D., & Alene, K. A. (2014). Hand hygiene compliance and associated factors among health care providers in Gondar University Hospital, Gondar, North West Ethiopia. *BMC Public Health*, *14*(1), 96. https://doi.org/10.1186/1471-2458-14-96

Abir, M., Davis, M. M., Sankar, P., Wong, A. C., & Wang, S. C. (2013). Design of a model to predict surge capacity bottlenecks for burn mass casualties at a large academic medical center. *Prehospital and Disaster Medicine*, *28*(1), 23-32. https://doi.org/10.1017/S1049023X12001513

Aldiabat, K. & Le Navenec, C. L. (2011). Clarification of the blurred boundaries between grounded theory and ethnography: Differences and similarities. *Turkish Online Journal of Qualitative Inquiry*, *2*(3), 1-13. https://doi.org/10.17569/tojqi.04785

Alexander, C. A., & Wang, L. (2015). Public health promotion: Autonomy of the emergency Nurse practitioner. *International Journal of Public Health Science (IJPHS)*, *4*(1), 27-36. http://dx.doi.org/10.11591/.v4i1.4708

Al-Tawfiq, J. A., Abed, M. S., Al-Yami, N., & Birrer, R. B. (2013). Promoting and sustaining a hospital-wide, multifaceted hand hygiene program resulted in significant reduction in health care-associated infections. *American Journal of Infection Control*, *41*(6), 482-486. https://doi.org/10.1016/j.ajic.2012.08.009

Amodia, P. L., Connor, J., & Mueller, M. (2017). Feasibility of using comprehensive unit-based safety program as a standardized method to identify and mitigate barriers to personal protective equipment use. *American Journal of Infection Control*, *45*(6), S101. https://doi.org/10.1016/j.ajic.2017.04.161

Annells, M. (1996). Grounded theory method, part I: Within the five moments of qualitative research. *Nursing Inquiry, 4*, 120-129. https://doi.org/10.1111/j.1440-1800.1997.tb00085.x

Arbon, P., Cusack, L., Ranse, J., Shaban, R. Z., Considine, J., Kako, M., & Hammad, K. (2013). Exploring staff willingness to attend work during a disaster: A study of nurses employed in four Australian emergency departments. *Australasian Emergency Nursing Journal*, *16*(3), 103-109. https://doi.org/10.1016/j.aenj.2013.05.004

Arendts, G., Quine, S., & Howard, K. (2013). Decision to transfer to an emergency department from residential aged care: A systematic review of qualitative research. *Geriatrics and Gerontology International, 13*(4), 825- 833. https://doi.org/10.1111/ggi.12053

Ashcraft, A. S., & Owen, D. C. (2014). From nursing home to acute care: Signs, symptoms, and strategies used to prevent transfer. *Geriatric Nursing, 35*(4), 316-320. https://doi.org/10.1016/j.gerinurse.2014.06.007

Azar, M., Badr, L. K., Samaha, H., & Dee, V. (2016). Does administrative support negate the consequences of nurse abuse?. *Journal of Nursing Management*, *24*(1), E32-E43. https://doi.org/10.1111/jonm.12286

Baack, S., & Alfred, D. (2013). Nurses' preparedness and perceived competence in managing disasters. *Journal of Nursing Scholarship*, *45*(3), 281-287. https://doi.org/10.1111/jnu.12029

Baduge, M. S. P., Moss, C., & Morphet, J. (2017). Emergency nurses' perceptions of emergency department preparedness for an Ebola outbreak: A qualitative descriptive

study. *Australasian Emergency Nursing Journal, 20*(2), 69-74. https://doi.org/10.1016/j.aenj.2017.02.003

Baker, C., Wuest, J., & Stern, P. N. (1992). Method slurring: The grounded theory/phenomenology example. *Journal of Advanced Nursing, 17*, 1355-1360. https://doi.org/10.1111/j.1365-2648.1992.tb01859.x

Bakir, A., & Bakir, V. (2006). Unpacking complexity, pinning down the "elusiveness" of strategy: A grounded theory study in leisure and cultural organisations. *Qualitative Research in Organizations and Management: An International Journal*, *1*(3), 152-172. https://doi.org/10.1108/1746564061

Balicer, R. D., Omer, S. B., Barnett, D. J., Everly, G. S. Jr. (2006). Local public health workers' perceptions toward responding to an influenza pandemic. *BMC Public Health, 6*(99), 1-8. https://doi.org/10.1186/1471-2458-6-99

Barnett, D. J., Taylor, H. A., Hodge Jr, J. G., & Links, J. M. (2009). Resource allocation on the frontlines of public health preparedness and response: Report of a summit on legal and ethical issues. *Public Health Reports*, *124*(2), 295-303. https://doi.org/10.1177/003335490912400218

Barriball, K. L. & While, A. (1994). Collecting data using a semi-structured interview: A discussion paper. *Journal of Advanced Nursing, 19*(2): 328-335. https://doi.org/10.1111/j.1365-2648.1994.tb01088.x

Bass, B. M., & Bass, R. (2008). *The Bass handbook of leadership: Theory, research, and managerial applications*. New York: The Free Press.

Batcheller, J., Burkman, K., Armstrong, D., Chappell, C. & Carelock, J. L. (2004). A practice model for patient safety: The value of the experienced registered nurse. *Journal of Nursing Administration, 34(4)*, 200-205. Retrieved from http://journals.lww.com/jonajournal/Citation/2004/04000/A_Practice_Model_for_Patient_Safety__The_Value_of.8.aspx

Baxter, J., & Eyles, J. (1997). Evaluating qualitative research in social geography: Establishing 'rigour' in interview analysis. *Transactions of the Institute of British Geographers*, *22*(4), 505-525. https://doi.org/10.1111/j.0020-2754.1997.00505.x

Beck, C. T., & Gable, R. K. (2012). A mixed methods study of secondary traumatic stress in labor and delivery nurses. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 41*(6), 747-760. https://doi.org/10.1111/j.1552-6909.2012.01386.x

Becker, P. H. (1993). Common pitfalls in published grounded theory research. *Qualitative Health Research*, *3*(2)*,* 254-260. https://doi.org/10.1177/104973239300300207

Bender, M. (2016). Conceptualizing clinical nurse leader practice: An interpretive synthesis. *Journal of Nursing Management*, *24*(1). https://doi.org/10.1111/jonm.12285

Benoliel, J. Q. (1996). Grounded theory and nursing knowledge. *Qualitative Health Research. 6*(3), 406-428. https://doi.org/10.1177/104973239600600308

Biddison, L. D., Berkowitz, K. A., Courtney, B., De Jong, C. M. J., Devereaux, A. V., Kissoon, N. & Powell, T. (2014). Ethical considerations: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. *Chest*, *146*(4), e145S-e155S. http://dx.doi.org/10.1378/chest.14-0742

Birks, M. & Mills, J. (2011). *Grounded theory: A practical guide*. Los Angeles, California: Sage.

Birks, M., Chapman, Y. & Francis, K. (2008). Memoing in qualitative research: Probing data and processes. *Journal of Research in Nursing, 13*(1), 68-75. https://doi.org/10.1177/1744987107081254

Blachere, F. M., Lindsley, W. G., Pearce, T. A., Anderson, S. E., Fisher, M., Khakoo, R., & Celik, I. (2009). Measurement of airborne influenza virus in a hospital emergency department. *Clinical Infectious Diseases*, *48*(4), 438-440. https://doi.org/10.1086/596478

Blumer, H. (1969). *Symbolic interactionism*. Englewood Cliffs, NJ: Prentice-Hall.

Blumer, H. (1986). *Symbolic interactionism: Perspective and method*. California: University of California Press.

Böhm, A. (2004). Theoretical coding: Text analysis in grounded theory. In U. Flick, E. Kardorff, & I. Steinke (Eds.), *A companion to qualitative research* (pp. 270-275). London: SAGE Publications.

Booth, C. M., Matukas, L. M., Tomlinson, G. A., Rachlis, A. R., Rose, D. B., Dwosh, H. A., & Ephtimios, I. E. (2003). Clinical features and short-term outcomes of 144 patients with SARS in the greater Toronto area. *Journal of the American Medical Association*, *289*(21), 2801-2809. https://doi.org/10.1001/jama.289.21.JOC30885

Bormann, L. & Abrahamson, K. (2014). Do staff nurse perceptions of nurse leadership behaviors influence staff nurse job satisfaction? The case of a hospital applying for

Magnet designation. *Journal of Nursing Administration*, *44*(4), 219-225. https://doi.org/10.1097/NNA.0000000000000053

Bowen, G. A. (2006). Grounded theory and sensitizing concepts. *International journal of qualitative methods*, *5*(3), 12-23. https://doi.org/10.1177/160940690600500304

Bowen, G. A. (2009). Supporting a grounded theory with an audit trail: An illustration. *International Journal of Social Research Methodology*, *12*(4), 305-316. http://dx.doi.org/10.1080/13645570802156196

Bowie, P., Bradley, N. A. & Rushmer, R. (2012). Clinical audit and quality improvement-time for a rethink? *Journal of Evaluation in Clinical Practice, 18*, 42–48. http://dx.doi.org/10.1111/j.1365-2753.2010.01523.x

Breiman, R.F., Evans, M.R., Preiser, W., Maguire, J., Schnur, A., Li, A., Bekedam, H. & MacKenzie, J. S. (2003). Role of China in the quest to define and control severe acute respiratory syndrome. *Emerging Infectious Diseases, 9*(9), 1037-1041. http://dx.doi.org/10.3201/eid0909.030390

Bryant, A. & Charmaz, K. (2010). *The Sage Handbook of Grounded Theory*. London: Sage

Bryman, A. & Bell, E. (2003). *Business research methods.* New York: Oxford University Press.

