PSYCHOLOGICAL FIRST AID TRAINING OF NURSES FOR DISASTER PREPAREDNESS: A NON-EQUIVALENT CONTROL GROUP STUDY

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Psychological First Aid Training of Nurses for Disaster Preparedness:

A non-equivalent control group study

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CERTIFICATE OF ORIGINALITY

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

_____ **(Signed)**

Nizar SAID (**Name of student)**

Dedication

I dedicate my thesis to my sweet and loving

Father (Belal), Mother (Ibtisam), Sisters (Tagreed, Amal, Najwa, Ala'), and Brothers (Mohammed, Taher, Ahmad)

Father-in-law (Esam), Mother-in-law (Khetam), Brothers-in-law (Ahmad, Ra'fat, Nizar), and Sister-in-law (Rahaf)

My sweet wife (Aseel), Daughter (Leen), and Son (Belal)

Along with the hard work and following by my respected supervisors (Dr. Vico Chiang and Prof. Alex Molassiotis)

Abstract of dissertation entitled:

"Psychological First Aid Training of Nurses for Disaster Preparedness:

A non-equivalent control group study"

Submitted by SAID Nizar

for the degree of Doctor of Philosophy at The Hong Kong Polytechnic University

Background: Disasters and the magnitude of destruction they create are ever increasing worldwide. Disasters have substantial physical and psychological effects on community and responders. Many studies have reported psychological trauma and long-lasting psychological problems, such as post-traumatic stress disorder (PTSD) and acute stress disorder (ASD), among responders. Therefore, it is important to prepare responders psychologically to better respond to disasters. Nurses contribute the largest number of healthcare providers and have major roles in disaster response and care; they must be prepared psychologically and physically to better respond to disasters. Psychological attention should be involved in any preparedness activity to limit the negative psychological outcomes of disasters, such as stress, depression, and PTSD. Psychological first aid (PFA) training may enable the trainees to provide supportive presence to mitigate acute distress and assess the need for continued care. In particular, the training may contribute to strengthening the psychological preparedness of nurses for disasters.

Aims: The primary aim was to investigate psychological preparedness for disasters among nurses and a PFA training programme for such preparedness. The objectives were to examine psychological preparedness for disasters among nurses with disaster field experience in terms of self-efficacy, dispositional optimism, self-esteem, trait-anxiety, and PTSD; and to evaluate the effects of the modified PFA training programme on improving psychological preparedness of nurses for disasters. The programme is believed to be able to enhance or improve nurses' psychological preparedness when compared with a control group.

Methods: The study involved two parts. Part one was an anonymous international cross-sectional online survey, targeting member nurses through different nursing organisations. Based on the adopted theoretical framework (Malkina-Pykh & Pykh, 2013; Zulch, Morrissey, Reser, & Creed, 2012), the instruments of this part included

demographic information, Psychological Preparedness for Disaster Threat Scale (PPDTS), PTSD Diagnostic Scale for DSM-5, and personality variables in the General Self-Efficacy Scale (GSE), The Life Orientation Test (LOT), State-Trait Anxiety Inventory (STAI), and Self-Esteem Scale (SES). The second part was a non-equivalent control group study with two arms, which took place in the West Bank, Palestine. According to the power analysis, 84 nurses were required for each arm. In the intervention group, nurses received the modified RAPID-PFA training for a duration of total nine hours (two hours per week). The control group is wait-listed. Both groups were asked to complete a pre-test (T0) and post-test (T1) upon programme completion. The set of evaluation tools included a PFA self-report survey, and the set of instruments as used in part one. Ethical approval was obtained from the Human Subjects Ethics Application Review System (HSEARS) of The Hong Kong Polytechnic University, and the An-Najah National University in Palestine before data collection. Confidentiality and anonymity of participation were ensured for all participants.

Data analysis: Statistical analysis was performed using SPSS, version 25 (IBM, 2017). Descriptive statistics was used to summarise the participant characteristics participants. Normality of the PPDTS distribution was evaluated with skewness and kurtosis from the Shapiro-Wilk test. The Alpha was set at the level of $p < .05$.

For part one: Mann-Whitney test was used to identify the relationship between binary variables and PPDTS scores. Kruskal-Wallis Test with post hoc adjustment was performed to identify the relationship between categorical variables and PPDTS scores. Spearman's rho correlation was used to investigate the relationship between the PPDTS and continuous variables, and Chi-Square to investigate the relationship between the PPDTS and categorical variables. Multiple regression was used to assess possible predictors of PPDTS. *For part two*, Chi-square and Mann-Whitney U test were used to check for any significant group differences in demographics and outcome variables between the intervention and control groups at baseline. The ITT principle was applied for analysis. Generalized Estimating Equations (GEE) model was used to assess any changes in the outcome variables between the intervention and control groups across the pre- and post-test study period (i.e. group-by-time interaction effect). For the sensitivity analysis, missing data were replaced by values generated by imputations. Sub-group analyses with Wilcoxon signed-rank test, after checking the distribution of normality, were used to evaluate any differences between the post-test mean scores of

primary outcomes within the respective intervention and control groups. Mann-Whitney U test was also used to compare those scores at different time points between the groups. Effect size estimates were calculated for the mean differences using Cohen's d, relating the mean score differences to the pooled standard deviation (Cohen, 1988).

Results: The results of part one from 88 participants revealed a moderate level of psychological preparedness (M = 43.1). Only around half had received training related to psychological preparedness, with a strong association between psychological preparedness training and PPDTS (U = 259, $p < 0.01$). The results suggest nurses' need for psychological preparedness training and pre-disaster planning in order to strengthen their disaster response. In addition, the personality variables that were investigated demonstrated their importance for inclusion in studying psychological preparedness.

In part two, five hospitals were randomly arranged to form two arms of the study, with a total of 168 nurses (n = 75 for intervention and control groups respectively after attrition at baseline). Workplace, PFA evaluation (on attitudes, skills, and knowledge), T-Anxiety, and PTSD, were significantly different ($p < 0.05$) between the two groups at baseline. With these as the covariates, the results of the adjusted GEE model based on ITT revealed that the PFA training imposed significant group-by-time effect ($p < 0.05$) on PPDTS, GSE, LOT, and SES. Multiple imputation by fully conditional specification (FCS) was performed to substitute the missing data for sensitivity analysis to compare the results generated between two models based on the ITT and per protocol (PP) principles. The result revealed that the adjusted GEE model (ITT) had essentially similar group, time, and group-by-time effects among the outcome measures, except for a better group effect of LOT and group-by-time effects of LOT and GSE ($p < 0.05$), but fewer group and group-by-time effects of SES, when compared to the original model (PP). Significant group-by-time effect of PPDTS ($p < 0.05$) as the primary outcome was observed in the adjusted model with ITT only. For *post hoc* analysis, the means of PPDTS showed greater improvement in the intervention group than in the control group at post-test (T1) (M = 43.09 and 31.96 respectively, $p < 0.01$). There were also statistically significant differences between the intervention and control groups in GSE, LOT, and SES at post-test ($p < 0.05$).

Discussion: The PFA training improved psychological preparedness, and this may help to build nurses' capacity in terms of their ability to adapt to current and future disasters. These capacities include increased self-efficacy, self-esteem, and optimism. The results suggest that nurses can improve their psychological preparedness if they receive the proper training. From the PFA training, their attitudes and behaviours may be enhanced to anticipate and manage their cognitive and emotional responses to disasters. As noted by Morrissey and Reser (2003), psychologically prepared individuals can focus on situational preparedness, such as household planning for disasters. In turn, they can reduce the risk of injury or death, as the safety inside their houses is ensured. They are also able to manage their feelings and concerns during the stressful time of a disaster, and have the confidence to deal with these types of situations. Studies have suggested that people with higher psychological preparedness tend to have more effective stress management during a disaster event, and decreased mental health problems in the aftermath (Morrissey & Reser, 2003; Roudini et al., 2017). The PFA training of nurses not only enhances the mental health support they provide to victims during disasters, but also benefits the mental health of nurses themselves.

Nurses in Palestine practise in a unique context, with experiential and cultural differences in psychological distress, of daily trauma and injuries surge and caring for people due to conflicts in the region. The added scenarios in PFA training were developed based on the real experiences of nurses, patients, and the community. Nurses have been given practice opportunities during the training through these scenarios. Such a modification in the training would have helped them to optimise deeper learning experiences from their daily living conditions, which may improve their decision making and the application in practice (Verkuyl et al., 2019; Verkuyl et al., 2020) to deal with these types of conflict situations. Furthermore, the debriefing and discussion sessions of nurses with one another during the scenario learning may more effectively motivate and facilitate their cognitive and affective learning, and the development of psychological preparedness.

Conclusion: From part one of the study, it is found that psychological training is associated with better psychological preparedness. This corresponds to the second part of this study, which aimed to investigate the effectiveness of psychological preparedness through psychological first aid training of nurses for disasters. Other outcome variables also showed better scores in the intervention group at post-test.

Significance: Nurses, particularly in Palestine, need to be competent in preparedness for psychological issues during disasters in order to deliver effective care, and for themselves in psychological preparation and self-caring. The PFA training is promising in improving nurses' psychological preparedness. The training could be considered to facilitate this goal. Meanwhile, it is recommended to further investigate this intervention with larger RCTs to achieve generalisability of the results. Hospital administrators, must continue identifying ways to enhance nurses' psychological preparedness, and to support suitable training interventions to improve such preparedness.

Publications arising from the thesis

Journal publications

Said, N. B., & Chiang, V. C. (2020). The knowledge, skill competencies, and psychological preparedness of nurses for disasters: A systematic review. *International Emergency Nursing*, *48*, 100806. doi:10.1016/j.ienj.2019.100806

Said, N. B., Molassiotis, A., & Chiang, V. C. (2020). Psychological preparedness for disasters among nurses with disaster field experience: An international online survey. *International Journal of Disaster Risk Reduction*, *46*, 101533. doi:10.1016/j.ijdrr.2020.101533

Conference and symposium presentations

Said, N. B., Molassiotis, A., & Chiang, V. C. (2020, January). Psychological preparedness for disasters among nurses with disaster field experience: An online survey. Conference session presented at N-nergizing Nursing Profession for NCD Challenges (N3 Nursing Conference), Bangkok, Thailand.

Said, N. B., Molassiotis, A., & Chiang, V. C. (2019, March). Psychological first aid training of nurses for disaster preparedness: A randomized control trial. Poster session presented at International Conference on Innovation in Nursing Education and Patient Care, Hong Kong.

Said, N. B., Chiang, V. C., & Loke, A. Y. (2018, July). Knowledge, skill competencies, and psychological capacities of nurses for disaster

preparedness: a future direction. Conference session presented at 29th International Nursing Research Congress, Melbourne, Australia.

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Reflections from my PhD journey

A doctorate or PhD degree is the highest academic qualification, which indicates the acquisition of competence and quality skills in conducting scientific research. I, and perhaps other PhD students as well, have gone through the stressful, frustrating, interesting, and sometime fun journey of doing a PhD. It is a mixture of feelings coming together.

I started my journey in September 2017, and I still remember my first meeting with my supervisors and further discussions with my chief supervisor. Perhaps these discussions were hints on how to manage the academic life, look for a topic of interest, and life in Hong Kong.

During the first year and in particular at the end of the second semester, my anxiety was at the highest point. I had different symptoms, such as disturbed sleep, uncomfortable feelings, and having no appetite for reading articles or books to complete my research idea.

Building a relationship with my supervisors and other school members is probably one of my most favourite memories. The support they provided, their advice, and their professional and academic backgrounds inspired me throughout the entire three years that I spent on my PhD study. Additionally, building a relationship with my colleagues was important to me. Some were in a close relationship with me. We discussed different issues together related to our programme and shared ideas. Perhaps most of us had similar feelings, barriers, and stress. We had the opportunity to exchange our ideas, hang out, and have fun and participate in activities to release some of these issues.

A PhD study implies good time management skills that respond not only to the demands of the academic sessions and tutorials received, but also to the completion of the doctoral thesis. Being self-regulated and with good guidance from my supervisors to make constructive and creative use of my abilities, was the success of doing things on time. Time also needs to be spent in the library, exploring books there, and attending workshops.

I am thankful and proud to be one of the students and graduates of my school, which has the vision to guide PhD students through the support of research student coordinator, Dr. Doris Leung. She helped organize a series of transferable skills workshops, seminars, and social activities involving all research students.

On the other side, there is my family. In my second year of studies, my baby girl was born - one of the happiest moments of my life. However, at the same time there was also more stress - the stress of balancing my PhD studies and my family. I needed to focus on my research work, but it was difficult. Being far away from my family caused more stress and distraction in my research work; in the end, life has to continue.

Since I was living in a student residence, I was able to take part in different clubs and committees. Through that, we organised many activities to create a community environment in which students, including myself, could participate in a wide variety of educational activities and events that were mostly informal but enjoyable. It helped us to develop skills, enhancing our understanding of different cultures (being culture-oriented) and international contexts, and developed us in many aspects, such as in our social, physical, intellectual, and academic capacities. These activities aim to build communities in which students' social need for belonging, friendship, recognition, respect, and dignity are met and respected. These communities foster learning, personal development, academic achievement, and successful transitions for both new students and senior ones. We were able to take part in the study life through building new friendships and managing those relationships, interacting with faculty members, staff, and many students from different cultures, and exposing ourselves to new and different perspectives. Inside the residence, I had opportunities to exercise, like going to the gym, walking, and hiking.

Now, the PhD is just the beginning of my career as a researcher. My PhD is a window and a lens to see and go forward in my research career. I realise that my thoughts now are different from what they were previously, and I am able to engage with the concepts that I have learned from first-hand experience. Finally, it is this journey that I am proud of. The memories are unforgettable, the story to be told to my family, children, friends, and my future students.

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Acronyms

APEDNN: Asia-Pacific Emergency and Disaster Nursing Network

ASD: Acute Stress Disorder

CMHC: Community Mental Health Center

DSM-5: The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

HSEARS: Human Subjects Ethics Application Review System

IASC: Inter-Agency Standing Committee

ICN: International Council of Nurses

IRB: Institutional Review Board

ISDR: International Strategy for Disaster Reduction

KSA: Knowledge, Skills, Attitude

M: Mean

MHFA: Mental Health First Aid

MHP: Mental Health Professional

MMAT: Mixed Methods Appraisal Tool

NBSB: National Biodefense Science Board

NCTSN: National Child Traumatic Stress Network

NCPTSD: National Center for PTSD

n.d.: No Date

NGO: None Governmental Organization

PFA: Psychological First Aid

PPDTS: Psychological Preparedness for Disaster Threat Scale

PTSD: Post-Traumatic Stress Disorder

PRISMA-P: Preferred Reporting Items for Systematic Review and Meta-Analyses Protocol

RAPID: Rapport, Assessment, Prioritization, Intervention, and Disposition

RCT: Randomized Controlled Trial

SD: Standard Deviation

T0: Pre-test

T1: Post-test

WHO: World Health Organization

WSDN: World Society of Disaster Nursing

CHAPTER ONE

INTRODUCTION

1.1. Disasters and Disaster Preparedness

Disasters and emergencies occur quickly, without warning. Disasters can be earthquakes, hurricanes, thunderstorms, outbreaks of infectious diseases, etc. They may cause negative consequences in a community and affected population, and may induce psychological problems in healthcare workers, such as nurses, and other service responders to the disaster (McFarlane and Williams, 2012). They will generate negative consequences. According to the World Health Organization (WHO) (2016), the global annual average death rate due to natural disasters from2011–2015 was 0.3 deaths per 100,000 populations, and the WHO Western Pacific Region reported the highest rate of 0.5 deaths per 100,000 populations. In 2015, there were 346 reported disasters, with an increase of 13.9% compared to 2014 (330), with more than 22,700 people dead (Guha-Sapir, Hoyois & Below, 2016). Whereas in 2017, there were 335 reported disasters, resulting in more than 9,000 deaths and more than 90 million people affected (Centre for Research on the Epidemiology of Disasters / CRED, 2018). Since 2001, disasters such as the September 11 attacks, hurricanes, and earthquakes focused attention towards enhancing disaster preparedness, response, and recovery (Muller et al., 2014). China, the United States, Indonesia, India, and the Philippines constitute the countries that are most affected by natural disasters, including floods, storms, and earthquakes (Guha-Sapir, Hoyois, Wallemacq, & Below,

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Note:
Some contents of Chapter 1 – 3 and 6 were published in,

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Said, N. B., & Chiang, V. C. (2020). The knowledge, skill competencies, and psychological preparedness of nurses for disasters: A systematic review. *International Emergency Nursing*, *48*, 100806. doi:10.1016/j.ienj.2019.100806

2016). Disaster is defined as “serious disruption in the community functions that cause a huge loss in many aspects such as human and environment, and this disruption exceeds the ability of that community to cope and using own resources” (International Strategy for Disaster Reduction, 2004, p. 17). It is also the wide destruction of community systems that limits their functions and capabilities; this destruction includes human life, and economic and environmental resources (Tzeng et al., 2016). Disaster preparedness is the adequate knowledge and practical abilities to respond effectively and quickly during and after a disaster to combat the negative consequences of these events (Achora & Kamanyire, 2016; Gladston & Nayak, 2017: Labrague et al., 2017; Slepski, 2005).