Byrne, M. (2001). Evaluating the findings of qualitative research. *American of Registered Nurse Journal, 73*(3), 703-704, 706. http://dx.doi.org/10.1016/S0001-2092(06)61966-2

Caley, M., Sidhu, K., Shukla, R., 2010. GPs' opinions on the NHS and HPA response to the first wave of the influenza A/H1N1 pandemic. *The British Journal of General Practice 60*(573), 283–285. https://doi.org/10.3399/bjgp10X483968

Calvin, A. O., Kite-Powell, D. M., & Hickey, J. V. (2007). The neuroscience ICU nurse's perceptions about end-of-life care. *Journal of Neuroscience Nursing, 39*, 143-150. Retrieved from http://journals.lww.com/jnnonline/Abstract/2007/06000/The_Neuroscience_ICU_Nurse_s_Perceptions_About.4.aspx

Casanova, L. M., Teal, L. J., Sickbert-Bennett, E. E., Anderson, D. J., Sexton, D. J., Rutala, W. A., & Weber, D. J. (2016). Assessment of self-contamination during removal of personal protective equipment for Ebola patient care. *Infection Control & Hospital Epidemiology*, *37*(10), 1156-1161. https://doi.org/10.1017/ice.2016.169

Cava, M. A., Fay, K. E., Beanlands, H. J., McCay, E. A., & Wignall, R. (2005). Risk perception and compliance with quarantine during the SARS outbreak. *Journal of Nursing Scholarship*, *37*(4), 343-347. http://dx.doi.org/10.1111/j.1547-5069.2005.00059.x

Centre for Health Protection (2014a). *Recommendations on use of personal protective equipment (PPE) in the setting of Ebola virus disease (EVD) in Hong Kong*. Retrieved April 26, 2017 from The Government of the Hong Kong Special Administrative Region, Centre for Health Protection Web site: http://www.chp.gov.hk/files/pdf/scic_recommendations_on_the_use_of_ppe_in_the_setting_of_evd_in_hong_kong.pdf

Centre for Health Protection (2014b). *Preparedness plan for influenza pandemic*. Retrieved October 5, 2016 from The Government of the Hong Kong Special Administrative Region, Centre for Health Protection Web site: http://www.chp.gov.hk/files/pdf/erib_preparedness_plan_for_influenza_pandemic_2014_eng.pdf

Centre for Health Protection (2017). *Statutory notifiable diseases*. Retrieved April 26, 2017 from https://cdis.chp.gov.hk/CDIS_CENO_ONLINE/disease.html

Chaffee, M. W., & McNeill, M. M. (2007). A model of nursing as a complex adaptive system. *Nursing Outlook*, *55*(5), 232-241. https://doi.org/10.1016/j.outlook.2007.04.003

Chan-Yeung, M. (2004). Severe acute respiratory syndrome (SARS) and healthcare workers. *International Journal of Occupational and Environmental Health, 10,* 421-427. http://dx.doi.org/10.1179/oeh.2004.10.4.421

Chan, L. S., Macdonald, M. E., Carnevale, F. A., & Cohen, S. R. (2017). 'I'm only dealing with the acute issues': How medical ward 'busyness' constrains care of the dying. *Health (London)1*, 1363459317708822. https://doi.org/10.1177/1363459317708822

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London: Sage Publications.

Chenitz, W. C., & Swanson, J. M. (1986). Qualitative research using grounded theory. In W. C. Chenitz & J. M. Swanson. *From practice to grounded theory* (pp. 3-15). Menlo Park, California: Addison-Wesley.

Cheong, S. K., Wong, T. Y., Lee, H. Y., Fong, Y. T., Tan, B. Y., Koh, G. Ch., Chan, K. M., Chia, S. E. & Koh, D. (2007). Concerns and preparedness for an avian influenza pandemic: A comparison between community hospital and tertiary hospital healthcare workers. *Industrial Health, 45,* 653-661. http://doi.org/10.2486/indhealth.45.653

Cherry, B., & Jacob, S. R. (2016). *Contemporary nursing: Issues, trends, & management*. Elsevier Health Sciences.

Chertow, D. S., Kleine, C., Edwards, J. K., Scaini, R., Giuliani, R. & Sprecher, A. (2014). Ebola virus disease in West Africa – clinical manifestations and management. *New England Journal of Medicine, 371*, 2054–2057. http://doi.org/10.1056/NEJMp1413084

Choi, S. P. P., Cheung, K. I. N., & Pang, S. M. C. (2013). Attributes of nursing work environment as predictors of registered nurses' job satisfaction and intention to leave. *Journal of Nursing Management*, *21*(3), 429-439. http://doi.org/10.1111/j.1365-2834.2012.01415.x

Chung, B. P. M., Wong, T. K. S., Suen, E. S. B., & Chung, J. W. Y. (2005). SARS: Caring for patients in Hong Kong. *Journal of Clinical Nursing*, *14*(4), 510-517. http://doi.org/10.1111/j.1365-2702.2004.01072.x

Cioffi, J. (1998). Decision making by emergency nurses in triage assessments. *Accident and Emergency Nursing, 6*(4), 184-191. https://doi.org/10.1016/S0965-2302(98)90077-7

Clarke, A. (2005). *Situational analysis: Grounded theory after the postmodern turn.* Thousand Oaks, CA: Sage.

Coffey, A., & Atkinson, P. (1996). *Making sense of qualitative data: Complementary research strategies*. Beverly Hills, California: Sage Publications.

Corazzini, K., Twersky, J., White, H. K., Buhr, G. T., McConnell, E. S., Weiner, M., & Colón-Emeric, C. S. (2014). Implementing culture change in nursing homes: An adaptive leadership framework. *The Gerontologist*, *55*(4), 616-627. https://doi.org/10.1093/geront/gnt170

Corbin, J., & Strauss, A. (1996). Analytic ordering for theoretical purposes. *Qualitative Inquiry*, *2*(2), 139-150. https://doi.org/10.1177/107780049600200201

Corbin, J., Strauss, A., & Strauss, A. L. (2014). *Basics of qualitative research*. Thousand Oaks, California: Sage.

Cowling, B. J., Park, M., Fang, V. J., Wu, P., Leung, G. M. & Wu, J. T. (2015). Preliminary epidemiologic assessment of MERS-CoV outbreak in South Korea, May–June 2015. *Euro Surveillance, 20*(25), 21163. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4535930/

Cranley, L. A., Doran, D. M., Tourangeau, A. E., Kushniruk, A., & Nagle, L. (2012). Recognizing and responding to uncertainty: A grounded theory of nurses' uncertainty. *Worldviews on Evidence-Based Nursing*, *9*(3), 149-158. https://doi.org/ 10.1111/j.1741-6787.2011.00237.x

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Croskerry, P., Singhal, G., & Mamede, S. (2013). Cognitive debiasing 1: origins of bias and theory of debiasing. *BMJ Quality & Safety, 1*, 1-7. https://doi.org/10.1136/bmjqs-2012-001712

Cutter, J. & Jordan, S. (2004). Uptake of guidelines to avoid and report exposure to blood and bodily fluids. *Journal of Advance Nursing, 46*(4), 441-452. https://doi.org/10.1111/j.1365-2648.2004.03010.x

Daiker, B. L. (2013). Adaptive challenges in medical practices. *Journal of Medical Practice Management*, *28*(6), 332-340. Retrieved from https://search.proquest.com/openview/f2dc275aa88e54e1e07047fe162c8b69/1?pq-origsite=gscholar&cbl=32264

Damery, S., Wilson, S., Draper, H., Gratus, C., Greenfield, S., Ives, J., Parry, J., Petts, J. & Sorell, T. (2009). Will the NHS continue to function in an influenza pandemic? A survey of healthcare workers in the West Midlands, UK. *BMC Public Health, 9*(142), 1-13. https://doi.org/10.1186/1471-2458-9-142

Dames, G. E. (2007). New frontiers for mission in a postmodern era: Creating missional communities. *Missionalia: Southern African Journal of Mission Studies*, *35*(1), 34-53. Retreived from http://hdl.handle.net/10520/EJC76010

Dawson, A. J., Stasa, H., Roche, M. A., Homer, C. S., & Duffield, C. (2014). Nursing churn and turnover in Australian hospitals: Nurses perceptions and suggestions for supportive strategies. *BMC Nursing*, *13*(1), 11. https://doi.org/10.1186/1472-6955-13-11

de Quadros, C. A., Andrus, J.K., Olive, J.M., Guerra de Macedo, C., Henderson, D. A. (1992). Polio eradication from the Western Hemisphere. *Annual Review of Public Health, 13,* 239-252. Retrieved from http://www.annualreviews.org/doi/pdf/10.1146/annurev.pu.13.050192.001323

Denscombe, M. (2014). *The good research guide: for small-scale social research projects*. McGraw-Hill Education (UK).

Dominguez-Gomez, E. & Rutledge, D. N. (2009). Prevalence of secondary traumatic stress among emergency nurses. *Journal of Emergency Nursing, 35*(3), 199-204. https://doi.org/10.1016/j.jen.2008.05.003

Dye, J. F., Schatz, I. M., Rosenberg, B. A., & Coleman, S. T. (2000). Constant comparison method: A kaleidoscope of data. *The Qualitative Report*, *4*(1), 1-10. Retrieved from http://nsuworks.nova.edu/tqr/vol4/iss1/8/

Egan, T. M. (2002). Grounded theory research and theory building. *Advances in Developing Human Resources, 4*(3), 277-295. https://doi.org/10.1177/1523422302043004

Ellingson, K., Haas, J. P., Aiello, A. E., Kusek, L., Maragakis, L. L., Olmsted, R. N., & VanAmringe, M. (2014). Strategies to prevent healthcare-associated infections through hand hygiene. *Infection Control & Hospital Epidemiology*, *35*(8), 937-960. https://doi.org/10.1086/677145

Enanoria, W. T., Crawley, A. W., Tseng, W., Furnish, J., Balido, J., & Aragón, T. J. (2013). The epidemiology and surveillance response to pandemic influenza A (H1N1) among local health departments in the San Francisco Bay Area. *BMC public health*, *13*(1), 276. https://doi.org/10.1186/1471-2458-13-276

Evans, C. (2005). Clinical decision making theories: Patient assessment in A&E. *Emergency Nurse, 13*(5), 16-19. https://doi.org/10.7748/en2005.09.13.5.16.c1192

Fauci, A. S. & Morens, D. M. (2012) The perpetual challenge of infectious diseases. *The New England Journal of Medicine, 366*(5), 454-461. https://doi.org/10.1056/NEJMra1108296

Fagerhaugh, S. Y. (1995). Analyzing data for basic social processes. In B. G. Glaser. *Grounded Theory 1984-1994* (pp.173-187). Mill Valley, California: Sociological Press.

Fenner, F. (1993). Smallpox: Emergence, global spread, and eradication. *History and Philosophy of the Life Sciences, 15*(3), 397-420. Retrieved from http://www.jstor.org/stable/23331731?seq=1#page_scan_tab_contents

Fidler, D. P., & Gostin, L. O. (2006). The new International Health Regulations: An historic development for international law and public health. *The Journal of Law, Medicine & Ethics*, *34*(1), 85-94. https://doi.org/10.1111/j.1748-720X.2006.00011.x

Figley, C. R. (1995). *Compassion fatigue: Coping with secondary traumatic stress disorder.* New York: Brunner / Mazel.

Filice, C. E., Vaca, F. E., Curry, L., Platis, S., Lurie, N., & Bogucki, S. (2013). Pandemic planning and response in academic pediatric emergency departments during the 2009 H1N1 influenza pandemic. *Academic Emergency Medicine*, *20*(1), 54-62. https://doi.org/10.1111/acem.12061

Fonkwo, P. N. (2008). Pricing infectious disease: The economic and health implications of infectious diseases. *EMBO Reports, 9*(1S), S13-S17. https://doi.org/10.1038/embor.2008.110

Fontana, A. & Frey, J. H. (1998). Interviewing: The art of science. In N. K. Denzin & Y. S. Lincoln. *Collecting and interpreting qualitative materials* (99. 361-376). Thousand Oaks, California: Sage Publications**.**

Fossum, M., Alexander, G. L., Göransson, K. E., Ehnfors, M., & Ehrenberg, A. (2011). Registered nurses' thinking aloud strategies on malnutrition and pressure ulcers in nursing homes: A scenario-based think-aloud study. *Journal of Clinical Nursing, 20*(17-18), 2425-2435. https://doi.org/10.1111/j.1365-2702.2010.03578.x

Fraenkel, J. R., & Wallen, N. E. (2003). *How to design and evaluate research in education*. McGraw-Hill Higher Education.

Gabriel, Y. (2015). Beyond compassion: Replacing a blame culture with proper emotional support and management. *International Journal of Health Policy and Management*, *4*(9), 617-619. https://doi.org/10.15171/ijhpm.2015.111

Gammon, J., Morgan-Samuel, H., & Gould, D. (2008). A review of the evidence for suboptimal compliance of healthcare practitioners to standard/universal infection control precautions. *Journal of Clinical Nursing*, *17*(2), 157-167. https://doi.org/10.1111/j.1365-2702.2006.01852.x

Garrett, A. L., Park, Y. S., & Redlener, I. (2009). Mitigating absenteeism in hospital workers during a pandemic. *Disaster medicine and public health preparedness*, *3*(S2), S141-S147. https://doi.org/10.1097/DMP.0b013e3181c12959

Gerdtz, M. F., & Bucknall, T. K. (1999). Why we do the things we do: Applying clinical decision making frameworks to triage practice. *Accident & Emergency Nursing, 7*(1), 50-57. https://doi.org/10.1016/S0965-2302(99)80103-9

Gibbs, G. R. (2007). Analyzing qualitative data. In U. Flick (Ed.), *The Sage qualitative research kit*. Thousand Oaks, California: Sage.

Glaser, B. G. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory.* Mill Valley, California: Sociology Press.

Glaser, B. G. (1992). *Basics of grounded theory analysis: Emergence vs forcing*. Sociology Press.

Glaser, B. G. (1998). *Doing grounded theory: Issues and discussions*, Mill Valley, CA: Sociology Press

Glaser, B. G. (2007). Naturalist inquiry and grounded theory. *Historical Social Research Supplement, 19*, 114-132. Retrieved from http://www.jstor.org/stable/40981073

Glaser, B. G. & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago: Aldine Publishing Company.

Goodband, A., Oakley, S., Rayner, J., Toms, J., & Brostoff, J. (2014). Influenza: Disease, epidemiology and the importance of vaccination uptake by healthcare workers. *Primary Health Care*, *24*(7), 33-38. Retrieved from https://journals.rcni.com/doi/abs/10.7748/phc.24.7.33.e860

Goulding, C. (1998). Grounded theory: The missing methodology on the interpretivist agenda. *Qualitative Market Research: An International Journal*, *1*(1), 50-57. https://doi.org/10.1108/13522759810197587

Graham, I. D., Logan, J., Davies, B., & Nimrod, C. (2004). Changing the use of electronic fetal monitoring and labor support: A case study of barriers and facilitators. *Birth, 31*(4), 293-301. https://doi.org/10.1111/j.0730-7659.2004.00322.x

Grol, R., Wensing, M., Eccles, M. & Davis, D. (2013). *Improving patient care: The implementation of change in health care*. John Wiley & Sons, Chichester.

Gurd, B., Gurd, B., Gao, T., & Gao, T. (2016). Understanding change recipients' responses to organizational change in Chinese hospitals. *Chinese Management Studies*, *10*(4), 675-691. https://doi.org/10.1108/CMS-10-2015-0242

Guttmann, A., Schull, M. J., Vermeulen, M. J., & Stukel, T. A. (2011). Association between waiting times and short term mortality and hospital admission after departure from emergency department: Population based cohort study from Ontario, Canada. *British Medical Journal*, *342*, d2983. https://doi.org/10.1136/bmj.d2983

Hallberg, L. R. (2006). The "core category" of grounded theory: Making constant comparisons. *International Journal of Qualitative Studies on Health and Well-being*, *1*(3), 141-148. https://doi.org/10.1080/17482620600858399

Hamers, J. P. H., Gulpers, M. J. M., & Strik, W. (2004). Use of physical restraints with cognitively impaired nursing home residents. *Journal of Advanced Nursing, 45*(3), 246-251. https://doi.org/10.1046/j.1365-2648.2003.02885.x

Hammad, K. S., Arbon, P., Gebbie, K., & Hutton, A. (2012). Nursing in the emergency department (ED) during a disaster: A review of the current literature. *Australasian Emergency Nursing Journal*, *15*(4), 235-244. https://doi.org/10.1016/j.aenj.2012.10.005

Hansen, C. D. (2009). *Grounded theory research methods*. Berrett-Koehler Publishers.

Harapan, H., Aletta, A., Anwar, S., Setiawan, A. M., Maulana, R., Wahyuniati, N., & Jamil, K. F. (2017). Healthcare workers' knowledge towards Zika virus infection in Indonesia: A survey in Aceh. *Asian Pacific Journal of Tropical Medicine, 10*(2), 189-194. https://doi.org/10.1016/j.apjtm.2017.01.018

Hayward, M. (2003). Management issues surrounding the United Kingdom health services' ability to deal effectively with major incidents involving bioterrorism. *Journal of Nursing Management*, *11*(3), 197-207. https://doi.org/10.1046/j.1365-2834.2003.00382.x

Heals, D. (2008). Development and implementation of a palliative care link-nurse programme in care homes. *International journal of palliative nursing*, *14*(12), 604-609. https://doi.org/10.12968/ijpn.2008.14.12.32065

Heifetz, R. A., & Linsky, M. (2002). *Leadership on the line: Staying alive through the dangers of leading*. Harvard Business Press.

Heifetz, R. A., Grashow, A., & Linsky, M. (2009). *The practice of adaptive leadership: Tools and tactics for changing your organization and the world*. Harvard Business Press.

Hick, J. L., Einav, S., Hanfling, D., Kissoon, N., Dichter, J. R., Devereaux, A. V., & Balk, R. (2014). Surge capacity principles: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. *CHEST Journal*, *146*(S4), e1S-e16S. https://doi.org/10.1378/chest.14-0733

Hickey, G. (1997). The use of literature in grounded theory. *Nursing Times Research, 2*(5), 371-378. https://doi.org/10.1177/174498719700200510

Hoffman, K. A., Aitken, L. M., & Duffield, C. (2009). A comparison of novice and expert nurses' cue collection during clinical decision-making: Verbal protocol analysis. *International Journal of Nursing Studies*, *46*(10), 1335-1344. https://doi.org/10.1016/j.ijnurstu.2009.04.001

Homan, R. (1991). *The ethics of social research.* London: Longman House.