1.2. Psychological Responses of Nurses to Disasters

Disaster is a significant source of psychological problems. People may lose loved ones, property, and valuable things in their lives. Different reactions may occur, such as psychological reactions to traumatic events (Secor-Turner & O’Boyle, 2006). Nurses, as first responders to disasters, must deal with people with different types and levels of trauma; and must be well prepared physically and psychologically to be able to provide the appropriate kinds of support for disaster victims, and even for themselves (Said, Molassiotis & Chiang, 2020). Healthcare workers are the key providers of community care, and nurses in particular constitute a large proportion of the workforce in the healthcare sector. They are on the frontline for caring, their role is broad from providing basic care, such as monitoring vital signs and morning care, to complex care, such as caring for severe trauma patients, patients with sepsis, and patients and families with psychological needs. Their professional care may be provided with limited resources or in situations making their work and duties more complicated and stressful, e.g. during

wars and earthquakes (Achora & Kamanyire, 2016). To succeed in their roles, nurses must possess the knowledge and skills to improve their capabilities and competence for disaster management. Preparedness for disasters is important, and an essential step towards caring for other people and themselves.

During and after disasters, nurses need to work for, but are not limited to, triage, caring for traumatised people, preparing isolation, and surgical procedures, etc. Nevertheless, researchers in disaster preparedness have found that nurses had low to moderate levels of disaster preparedness (Al-Khalaileh, Bond & Alasad, 2012; Tzeng et al., 2016). In addition, the results of some studies primarily aimed to evaluate such preparedness in terms of knowledge, skill competencies, and the essential psychological attributes in disasters, which showed there is a need to enhance nurses' psychological preparedness (Said & Chiang, 2020). For instance, good psychological quality is important for nurses to better respond to disasters (Shipman et al., 2016; Yan et al., 2015). With this quality, they are more prepared to provide required care and ongoing support to victims effectively and efficiently (Said & Chiang, 2020). Another study showed that few nurses recognised the importance of psychological care (Alzahrani & Yiannis, 2017), whereas other studies revealed that nurses value the psychological attention (preparedness) and they stressed the need to improve this quality (Li et al., 2017; Wenji et al., 2015; Yan et al., 2015; Yang et al., 2010). However, these studies have some considerations that could be avoided in future studies. For example, a study by Shipman et al. (2016) used non-probability sampling that would sometimes generate sample bias, in addition to having a relatively small sample size (10 participants). Also, in another quantitative study, Yan et al. (2015) included only nurses working in hospitals, but nurses working in other locations could also have something to share from their experiences. In addition, the questionnaire used in this study was developed by military nurses, so the content may not be reflective of the types of skills required by non-

military nurses. Other studies (Alzahrani & Yiannis, 2017; Wenji et al., 2015) have some weaknesses in methodological aspects that may be a source of bias, such as sample size issues and generalisability problems.

1.3. The Need for Psychological Support for Nurses in Response to Disasters

It is not unusual that nurses themselves may experience psychological problems after a disaster (Said & Chiang, 2020). They may have nightmares, continuous thinking of victims with mixed emotions, some may even develop post-traumatic stress disorder (PTSD) and may avoid speaking about their experiences (Li et al., 2017). In another study, nurses considered their capacity in psychological intervention as a need in disaster preparedness (Loke & Fung, 2014). In terms of study quality, the latter was a focus group study with a written inquiry and quantitative analysis without the use of a standard questionnaire, and with a relatively small sample size. The other study was a qualitative design that included 15 nurses, with a focus on drawing out their experiences after their participation in earthquake relief.

Nurses also need community support to overcome their own stress. Furthermore, it is important to have psychological support. Nurses who participated in the Wenchuan earthquake relief received psychological counselling during and after the provision of on-site relief, and special care was taken to minimise any psychological trauma after they returned to normal work (Yang et al., 2010). Nurses in this study reported that these measures helped them to minimise psychological trauma, cope better, and in the case of PTSD, to seek resources for help in recovering from the trauma. Support such as this, or additional education, may be an essential component, among others, to enhance nurses' disaster preparedness. Notably, in a cross-sectional descriptive study,

nurses who participated in the Ebola virus outbreak reported the need for mental health and psychological support before, during, and after deployment in addition to coping strategies (Von Strauss et al., 2017). These findings have added valuable information to the literature. However, these studies are limited by their research design and relatively small sample size, and did not include how to determine the size and size calculations, which would need to be enhanced in future studies. In summary, there has been a lack of knowledge and skills in disaster psychological care, as nurses are not well trained to provide counselling and support to victims or their colleagues after disasters (Said & Chiang, 2020); and nurses themselves might also be affected psychologically during the process of disaster care or relief, with some nurses experiencing PTSD even years later (Wenji et al., 2015).

CHAPTER TWO

BACKGROUND

In this chapter, as the background of this study, current evidence about disaster mental health and psychological preparedness is summarised. A scoping review that describes and critically analyses the related studies is followed. It introduces the aims, methods, results, discussion, and the research implications that form the research questions of this study.

2.1. Disaster Mental Health

Crises and traumatic events, such as disasters and manmade crises, are dangerous and unpredictable. Sometimes people may continue to suffer from the psychological and physiological consequences of a disaster for a long time afterward (Te Brake et al., 2009) (Figure 1). People also have different perceptions and reactions towards disasters and traumatic events. Some may develop panic attacks and behave irrationally during these events, and they may experience some disorientation and be incapacitated due to fear and exhaustion (Guterman, 2005).

According to Butler, Panzer and Goldfrank (2003), disaster victims' perceptions and reactions vary from mild to severe (Figure 2). Comprehensive reviews have shown that disasters lead to negative consequences in five categories, (1) psychiatric illness, such as PTSD, (2) nonspecific distress, such as perceived stress, (3) health problems and concerns, such as sleep problems, (4) long term living problems, such as family conflicts, and (5) psychosocial problems, such as limited social participation (Butler, Panzer & Goldfrank, 2003).

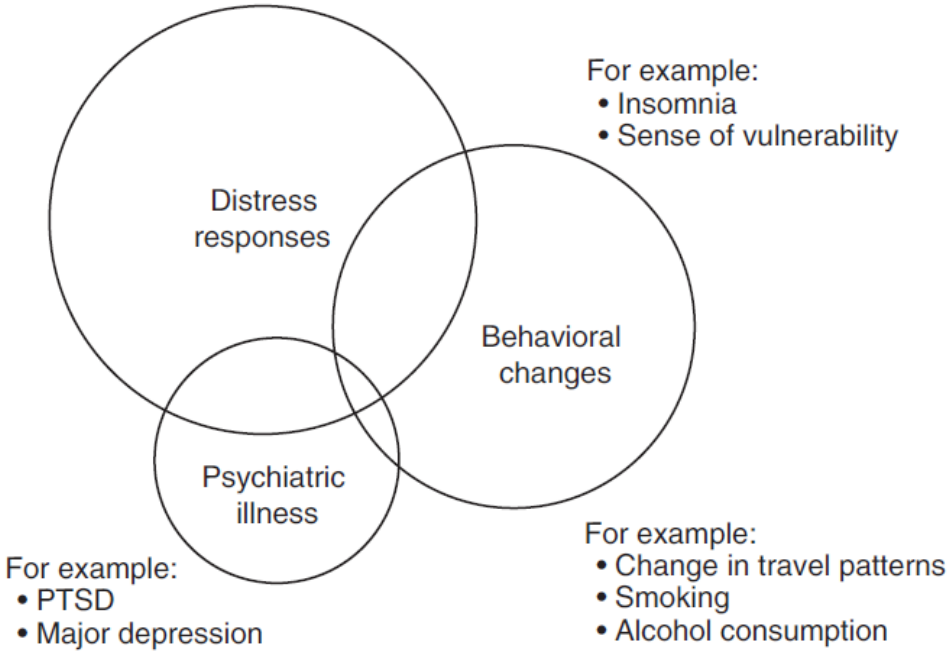

Figure 1: Psychological consequences of disaster (From: Butler, Panzer & Goldfrank, 2003, p. 4).

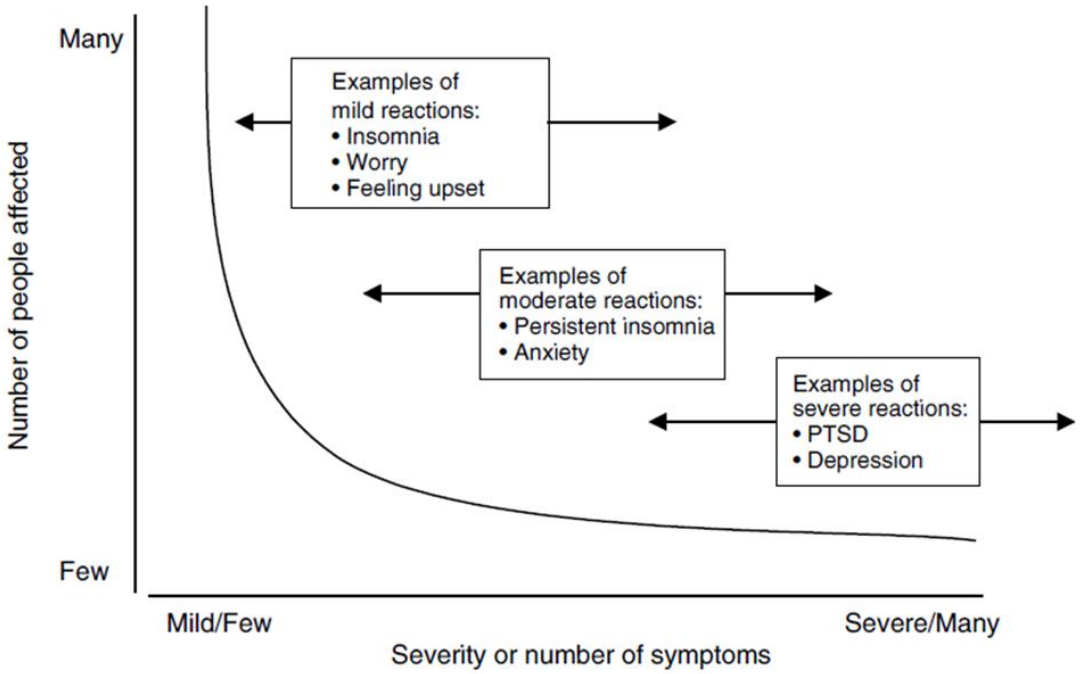

Figure 2: Severity of psychological reactions experienced by the population following a traumatic event (From: Butler, Panzer, & Goldfrank, 2003, p. 38).

In countries affected by disasters and traumatic experiences, there is a greater burden of mental health problems and adverse effects on psychosocial well-being (Said et al., 2020). Mental health problems cause suffering and affect quality of life, adding to the economic burden of the affected community (Weissbecker, 2009). For example, after Hurricane Sandy, people were exposed to an increased risk of depression and anxiety; and some experienced high levels of mental health problems. Later, they were also exposed to an increased risk of PTSD (Schwartz et al., 2015). Wynn (2017) also reported that survivors might experience grief, sadness, anxiety, and depression; and problems sleeping, concentrating, making decisions, and setting priorities. Out of all of the issues following disasters and crises, psychological traumas may outnumber physical traumas (McCabe et al., 2011).

People may experience the psychological consequences of disaster immediately or after the trauma has passed. According to Guterman (2005), the psychological impact of disasters is conceptualised in three stages: the rescue stage, inventory stage, and recovery stage. The psychological consequences of traumatic events, such as terrorism, could also influence the community and nation in different areas, such as economic and/or health care utilisation. Similarly, disasters may have a profound effect on nurses' mental health. Nurses work in a stressful environment, dealing with people suffering from extreme stress, sorrow, sadness, or even anxiety. In addition, they witness death and different traumas, maybe worry about how to cope with these events, and they even think about how their families could be kept safe during disasters. Therefore, nurses are at risk of developing psychological reactions, such as acute stress disorder (ASD), PTSD, anxiety, and depression. Nurses may also experience mild distress responses such as insomnia, and perhaps other behavioural changes (Secor-Turner & O'Boyle, 2006). The integration of prevention strategies, promotion needs, and healthcare needs

to address and respond to the psychological consequences of a traumatic event into public health planning is important (Butler, Panzer, & Goldfrank, 2003).

After disasters and traumatic events, early psychosocial interventions, such as psychological-first aid, are believed to be effective in preventing post-traumatic stress disorder (PTSD). After crises and shocking events, acute psychological trauma support is offered by a variety of caregivers (Te Brake et al., 2009). People undergoing the development of psychological problems need early psychosocial intervention. Following any usual medical relief for the traumatic event, there is a need for mental health services. A variety of mental health providers, such as psychiatric nurses, psychiatrists, and psychologists, are responsible for deployment in a first response, and to continue their support into the recovery stage (Wynn, 2017). At any stage of the recovery, the prevention of mental health issues should be a concern for any affected populations (Schwartz et al., 2015). Psychosocial care after disaster is important. It must be integrated with crisis management, and be made a continuous type of mental health support to survivors as much as possible (Te Brake et al., 2009). There is even a positive connection between mental health and disaster preparedness of the community in general (Clay, Goetschius, Papas, & Kendra, 2014).

Disaster mental health aims to restore the capacity of individuals to cope with a stressful situation, and to mitigate the consequences of a disaster in vulnerable populations (Cohen, 2002). It is "a significant reduction method to protect individuals from detrimental psychological effects arising from unexpected natural disasters" (Roudini, Khankeh, & Witruk, 2017, p. 2). It is also defined by the National Biodefense Science Board (NBSB) (2008) as "the provision of psychological support to affected individuals and communities by trained mental health professionals" (p. 2). The mental health

needs of disaster victims are both directly and indirectly affected by related disasters (Jacobs et al., 2016).

However, the mitigation of disaster impact on affected populations is complex. This may be a result of many factors, such as the inadequate availability of mental health professionals with disaster-response expertise, in addition to the unwillingness of many healthcare professionals to work during disasters (Balicer, Omer, Barnett, & Everly, 2006). Poor coordination and unplanned work among providers and within the emergency system are other factors (McCabe et al., 2011). Planners of disaster responses must routinely incorporate early behavioural health interventions (Yun, Lurie, & Hyde, 2010). Responders, such as nurses and disaster response planners, must be aware of possible and expected behavioural health outcomes, community support services, and population needs, in order to respond to mental and psychosocial needs after a disaster (Yun, Lurie, & Hyde, 2010). Public health workers must(1) listen actively, (2) prioritise and react to the needs of affected people, (3) recognise minor psychological problems and potentially serious psychological issues, and give information about these conditions, (4) communicate about how to deal with acute stress disorder, (5) recognise the risk factors of a poor mental health outcome and reduce them, (6) use interpersonal support resources, and (7) refer victims to different types of mental health services (Parker et al., 2006).

2.2. Psychological Preparedness of Nurses and Responders to Disasters

Psychological preparedness for disaster and disaster mental health preparedness share similarities, and perhaps mental health carries a broader meaning than psychology in a

disaster. In essence, psychological preparedness will positively support nurses and even the community in facing negative emotions and stress after a disaster (Roudini, Khankeh & Witruk, 2017). Mental health education, such as Psychological First Aid (PFA) and psychological debriefing, can help prepare nurses and other healthcare providers to respond to the psychiatric and psychological needs of victims and/or their families suffering from the negative impact of disasters (Langan et al., 2017). They will also be able to adapt to stressful and adverse situations as a result of disaster. Support from different people, such as supervisors, friends and families, would also be of positive assistance for nurses in disaster relief (Loke & Fung, 2014).