Hoot, N. R., & Aronsky, D. (2008). Systematic review of emergency department crowding: Causes, effects, and solutions. *Annals of Emergency Medicine*, *52*(2), 126-136. https://doi.org/10.1016/j.annemergmed.2008.03.014

Hope, K., Massey, P. D., Osbourn, M., Durrheim, D. N., Kewley, C. D., & Turner, C. (2011). Senior clinical nurses effectively contribute to the pandemic influenza public health response. *Australian Journal of Advanced Nursing, 28*(3), 47-53. Retrieved from http://www.ajan.com.au/Vol28/28-3_Hope.pdf

Horwitz, I. B., Horwitz, S. K., Daram, P., Brandt, M. L., Brunicardi, F. C., & Awad, S. S. (2008). Transformational, transactional, and passive-avoidant leadership characteristics of a surgical resident cohort: Analysis using the multifactor leadership questionnaire and implications for improving surgical education curriculums. *Journal of Surgical Research*, *148*(1), 49-59. https://doi.org/10.1016/j.jss.2008.03.007

Hospital Authority (2018). *Clusters, Hospitals & Institutions*. Retrieved from Hospital Authority Web site: http://www.ha.org.hk/visitor/template101.asp?Parent_ID=10004&Content_ID=10036&

Hospital Authority & Centre for Health Protection (2006). HA Contingency Plan for Influenza Pandemic. Retrieved September 25, 2016 from

http://icidportal.ha.org.hk/sites/en/webpages/avian%20influenza/1.HA%20Contingency%20Plan%20for%20Influenza%20Pandemic.pdf

Hsu, E. B., Thomas, T. L., Bass, E. B., Whyne, D., Kelen, G. D., & Green, G. B. (2006). Healthcare worker competencies for disaster training. *BMC Medical Education*, *6*, 19. https://doi.org/10.1186/1472-6920-6-19

Hui, S. S. C., Kan, C. Y. E., Cheng, M. W. W., Yeung, C. W., & Chui, O. L. (2016). A pilot study on a diabetes link-nurse program to enhance nurse confidence and competence in diabetes care. *Diabetes Research and Clinical Practice*, *120*, S164-S165. https://doi.org/

Hung, L. S. (2003). The SARS epidemic in Hong Kong: What lessons have we learned?. *Journal of the Royal Society of Medicine*, *96*(8), 374-378. Retrieved from http://europepmc.org/articles/pmc539564

Imai, T., Takahashi, K., Hasegawa, N., Lim, M. K. & Koh, D. (2005). SARS risk perceptions in healthcare workers, Japan. *Emerging Infectious Diseases, 11*(3)*,* 404-410. https://doi.org/10.3201/eid1103.040631

Imai, T., Takahashi, K., Todoroki, M., Kunishima, H., Hoshuyama, T., Ide, R., Kawasaki, T., Koyama, N., Endo, K., Fujita, H., Iwata, K., Koh, G., Chia, S. E. & Koh, D. (2008). Perception in relation to a potential influenza pandemic among healthcare workers in Japan: Implications for preparedness. *Journal of Occupational Health, 50*, 13-23. http://doi.org/10.1539/joh.50.13

Ip, D. K., Lau, E. H., Tam, Y. H., So, H. C., Cowling, B. J., & Kwok, H. K. (2015). Increases in absenteeism among health care workers in Hong Kong during influenza epidemics,

2004-2009. *BMC Infectious Diseases*, *15,* 586. https://doi.org/10.1186/s12879-015-1316-y

Irvin, C. B., Cindrich, L., Patterson, W., & Southall, A. (2008). Survey of hospital healthcare personnel response during a potential avian influenza pandemic: Will they come to work?. *Prehospital and Disaster Medicine*, *23*(4), 328-335. https://doi.org/10.1017/S1049023X00005963

Jones, M. L. (2005). Role development and effective practice in specialist and advanced practice roles in acute hospital settings: systematic review and meta-synthesis. *Journal of Advanced Nursing*, *49*(2), 191-209. http://doi.org/10.1111/j.1365-2648.2004.03279.x

Källberg, A. S., Ehrenberg, A., Florin, J., Östergren, J., & Göransson, K. E. (2017). Physicians' and nurses' perceptions of patient safety risks in the emergency department. *International Emergency Nursing, 33,* 14-19. https://doi.org/10.1016/j.ienj.2017.01.002

Kang, J., O'donnell, J. M., Colaianne, B., Bircher, N., Ren, D., & Smith, K. J. (2017). Use of personal protective equipment among health care personnel: Results of clinical observations and simulations. *American Journal of Infection Control*, *45*(1), 17-23. https://doi.org/10.1016/j.ajic.2016.08.011

Kelen, G. D., & McCarthy, M. L. (2006). The science of surge. *Academic Emergency Medicine, 13*(11), 1089-1094. http://doi.org/ 10.1197/j.aem.2006.07.016

Kilbourne, E. D. (2006). Influenza pandemics of the 20th century. *Emerging Infectious Diseases, 12*(1), 9-14. http://doi.org/10.3201/eid1201.051254

Kilmarx, P. H., Clarke, K. R., Dietz, P. M., Hamel, M. J., Husain, F., McFadden, J. D., & McAuley, J. (2014). Ebola virus disease in health care workers—Sierra Leone, 2014. *Morbidity and Mortality Weekly Report*, *63*(49), 1168-71. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6349a6.htm?s_cid%3Dmm6349a6_x

Kim, D. H. (2015). Structural factors of the Middle East respiratory syndrome coronavirus outbreak as a public health crisis in Korea and future response strategies. *Journal of Preventive Medicine and Public Health*, *48*(6), 265-270. http://doi.org/10.3961/jpmph.15.066

Kim, J. S., & Choi, J. S. (2016). Factors influencing emergency nurses' burnout during an outbreak of Middle East respiratory syndrome coronavirus in Korea. *Asian Nursing Research*, *10*(4), 295-299. https://doi.org/10.1016/j.anr.2016.10.002

Ko, N. Y., Feng, M. C., Chiu, D. Y., Wu, M. H., Feng, J. Y. & Pan, S. M. (2004). Applying theory of planned behavior to predict nurses' intention and volunteering to care for SARS patients in southern Taiwan. *The Kaohsiung Journal of Medical Sciences, 20*(8), 389-398. https://doi.org/10.1016/S1607-551X(09)70175-5

Koh, D., Lim, M. K., Chia, S. E., Ko, S. M., Qian, F., Ng, V., Tan, B. H., Wong, K. S., Chew, W. M., Tang, H. K., Ng, W., Muttakin, Z., Emmanuel, S., Fong, N. P., Koh, G., Kwa, C. T., Tan, K. B. & Fones, C. (2005). Risk perception and impact of Severe Acute Respiratory Syndrome (SARS) on work and personal lives of healthcare workers in Singapore: What can we learn? *Medical Care, 43*(7)*,* 676-682. Retrieved from http://www.jstor.org/stable/3768367

Koh, Y., Hegney, D., & Drury, V. (2012). Nurses' perceptions of risk from emerging respiratory infectious diseases: A Singapore study. *International Journal of Nursing Practice*, *18*(2), 195-204. https://doi.org/10.1111/j.1440-172X.2012.02018.x

Kothari, A., Rudman, D., Dobbins, M., Rouse, M., Sibbald, S., & Edwards, N. (2012). The use of tacit and explicit knowledge in public health: A qualitative study. *Implementation Science*, *7*(1), 20. https://doi.org/10.1186/1748-5908-7-20

Kroll, L., Singleton, A., Collier, J., & Rees Jones, I. (2008). Learning not to take it seriously: Junior doctors' accounts of error. *Medical Education*, *42*(10), 982-990. https://doi.org/10.1111/j.1365-2923.2008.03151.x

Lakanmaa, R. L., Suominen, T., Perttilä, J., Ritmala-Castrén, M., Vahlberg, T., & Leino-Kilpi, H. (2014). Basic competence in intensive and critical care nursing: Development and psychometric testing of a competence scale. *Journal of Clinical Nursing*, *23*(5-6), 799-810. https://doi.org/10.1111/jocn.12057

Lam, K. K. & Hung, S. Y. M. (2013). Perceptions of emergency nurses during the human swine influenza outbreak: A qualitative study. *International Emergency Nursing 21*(4), 240-246. https://doi.org/10.1016/j.ienj.2012.08.008

Lam, S. K., Kwong, E. W., Hung, M. S., & Pang, S. (2016). Bridging the gap between guidelines and practice in the management of emerging infectious diseases: A qualitative study of emergency nurses. *Journal of Clinical Nursing*, *25*(19-20), 2895-2905. https://doi.org/10.1111/jocn.13343

Laposa, J. M., Alden, L. E. & Fullerton, L. M. (2003). Work stress and posttraumatic stress disorder in ED nurses/personnel. *Journal of Emergency Nursing, 29*(1), 23-28. https://doi.org/10.1067/men.2003.7

Lautenbach, E., Saint, S., Henderson, D. K. & Harris, A.D. (2010). Initial response of health care institutions to emergence of H1N1 influenza: experiences, obstacles, and perceived future needs. *Clinical Infectious Diseases 50*(4)*,* 523-527. https://doi.org/10.1086/650169

Leggat, S. G., Bartram, T., Casimir, G., & Stanton, P. (2010). Nurse perceptions of the quality of patient care: Confirming the importance of empowerment and job satisfaction. *Health Care Management Review*, *35*(4), 355-364. https://doi.org/10.1097/HMR.0b013e3181e4ec55

Leppin, A. & Aro, A. R. (2009). Risk perceptions related to SARS and avian influenza: theoretical foundations of current empirical research. *International Journal of Behavioral Medicine, 16*(1), 7-29. https://doi.org/10.1007/s12529-008-9002-8

Levin, P. J., Gebbie, E. N. & Qureshi, K. (2007). Can the health-care system meet the challenge of pandemic flu? Planning, ethical, and workforce considerations. *Public Health Reports, 122*(5)*,* 573-578. https://doi.org/10.1177/003335490712200503

Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic inquiry.* Beverly Hills, California: Sage Publications.

Lipsitch, M., Riley, S., Cauchemez, S., Ghani, A. C., & Ferguson, N. M. (2009). Managing and reducing uncertainty in an emerging influenza pandemic. *New England Journal of Medicine*, *361*, 112-115. https://doi.org/10.1056/NEJMp0904380

Liu, H., & Liehr, P. (2009). Instructive messages from Chinese nurses' stories of caring for SARS patients. *Journal of Clinical Nursing*, *18*(20), 2880-2887. https://doi.org/10.1111/j.1365-2702.2009.02857.x

Locke, L. F., Spirduso, W. W., & Silverman, S. J. (2014). *Proposals that work*. New York: SAGE.

Loeb, M., McGeer, A., Henry, B., Ofner, M., Rose, D., Hlywka, T., 2004. SARS among critical care nurses, Toronto. *Emerging Infectious Diseases Journal, 10*(2), 251-255. https://doi.org/10.3201/eid1002.030838

Lofland, J. & Lofland, L. (1984). *Analyzing social settings*. Belmont, California: Woodsworth Press.

Loftus, L. A. & McDowell, J. (2000). The lived experience of the oncology clinical nurse specialist. *International Journal of Nursing Studies 37*(6), 513-521. https://doi.org/10.1016/S0020-7489(00)00028-6

Low, J. G. & Wilder-Smith, A. (2005). Infectious respiratory illnesses and their impact on healthcare workers: A review. *Annals, Academy of Medicine, Singapore, 34*(1)*,* 105-110. Retrieved from http://annals.edu.sg/pdf200502/LowJGH.pdf

Ma, X., He, Z., Wang, Y., Jiang, L., Xu, Y., Qian, C., Sun, S., Chen, E., Hu, Z., Zhou, L., Zhou, F., Qin, T., Cao, X., An, Y., Sun, R., Zhang, X., Lin, J., Ai, Y., Wu, D. & Du, B. (2011). Knowledge and attitudes of healthcare workers in Chinese intensive care units regarding 2009 H1N1 influenza pandemic. *BMC Infectious Diseases, 11*, 24. https://doi.org/10.1186/1471-2334-11-24

MacIntyre, C. R., Chughtai, A. A., Seale, H., Richards, G. A., & Davidson, P. M. (2015). Uncertainty, risk analysis and change for Ebola personal protective equipment guidelines. *International Journal of Nursing Studies, 52*(5), 899-903. https://doi.org/10.1016/j.ijnurstu.2014.12.001

Mahsud, R., Yukl, G., & Prussia, G. (2010). Leader empathy, ethical leadership, and relations-oriented behaviors as antecedents of leader-member exchange quality. *Journal of Managerial Psychology*, *25*(6), 561-577. https://doi.org/10.1108/02683941011

Malloy, T., & Penprase, B. (2010). Nursing leadership style and psychosocial work environment. *Journal of Nursing Management*, *18*(6), 715-725. https://doi.org/10.1111/j.1365-2834.2010.01094.x

Martin, S. D., Brown, L. M., & Reid, W. M. (2013). Predictors of nurses' intentions to work during the 2009 Influenza A (H1N1) pandemic. *The American Journal of Nursing*, *113*(12), 24-31. https://doi.org/10.1097/01.NAJ.0000438865.22036.15

Martinese, F., Keijzers, G., Grant, S. & Lind, J. (2009). How would Australian hospital staff react to an avian influenza admission, or an influenza pandemic? *Emergency Medicine Australasia, 21*(1), 12-24. https://doi.org/10.1111/j.1742-6723.2008.01143.x

Mason, J. (2002). Qualitative interviewing: Asking, listening and interpreting. In T. May. *Qualitative Research in Action* (pp. 225-241). London: Sage publications.

Masur, H., Emanuel, E., Lane, H. C. (2003). Severe acute respiratory syndrome: Providing care in the face of uncertainty. *Journal of the American Medical Association, 289*(21), 2861-2863. https://doi.org/ 10.1001/jama.289.21.JED30036

Matthew-Maich, N., Ploeg, J., Dobbins, M. & Jack, S. (2013). Supporting the uptake of nursing guidelines: what you really need to know to move nursing guidelines into practice. *Worldviews on Evidence-Based Nursing, 10*(2), 104-115. https://doi.org/10.1111/j.1741-6787.2012.00259.x

Maunder, R., Hunter, J., Vincent, L., Bennett, J., Peladeau, N., Leszcz, M., Sadavoy, J., Verhaeghe, L. M., Steinberg, R., Mazzulli, T. (2003). The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *Canadian Medical Association Journal, 168*(10), 1245-51. Retrieved from http://www.cmaj.ca/content/168/10/1245.short

May, C., Sibley, A., & Hunt, K. (2014). The nursing work of hospital-based clinical practice guideline implementation: An explanatory systematic review using Normalisation Process Theory. *International Journal of Nursing Studies, 51*(2), 289-299. https://doi.org/10.1016/j.ijnurstu.2013.06.019

McCraken, G. (1988). *The long interview*. Newbury Park, CA: Sage.

McMahon, S. A., Ho, L. S., Brown, H., Miller, L., Ansumana, R., & Kennedy, C. E. (2016). Healthcare providers on the frontlines: a qualitative investigation of the social and emotional impact of delivering health services during Sierra Leone's Ebola epidemic. *Health Policy and Planning*, *31*(9), 1232-1239. https://doi.org/10.1093/heapol/czw055

McNamara, M. S., Fealy, G. M., Casey, M., O'connor, T., Patton, D., Doyle, L., & Quinlan, C. (2014). Mentoring, coaching and action learning: Interventions in a national clinical leadership development programme. *Journal of Clinical Nursing*, *23*(17-18), 2533-2541. https://doi.org/10.1111/jocn.12461

Mead, G. H. (1934). *Mind, self and society*. Chicago: University of Chicago Press.

Meek, H. W. (2003). The place of the unconscious in qualitative research. *Forum: Qualitative Social Research, 4*(2), 38. http://dx.doi.org/10.17169/fqs-4.2.711

Meleis, A. I. (2011). *Theoretical nursing: Development and progress*. Lippincott Williams & Wilkins.

Mello, J. E. & Flint, D. J. (2009). A refined view of grounded theory and its application to logistics research. *Journal of Business Logistics, 30*(1), 107-125. https://doi.org/10.1002/j.2158-1592.2009.tb00101.x

Melnyk, B. M., Gallagher-Ford, L., Long, L. E., & Fineout-Overholt, E. (2014). The establishment of evidence-based practice competencies for practicing registered nurses and advanced practice nurses in real-world clinical settings: proficiencies to improve healthcare quality, reliability, patient outcomes, and costs. *Worldviews on Evidence-Based Nursing*, *11*(1), 5-15. https://doi.org/10.1111/wvn.12021

Merriam, S. B. (1998). *Qualitative Research and Case Study Applications in Education.* San Francisco: Jossey-Bass Publishers.

Meslin, E. M. (2009). Achieving global justice in health through global research ethics: Supplementing Macklin's 'top-down' approach with one from the 'ground up'. In R. M. Green, A. Donovan, & S. A. Jauss. *Global Bioethics: Issues of Conscience for the Twenty- First Century* (pp. 163–177). New York: University Press.

Miles, M. B. & Huberman, A. M. (1994). *Qualitative Data Analysis* (2nd edition). Thousand Oaks, CA: Sage Publications.

Mills, J., Bonner, A., & Francis, K. (2006). The development of constructivist grounded theory. *International Journal of Qualitative Methods*, *5*(1), 25-35. https://doi.org/10.1177/160940690600500103

Ministry of Health (2014). A guide to organising a primary care clinic during an influenza pandemic. Retrieved September 26, 2016 from https://www.moh.gov.sg/content/dam/moh_web/Diseases%20and%20Conditions/Flupandemic/Flu%20PCC%20Guide.pdf

Mintzberg, H. (2012). Managing the myths of health care. *World Hospitals and Health Services, 48*(3), 1-7. https://doi.org/ Retrieved from http://www.mintzberg.org/sites/default/files/article/download/managing_the_myths_of_health_care.pdf

Mitchell, T. L. & Radford, J. L. (1996). Rethinking research relationships in qualitative research. *Canadian Journal of Community Mental Health, 15*(1), 49-60. https://doi.org/10.7870/cjcmh-1996-0004

Möhler, R., & Meyer, G. (2014). Attitudes of nurses towards the use of physical restraints in geriatric care: A systematic review of qualitative and quantitative studies. *International Journal of Nursing Studies, 51*(2), 274-288. https://doi.org/10.1016/j.ijnurstu.2013.10.004

Moore, J., Prentice, D., & Taplay, K. (2015). Collaboration: What does it really mean to nurses?. *Journal of Clinical Nursing*, *24*(13-14), 2052-2054. https://doi.org/10.1111/jocn.12859

Morens, D. M., Folkers, G. K. & Fauci, A. S. (2004). The challenge of emerging and re-emerging infectious diseases. *Nature, 430*(6996)*,* 242-249. Retrieved from https://search.proquest.com/docview/204558281/fulltextPDF/CD86A7EA4F3B4112PQ/1?accountid=146240

Morse, J. M. (1994). Designing qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative inquiry* (pp. 220-235). Thousand Oaks, CA: Sage.

Morse, J. M. & Field, P. A. (1996). *Nursing research: The application of qualitative approaches (2nd ed.)*. Cheltenham: Stanley Thornes (Publishers) Ltd.