Previous studies have shown that PFA exerts a positive impact on professionals in disaster preparedness. For example, the War Trauma Foundation and World Vision International developed and applied a pilot to test the draft PFA guide (World Health Organization, 2011). The purpose was to provide basic information on PFA for assistance personnel who participated in the acute emergency following the Haiti earthquake. Participants benefited from this orientation in terms of skills for the immediate response, and self-confidence in the emergency response. The staff who were included saw improvements in their support and interactions with people in the disaster. In addition, the full PFA guide will be useful and helpful in the disaster preparedness and recovery stages. In the same study, healthcare providers showed willingness to request more details and in-depth training in PFA, which would help them in future disaster work, either benefiting victims or themselves (Schafer, Snider & van Ommeren, 2010).

2.3. Summary

Previous studies have focused on the psychological impact of disasters, either on survivors or responders, and which may be long lasting, such as stress and anxiety. Nevertheless, few studies have focused on the psychological issues of disasters as part of pre-event preparedness, especially for healthcare responders (Clay, Goetschius, Papas, & Kendra, 2014). This is despite the fact that the WHO supports responders' mental well-being and the provision of psychosocial support for responders and victims alike (IASC Reference Group for Mental Health and Psychosocial Support in Emergency Settings, 2010). According to the WHO (2007), mental health services and psychosocial support for victims and survivors begins in four phases: the rescue phase that starts immediately after an event; the relief phase, offered after two weeks of the disaster until six months post-disaster; the rehabilitation phase, which continues to the first or second year after the disaster; and the rebuilding phase, which may last for a few years. Therefore, psychological preparedness is important for each stage in order to minimise the psychological consequences of traumatic events for all parties who experience a disaster. Mental health and psychological preparedness should be integrated into disaster preparedness plans, and to make sure that all steps in this plan are executed, procedures and explanations of each step should be made to the related parties (WHO, 2007).

First responders, such as rescue workers, paramedics, firefighters, police, etc., are under the threat of either natural or human- caused disasters, and are at risk of developing psychological problems (Wilson, 2015). In particular, because of witnessing injuries and deaths, experiencing the tragedies of other people, and working under pressure and stress, rescue workers are at high risk for the development of PTSD. For instance, in Asia, rescue workers who had worked in major disasters had a higher incidence of

PTSD compared to those in Europe, with a 10% pooled worldwide PTSD prevalence (Berger et al., 2012), while first responders had PTSD prevalence ranging from 1.3% to 22.0% (Wilson, 2015).

Disasters induce obvious challenges, in that responders must take care of themselves while caring for others. Responders, including nurses and other healthcare workers, must be ready and competent for the delivery of care and services during future disasters (Al-Ali & Abu Ibaid, 2015) through training and drills to ensure their preparedness. In general, there is a relative paucity of focus on psychological attributes as one of the dimensions of disaster preparedness (Clay, Goetschius, Papas, & Kendra, 2014). This means that psychological preparedness and related training should be included in the preparation of nurses for disasters, to limit the negative psychological outcomes of disasters, such as undue stress, depression, and PTSD. The question of what measures are required to enhance better psychological capacity, and the attributes that contribute to nurses' disaster preparedness, is posed. Educating nurses and other healthcare workers in PFA will enhance both the psychological and social support availability for trauma victims. This implies the importance of training nurses and other healthcare workers in PFA skills (WHO, 2016).

2.4. Scoping review: Psychological preparedness for disaster among responders

In researching nurses' preparedness, different studies have revealed the need for psychological focus and enhancement. The researcher points out here that different studies have revealed that nurses have not received any training to improve or enhance psychological preparedness (Li et al., Li et al., 2015; 2017; Von Strauss et al., 2017; Yang et al., 2010). It is important to look for psychological preparedness in responders,

in particular nurses. In order to capture a complete picture of psychological preparedness, a literature review was conducted, aiming to identify the gap or required future practices in psychological preparedness. Following that step, the researcher can move forward to investigate the evidence of measures and interventions that will lead to better preparedness, and future implications.

2.4.1 Aims

The aims of this literature review were to investigate what is psychological preparedness (PP), and to evaluate the available interventions that may enhance responders', in particular nurses', PP to disaster for implications in future studies. The review used the SPIDER framework (Cooke, Smith & Booth, 2012) to guide the search; Sample (S) as *responders to disaster*; Phenomenon of Interest (PI) as p*sychological preparedness for disasters*; Design (D) as *'unlimited' in quantitative, qualitative, or mixed-methods studies*; Evaluation (E) as *psychological*; and Research Type (R) as '*all types of studies, excluding case studies, reports, and review articles*'.

2.4.2. Methods

2.4.2.1. Data sources and search strategy

Five electronic databases were searched for relevant articles published until November 2018, including PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), MedLine via EBSCO host, ScienceDirect and Scopus. The following keywords and medical subject headings were used in the Boolean search strategy: [*psycho** AND prepar* AND disaster].

2.4.2.2. Eligibility criteria

The inclusion criteria are studies that are peer reviewed, published in English. In addition, studies that utilised psychological interventions or assessed psychological preparedness or any other issues related to psychological preparedness, such as disaster mental health targeting responders, whatever the nature of the job, were included. Review studies, reports, and correspondence were excluded.

2.4.2.3. Search outcomes

Articles were considered for inclusion for full review by three stages of identification, screening, and eligibility checking respectively according to the PRISMA-P guidelines (Shamseer et al., 2015). Fifteen articles were included for quality appraisal and data synthesis to generate results (Figure 3). A detailed number of articles generated from the process of search and selection strategies is outlined in Table 1.

Database/Keywords	**CINHAL**	**MEDLINE**	**PUBMED**	**SD**	**SCOPUS**	**Identified from other sources**
Psycho* AND prepar* (S1)	1723	921	1085	3139	12614	10
S1+disaster (S2)	92	65	142	523	655	
Total (1477+10)	1487					

Table 1: Detailed numbers of the articles generated from keyword search strategies.

2.4.2.4. Quality appraisal

The quality of the studies included for review was assessed using the Mixed Methods Appraisal Tool (MMAT) (Pluye et al., 2011). The MMAT is designed for the appraisal of the most common types of study methodologies and the design of quantitative,

qualitative, and mixed methods approaches. There are two basic screening questions to fulfil first, in order to decide whether the quality appraisal will continue or not for a particular study. If fulfilled, the ratings of qualitative (QUAL) or quantitative (QUAN) studies can be determined based on the number of a total of four methodological quality criteria having been met (e.g. for a randomised controlled trial "Are there complete outcome data (80% or above)?"). Therefore, the results vary from 25% (*) of one, 50% (**) of two, 75% (***) of three, and 100% (****) of all four criteria being met. For mixed-methods research studies, the rating is done with an assessment of the QUAL and QUAN components respectively, and with an additional set of three criteria for the mixed-methods component (MM). The premise of such a rating by three components as set by MMAT, is that the overall quality of a combination cannot exceed the quality of its weakest component. Thus, the overall quality rating of a mixed-methods study is the score of the study component in the mixed design that is rated lower. For example, the rating is as low as 25% (*) when QUAL=1 or QUAN=1 or MM=0; 50% (**) when QUAL=2 or QUAN=2 or MM=1; 75% (***) when QUAL=3 or QUAN=3 or MM=2; and 100% (****) when QUAL=4 and QUAN=4 and MM=3 (Pluye et al., 2011).

2.4.2.5. Data extraction and synthesis

Data extraction was conducted by the three researchers based on author, year, country, aims/objectives, research design, sample size and instrument used, major findings, and implications of the articles included for critical review (Table 2). The results were developed through the narrative synthesis technique (Centre for Reviews and Dissemination, 2008) by the study quality and findings of the related studies in order to identify the commonality, differences, risk of bias, and overall robustness of the evidence. Studies with the MMAT rating of ** or above are considered to be of acceptable to higher quality and were included for analysis. During the process, how

psychological preparedness was elaborated on, any intervention used, how it worked, why and for whom; synthesis of the findings; relationships within and between studies; and assessing robustness of the synthesis (Centre for Reviews and Dissemination, 2008) were assessed to capture the representative results from the 15 studies.

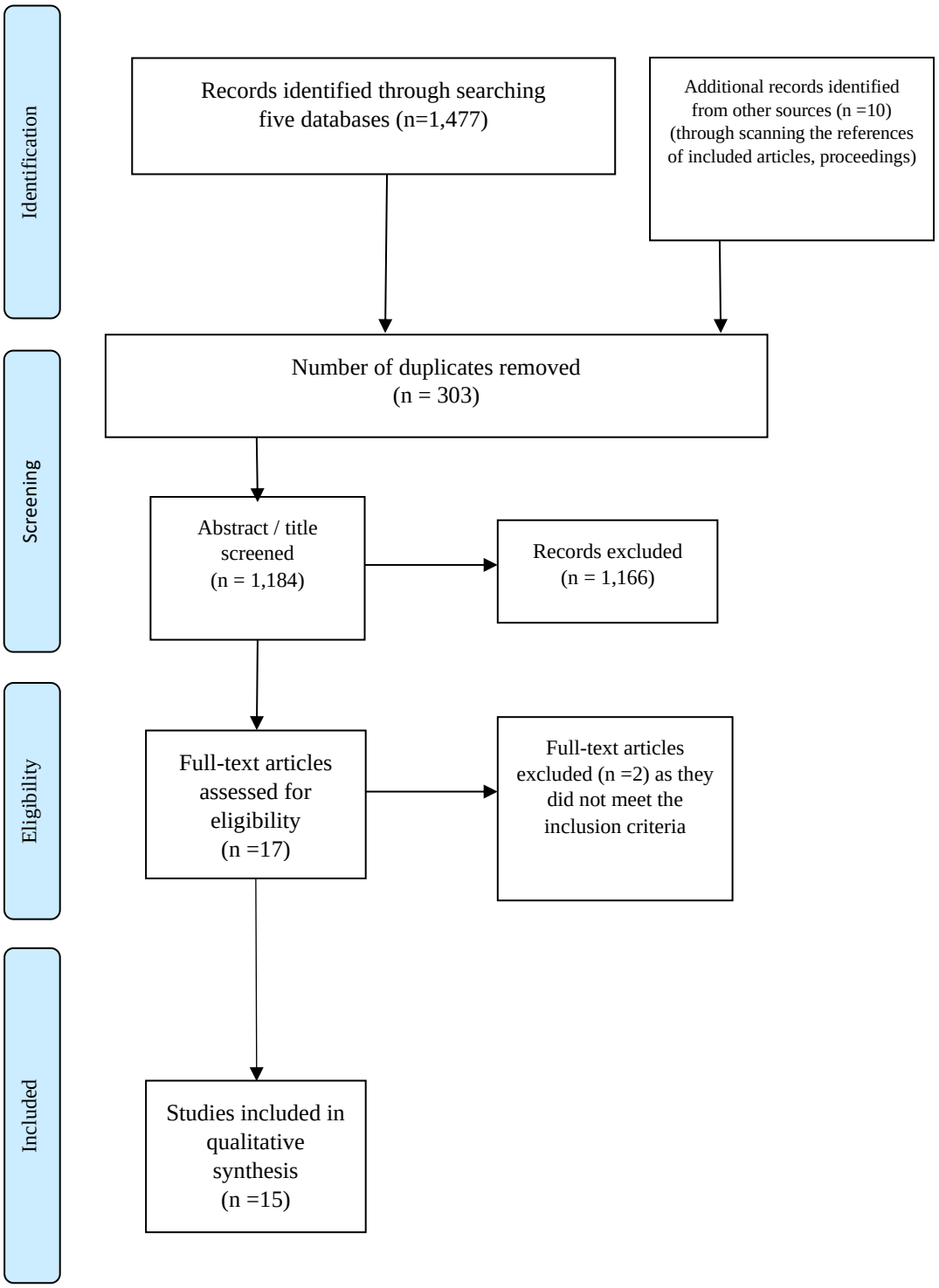

Figure 3: PRISMA summary of the search process.

Table 2: Summary of the 15 identified studies for review I (Table of Evidence)

No.	Author / Year (country)	Aims / Objectives	Research Design	Sample size	Instrument(s) Used	Major Findings	Implications	MMAT Rating
1	Everly, G. S. et al. (2014) (USA)	1. To determine whether relevant knowledge, skills, and attitudes (KSAs) were imparted to trainees to support effective PFA delivery 2.To identify whether resilience is built through the use of RAPID-PFA	A cross-sectional Pre- and post-test study	1,191 participants	The PFA survey	* Knowledge pertaining to crisis intervention, self confidence in one's ability to apply PFA, and self-confidence in one's own personal resiliency all increased with effect sizes (knowledge) ranging from moderate to large * The measures related to technical self-efficacy applying PFA interventions showed a higher mean difference and effect size than the personal confidence/ resilience measure	* The training is able to impart the basic knowledge necessary for immediate mental health intervention, and to bring about participants the technical self-efficacy and personal confidence to deliver quality services in a disaster setting * Public health personnel, first responders, and first receivers have to be trained in PFA	***
2	Gill, K. B., & Gershon, R. R. (2010) (USA)	1. Identify and categorize disaster mental health training programmes provided in New York City between September 11, 2001, and June 2005 2. Determine the programme's curricula 3. Identify the target audiences that received the training	Pilot study	Ten agencies representatives'	Self-constructed questionnaire	* Twenty-one identified topics of training in disaster mental health provided in USA, such as trauma and PTSD, key concepts in disaster mental health, trauma interventions, and PFA. * The quality of provided programmes under expectations.	* Improving the quality of disaster mental health training programmes are provided	**
3	Hawley, S. R. et al. (2006) (USA)	1. Evaluate knowledge and perceived value of mental health preparedness 2. Evaluate the emergency preparedness training to knowledge and perceived	Cross-sectional	197 health professionals	Self-constructed survey	* Training in psychological first aid, coping, and resiliency can facilitate first responders and healthcare workers to mitigate harmful psychological effects. * Respondents have knowledge of	* The need for mental health components to be incorporated into terrorism preparedness training. * Further studies to determine the most effective mental health preparedness training content and instruction modalities are needed.	***

No.	Author / Year (country)	Aims / Objectives	Research Design	Sample size	Instrument(s) Used	Major Findings	Implications	MMAT Rating
		value of mental health preparedness				and value the importance of mental health preparedness issues		
4	Hawley, S. R. et al. (2007) (USA)	1. To address the need for mental health preparedness assessment by qualitatively surveying public health and allied health professionals regarding mental health preparedness.	Quantitative	144 professionals from public health and allied	Self-constructed survey	* Most of participants have low mental health preparedness. * Most of participants addressed the need to mental health preparedness training	* Efforts in developing a mental health preparedness needs and training is needed * Further research on the coordination and training needs of public health and mental health agencies is needed	**
5	Hawley, S. R., Hawley, G. C., Romain, T. S., & Ablah, E. (2007) (USA)	To assess the impact of the disaster mental health training on perceived mental health preparedness knowledge	Cross-sectional with pre- and post-test	157 public health and allied health professionals	Self-constructed survey	* The perceptions of mental health preparedness knowledge (e.g. stress reactions) improved after training. * More understanding the importance of including mental health plans in preparedness planning,	* Disseminate the mental health preparedness training to responders and agencies. * Future study to included follow up evaluation.	**
6	Jordans, M. J. et al. (2012) (Nepal)	To evaluate the impact of brief two-day training courses on the knowledge and attitudes of front-line level staff on the integration of mental health and psychosocial support in disaster relief and humanitarian efforts	A pilot study with pre-post and follow up evaluation	109 participants	Self-designed questionnaire	* Improving in knowledge and understanding of the application of core principles for mental health and psychosocial support in emergency settings. * Increasing in mental health literacy	* Recommended to use the training course in future for disaster preparedness for front-line humanitarian staff. * Further research on and more specific training needed.	**
7	Laborde, D. J., Magruder, K., Caye, J., & Parrish, T. (2013) (USA)	To test feasibility of developing evidence-based mental health training to build capacity to respond to natural disasters in black communities	Quantitat-ive	28 participants	Self-constructed scale to measure knowledge of PDMH	* The study identified training components to increase knowledge and improve self-efficacy in mental health preparedness and planning	* The training needs further testing of adaptability, effectiveness, and sustain-ability. * The intervention needs to be applied in large study with similar sample characteristics	***