Morse, S. (2012). Public health surveillance and infectious disease detection. *Biosecurity and Bioterrorism*, *10*(1), 6-16. https://doi.org/10.1089/bsp.2011.0088

Mruck, K. & Breuer, F. (2003). Subjectivity and reflexivity in qualitative research—The FQS issues. *Forum: Qualitative Social Research, 4*(2), 23. http://dx.doi.org/10.17169/fqs-4.2.696

Mulhall, A. (2003). In the field: Notes on observation in qualitative research. *Journal of Advanced Nursing, 41*(3), 306-13. https://doi.org/10.1046/j.1365-2648.2003.02514.x

Mullen, P. D. (1985). Generating grounded theory: Two case studies. *International Quarterly of Community Health Education, 6*(3), 177-203. https://doi.org/10.2190/TY8U-DH83-V8MK-B62H

Muller, M. P., Carter, E., Siddiqui, N., & Larson, E. (2015). Hand hygiene compliance in an emergency department: The effect of crowding. *Academic Emergency Medicine*, *22*(10), 1218-1221. https://doi.org/10.1111/acem.12754

Nap, R. E., Andriessen, M. P., Meessen, N. E., & Van der Werf, T. S. (2007). Pandemic influenza and hospital resources. *Emerging Infectious Diseases*, *13*(11), 1714. https://doi.org/10.3201/eid1311.070103

Ng, K., & Hase, S. (2008). Grounded suggestions for doing a grounded theory business research. *Electronic Journal of Business Research Methods, 6*(2), 155-170. Retrieved from https://s3.amazonaws.com/academia.edu.documents/46796364/Grounded_suggestions_for_doing_a_grounde20160625-27528-1moqx73.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1507292310&Signature=z%2FfqT33LpPAPI7KJCroaZZNPAIU%3D&response-content-disposition=inline%3B%20filename%3DGrounded_suggestions_for_doing_a_grounde.pdf

Nichol, K., Bigelow, P., O'Brien-Pallas, L., McGeer, A., Manno, M. & Holness, D. L. (2008). The individual, environmental, and organizational factors that influence nurses' use of facial protection to prevent occupational transmission of communicable respiratory illness in acute care hospitals. *American Journal of Infection Control, 36*(7), 481-487. https://doi.org/10.1016/j.ajic.2007.12.004

Nickell, L. A., Crighton, E. J., Tracy, C. S., Al-Enazy, H., Bolaji, Y., Hanjrah, S., Hussain, A., Makhlouf, S. & Upshur, R. E. (2004). Psychosocial effects of SARS on hospital staff: Survey of a large tertiary care institution. *Canadian Medical Association Journal, 170*(5)*,* 793-798. https://doi.org/10.1503/cmaj.1031077

Northouse, L. L., Schafer, J.A., Tipton, J. & Metivier, L. (1999). The concerns of patients and spouses after the diagnosis of colon cancer: A qualitative analysis. *Journal of*

Wound, Ostomy and Continence Nursing, 26(1), 8-17. https://doi.org/10.1016/S1071-5754(99)90005-0

O'Boyle, C., Robertson, C., & Secor-Turner, M. (2006). Nurses' beliefs about public health emergencies: Fear of abandonment. *American Journal of Infection Control*, *34*(6), 351-357. https://doi.org/10.1016/j.ajic.2006.01.012

O'Connor, E. J., & Fiol, C. M. (2006). Reclaiming physician power: Your role as a physician executive. *Physician Executive, 32*(6), 46-50. Retrieved from https://search.proquest.com/openview/5c65c6603c257f46958c5bcba5bb7480/1?pq-origsite=gscholar&cbl=36212

Odell, J. (2015). Clinical decision-making in minor illness. *Nurse Prescribing*, *26*(10), 505-510. https://doi.org/10.12968/pnur.2015.26.10.505

Ofstead, C. L., Amelang, M. R., Wetzler, H. P., & Tan, L. (2017). Moving the needle on nursing staff influenza vaccination in long-term care: Results of an evidence-based intervention. *Vaccine, 35*(18), 2390-2395. https://doi.org/10.1016/j.vaccine.2017.03.041

Olu, O., Kargbo, B., Kamara, S., Wurie, A. H., Amone, J., Ganda, L., & Worku, N. (2015). Epidemiology of Ebola virus disease transmission among health care workers in Sierra Leone, May to December 2014: A retrospective descriptive study. *BMC Infectious Diseases*, *15*, 416. https://doi.org/10.1186/s12879-015-1166-7

Oreg, S., Vakola, M., & Armenakis, A. (2011). Change recipients' reactions to organizational change: A 60-year review of quantitative studies. *The Journal of Applied Behavioral Science*, *47*(4), 461-524. https://doi.org/10.1177/0021886310396550

Parmeggiani, C., Abbate, R., Marinelli, P., & Angelillo, I. F. (2010). Healthcare workers and health care-associated infections: Knowledge, attitudes, and behavior in emergency departments in Italy. *BMC Infectious Diseases*, *10*, 35. https://doi.org/10.1186/1471-2334-10-35

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, California: Sage.

Paulus, R. A., Davis, K., & Steele, G. D. (2008). Continuous innovation in health care: Implications of the Geisinger experience. *Health Affairs, 27*(5), 1235-1245. https://doi.org/10.1377/hlthaff.27.5.1235

Pedersen, M. S., Landheim, A. & Lien, L. (2014). Bridging the gap between current practice recommendations in national guidelines: A qualitative study of mental health services. *BioMed Central Health Services Research, 14*(S2), 94. https://doi.org/10.1186/1472-6963-14-S2-P94

Peiris, J. S., de Jong, M. D. & Guan, Y. (2007). Avian influenza virus (H5N1): A threat to human health. *Clinical Microbiology Reviews, 20*(2), 243-267. https://doi.org/10.1128/CMR.00037-06

Ploeg, J., Davies, B., Edwards, N., Gifford, W., & Miller, P. E. (2007). Factors influencing best-practice guideline implementation: Lessons learned from administrators, nursing staff, and project leaders. *Worldviews on Evidence-Based Nursing*, *4*(4), 210-219. https://doi.org/10.1111/j.1741-6787.2007.00106.x

Polit, D. F., & Beck, C. T. (2018). *Essentials of nursing research: Appraising evidence for nursing practice.* Philadelphia: Wolters Kluwer Health.

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., & Britten, N. (2006). *Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC Methods Programme.* Swindon: Economic and Social Research Council.

Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative research in health care: Analysing qualitative data. *British Medical Journal*, *320*(7227), 114-116. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1117368/

Pretz, J. E. & Folse, V. N. (2011). Nursing experience and preference for intuition in decision making. *Journal of Clinical Nursing, 20*(19-20), 2878-2889. https://doi.org/10.1111/j.1365-2702.2011.03705.x

Ramalho, R., Adams, P., Huggard, P., & Hoare, K. (2015). Literature review and constructivist grounded theory methodology. *Forum: Qualitative Social Research, 16*(3), 1-7. http://doi.org/10.17169/fqs-16.3.2313

Rambaldini, G., Wilson, K., Rath, D., Lin, Y., Gold, W. L., Kapral, M. K. & Straus, S. E. (2005). The impact of severe acute respiratory syndrome on medical house staff: A qualitative study. *Journal of General Internal Medicine, 20*(5), 381-385. 10.1111/j.1525-1497.2005.0099.x

Raup, G. H. (2008). The impact of ED nurse manager leadership style on staff nurse turnover and patient satisfaction in academic health center hospitals. *Journal of Emergency Nursing*, *34*(5), 403-409. https://doi.org/10.1016/j.jen.2007.08.020

Rebmann, T., & Wagner, W. (2009). Infection preventionists' experience during the first months of the 2009 novel H1N1 influenza A pandemic. *American Journal of Infection Control*, *37*(10), e5-e16. https://doi.org/10.1016/j.ajic.2009.09.003

Rhodes, K. V. & Pollock, D. A. (2006). The future of emergency medicine public health research. *Emergency Medicine Clinics of North America, 24*(4), 1053-1073. Retrieved from http://repository.upenn.edu/spp_papers/106

Robinson, S. M., Sutherland, H. R., Spooner, D. J. W., Bennett, T. J. H., Lit, C. A., & Graham, C. A. (2009). Ten things your emergency department should consider to prepare for pandemic influenza. *Emergency Medicine Journal*, *26*(7), 497-500. http://dx.doi.org/10.1136/emj.2008.061499

Rueden, K. T. V., Hinderer, K. A., Mcquillan, K. A., Murray, M., Logan, T., Kramer, B., Gilmore, R., & Friedmann, E. (2010). Secondary traumatic stress in trauma nurses: Prevalence and exposure, coping, and personal/environmental characteristics. *Journal of Trauma Nursing, 17*(4), 191-201. http://doi.org/10.1097/JTN.0b013e3181ff2607

Rumsey, M., Fletcher, S. M., Thiessen, J., Gero, A., Kuruppu, N., Daly, J. & Willetts, J. (2014). A qualitative examination of the health workforce needs during climate change disaster response in Pacific Island Countries. *Human Resources for Health, 12*, 9. https://doi.org/10.1186/1478-4491-12-9

Searle, C., & McInerney, F. (2008). Nurses' decision-making in pressure area management in the last 48 hours of life. *International Journal of Palliative Nursing, 14*(9), 432-438. Retrieved from http://web.a.ebscohost.com/ehost/detail/detail?vid=0&sid=996cc360-0140-4991-9d72-

d505c3b13c69%40sessionmgr4010&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#db=afh&AN=34490260