No.	Author / Year (country)	Aims / Objectives	Research Design	Sample size	Instrument(s) Used	Major Findings	Implications	MMAT Rating
8	Lam, R. P. et al. (2017) (Hong Kong)	1. To assess the level of disaster preparedness and training needs of emergency department (ED) doctors and nurses in Hong Kong. 2. Identify factors associated with high-perceived personal preparedness.	Cross-sectional	107 nurses and doctors working in ED	Online self-constructed survey	* Respondents lacked training in disaster management, emergency communication, psychological first aid, public health interventions, disaster law and ethics, media handling, and humanitarian response in an overseas setting.	* Development of core-competency-based training targeting the under-trained areas, increase staff confidence and increasing their willingness to respond to disaster relieve	***
9	Li, Y., Turale, S., Stone, T.E., Petrini, M. (2015) (China)	To identify a substantive theory to enhance nursing's knowledge about how to prepare nurses to work more effectively in disasters.	Qualitative study using grounded theory (GT)	15 RNs	In-depth interviews and field notes	* Nurses were unprepared educationally and psychologically for their disaster work. * The participants found themselves thrust in “terrible” scenes of destruction, experienced personal dangers and ethical dilemmas, and tried the best they could to help survivors, communities and themselves, with limited resources and confronting professional work.	* Addressing disaster nursing education and disaster preparedness * Nurses’ mental health knowledge and skills should be improved.	***
10	McCabe, O. L. et al., (2011) (USA)	To determine the feasibility, effectiveness, and impact of the overall program and of a one-day workshop in Psychological First Aid (PFA) for paraprofessionals	Mixed-methods including one group quasi-experimental design	219 participants	* Psychological First Aid Knowledge, Skills, and Attitudes Questionnaire	* The model demonstrated to be practicable in terms of readiness, willingness, and ability to collaborate and accomplish project aims	* Spreading the PFA training to other community members. * Enhancing community disaster preparedness planning with the full intervention program	***
11	McCabe, O. L. et al. (2014) (USA)	1. To validate the companion interventions to address community mental health planning and response challenges	Mixed-methods	391 participants	* PFA Knowledge, Skills, and	* Significant improvements in self-reported and objectively measured KSA	Replication of the model for capacity building for public health preparedness and resilience at multiple levels of the public health emergency preparedness system	**

No.	Author / Year (country)	Aims / Objectives	Research Design	Sample size	Instrument(s) Used	Major Findings	Implications	MMAT Rating
		in public health emergency preparedness 2. To evaluate the effectiveness of PFA and 'guided preparedness planning' (GPP) intervention			Attitudes Questionnaire * The GPP Knowledge, Skills, and Attitudes Survey Form * The Community Disaster Preparedness Planning Test	* GPP teams proved capable of producing quality drafts of basic community disaster plans in 1 day, and PFA trainees confirmed upon follow-up that their training was useful in real-world trauma contexts		
12	Reifels, L., Naccarella, L., Blashki, G., & Pirkis, J. (2014) (Australia)	To examine the capacity of the disaster mental health workforce provide the three evidence-supported intervention types of psychological first aid, skills for psychological recovery, and intensive mental health treatments.	Cross-sectional	791 participants	Composite workforce capacity indicators (CCI) questionnaire	* Significant gaps in the disaster mental health capacity of providers in view of the three-tiered intervention framework. * Less than half of participants have the capacity to deliver current best practice interventions.	* The need for evidence based disaster mental health training and support programs to be available to provider in scalable and continuous.	***
13	Yan, Y. E. et al., (2015) (China)	To explore the skills, knowledge and attitudes required by registered nurses from across China who worked in the aftermath of three large earthquakes.	A descriptive study using a question-aire survey that collected quantitate-ive and	89 RNs	Questionnaire of Nurses' Disaster Nursing Skills at Earthquake Sites (plus nine open-end qualitative questions)	* They emphasized the need for psychological care of victims as well as that of fellow health workers.	* More attention for disaster nursing competencies and disaster preparedness. * Developing disaster education contents and training in China and specific policies needed. * Nurse leaders and other leaders in health, education and government China need to work collaboratively to help ensure the nursing preparedness for disasters.	***

No.	Author / Year (country)	Aims / Objectives	Research Design	Sample size	Instrument(s) Used	Major Findings	Implications	MMAT Rating
			qualitative data					
14	Yin, H., He, H., Arbon, P., & Zhu, J. (2011) (China)	1. To determine nursing skills most relevant for disaster nurses. 2. Set out recommendations to enhance training of nurses responding to disasters. 3. To improve the capacity of nurses to prepare and respond to severe natural disasters.	Cross-sectional	24 nurses	Self-designed questionnaire	* Nurses identified the most essential, frequently used, proficiently, and most important for training skills in disasters.	* The core of disaster management training should include some skills such as mass casualty transportation and emergency management. * The training content should be in accordance with the characteristics of disasters and the trainees' background knowledge and clinical experience.	***
15	Ranse, J., Hutton, A., Jeeawody, B., & Wilson, R. (2014) (Worldwide)	1. Determine the international research priorities for disaster nursing	Internat-ional Delphi technique	Round one: 14 nurses Round two: 23 nurses Round three: 16 nurses	Self-designed questionnaire	* Research statements were generated in the areas of: education, training, and curriculum; psychosocial; strategy, relationship, and networking; and clinical practice. * Psychosocial aspects of disaster nursing ranked the highest of research areas.	* Future disaster nursing research should focus on the area of psychosocial aspects of disaster nursing.	**

2.4.3. Results

2.4.3.1. General characteristics

A total of 1,487 relevant articles was identified through the search strategy. Articles were included for review by the three stages of identification, screening, and eligibility checking respectively (Shamseer et al., 2015). First, after the search of five selected electronic databases was completed with 1,477 articles identified, an additional 10 articles were identified from scanning the references of those articles. Among these, 303 duplicates were sorted and excluded with the aid of Endnote software X8.1. Subsequently, the remaining 1,184 papers were screened for any irrelevant titles and abstracts, with 1,166 excluded and 17 remaining. Finally, inclusion criteria and the full content of the remaining articles were further checked for eligibility. Fifteen articles were then finalised and included for quality appraisal and data synthesis to generate results (Figure 3).

2.4.3.2. Methodological design and quality appraisal

Concerning the methodological aspect, 11 studies (73%) used a quantitative design (Everlye et al., 2014; Gill & Gershon, 2010; Hawley et al., 2006; Hawley et al., 2007a; Hawley et al., 2007b; Jordans et al., 2012; Lam et al., 2017; McCabe et al 2011; Reifels, Naccarella, Blashki, & Pirkis, 2014; Yan et al., 2015; Yin, He, Arbon, & Zhu, 2011). Two studies had a qualitative design (Li, Turale, Stone, Petrin, 2015; Ranse, Hutton, Jeeawody, & Wilson, 2014), whereas the remaining two studies used mixed methods (Laborde, Magruder, Caye, & Parrish, 2013; McCabe et al. 2014b). In terms of research location, eight studies (53%) were conducted in the U.S., three (20%) in China, one in Nepal, one in Hong Kong, and one at an international level. In terms of disaster characteristics, all types of papers that were included concerned natural phenomena, such as earthquakes and tsunamis, while one, bioterrorism, was human-caused, . Nine

studies (60%) were rated with *** (Everly et al., 2014; Hawley et al., 2006; Laborde et al., 2013; Lam et al., 2017; Li, Turale, Stone, & Petrini, 2015; McCabe et al., 2011; Reifels, Naccarella, Blashki, & Pirkis, 2014; Yan Turale, Stone, & Petrini, 2015; Yin, He, Arbon, & Zhu, 2011), whereas six studies (40%) were evaluated as ** (Gill & Gershon, 2010; Hawley et al., 2007a; Hawley et al., 2007b; Jordans et al., 2012; McCabe et al., 2014b; Ranse, Hutton, Jeeawody, & Wilson, 2014) using the MMAT.

2.4.3.3. Trainee characteristics focusing on nurses

Concerning the demographics of the papers: four articles (27 %) were a total sample including nurses (Li, Turale, Stone, & Petrini, 2015; Yan et al., 2015; Yin, He, Arbon, & Zhu, 2011; Ranse, Hutton, Jeeawody, & Wilson, 2014), 73% were concerned with different staff, such as personnel involved in disaster relief, disaster mental health workforce, doctors, public health personnel, etc. Looking for nurses' representation in the articles that were included, five articles (33%) included nurses as a component sample (Everlye et al., 2014; Hawley et al., 2006; Hawley et al., 2007b; Laborde et al., 2013; Lam et al., 2017; Reifels, Naccarella, Blashki, & Pirkis, 2014).

2.4.3.4. Availability of Training Programmes, Models, and Duration

For psychological preparedness, eight studies (53%) conducted various training with pre- and/or post-tests to evaluate participant preparedness after the training (Everly et al., 2014; Hawley et al., 2006; Hawley et al., 2007a; Hawley et al., 2007b; Jordans et al., 2012; Laborde et al., 2013; McCabe et al., 2011; McCabe et al., 2014b). Table 3 summarises the results of six types of this training. Another two studies (13%) conducted surveys about existing programmes or training needs (Gill & Gershon, 2010; Reifels, Naccarella, Blashki, & Pirkis, 2014).

In addition, five studies (33%) identified the need for psychological preparedness through a general assessment of disaster preparedness. From these studies, responders identified the need for psychological care, psychological crisis intervention, and psychological first aid as issues or competencies needed for better disaster preparedness (Lam et al., 2017; Li, Turale, Stone, & Petrini, 2015; Ranse, Hutton, Jeeawody, & Wilson, 2014; Yan et al., 2015; Yin, He, Arbon, & Zhu, 2011).

Among the studies that conducted training, three studies used psychological first aid (PFA) and two of the PFA interventions were combined with Guided Preparedness Planning (GPP) training (Everly et al., 2014; McCabe et al., 2011; McCabe et al., 2014b). One had training on mental health and psychosocial support (Jordans et al., 2012); one study involved a terrorism preparedness training conference (Hawley et al., 2006); two included mental health and disaster/terrorism preparedness presentations (Hawley et al., 2007a; Hawley et al., 2007b); and one featured Disaster Mental Health Preparedness Training (Laborde et al., 2013). Of these studies, six studies (40%) indicated the duration of the training used. It varied from one day (six hours) to three days (Everly et al., 2014; Hawley et al., 2006; Jordans et al., 2012; Laborde et al., 2013; McCabe et al., 2011; McCabe et al., 2014b), while the other two studies did not identify the duration of the intervention (Hawley et al., 2007a; Hawley et al., 2007b).

Table 3: Summary of available training and results

Authors (Quality appraisal results)	Psychological First Aid (PFA)	Guided Preparedness Planning	Mental health and psychosocial support	Terrorism preparedness training conference	Mental health and disaster/terrorism preparedness presentations	Disaster Mental Health Preparedness Training
Everly et al., 2014 (***)	Improvement in knowledge pertaining to crisis intervention, self-confidence in one's ability to apply PFA, and self-confidence in one's own personal resiliency in PFA application.					
McCabe et al., 2011 (***)	The training was demonstrated to be practicable, effective in acquiring PFA knowledge, improving perceived self-efficacy to use PFA with prospective disaster survivors.					
McCabe et al., 2014b (**)	Significant improvement in knowledge, skills, and attitude in PFA application after the training.	Significant improvement in mean total correct pre-post scores (8.6, 10.2, respectively) in knowledge, skills, and attitude toward disaster preparedness planning ($p \leq 0.001$).				

Authors (Quality appraisal results)	Psychological First Aid (PFA)	Guided Preparedness Planning	Mental health and psychosocial support	Terrorism preparedness training conference	Mental health and disaster/terrorism preparedness presentations	Disaster Mental Health Preparedness Training
Jordans et al., 2012 (**)			Improved knowledge and understanding of the application of core principles for mental health and psychosocial support in emergency settings, in addition to increase in mental health literacy			
Hawley et al., 2006 (***)				• Trainees reported increased knowledge and value the importance of mental health preparedness issues. • Trainees who reported increased knowledge and value the importance of mental health preparedness have significant higher ability levels of competencies in terrorism preparedness		

Authors (Quality appraisal results)	Psychological First Aid (PFA)	Guided Preparedness Planning	Mental health and psychosocial support	Terrorism preparedness training conference	Mental health and disaster/terrorism preparedness presentations	Disaster Mental Health Preparedness Training
Hawley et al., 2007a (**)					Most of participants post- training indicated that they had low mental health preparedness, and addressed the need for mental health preparedness training.	
Hawley et al., 2007b (**)					The perceptions of mental health preparedness knowledge (e.g. stress reactions) improved after training. More understanding of the importance of including mental health plans in preparedness planning,	
Laborde et al., 2013 (***)						Increased knowledge and improved self-efficacy in mental health preparedness and planning.

2.4.3.5. Underpinning Theory/Definition

None of the included studies used a theoretical framework or theory definition to conduct the training or research, and there was also no clear definition of psychological preparedness or mental health preparedness. Such preparedness appears to refer to the measures and ability to respond to and provide psychological care, having disaster mental health literacy, and coping strategies - in other words, self-care.

2.4.3.6. Outcome measures

The most apparent outcome measures were in the areas of knowledge and understanding concepts in disaster mental health, self-efficacy, and self-confidence and attitude.

2.4.3.6.1. Knowledge and understanding concepts in disaster mental health

Most of the studies with knowledge as an outcome measurement showed improvements after the intervention, compared to status before the intervention, for example, in the study by Everly et al. (2014), the pre-post mean PFA intervention improved knowledge and understanding concepts in disaster mental health from 6.43 (1.99) to 7.66 (2.12). Similar to McCabe et al., (2011) and McCabe et al., (2014b), a significant improvement in knowledge was seen after the PFA training.

In the study by Hawley et al. (2006), the mean of knowledge in mental health preparedness was 3.33 after training. However, these results were not compared to status before the training, and since there was no pre-test data, the improvements were not seen. In another study, 57 % of participants indicated they had "none" or "very little" knowledge of mental health preparedness (Hawley et al., 2007b).

Hawley et al. (2007a) found that the mean perception of knowledge about typical stress reactions from terrorist or disaster events increased from 3.17 (“adequate”) at pre-test to 4.63 (“good” to “very good”) post-test. Looking to a study by Jordans et al. (2012), improvements were seen after the two-day workshop in mean knowledge (10.96) compared to pre-training (8.65), and even more at a two -month follow-up (11.58). It is notable here that women under 25 years age saw more improvements post-test than others did; also the regression support demonstrated a significant association for gender ($\beta = .222$; $p = .037$). In addition, participants gained more understanding of mental health in a disaster when they had received training. All participants understood factors affecting disaster- related reactions and emotional regulation, 93% knew that post-disaster support is needed, but only 21% identified the correct time of PFA administration.

2.4.3.6.2. Self-efficacy

Self-efficacy measures were found in only three studies (Everly et al., 2014; McCabe et al., 2011; McCabe et al., 2014b). The self-efficacy mean improved after PFA training from 3.55 (0.70) to 4.28 (0.54) (Everly et al., 2014). Similarly, self-efficacy for applying the techniques of PFA improved in the studies of McCabe et al. (2011) and McCabe et al. (2014b).

2.4.3.6.3. Self-confidence and attitude

Self-confidence is the belief, or the attitude to have these abilities, to achieve certain work; it is the perception of one’s abilities and trust in oneself (Judge, Erez, Bono, & Thoresen, 2002; Van der Meer et al., 2018). For example, self-confidence in applying PFA was improved after PFA training from a mean of 3.81 (0.74) to 4.28 (0.64) (Everly

et al., 2014). Similarly, an improvement was seen in the McCabe et al. (2011) and McCabe et al. (2014b) studies. In another study, the mean of perceived value of mental health preparedness was 3.77 compared to knowledge (3.33), as mentioned above (Hawley et al., 2007b). In addition, it is noted here that statistically significant positive correlations existed between knowledge and the value of mental health preparedness to achievement in terrorism preparedness competencies. However, these studies were weak in their methodological quality. Rigorous methodology had not been well established, e.g. there was unclear sample size estimation, with unknown power and effect size. Generally, the studies that were included concluded there was a lack of psychological qualities for better preparedness, and highlighted the need to include disaster mental health in preparedness activities and plans. Moreover, the psychological preparedness of responders is important for a better response.

In summary, no standard training has been found to be a gold standard in psychological preparedness. The usual training identified is psychological first aid, which was used in the three studies that were included. The other, is disaster mental health preparedness training, which was used in one study, and one brief training in mental health and psychosocial support in emergencies. Other programmes were presentations or were described as training, but without details of the programme content.

2.4.4. Discussion

2.4.4.1. Psychological Preparedness for Disasters

The review is considered to have aggregated the evidence of responder psychological preparedness for disaster. The current findings show a paucity of research concerning responders' psychological preparedness. The current review provides important implications for psychological preparedness at the professional level and in future, perhaps at the community level as well.

The studies that were included point to the importance of psychological preparedness for disasters, and they urge training responders to be able to respond effectively. Moreover, responders in these studies identified the need for different qualities in disaster preparedness, such as competency in psychological care, psychological crisis intervention, and psychological first aid (Lam et al., 2017; Li, Turale, Stone, & Petrini, 2015; Ranse, Hutton, Jeeawody, & Wilson, 2014; Yin, He, Arbon, & Zhu, 2011; Yan Turale, Stone, & Petrini, 2015). As disaster may cause psychological trauma, such as acute stress and post-traumatic stress disorder (PTSD) (Mao, Fung, Hu, & Loke, 2018), there is a strong need for responders to be prepared to minimise these consequences. Furthermore, the psychological and mental health preparedness of healthcare workers for the care of disaster survivors, as well as for the workers themselves, is an important aspect of public health in a disaster (Reid et al., 2005).

2.4.4.2. Psychological First Aid Training for Emergency Situations

From this review, psychological first aid training was employed to address community mental health planning and response challenges in public health emergency preparedness, in order to help in capacity building and resilience of the public health emergency preparedness system (McCabe et al., 2014b). Similarly, another two studies done by Everly et al. (2014) and McCabe et al. (2011) used the same training model. Their results showed that knowledge and understanding of disaster mental health concepts, self-care in disaster time, self-efficacy as a PFA provider, and the attitudes and willingness to respond as a PFA provider all improved after the training. These results are consistent with the outcomes of other studies on emergency preparedness (Everly, Barnett, & Links, 2012; Schafer, Snider, & Van Ommeren, 2010). Furthermore, the evidence suggests that PFA training helps to build capacity for an effective response to emergency and to reduce conflict (Findley, Halpern, Rodriguez,

& Vermeulen, 2016). In addition, PFA could reduce anxiety and distress as a result of traumatic effects (Brymer et al., 2006; Forbes et al., 2011; Fox et al., 2012). However, these studies failed to achieve the essential need for robust methodology, such as sample size calculation, and the presence of a stronger design, such as the use of sample randomisation. Studies with strong design and good sample power are required to produce accurate and strong evidence from the findings.

2.4.4.3. Psychological First Aid Training for Disasters

Psychological first aid was also considered to be an early mental health intervention to mitigate the effect of disasters and trauma (Findley et al., 2016; Vernberg et al., 2008). It might be applicable as a mental health intervention to "empower the public and responders to promote mental well-being and prevent adverse mental health outcomes" for disaster mitigation (Cheung, 2015, p. 47). Furthermore, the Committee on Responding to the Psychological Consequences of Terrorism, Board on Neuroscience and Behavioral Health, recommended psychological first aid for the community as evidence-based techniques, training, and education in all phases of traumatic events as a preventive measure, in order to limit the psychological consequences of these events and reduce physiological arousal (Butler, Panzer, & Goldfrank, 2003).

2.4.4.4. Mental Health Training for Disaster Responders

Current review results showed that most disaster mental health topics provided in New York City as an example, are trauma and PTSD, key concepts in disaster mental health, trauma interventions, crisis counselling, responder care/peer support, and psychological first aid (Gill & Gershon, 2010). It is important to develop disaster mental health training for the community. In this regard, Laborde et al. (2013) identified training

components and procedures that are acceptable and feasible for participants, who can contribute to the Black community mental health preparedness and planning. In addition, some Asian countries, such as Thailand, developed their own community mental health programmes following the 2004 tsunami, to enhance and sustain people's well-being (Roudini, Khankeh, & Witruk, 2017). In Nepal, 109 responders received training in mental health and psychosocial support (Jordans et al., 2012). The training followed the IASC Guidelines on Mental Health and Psychosocial Support in Emergencies, and was found to be successful in increasing responders' understanding of the application of core principles for mental health and psychosocial support in emergency settings.

Acquiring information regarding perceived knowledge on mental health preparedness is essential for future planning for improved preparedness and a better response. With more training, better preparedness in disaster mental health qualities and more capabilities to transmit these qualities, may be achieved in the public health workforce. It is also found that responders need more training, such as in psychological first aid and coping, and that responders value the importance and need for mental health preparedness with more exposure to preparedness training (Hawley et al., 2006). It is not unknown that disaster responders demonstrate a lack of disaster mental health capacity. Furthermore, gaps in disaster mental health, as a lack of familiarity with disaster mental health interventions, and the need for PFA training could exist (Reifels et al., 2014). The statistics following training in mental health disaster preparedness showed improvements in knowledge and understanding of the application of the core principles for mental health and psychosocial support in emergency settings, in addition to mental health literacy. In terms of PFA, the training demonstrated success in achieving the goals in each study (Everly et al., 2014; McCabe et al., 2011; McCabe et

al., 2014b), such as acquiring more knowledge in disaster mental health, self-care during a disaster, and the ability to provide PFA with confidence. However, the mental health training content was different in each study, whereas the content for PFA training was consistent in all studies. Other PFA modules, such as the PFA field operation guide of the National Child Traumatic Stress Network (NCTSN) and National Center for Post-traumatic Stress Disorder (NCPTSD) (Brymer et al., 2006), have similar principles. The PFA principles, objectives, and techniques in this guide are designed to meet four basic standards, 1) consistence of research evidence on risk and resilience following trauma, 2) being applicable and practical in a field setting, 3) being appropriate for developmental levels across the lifespan, and 4) being culturally informed and deliverable in a flexible manner (Vernberg et al., 2008, p. 382).

2.4.4.5. Psychological Preparedness and Psychological First Aid (PFA)

It seems that with psychological preparedness (especially disaster responders), people will exhibit more ability to cope with confidence, and more emotional stability and physical preparedness (Morrissey & Reser, 2003). Some training, such as PFA, has been used with an intention to "galvanize general interest in disaster preparedness" (McCabe et al., 2014b, p. 513). Psychological first aid is also recommended as an intervention choice to enhance psychological status when offered to people in acute distress after exposure to an extreme stressor (IASC Reference Group for Mental Health and Psychosocial Support in Emergency Settings, 2010). This means that psychological preparedness is essential in disaster preparedness. Therefore, responders need to be prepared psychologically to confront disaster and provide psychological support. It is also important to point out that self-confidence has a positive relationship with resilience, in other words, gaining self-confidence enhances resilience (Ertekin Pinar, Yildirim, & Sayin, 2018; Van der Meer et al., 2018).

It has been noticed that nurses pay the least attention to psychological preparedness and its evaluation. The next efforts should be focused on nurses who are on the frontlines of caring and responding. This will enable them to provide care for disaster victims, as well as for themselves, to overcome the psychological impact of disasters and establish confidence in providing care during a critical time.

2.4.4.6. Lack of definition for Psychological Preparedness for Disaster

According to Alexander and Klein (2009), training for disasters is considered to be a pre-disaster factor to protect against psychological effects. Cultivating the positives of proper training, responders will protect themselves and others against psychological trauma. However, none of the articles that were included defined psychological preparedness. The studies also failed to find the personality factors that could be mediators in psychological preparedness. In this regard, Malkina-Pykh and Pykh, (2013, 2015) suggested and proved that personality variables, including self-efficacy, dispositional optimism, trait anxiety, and self-esteem, were effective in assessing psychological preparedness (cited in Said et al., 2020). For instance, personality factors, such as self-efficacy, play an important role in decision-making, which is a cognitive process possibly leading to right judgment, thus contributing to preparedness (Mulilis & Duval, 1995). Anxiety, for example, may also contribute to reducing the preparedness process. It also refers to judgement that motivates people to begin the essential preparedness process (Paton, Smith, & Johnston, 2005).

As there was a lack of clear definition of psychological preparedness identified from the articles that were reviewed, an operational definition was identified through another,

narrative search of the literature. Psychological preparedness is defined as a state of awareness, anticipation (enthusiastic) and readiness of a person/people in a threat situation for any unexpected and emotional arousal. A person owns his or her psychological response, and the ability to manage that situation (Zulch, Morrissey, Reser, & Creed, 2012). From this definition, awareness and anticipation, capacity, confidence, competence, and perceived knowledge to manage psychological responses are considered to be the essential elements of psychological preparedness for disaster. Zulch et al. (2012) further developed and validated a scale called the Psychological Preparedness for Disaster Threat Scale (PPDTS) as a measure of psychological preparedness. Our review finding is consistent with Roudini, Khankeh, and Witruk (2017), who demonstrated that valid and reliable tools are scarce; there is a need to develop such tools to evaluate psychological preparedness. In this regard, PPDTS may be the first valid and reliable scale to evaluate psychological preparedness for disaster.

2.4.5. Conclusion and Research Implications

Psychological aspects should be included in disaster preparedness plans. If responders such as nurses are not prepared for a stress response and their physical or mental reactions, this may lead to the maladaptive signs and symptoms. They may experience different negative consequences, including physical and psychological conditions such as anxiety, affected mood, sleep disturbance, and appetite problems, which may affect their daily functioning (Oldham, 2013).

There are still research gaps in most of the studies that focus on disaster mental health. The results of the literature review suggest that responders, especially nurses, are not prepared psychologically, and some mental health training and PFA were provided in

an attempt to improve the situation. The stronger focus in the U.S. on psychological preparedness training may be a result of the September 2001 (11/9) event, which draws attention for stakeholders or humanitarian organisations to have more of a focus on psychological preparedness. Some attempts were made to improve psychological preparedness (for example with PFA training), but none of the studies evaluated psychological preparedness after this kind of training.

Psychological first aid training may ensure better adequacy of knowledge and understanding of psychological preparedness and skills to be applied in a time of disaster. Perhaps this improvement will lead to better physical preparedness on the part of nurses, as Morrissey and Reser (2003) found in their study that a lack of psychological preparedness is linked with lower physical preparedness. Furthermore, there has been no consistent definition, conceptualisation or standardised measure of psychological preparedness developed, as found in the articles that were included.

The findings provide important directions in developing responder preparedness to disaster, especially for nurses. As disaster preparedness in general is still weak to moderate, with less attention given to the psychological aspects (Said & Chiang, 2020; Said et al., 2020), it is necessary for nurses to develop psychological preparedness for disaster. It also appears that there is little to no published research on identification of the elements of psychological preparedness for disaster. Furthermore, the literature review did not identify clear measures that would enhance the psychological preparedness of nurses for disaster, for example specific training such as psychological first aid (Said & Chiang, 2020). Overall, there is an absence of larger scale studies of

psychological preparedness among nurses. Rigorous methodology is required to establish the related studies in order to obtain better results with less bias.

In order to understand more about the psychological preparedness of nurses for disasters and bridge the gap, there is a need to evaluate the meaning and status of psychological preparedness, especially among nurses with disaster relief experience, in addition to identifying the most correlated factors affecting their preparedness, such as their experience of previous disaster preparedness training. Obtaining information about psychological preparedness at the international level and from nurses who have relief experience will help to generate a better overview of the preparedness level. In addition, studies are required to investigate effective training, e.g. PFA, that can develop and enhance nurses' psychological preparedness for disaster. The Malkina-Pykh and Pykh (2013) model, which includes the elements (personality variables) as self-efficacy, self-esteem, trait-anxiety, and dispositional optimism, in addition to PTSD symptoms, can be used to evaluate the results after PFA training. All study results will help to provide further implications and recommendations for practice, research, and policy development. A study consisting of two parts is considered, in which the first part includes an international survey of nurses' psychological preparedness for disaster from a global perspective on the current status of psychological preparedness of nurses for disasters. This will help in understanding the psychological preparedness and its correlates, and the results would suggest a future direction toward improving and assessing this preparedness. The second part is a clinical evaluation study on PFA training for nurses working in emergency services, which is considered to achieve the following research aims and objectives.

2.5. Thesis Aims

The literature review indicates a gap related to the status of psychological preparedness of nurses to disasters and identifying particular intervention that could enhance such preparedness for them. This study explores the psychological preparedness of nurses, and an intervention (modified RAPID-PFA) that aims to improve the preparedness. The overall objectives are,

1) to investigate to what extent nurses with disaster response experience are prepared psychologically for disasters, and
2) the efficacy of a modified psychological first aid training programme to enhance the preparedness

To explore psychological preparedness of nurses for disasters, an international online survey was conducted to achieve the first objective, and an interventional study using non-equivalent control group with pre-pot-test was implemented to achieve the second objective.

CHAPTER THREE

STUDY ONE METHODOLOGY

3.1. Overview

This section introduces the purpose and objectives of the part one study (an international survey), and the framework that informs the study and its methods. Study results would contribute to literature that emphasises the focus of nurses' psychological preparedness with a global perspective, and recommendations made according to the results. After responding to the survey, nurses may have more awareness of psychological preparedness for disaster and may start learning more about this issue in order to improve their capability in this area. They may further invite their colleagues and families to enhance their own knowledge of this area and focus more on the same issue. The study is a very good opportunity to obtain information about psychological preparedness of nurses for disasters at the international level, and to inform possible training, like psychological first aid training, for the Palestinian nurses in preparing for disasters.

3.2. Theoretical framework

Inability to manage negative situations such as stress will lead to poor decision making, disturbances in cognitive processes, and negative psychological outcomes (Malkina-Pykh & Pykh, 2013). As discussed in the literature review, psychological preparedness is represented by a number of characteristics that play roles in the decision-making process of a disaster response. These characteristics may serve as the predictors of

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Note:
Some contents of this chapter were published in,

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nurses' psychological preparedness for disasters, such as self-efficacy, optimism, locus of control, anxiety, responsibility role, and coping style (Becker, Johnston, Paton, & Ronan, 2012; Malkina-Pykh, & Pykh, 2013, 2015).

Based on the Malkina-Pykh and Pykh (2013, 2015) non-linear integrated model of psychological preparedness for threats and impacts of climate change disasters [the response function model (MRF)], the authors argued that personality variables, such as *self-efficacy, dispositional optimism, trait anxiety, and self-esteem* are effective elements in the assessment of psychological preparedness. Post-traumatic stress disorder is added to the framework, as it is found that most frequently studied effect of traumatic events is the PTSD, and its early symptoms may develop within days of trauma exposure (Naushad et al., 2019; Qi, Gevonden, & Shalev, 2016). Furthermore, PTSD is the most common and seriously psychological effect of disasters (Dutheil, Mondillon, & Navel, 2020; Naushad et al., 2019). Given the importance of assessing PTSD and its correlation with psychological preparedness, the adopted model was modified as such to satisfy this need. In part one of this study, those variables will be applied to evaluate the psychological preparedness of nurses, and to identify whether they are predictors for psychological preparedness.

Bandura (1995, p.2) defined *self-efficacy* as "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations". Simply, it refers to one's abilities and capabilities to succeed and perform well in stressful situations. People have different levels of efficacy, as they have different levels of cognitive processing of information. Previous success in coping attempts and avoidance of threat arousal will enhance self-efficacy (Bandura, 1977). Self-efficacy can influence

actions, behaviours, and life plans (Schunk, 2001). Efficacy derives from four primary sources as performance accomplishments, verbal persuasions, reduced emotional arousal, and vicarious experience (Bandura, 1977). Persons having any of those four primary sources, observing people with a success story, and receiving positive encouragement from others will build and foster their efficacy (Tsang, Hui, & Law, 2012). The concept of self-efficacy explains how people react and respond to stress, either emotionally or behaviourally. Since it reflects the capacity to do something (Malkina-Pykh & Pykh, 2013), it is not surprising that previous studies have found that self-efficacy is a predictor of preparedness (Paton, Smith, & Johnston, 2005; Sims & Baumann, 1972).

Dispositional optimism refers to views of someone to something. It is the belief that good things will happen. These kinds of people have positive expectations, they mostly have constant stability, and this optimism derives from internal (Benight et al., 1999; Scheier & Carver, 1985) and/or external causes (Scheier & Carver, 1985). Dispositional optimism has a positive relationship with coping, and coping will enhance both cognitive and the emotional functions (Karademas, 2006). People with optimism will mostly have less psychological distress and greater resilience to post-disaster psychopathology (Goldmann & Galea, 2014). Therefore, being optimistic is important in coping with disaster situations. Optimistic people can actively cope with their problems successfully, and confront their difficulties to push towards their goals (Scheier & Carver, 1985). It has also been found that optimism is positively correlated with seeking social support, and inversely correlated with emotional expressions and disengagement from a goal (Scheier, Weintraub & Carver, 1985). Optimism is found to have positive influences with reported physical illness burden in patients suffering from chronic fatigue syndrome, with decreased anxiety and depression, and enhanced

palliative coping strategies (Lutgendorf et al., 1995; Zeidner & Hammer, 1992). It has a positive relationship with well-being in the context of a stressful event and a negative relationship with psychological distress (Steffen, 1998).