Shanahan, D. J. (2011). Bedrails and vulnerable older adults: How should nurses make 'safe and sound' decisions surrounding their use? *International Journal of Older People Nursing, 7*(4), 272-281. http://doi.org/10.1111/j.1748-3743.2011.00285.x

Shanley, C., Whitmore, E., Conforti, D., Masso, J., Jayasinghe, S., & Griffiths, R. (2011). Decisions about transferring nursing home residents to hospital: Highlighting the roles of advance care planning and support from local hospital and community health services. *Journal of Clinical Nursing, 20*(19-20), 2897-2906. http://doi.org/10.1111/j.1365-2702.2010.03635.x

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, *22*(2), 63-75. Retrieved from https://pdfs.semanticscholar.org/452e/3393e3ecc34f913e8c49d8faf19b9f89b75d.pdf

Shih, F. J., Gau, M. L., Kao, C. C., Yang, C. Y., Lin, Y. S., Liao, Y. C., & Sheu, S. J. (2007). Dying and caring on the edge: Taiwan's surviving nurses' reflections on taking care of patients with severe acute respiratory syndrome. *Applied Nursing Research*, *20*(4), 171-180. https://doi.org/10.1016/j.apnr.2006.08.007

Shih, F. J., Turale, S., Lin, Y. S., Gau, M. L., Kao, C. C., Yang, C. Y., & Liao, Y. C. (2009). Surviving a life-threatening crisis: Taiwan's nurse leaders' reflections and difficulties fighting the SARS epidemic. *Journal of Clinical Nursing*, *18*(24), 3391-3400. http://doi.org/10.1111/j.1365-2702.2008.02521.x

Smith, C., & Hewison, A. (2012). Are nurses prepared to respond to a bioterrorist attack: A narrative synthesis. *Journal of Advanced Nursing*, *68*(12), 2597-2609. http://doi.org/10.1111/j.1365-2648.2012.06061.x

Smith, K. & Biley, F. (1997). Understanding grounded theory: Principles and evaluation. *Nurse Researcher, 4*(3), 17-30. http://doi.org/10.7748/nr.4.3.17.s3

Smyth, O., & McCabe, C. (2017). Think and think again! Clinical decision making by advanced nurse practitioners in the emergency department. *International Emergency Nursing*, *31*, 72-74. http://dx.doi.org/10.1016/j.ienj.2016.08.001

Sopirala, M. M., Yahle-Dunbar, L., Smyer, J., Wellington, L., Dickman, J., Zikri, N., & Nash, M. (2014). Infection control link nurse program: An interdisciplinary approach in targeting health care-acquired infection. *American Journal of Infection Control*, *42*(4), 353-359. https://doi.org/10.1016/j.ajic.2013.10.007

Speroni, K. G., Seibert, D. J., & Mallinson, R. K. (2015). Nurses' perceptions on Ebola care in the United States, Part 2: A qualitative analysis. *Journal of Nursing Administration*, *45*(11), 544-550. http://doi.org/10.1097/NNA.0000000000000261

Sridhar, S., Brouqui, P., Fontaine, J., Perivier, I., Ruscassier, P., Gautret, P., & Regner, I. (2016). Risk perceptions of MSF healthcare workers on the recent Ebola epidemic in West Africa. *New Microbes and New Infections*, *12*, 61-68. https://doi.org/10.1016/j.nmni.2016.04.010

Steeves, R. H. & Kahn, D. H. (1995). A hermeneutical human science for nursing. In A. Omery, C. E. Kasper, & G. G. Page. *In search of nursing science* (pp. 175-193). Thousand Oaks, California: Sage.

Stergachis, A., Garberson, L., Lien, O., D'Ambrosio, L., Sangaré, L., & Dold, C. (2011). Health care workers' ability and willingness to report to work during public health emergencies. *Disaster Medicine and Public Health Preparedness, 5*(4), 300-308. https://doi.org/10.1001/dmp.2011.77

Stern, P. N. (1996). Conceptualizing women's health: Discovering the dimensions. *Qualitative Health Research, 6*(2), 152-161. https://doi.org/10.1177/104973239600600202

Stirling, B. V., Harmston, J., & Alsobayel, H. (2015). An educational programme for nursing college staff and students during a MERS-coronavirus outbreak in Saudi Arabia. *BMC Nursing*, *14*, 20. https://doi.org/10.1186/s12912-015-0065-y

Stone, P. W., Clarke, S. P., Cimiotti, J., & Correa-de-Araujo, R. (2004). Nurses' working conditions: implications for infectious disease. *Emerging Infectious Diseases*, *10*(11), 1984-1989. http://doi.org/10.3201/eid1011.040253

Straus, S. E., Wilson, K., Rambaldini, G., Rath, D., Lin, Y., Gold, W. L. & Kapral, M. K. (2004). Severe acute respiratory syndrome and its impact on professionalism: Qualitative study of physicians' behaviour during an emerging healthcare crisis. *British Medical Journal, 329*, 83. https://doi.org/10.1136/bmj.38127.444838.63

Strauss, A. (1987). *Qualitative analysis for social scientists*. Cambridge, UK: University of Cambridge Press.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research techniques*. Sage publications.

Streubert, H. J. & Carpenter, D. R. (1995). *Qualitative research in nursing: Advancing the humanistic imperative*. Philadelphia: Lippincott.

Stuart, R.L. & Gillespie, E.E. (2008). Preparing for an influenza pandemic: Healthcare workers' opinions on working during a pandemic. *Healthcare Infection, 13*(3), 95-99. https://doi.org/10.1071/HI08024

Styra, R., Hawryluck, L., Robinson, S., Kasapinovic, S., Fones, C. & Gold, W. L. (2008). Impact on health care workers employed in high-risk areas during the Toronto SARS outbreak. *Journal of Psychosomatic Research, 64*(2), 177-183. https://doi.org/10.1016/j.jpsychores.2007.07.015

Sugerman, D., Nadeau, K. H., Lafond, K., Cameron, W., Soetebier, K., Jhung, M., & Fry, A. (2011). A survey of emergency department 2009 pandemic influenza A (H1N1) surge preparedness—Atlanta, Georgia, July–October 2009. *Clinical Infectious Diseases*, *52*(S1), S177-S182. https://doi.org/10.1093/cid/ciq035

Sullivan, G. B. (2002). Reflexivity and subjectivity in qualitative research: The utility of a Wittgensteinian framework. *Forum: Qualitative Social Research, 3*(3), 20. http://dx.doi.org/10.17169/fqs-3.3.833

Sun, B. C., Hsia, R. Y., Weiss, R. E., Zingmond, D., Liang, L. J., Han, W., & Asch, S. M. (2013). Effect of emergency department crowding on outcomes of admitted patients. *Annals of Emergency Medicine*, *61*(6), 605-611. https://doi.org/10.1016/j.annemergmed.2012.10.026

Sung, K., Seo, Y., & Kim, J. H. (2012). Relationships between compassion fatigue, burnout, and turnover intention in Korean hospital nurses. *Journal of Korean Academy of Nursing, 42*(7), 1087-1094. http://doi.org/10.4040/jkan.2012.42.7.1087.

Swatzky, J. V. & Enns, C. L. (2012). Exploring the key predictors of retention in emergency nurses. *Journal of Nursing Management, 20*(5), 696-707. http://doi.org/10.1111/j.1365-2834.2012.01355.x

Syrett, J. I., Benitez, J. G., Livingston, W. H. & Davis, E. A. (2007). Will emergency health care providers respond to mass casualty incidents?. *Journal of Healthcare Protection Management, 23*(2), 27-40. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/17907606

Tam, K. P., Lee, S. & Lee, S. S. (2007). Impact of SARS on avian influenza preparedness in healthcare workers. *Infection, 35*(5), 320–325. https://doi.org/10.1007/s15010-007-6353-z

Taira, B. (2013). Public health interventions in the emergency department: One resident's perspective. *Annals of Emergency Medicine*, 61(3), 326-329. http://dx.doi.org/10.1016/j.annemergmed.2012.08.029

Taylor, S. J., Bogdan, R., & DeVault, M. (2015). *Introduction to qualitative research methods: A guidebook and resource*. John Wiley & Sons.

Thompson, C., Aitken, L., Doran, D., & Dowding, D. (2013). An agenda for clinical decision making and judgement in nursing research and education. *International Journal of Nursing Studies*, *50*(12), 1720-1726. https://doi.org/10.1016/j.ijnurstu.2013.05.003

Thornberg, R. (2012). Informed grounded theory. *Scandinavian Journal of Educational Research, 56*(3), 243-259. http://doi.org/10.1080/00313831.2011.581686

Thorne, S. (2000). Data analysis in qualitative research. *Evidence-Based Nnursing*, *3*(3), 68-70. http://dx.doi.org/10.1136/ebn.3.3.68

Thygeson, M., Morrissey, L., & Ulstad, V. (2010). Adaptive leadership and the practice of medicine: A complexity-based approach to reframing the doctor-patient relationship. *Journal of Evaluation in Clinical Practice*, *16*(5), 1009-1015. http://doi.org/10.1111/j.1365-2753.2010.01533.x

Tobin, G. A., & Begley, C. M. (2004). Methodological rigour within a qualitative framework. *Journal of Advanced Nursing*, *48*(4), 388-396. http://doi.org/10.1111/j.1365-2648.2004.03207.x

Tunc, T., & Kutanis, R. O. (2009). Role conflict, role ambiguity, and burnout in nurses and physicians at a university hospital in Turkey. *Nursing & health sciences*, *11*(4), 410-416. http://doi.org/10.1111/j.1442-2018.2009.00475.x