Trait anxiety has a negative effect on people exposed to a traumatic effect (Said et al., 2020); it can influence the development of posttraumatic stress disorder (PTSD) symptoms and somatic symptoms (Hensley & Varela, 2008), in addition to exerting a negative effect on cognitive function (Zeidner & Hammer, 1992). People could engage in cognitive appraisal when facing the possible occurrence of a harmful event (Lazarus, 1966; Lazarus & Folkman, 1984). In this situation, coping efforts occur with the person who is involved in the appraisal, in order to manage that risk or threatening event, in addition to controlling their emotional reactions. In the appraisal process, people may engage in primary or secondary appraisal. By direct emotional coping to confront harmful events, they will experience less stress. In a secondary appraisal, people who have the perception that they can successfully cope and deal with threats will experience positive stress, and those with the opposite perception will experience negative stress (Lazarus, 1966). With high trait anxiety, people exposed to a threatening situation will develop more distressed emotions because of stress. They may also be unwilling to develop active coping and disengagement tendencies in terms of their own goals (Carver, Scheier, & Weintraub, 1989), and a loss of control (Lazarus, 1991). Thus, trait anxiety of individual nurses may affect their disaster preparedness behaviours.

Self-esteem can be a dimension of self-concept (Elliott, 1986), which is a motivational force, and is a favourable or unfavourable attitude towards the self (Rosenberg's, 1965). With high self-esteem, people tend to appraise their coping, which may lead to challenges of that appraisal (Blascovich & Tomaka, 1996). Active coping may lead

them to be more resistant and to having more control over situations (Aspinwall & Taylor, 1997). People with high self-esteem are typically more prepared for disasters such as floods, and they also have more interest and motivation to enhance their self-image and self-perception of success (Mishra, Suar, & Paton, 2011). James (1890) also refers self-esteem to the success of a person in his/her presentation to others, as he considered self-esteem to be an equation ratio between success and presentation. In addition, he considered directions of actions towards success according to a person's responses to the overall feedback of others. For instance, if a person with low self-esteem receives positive feedback from others, he/she may respond accordingly with more favourable outcomes. As an intrapersonal resource, it is clear that self-esteem is a potential predictor of disaster preparedness (Mishra, Suar, & Paton, 2011).

Based on the personality variables above (Malkina-Pykh & Pykh, 2013; Malkina-Pykh & Pykh, 2015), and the operational definition of psychological preparedness for disaster (Zulch, Morrissey, Reser, & Creed, 2012), the theoretical framework for this study is illustrated in Figure 4.

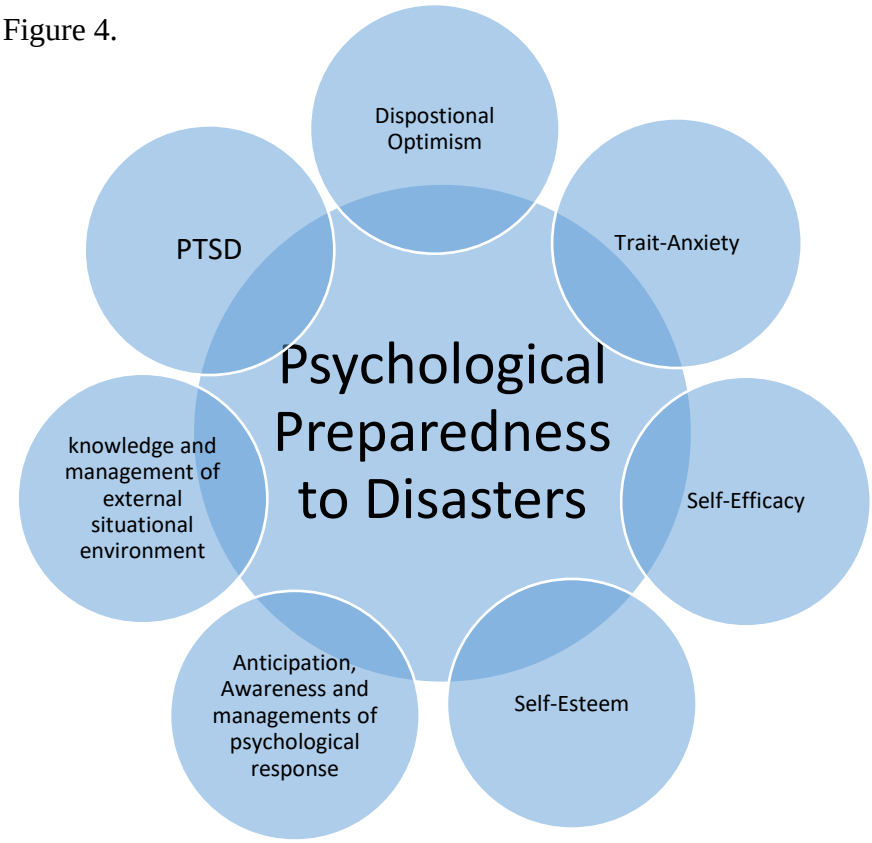

Figure 4: Theoretical framework for part one study

3.3. Aims and Objectives

As identified from previous reviews about the need to better understand nurses' psychological preparedness, Part one of the study aimed to investigate psychological preparedness for disasters among nurses with disaster field experience.

The objectives were,

1) to evaluate the extent of psychological preparedness of nurses with disaster field experience in relation to self-efficacy, self-esteem, dispositional optimism, trait-anxiety, and PTSD,
2) to identify to what extent nurses are psychologically prepared for a disaster response, and
3) to obtain results that may be used to inform better structure of the educational intervention and study in the second part.

3.4. Research questions

1. Are nurses psychologically prepared for disasters?
2. what extent nurses with disaster response expertise are prepared psychologically for disasters?
3. Is there any relation between the psychological preparedness of nurses with disaster relief experience and the presence of PTSD symptoms?
4. Do previous trainings in disaster preparedness, psychological/mental health preparedness, and stress management affect psychological preparedness for disasters?

   Do self-efficacy, self-esteem, dispositional optimism, and trait-anxiety affect psychological preparedness?

3.5. Methods

3.5.1 Design

As Palestinian nurses in the West Bank have limited computer literacy and access to the Internet and email communication (AbuShanab, 2018; UNESCO, 2014), and it is more comprehensive to understand the psychological preparedness of nurses with disaster field experience from a global perspective, the first part of this study was an international cross-sectional online survey. Survey design followed the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). The checklist aids in outlining the survey design, such as describing the target population, sample frame, the type of sampling, and data analysis. It gives readers a better understanding of the sample selection and the flow of the e-survey process (Eysenbach, 2012) (Appendix I). The use of an online survey is usually less costly, is easier to recruit a larger number of participants, and saves time; has high accessibility rates (responders worldwide can participate); and provides more features, affordability, and flexibility (Helms, Gardner, & McInnes, 2017). Survey hubs, such as MySurvey at The Hong Kong Polytechnic University (PolyU), have exclusive features that enable researchers to conduct their surveys efficiently.

3.5.2. Sampling and Setting

The survey was anonymous and performed with an online delivery method. The sampling was convenience and snowballing that targeted member nurses from the World Society of Disaster Nursing (WSDN), Asia-Pacific Emergency and Disaster Nursing Network (APEDNN), and other nursing networks.

Since the researchers have no actual or estimation for the size of population and there are a lack of similar studies targeting the intended population, the researcher used Smith

(2016) formula to calculate the needed sample size. Smith (2016) provided an equation for sample size calculation based on z value, standard deviation, and margin of error. Then, the required sample size can be estimated by the formula,

$N = (Z \text{ value})^2 \times \text{standard deviation} (1 - \text{standard deviation}) / (\text{margin of error})^2$ (considering Z value is a constant = 1.96, CI=95%, SD= 0.5, and margin of error +/- 10%). With a margin of error estimated as 10%, the required sample size was 94 nurses.

The World Society of Disaster Nursing (WSDN) aims to contribute to the health and welfare of people through promotion of international academic exchanges and collaborative research on disaster nursing, and systematisation of disaster nursing knowledge and practice. It has more than 40 organisational members. Furthermore, the Asia-Pacific Emergency and Disaster Nursing Network (APEDNN) aims to build the capacities of nurses and midwives to fully contribute to coordinated and effective prevention, preparedness and response efforts; improved service delivery, and the building of community resilience during times of emergencies and disasters (Said et al., 2020). The network has more than 200 individual members from over 40 countries in the Asia Pacific Region. Other nurses' networks include, but are not limited to, the Japan Society of Disaster Nursing, Mahidol University, Center for Medical Education and Career Development (CMECD), World Health Organization Collaborating Centre (WHOCC) for Nursing, Midwifery Education and Research Capacity Building, Nurses' Professional Association of Queensland, etc.

3.5.3. Recruitment of subjects and Procedures

After obtaining ethical approval from the Human Subjects Ethics Application Review System (HSEARS) of The Hong Kong Polytechnic University, the questionnaires were uploaded to an online survey website (mySurvey via PolyU). Letters were sent to

secretariats of the World Society of Disaster Nursing (WSDN), Asia-Pacific Emergency and Disaster Nursing Network (APEDNN), and other nursing networks for their agreement to participate in this study. Three free registrations for the APEDNN conference in Hong Kong in November 2019 were offered to nurses who had completed the survey in appreciation of their participation. Agreements from the networks and Society were received for circulating the invitation and survey link between their member nurses and member organisations. A template of the member invitation emails that contained the survey details were sent to them containing an explanation of the study and aims, and also the survey link. All participating nurses and organisations were also encouraged to feel free to forward the survey invitation to their networks of nurses who fit the inclusion and exclusion criteria for snowballing of the recruitment process. By this process, there was no access to known names and email addresses or contact lists, thus maintaining study confidentiality and anonymity. The snowball sampling aimed to maximise and increase the number of survey responders in order to achieve the study aim of part one. The participant inclusion criteria were, being either male or female nurses; having at least a one-time experience of responding to disaster; and including all ages, positions held, and educational levels.

After member nurses received the invitation email and agreed to participate, they declared that they had read the information provided, and met the inclusion criteria, and were ensured that the data derived from their responses would be solely utilised for research purposes. After the declaration, they found the survey from the hyperlink to proceed to the mySurvey via PolyU containing the set of survey questionnaires. The first page of the survey contained all information regarding the study and the assurance statements of confidentiality and anonymity of the nurses' answers. They would then proceed to the other pages of the survey. Survey completion and submission implied

consent. After two weeks of the first invitation emails being sent out, another email was sent as a reminder to the respective networks and Society to disseminate the survey again. After another two weeks, a second reminder was sent. The study was conducted over the period March to May 2019.

3.5.4. Instruments

The survey content was divided into five sections (Appendix II), all questions were in English language, and took approximately 15-20 minutes to complete. Structured questionnaires were included in the first four sections. The *first section* was about participant demographics, including age, gender, education levels, specialty, marital status, workplace (hospital, clinic), working department, current position, years of work experience, working hours per week, number of responding times to disasters, nature or type of disaster relief (earthquake, hurricanes, etc.), last relief participation, and previous disaster/psychological training (how many times and the nature of this type of training).

The *Second section* was a PTSD Diagnostic Scale for DSM-5 (Foa et al., 2015). It is a 24-item scale with 0-4 answers (0 = Not at all, 1 = Once a week or less/a little, 2 = 2 to 3 times a week/somewhat, 3 = 4 to 5 times a week/very much, 4 = 6 or more times a week/severe). Permission was obtained from the authors. Internal consistency of the PDS–5 was excellent (α=.95) for the full scale. The internal consistencies of the subscales ranged from acceptable to excellent. The intrusion subscale was excellent (α=.90), the avoidance subscale was acceptable (α=.75), and the negative alterations in cognition and mood subscale (α=.89) and the alterations in arousal and reactivity subscale (α=.84) were good. Furthermore, test–retest reliability for the PDS–5 total score was excellent, with r (190) = .90 ($p < .001$). And the test–retest reliability of the

four subscales ranged from adequate to good. Percentage agreement between diagnoses at the two time points was 83%, indicating a high degree of test–retest reliability. Current study showed high internal consistency (α=.95) similar to previous reliability results.

The *third section* was Psychological Preparedness for Disaster Threat Scale (PPDTS) (Zulch, Morrissey, Reser, & Creed, 2012). The PPDTS is a scale with 18 questions on a 4-point Likert-type scale (1 = not at all true of me to 4 = exactly true of me). The psychometric properties of the PPDTS demonstrated that the scale is a valid and reliable measure of psychological preparedness. Content and face validities were assessed using ratings by 12 experts with the initial 51-item version of the PPDTS. The experts included practising psychologists, university academics, and six doctoral-level students. Face validity was also assessed by recruiting 10 university students. Accordingly, the PPDTS was revised based on the recommendations by experts and university students. Five different university students were then invited to pilot test the entire survey. After this process, the scale was reduced to 40 items. The 40-item scale was further administered to 1,494 students and staff members at universities in Queensland. After Exploratory Factor Analysis and Confirmatory Factor Analyses, an 18-item instrument was finally tested for reliability. The scale showed excellent scale reliability, with a Cronbach's alpha value of .93 (Zulch, Morrissey, Reser, & Creed, 2012). Cronbach alpha was high (0.97) in the current study. Permission to use PPDTS has been obtained from the authors.

The *fourth section* contains a collection of four tools, *General Self-Efficacy Scale, The Life Orientation Test (LOT), State-Trait Anxiety Inventory (STAI),* and *Self-Esteem Scale*. The *General Self-Efficacy Scale (GSE)* contains 10 questions with the available

answers ranging from 1-5 (1=not at all true, 2=hardly true, 3=moderately true, 4=exactly true) (Schwarzer & Jerusalem, 1995). According to Schwarzer & Jerusalem (1995), the internal reliability of this scale ranges between .76 and .90. For validity, it is correlated well to emotion, optimism, and work satisfaction, while negative coefficients were found for depression, stress, health complaints, burnout, and anxiety. In the current study, the internal consistency was 0.92.

The Life Orientation Test (LOT) was developed to assess individual differences in generalised optimism versus pessimism. There are 10 questions with 0 to 4 Likert-scale answers (0 = strongly disagree, 1 = disagree, 2 = neutral, 3 = agree, 4 = strongly agree) (Scheier, Carver & Bridges, 1994). Cronbach's alpha for the entire six items of the scale was .78, suggesting that the scale has an acceptable level of internal consistency. The test-retest correlations were .68, .60, .56, and .79, suggesting that the scale is stable across time. Current study showed good internal consistency (α=.70) similar to previous reliability results. Permission to use the scale has been obtained from the authors.

The State-Trait Anxiety Inventory (STAI) is a self-administered measure of trait and state anxiety level (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). It has 20 items for assessing trait anxiety and 20 for state anxiety. In this study, only the trait anxiety measure was used (Said et al., 2020). All items are rated on a 4-point scale (from “Almost Never” to “Almost Always”). Higher scores indicate greater anxiety. Internal consistency coefficients for the scale have ranged from .86 to .95; and test-retest reliability coefficients have ranged from .65 to .75 over a two-month interval. In the current study, the internal consistency of the trait anxiety scale was α=.68. Permission to use has been obtained from the authors.

Self-Esteem Scale has 10 questions with 4-Likert scale answers (1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree) pertaining to self-worth and self-acceptance (Rosenberg, 1965). The Rosenberg Self-Esteem Scale presented high ratings in reliability areas, with an internal consistency of 0.77, and a minimum coefficient of reproducibility as 0.90 (Rosenberg, 1965). In the current study, the internal consistency was 0.79.

The fifth section contained two optional open-ended questions. The first one asked the responders to share their experiences of how to improve psychological preparedness; and the second asked if they could add any further comments or notes.

3.5.5. Pilot test

The survey was piloted with a few university nursing students (n = 10) before releasing the final version to a target sample. The pilot aimed to check that the results were meaningful, with no technical problems when administering the questionnaires online. The questions should also be displayed correctly and be understandable to all responders. Suggestions for the structure, possible problems that may appear during the response process, and the time needed for responding are other issues to observe from the pilot for improvement (WiderFunnel, 2018).