Tzeng, H. M. & Yin, C. Y. (2006). Nurses' fears and professional obligations concerning possible human-to-human avian flu. *Nursing Ethics,13*(5), 455-470. http://doi.org/10.1191/0969733006nej893oa

van 't Klooster, T. M., Wielders, C. C., Donker, T., Isken, L., Meijer, A., van den Wijngaard, C. C., van der Sande, M. A. & van der Hoek, W. (2010). Surveillance of Hospitalisations for 2009 Pandemic Influenza A (H1N1) in the Netherlands, 5 June – 31 December 2009. *Eurosurveillance, 15*(2). 9-16. Retrieved from https://www.researchgate.net/profile/Adam_Meijer/publication/41087795_Surveillance_of_Hospitalisations_for_2009_Pandemic_Influenza_AH1N1_in_the_Netherlands_5_June-31_December_2009/links/02bfe51178d6e98527000000/Surveillance-of-Hospitalisations-for-2009-Pandemic-Influenza-AH1N1-in-the-Netherlands-5-June-31-December-2009.pdf

Veater, J., Wong, N., Stephenson, I., Kirk-Granger, H., Baxter, L. F., Cannon, R. & Wiselka, M. (2017). Resource impact of managing suspected Middle East respiratory syndrome patients in a UK teaching hospital. *Journal of Hospital Infection*, *95*(3), 280-285. https://doi.org/10.1016/j.jhin.2016.12.010

Veenema, T. G., Griffin, A., Gable, A. R., MacIntyre, L., Simons, R. A. D. M., Couig, M. P., & Larson, E. (2016). Nurses as leaders in disaster preparedness and response—a call to action. *Journal of Nursing Scholarship*, *48*(2), 187-200. http://doi.org/10.1111/jnu.12198

Veenema, T. G., Losinski, S. L., Newton, S. M., & Seal, S. (2016). Exploration and development of standardized nursing leadership competencies during disasters. *Health Emergency Disaster Nursing*, *4*(1), 26-38. http://doi.org/10.24298/hedn.2015-0016

Venkat, A., Hunter, R., Hegde, G. G., Chan-Tompkins, N. H., Chuirazzi, D. M., & Szczesiul, J. M. (2012). Perceptions of participating emergency nurses regarding an ED seasonal influenza vaccination program. *Journal of Emergency Nursing*, *38*(1), 22-29. http://doi.org/10.1016/j.jen.2010.08.015

Vinck, L., Isken, L., Hooiveld, M., Trompenaars, M. C., IJzermans, J. & Timen, A. (2011). Impact of the 2009 influenza A(H1N1) pandemic on public health workers in the Netherlands. *Eurosurveillance, 16*(7), 1-7. Retrived from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.646.7128&rep=rep1&type=pdf

Vinkenburg, C. J., Van Engen, M. L., Eagly, A. H., & Johannesen-Schmidt, M. C. (2011). An exploration of stereotypical beliefs about leadership styles: Is transformational

leadership a route to women's promotion?. *The Leadership Quarterly*, *22*(1), 10-21. https://doi.org/10.1016/j.leaqua.2010.12.003

Wagner, C., Smits, M., Sorra, J., & Huang, C. C. (2013). Assessing patient safety culture in hospitals across countries. *International Journal for Quality in Health Care*, *25*(3), 213-221. https://doi.org/10.1093/intqhc/mzt024

Ward, D. (2016). Role of the infection prevention and control link nurse: Benefits and barriers to implementing link-nurse systems, and the qualities and support healthcare staff need to be effective in the role. *Primary Health Care*, *26*(5), 28-31. Retrieved from https://journals.rcni.com/doi/abs/10.7748/phc.26.5.28.s29

Weber, T. (2003). There is no objective subjectivity in the study of social interaction. *Forum: Qualitative Social Research, 4*(2), 43. http://dx.doi.org/10.17169/fqs-4.2.716

Wen, Z., Zhang, D., Yu, K., & Sato, T. (2015). Information centric networking for disaster information sharing services. *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences, E98A*(8), 1610-1617. http://doi.org/10.1587/transfun.E98.A.1610

Wilson, H. S. & Hutchinson, S.A. (1996). Methodological mistakes in grounded theory. *Nursing Research, 45*(2), 122-124. Retrieved from http://journals.lww.com/nursingresearchonline/Citation/1996/03000/Methodologic_Mistakes_in_Grounded_Theory.12.aspx

Winpenny, P. & Glass, J. (2000). Interviewing in phenomenology and grounded theory: Is there a difference?. *Journal of Advanced Nursing, 31*(6), 1485-1492. 10.1046/j.1365-2648.2000.01431.x

Wise, M. E., De Perio, M., Halpin, J., Jhung, M., Magill, S., Black, S. R., & Finelli, L. (2011). Transmission of pandemic (H1N1) 2009 influenza to healthcare personnel in the United States. *Clinical Infectious Diseases*, *52*(S1), S198-S204. https://doi.org/10.1093/cid/ciq038

Wolfe, M. K., Wells, E., Mitro, B., Desmarais, A. M., Scheinman, P., & Lantagne, D. (2016). Seeking clearer recommendations for hand hygiene in communities facing Ebola: A randomized trial investigating the impact of six handwashing methods on skin irritation and dermatitis. *PloS one*, *11*(12), e0167378. https://doi.org/10.1371/journal.pone.0167378

Wong, E. L., Wong, S., Lee, N., Cheung, A. & Griffiths, S. (2012). Healthcare workers' duty concerns of working in the isolation ward during the novel H1N1 pandemic. *Journal of Clinical Nursing, 21*(9-10), 1466-1475. http://doi.org/10.1111/j.1365-2702.2011.03783.x

Wong, T. Y. & Lai, S. T. (2003). Common infectious diseases in Hong Kong. *The Hong Kong Practitioner, 25*(11), 542-549. Retrieved from http://hkjo.lib.hku.hk/archive/files/9cdb98b8f4bb417e1ec171b92bc076f7.pdf

Wong, T. Y., Koh, G. C., Cheong, S. K., Lee, H. Y., Fong, Y. T., Sundram, M., & Koh, D. (2008). Concerns, perceived impact and preparedness in an avian influenza pandemic: A comparative study between healthcare workers in primary and tertiary care. *Annals-Academy of Medicine Singapore*, *37*(2), 96-102. Retrieved from http://www.annals.edu.sg/pdf/37VolNo2Feb2008/V37N2p96.pdf

World Health Organization (2004). *The World health report 2004–Changing history*. Retrieved September 25, 2016 from http://www.who.int/whr/2004/en/report04_en.pdf

World Health Organization (2005a). *Combating emerging infectious diseases in the South-East Asia Region*. Retrieved September 25, 2016 from http://www.searo.who.int/LinkFiles/Publication_139-combating-emerging.pdf

World Health Organization (2005b). *WHO outbreak communication guidelines*. Retrieved September 25, 2016 from http://www.who.int/csr/resources/publications/WHO_CDS_2005_28en.pdf

World Health Organization (2008a). *International health regulations*. Retrieved September 26, 2016 from http://whqlibdoc.who.int/publications/2008/9789241580410_eng.pdf

World Health Organization (2008b). *Outbreak Communication Planning Guide*. Retrieved September 26, 2016 from http://www.who.int/ihr/elibrary/WHOOutbreakCommsPlanngGuide.pdf

World Health Organization (2009). *Hospital preparedness checklist for pandemic influenza: Focus on pandemic (H1N1) 2009.* Retrieved September 26, 2016 from http://www.euro.who.int/__data/assets/pdf_file/0004/78988/E93006.pdf

World Health Organization (2009). *Pandemic influenza preparedness and response: WHO guidance document*. Retrieved August 20, 2016 from http://www.who.int/influenza/resources/documents/pandemic_guidance_04_2009/en/

Wu, P., Fang, Y., Guan, Z., Fan, B., Kong, J., Yao, Z., & Hoven, C. W. (2009). The psychological impact of the SARS epidemic on hospital employees in China: Exposure, risk perception, and altruistic acceptance of risk. *The Canadian Journal of Psychiatry*, *54*(5), 302-311. https://doi.org/10.1177/070674370905400504

Yagasaki, K., & Komatsu, H. (2011). Preconditions for successful guideline implementation: Perceptions of oncology nurses. *BioMed Central Nursing, 10*, 23. https://doi.org/10.1186/1472-6955-10-23

Yin, R. K. (1989). *Case study research: Design and methods.* London: Sage.

Yoder, E. A. (2010). Compassion fatigue in nurses. *Applied Nursing Research, 23*(4), 191-197. https://doi.org/10.1016/j.apnr.2008.09.003

Zhang, L. F., You, L. M., Liu, K., Zheng, J., Fang, J. B., Lu, M. M., & Wu, X. (2014). The association of Chinese hospital work environment with nurse burnout, job satisfaction, and intention to leave. *Nursing Outlook*, *62*(2), 128-137. https://doi.org/10.1016/j.outlook.2013.10.010

Zhang, Y., & Wildemuth, B. M. (2009). Unstructured interviews. In B. Wildemuth. *Applications of social research methods to questions in information and library science* (pp. 222-231). Westport, Connecticut: Libraries Unlimited.

Zhu, J., Rodgers, S., & Melia, K. M. (2014). The impact of safety and quality of health care on Chinese nursing career decision-making. *Journal of Nursing Management*, *22*(4), 423-432. http://doi.org/10.1111/jonm.12140

Ziemann, A., Rosenkötter, N., Riesgo, L. G. C., Fischer, M., Krämer, A., Lippert, F. K., & Krafft, T. (2015). Meeting the International Health Regulations (2005) surveillance core capacity requirements at the subnational level in Europe: The added value of syndromic surveillance. *BMC Public Health*, *15*, 107. https://doi.org/10.1186/s12889-015-1421-2