3.5.6. Data analysis

The statistical software SPSS v. 25 (IBM Corp, 2017) was used for data analysis. Analysis included descriptive statistics to describe the nurses' characteristics and their responses on PPDTS, PSD-5, and other included measures. Shapiro-Wilk Test of Normality showed that PPTDS scores deviated significantly from a normal distribution

(p = 0.001). Therefore, nonparametric tests were used in data analysis. Mann-Whitney test was used to identify the relationship between binary variables and PPDTS scores. Kruskal-Wallis Test with *post hoc* adjustment was performed to identify the relationships between categorical variables and PPDTS scores. Spearman rho correlation was performed to establish the relationships between the PPDTS and continuous variables, and Chi-Square to establish the relationships between the PPDTS and categorical variables. Multiple regression was also used to assess possible predictors of PPDTS.

CHAPTER FOUR

STUDY TWO METHODOLOGY

4.1. Overview

The RAPID model developed by the Johns Hopkins Center for Public Health Preparedness for PFA is a recent programme that enables healthcare providers and others to provide psychological first aid (Everly, Barnett, & Links, 2012; Everly et al., 2014; McCabe et al., 2011). The programme is readily applicable in public health settings, the workplace, and mass disaster venues. The model is unique, as it consists of a platform grounded in theory and statistical modelling, evidence informed components, and an empirically validated training designed to address the needs of people in acute distress and the aftermath of disasters. The programme may increase nurses' ability to care for and knowledge of triage victims with psychological and behavioural crisis reactions, in addition to their abilities in mitigating acute distress and dysfunction and recognising the victims' needs to access further mental health support. It is believed to impart the necessary knowledge, promote a sense of self-efficacy (skills), and instil self-confidence (attitudes) of care providers in responding to disasters (Everly, Barnett, & Links, 2012; Everly et al., 2014). In essence, the programme will enable nurses to minimise the psychological impact of traumatic events, while building resistance and enhancing the recovery of the victims (and even in the nurses themselves).

In a study in Gaza, participants in PFA training increased their learning skills in helping themselves and others, providing a sense of calming, hope, and control; and other positive outcomes, such as positive coping (Schafer, Snider, & Sammour, 2016). Similarly, it is found that perceived confidence and capability in practicing PFA after

an emergency or disaster increased from 71% to 90%; and knowledge and intentions to use PFA also increased with PFA training (Chandra et al., 2014). The authors suggested that PFA training and application is feasible at the preparedness level. Nevertheless, there is a lack of PFA adoption in many organisations and facilities. This could be due to a lack of knowledge of when PFA would be useful, as well as facilities barriers to provide ongoing training, such as financial resources (Hambrick et al., 2014).

Healthcare organisations and facilities must overcome the barriers towards competence building and employee training in resisting the negative consequences of disasters. In building up competence in disaster preparedness, there is a strong need to understand the effectiveness of training, either training that promotes PFA use, or training that promotes the integration of PFA into existing disaster preparedness efforts (Hambrick et al., 2014). Adding to that, some studies (Lee et al, 2017; McIntyre & Nelson Goff 2012; Schafer, Snider, & van Ommeren 2010) have shown promising findings regarding the favourable outcomes of PFA programmes.

In part two of the study, the RAPID-PFA training programme was modified based on the Johns Hopkins' RAPID model of Psychological First Aid (Everly, McCabe, Semon, Thompson & Links, 2014), which has five components: Rapport and Reflective listening (R), Assessment of needs (A), Prioritization (P), Intervention (I), and Disposition (D). The original RAPID-PFA has two versions that are fully online, and an in-person training workshop, which contains lectures and simulated role-play videos for trainees to watch. The RAPID-PFA used in this study was modified based on the one used for in-person training. During the intervention, the modified RAPID-PFA was administered through face-to-face interactions, combined with scenario-based

simulations relevant to the Palestinian situation, with group work and discussions, and debriefing sessions. The training was considered to be strengthened by the group work and discussion, and experiential learning was based on scenario-based simulations and debriefing sessions. The modified RAPID-PFA that emphasised face-to-face interactions aided in enriching the participants about the psychological consequences of disasters (such as acute stress disorder) and common psychological and behavioural symptoms that may occur in the wake of a disaster. This modification was also a better fit for the recruitment of local subjects, who have limited access to the Internet and email. The oral instruction language is preferably not English but rather local, while the content and steps in the training programme were in English. As informed by the results from part one, such as the need to incorporate PTSD explanations during the intervention sessions, further adjustment of the modified RAPID-PFA training could be made to refine the content for comparison with the outcome variables of the control group. Since the study required to have nurses to participate in the training face-to-face, it was difficult to include nurses who participated in part one of the study which was international. The study included nurses in Palestine other than those responded to part one study.

4.2. Aim and Objectives

The aim of this part was to evaluate the effects of the proposed training intervention (modified RAPID-PFA) to enhance or improve nurses' psychological preparedness. The objectives were:

1) to evaluate the extent of nurses' psychological preparedness before and after the modified face-to-face PFA training, and
2) to evaluate nurses' self-efficacy, self-esteem, dispositional optimism, trait-anxiety, and PTSD with the modified face-to-face PFA training, compared to the control group.

4.3. Research Questions

1) Does the modified RAPID-PFA training improve nurses' psychological preparedness for disasters?
2) Does the modified RAPID-PFA training improve or have a significant effect on nurses' self-efficacy, self-esteem, dispositional optimism, trait-anxiety, and PTSD?

4.4. Study Hypotheses

1) $\boldsymbol{H_0}$: There is no significant difference in psychological preparedness among nurses after the modified RAPID-PFA training.
2) $\boldsymbol{H_0}$: There is no significance difference in psychological preparedness between nurses in the intervention group and control group.
3) $\boldsymbol{H_0}$: There is no significance difference in terms of self-efficacy, self-esteem, dispositional optimism, trait-anxiety, and PTSD in PFA application of nurses after the modified RAPID-PFA training.

4.5. Methods

4.5.1. Design

The study was a non-equivalent control group design with pre-post-test. The study included two study arms: the control group (wait-listed), and the intervention group using the modified face-to-face RAPID-PFA with simulation. This design was used as the researcher was unable to include more hospitals to be randomized to recruit larger sample size of participants. Given the availability to only include a smaller number of the respected hospitals for recruitment of participants, the study design was best considered as a non-equivalent control group.

4.5.2. Sampling and Setting

Due to the lack of studies that have investigated a similar primary outcome (psychological preparedness) with a similar design, a medium size effect with a Cohen's d = .5 was assumed. According to Cohen's (1988), in which the power is 0.8, with a medium effect size and a significance level (α) of .05, 64 nurses were required for each arm. Assuming a 70% recruitment rate, a total of 168 nurses would be approached and recruited (84 nurses for each arm).

The study included five hospitals (four hospitals in the Nablus district, and Palestine Medical Complex in Ramallah city, in the West Bank, Palestine). Nablus is a major city in the West Bank; it is home to one surgical public hospital, one university teaching hospital, and four private hospitals (two of them excluded from randomisation as they are small hospitals), with a total of 866 nurses working in all hospitals. The public and the university teaching hospitals with surgical departments are major trauma and accident centres in the north West Bank, and the Palestine Medical Complex is the main centre in the middle and south West Bank.

4.5.2.1. Palestinian Condition

Palestine is a nation located in Western Asia on the eastern Mediterranean coast (Figure 5). According to The Excellence Center in Palestine (2016), Jordan shares the east border of Palestine, and there is the Dead Sea. Lebanon is to the north, and in the south, it is connected to the Red Sea, Sinai, and Egypt. The Mediterranean Sea on the west border acts as a bridge connecting Africa, Asia, and Europe (Irving, 2011). Since the political conflict with the Israeli government, the area has been exposed to different wars and conflicts, such as the 1948 War (Irving, 2011; Rogan & Shlaim,

2007), 1967 War, First Intifada in 1986, Second Intifada in 2000 (Irving, 2011), and others.

Figure 5: Map of Palestine "Yellow zone, West Bank, and Gaza Strip" (The Excellence Center in Palestine, 2016).

Israel is currently occupying the area and sharing the land of the Palestinians. Given the sensitivity of the region, Palestine, or whatever this geographical area is named, is at risk for many human-made disasters, such as bioterrorism or nuclear attack. In addition, studies of historical earthquakes (Figure 6) have shown that many earthquakes have occurred along the Dead Sea Transform fault (El-Isa, McKnight & Eaton, 2015; El-Isa & Mustafa, 1986). One was the Nablus Earthquake. It occurred on 11 July 1927 in north Jericho at the boundary between the Arabian and the Sinai plates, with a magnitude of approximately 6.3 (Al-Dabbeek & El-Kelani, 2005). Given its history of earthquakes, the area is highly vulnerable to earthquake damage and losses; and the political context of the area is at risk of other damages and human losses, and with possibility of having psychological and mental health consequences as a result. For example, Shamia, Thabet, and Vostanis (2015) found that one in five nursing staff in Gaza experienced PTSD after two years of the 2009 war. Therefore, the need is

urgent to establish good disaster planning and preparation, on the part of both the community and medical staff, for such disasters in particular focusing on psychological preparedness. It is possible that following the intervention for psychological preparedness, nurses can learn and have the competence to mitigate negative adverse effects of the traumatic events; including better management of stress, minimizing the possibility of having subsequent mental health problems, and have the control over the impact of similar events (Roudini, Khankeh, & Witruk, 2017).

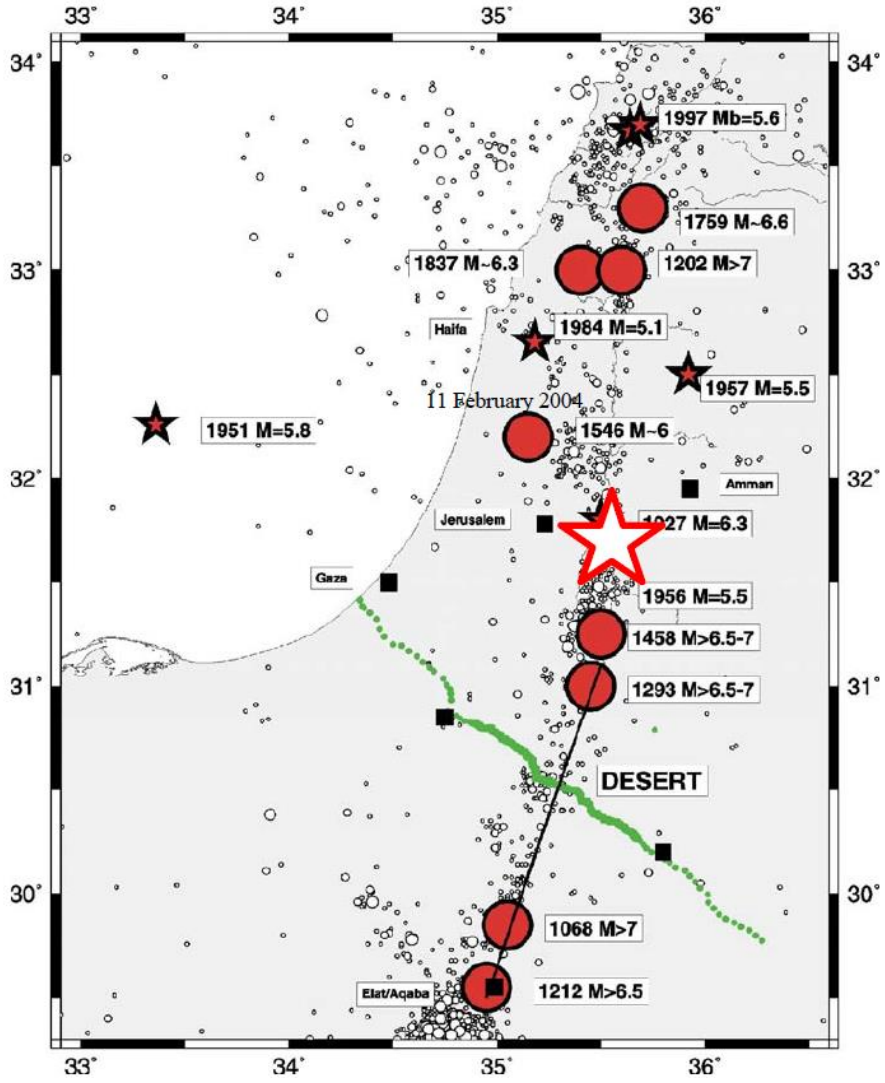

Figure 6: Seismicity map of the Dead Sea Transform region from 1000-2004. "The large star refers to the earthquake of 11 February 2004; other red circles refer to different earthquakes during this period" (Al-Dabbeek & El-Kelani, 2005, p. 2).

4.5.2.2. Recruitment of subjects and data collection

4.5.2.2.1 *Recruitment of subjects*

Ethical approval was obtained from the Human Subjects Ethics Application Review System (HSEARS) of The Hong Kong Polytechnic University, and the Institutional Review Board (IRB) at An-Najah National University, Palestine. The researcher and the research assistant were responsible for simple randomisation by drawing first the hospitals to allocate the intervention arm, then the hospitals to form the control arm based on the five hospitals in Nablus City and the Palestine Medical Complex. The hospitals, chosen based on randomization process, were contacted with an invitation letter explaining the study, aims, and procedures.

Following the agreement of the respective hospitals, related nursing managers of the Emergency Room (ER), intensive care unit (ICU), and trauma units were approached to aid in inviting the nurses there to participate in the study (convenience sampling at this level), and to ensure that the study purposes and design were fully explained to potential participants. Since the study used convenience sampling, the related nursing units in each hospital were reached unit by unit, until the required 84 nurses of each arm were recruited based on the inclusion and exclusion criteria, and joined the study.

4.5.2.2.2. *Data collection*

For the control arm, nurses from particular randomised hospitals who agreed to participate in the study received an envelope containing a set of questionnaires for pre-test (T_0) with the consent form, and the information sheet that explained the study, aims, confidentiality, anonymity of responses, non-maleficence, and the right to not continue the study at any time. After filling in the questionnaire, nurses returned their responses

before the training (T_0) in the envelope that had been provided, and sent it to the nursing manager in the respective hospitals. The research assistant and researcher (PhD candidate) collected the questionnaires from the nursing managers within two days. Questionnaires of T_1 were also provided to the nurses in advance, and they were reminded at the time to fill in the questionnaire and return it to the researchers. At the end of the study, the research assistant and the researcher reached the respective nurses who joined the control group to collect their responses post-test (T_1). For the intervention arm, 84 nurses who were required to participate in the study from the randomised intervention hospitals would be divided into three classes. Each training class had 25 - 30 nurses to participate in the group work interactions and dynamics.

As for the control arm, the intervention group completed pre-test (T_0) at the first training session, and for the convenience of a high response rate, the post-test was performed and collected immediately from the trainees after five weeks of training (T_1). It is important to mention here that that data collection performed by the researcher and the research assistant without any interference of the trainer during pre-test or post-test. In addition, all responses were anonymous. The flow of the hospitals' randomisation for the two arms and the participant recruitment are illustrated in Figure 7.

4.5.3. Models and Forms of Psychological First-Aid training

Psychological first aid is defined as a pragmatically oriented intervention for survivors, or even responders, targeting acute stress reactions and immediate needs (The NIMH, 2004). It is also an evidence-informed modular approach for assisting people in coping with the immediate aftermath of crises, to reduce initial distress, and to foster short- and long-term adaptive functioning and coping (Brymer et al., 2006).

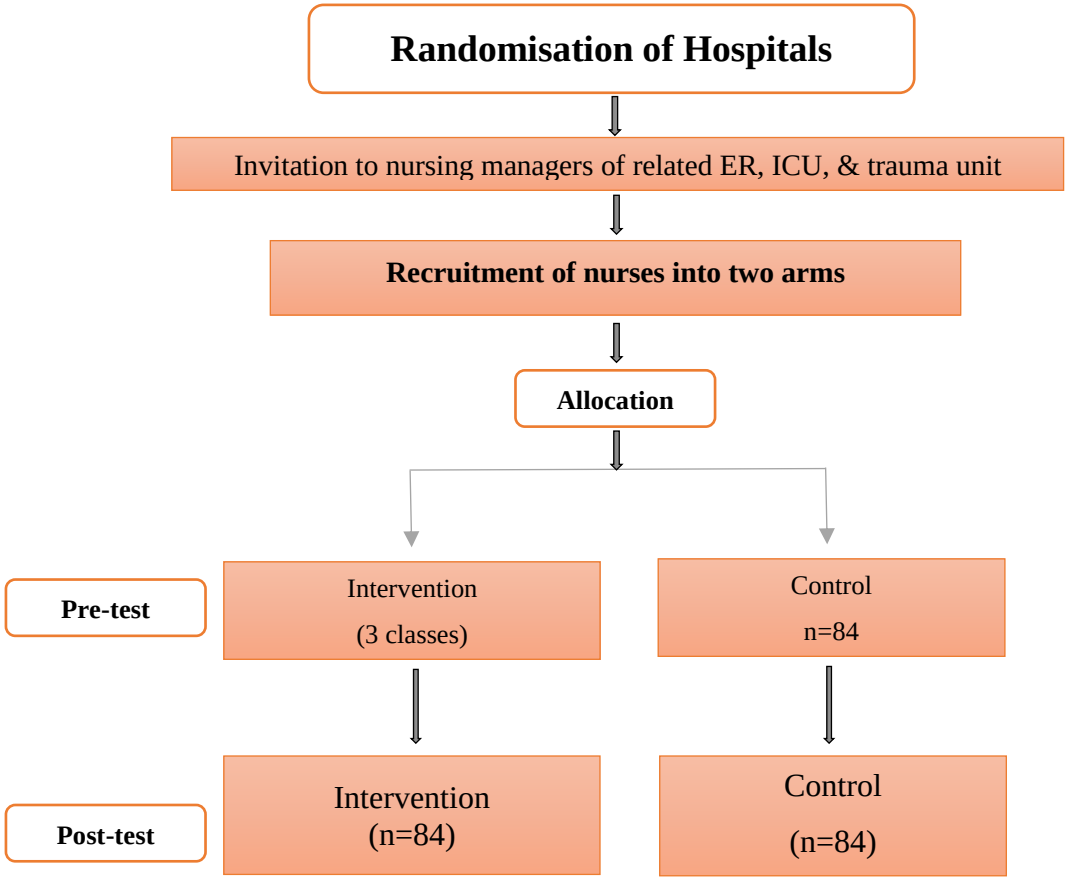

Figure 7: Flow of participant recruitment

Various forms of PFA training are available worldwide, such as McCabe et al. (2014a), who suggested a competence-based model of PFA training. They developed The Psychological First Aid (PFA) Competency Set 1.0. The Set is an 18-cell matrix of consensus-based and empirically supported Core Competencies of Knowledge, Skills, and Attitudes (KSA), which constitute six PFA competency domains of 1) initial contact, rapport building, and stabilisation; 2) brief assessment and triage; 3) intervention; 4) triage; 5) referral, liaison, and advocacy; and 6) self-awareness and self-care. Psychological First Aid generates positive outcomes and impacts on survivors and individuals in terms of safety, reduction of acute stress reactions and symptoms, maintaining rest and normal sleep, and connection to different resources, referrals or social resources (National Institute of Mental Health, 2002).

According to McCabe et al. (2014a), the KSA training in PFA should also support the empirically established elements of immediate mass trauma intervention (Hobfoll et al., 2007). With the consideration of these five elements and the six PFA competency domains, the appropriate PFA curriculum can be formed to drive the design and directions of outcome evaluation of the training programme for many types of psychological crises, and is suitable for training participants from different professions. They are also applicable to a broad range of disaster and traumatic events; pedagogically sound; and faithful to educational principles and comprehensive learning domains.

The cognitive learning domains in the McCabe et al. (2014a, b) competence model represent the mental skills pointing to knowledge. The psychomotor domain represents the physical activities of skills development. And the affective domains cover the feelings or emotions pointing to a change in attitude upon learning. McCabe et al. (2014 a, b) argued that the application of PFA training is appropriate for different types of psychological crises. Indeed, individuals may benefit from acquiring knowledge and skills after PFA training to respond to the psychological consequences of trauma. Further, the training may help in maximising self-resilience, in turn allowing them to help their families, friends, etc. (Butler, Panzer & Goldfrank, 2003).

4.5.4. The Intervention

4.5.4.1. Theoretical Framework of the Face-to-face Simulation and Role Play in the training

The Kolb's model of experiential learning (1984), which incorporates an inventory of learning styles, was adopted for the PFA training in this study. Learning is defined by

Kolb (1984) as “the process whereby knowledge is created through the transformation of experience” (p.38). And experiential learning is “a particular form of learning from life experience; often contrasted with lecture and classroom learning” (Kolb, 2015, p. xviii). Similar to action research and problem-based learning, individuals who learn from life experiences control their learning (Kolb, 2015). The Kolb's experiential learning theory (1984) works on two levels in terms of a four-stage cycle of learning, and four separate learning styles.

The stages of learning cycle (Figure 8) are used to guide the intervention design (PFA with face-to-face simulation) in this study. The learning cycle includes four stages, 1) Concrete Experience (nurses will practice PFA during their learning and training), 2) Reflective Observation of the new experience (nurses will reflect on their learning about PFA in their daily work), 3) Abstract Conceptualisation (new learning will allow nurses to conclude how the PFA they learn can help them and their patients), and 4) Active Experimentation (nurses will use their new leaning in their professional life), and the cycle begins again. Once the learners have achieved an adequate balance of the four stages during their learning experience, they will reach optimal and effective learning (Abdulwahed & Nagy, 2009; McLeod, 2017).

The adopted Kolb’s theory drives and contributes to maximising the learning of PFA training with face-to-face simulation. With integration of Kolb’s theory for experiential learning, the models of Zulch et al. (2012) for psychological preparedness, and Malkina-Pykh and Pykh (2013, 2015) psychological preparedness and personality variables, the theoretical framework for the part two study that drives the training intervention (modified RAPID-PFA) emerged (Figure 9).

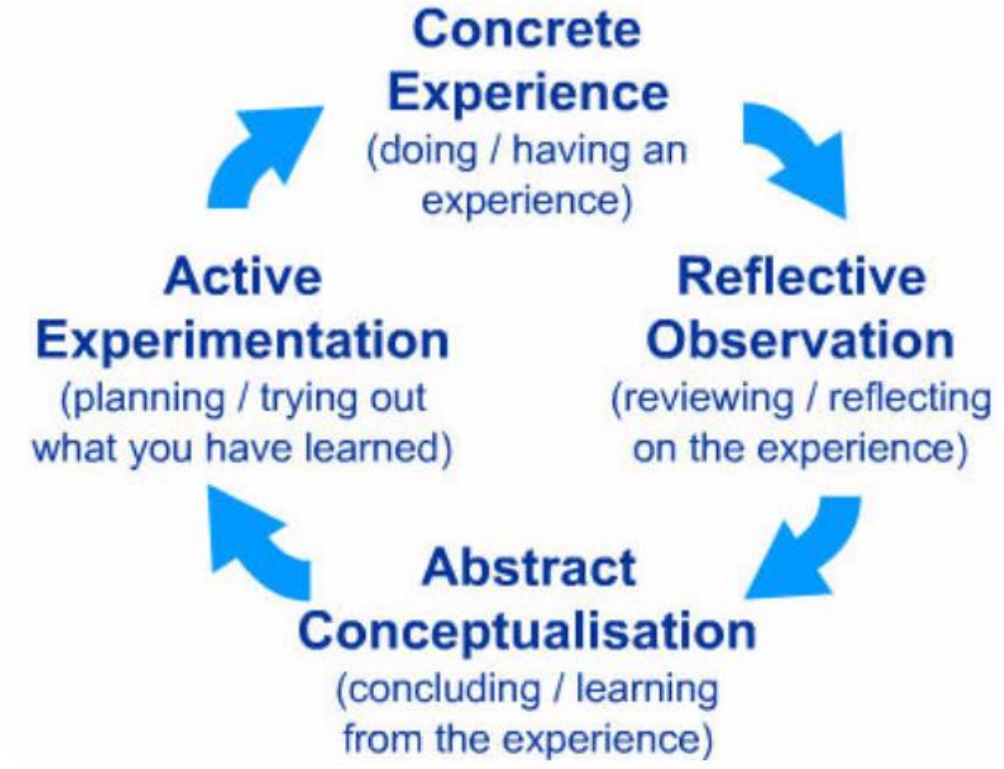

Figure 8: Kolb's experiential learning style (McLeod, 2017).

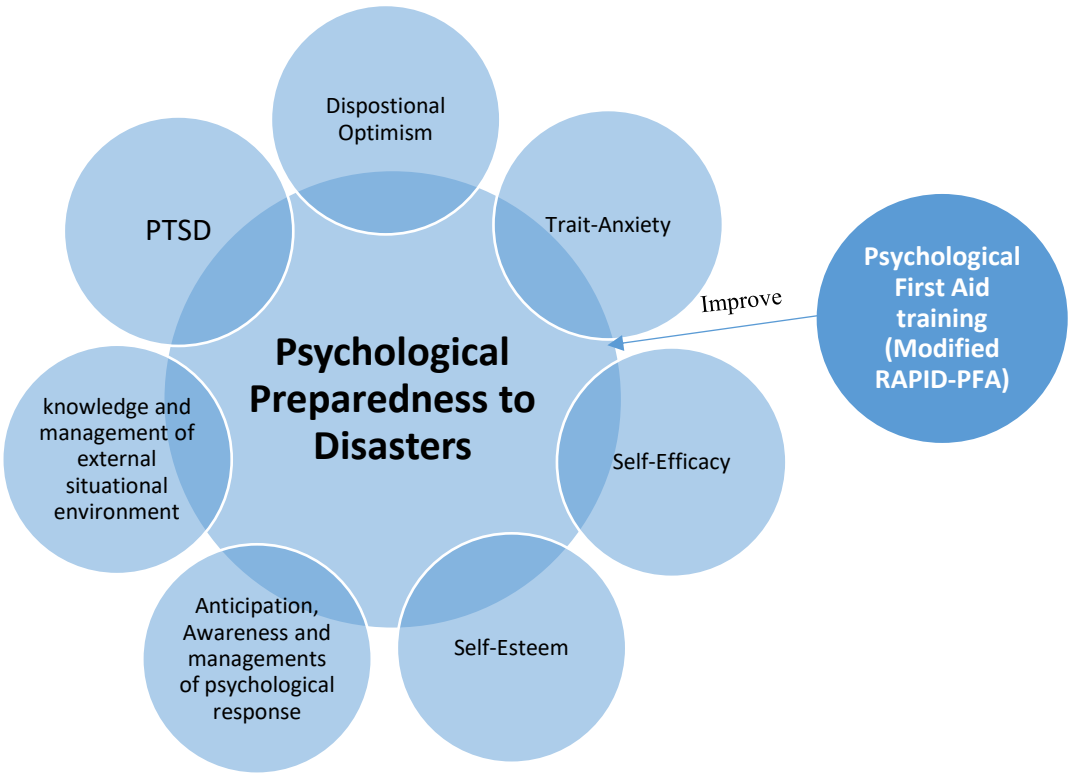

Figure 9: The theoretical framework of part two study involving PFA training application.

4.5.4.2. Pedagogy of the Intervention in terms of Simulation and Role Play

According to Glover (2014), simulation is a very general and flexible teaching approach that can be used in different disciplines. Learners may use simulation when they need to develop skills and experience. Simulation is a mechanism for learners to obtain real-time feedback on their actions and acts. And it refers to the emulation of real-world practices and processes in a safe environment. It aims to provide an experience as close to a 'real situation' as possible. Simulated activities have the advantage of allowing learners to reconstruct the scenario and try alternative strategies and approaches. This allows learners to develop experiences of specific situations by applying their wider learning and knowledge. Simulation learning is an active process through which participants, based on their current and past knowledge and experiences, construct new knowledge (Shapira-Lishchinsky, 2014).

Simulation has been used for a long time as a method for improving nurses' clinical training. It is a method for creating learning environments, to measure and improve understanding of the nature and frequency of errors (Wang, 2011). Although simulation training may be higher in cost and time, it allows practitioners to learn, practise, and gain experience in a safe and structured environment without risk to patients. It also allows educators a better context to ensure that the simulation achieves the learning outcomes (Zigmont, Kappus, & Sudikoff, 2011). Furthermore, following simulation, the presence of a debriefing session is essential to improve critical thinking and clinical reasoning (Xu & Zeng, 2016). Under Bloom's Taxonomy (1956), the abilities of synthesis and evaluation respectively are the highest levels in the learning hierarchy. It is important to enhance the learning process using the best learning techniques available in order to achieve the desired learning outcomes. Simulation learning can improve

learners' abilities in analysis and synthesis (Bloom, 1956). Furthermore, learning through simulation is experientially based (Kolb, 1984; 2015) and can maximise knowledge, attitude, and self-efficacy through the learning process (Lisko & O'del, 2010; Szeto, Haines, & Buchholz, 2016).

On the hand, role-playing provides a safe environment for learners to learn (Fry, Ketteridge, & Marshall, 2009). It has been widely used, especially in psychiatric education, which optimises teaching situations (Barney & Shea, 2007; McNaughton, Ravitz, Wadell, & Hodges, 2008). Role-play is defined as,

> *a planned learning activity where participants take on the role of individuals representing different perspectives (e.g. a mock interview) to meet learning outcomes related to empathy or to expose participants to a scenario in which they will have to take part 'for real' in the near future* (Fry, Ketteridge, & Marshall, 2009, p.509).

In general, role play is a useful teaching and learning tool (Feather & Fry, 2009) and one of active learning and teaching strategies that contributes positively to the learning process (Erturk, 2015; Sims, 2002). Active learning is "anything course-related that all students in a class session are called upon to do other than simply watching, listening and taking notes" (Felder & Brent, 2009, p. 2). Role-play, hence, provides an opportunity to motivate learners for education.

Types of role-play may include face-to-face exercises to be recorded and stored for the learning process, or the demonstration of real cases or something that could happen in

a managed way, to encourage learners to explore attitudes, personal behaviours and feelings as part of their professional development (McNaughton, Ravitz, Wadell, & Hodges, 2008). Learners can be directed to investigate, practise, and explore all sides of clinical interactions through active role-play as a simulation with clear roles, or watching a demonstration by experienced people using a pre-prepared recording (Feather & Fry, 2009).

Green and Blaszczynski (2012) considered role-play an effective strategy and activity for developing soft skills (e.g. personal qualities and attitudes). It is the best way to develop initiative, communication, problem solving, self-awareness, and cooperative teamworking skills (Blanter, 2009). Role-play also helps students to understand their education subjects better, and to integrate knowledge in action, by addressing problems, exploring alternatives, critical thinking and essential skills for therapeutic communication (Blatner, 2009; McNaughton, Ravitz, Wadell, & Hodges, 2008). Furthermore, the powerful emotions in role play during simulation might enhance learner development of empathy, respect, positive regard, and compassion (Martin & Khan, 1995).

Role play transforms the content of education from information into experience, and learners could feel a commitment to, and confident about learning. It contributes to non-verbal communication and enhances students' ability to think more about non-verbal communication; and it can be an effective way for learners to experience different practical situations of emotional attraction to the role-play scenarios, for a deeper reflection on learning (Kodotchigova, 2002). With intimation during the simulation, adequate debriefing, feedback and reflection, learners usually find role-play a useful learning technique (Feather & Fry, 2009; Shapira-Lishchinsky, 2014). Debriefing after

role play is also essential for trainers and learners to discuss the situation and the various perspectives of the individual characters, and allows time for trainers to provide useful feedback to students for development (Xu & Zeng, 2016).

Overall, with the benefits and importance of simulation and role-play in the nursing field, these learning methods were integrated with the RAPID-PFA training in order to have experiential learning in the real world. This integration would help nurses to connect theory with specific disaster situations, and contribute to developing their ability in RAPID-PFA application to enhance psychological preparedness for disasters. With this integration, nurses had encounters with anonymised cases of different situations related to conflicts in the area, which were practised in the scenario and role-playing sessions, with emphasis on a safe learning environment. In addition, nurses experienced different situations and were provided time to reflect on these experiences. By this application, nurses would develop better insights toward the PFA concepts. Furthermore, nurses who assimilated the personalities of PFA providers would learn and practise this application and retain this experiential learning practice for future applications. Other nurses explored ideas related to PFA application and were able to notice the relevance of this application.

4.5.4.3. Training with the Modified RAPID-PFA for part two

The part two study involved two arms:

1. Modified PFA training: This training programme is modified from the RAPID-PFA (Reflective Listening, Assessment, Prioritization, Intervention, and Disposition), developed by the Johns Hopkins Center for Public Health Preparedness (Everly et al., 2014; Everly & Lating, 2017). The modified

programme was nine hours, with interactive didactic lectures, group discussions, and the addition of simulation role play exercises based on disaster scenarios relevant to the Palestinian situation. The training provided nurses without formal mental health education the opportunity to acquire the concepts and skills associated with PFA. The content is shown in Table 4. Face-to-face training was chosen to be the preferred mode of delivery for, 1) nurses could have more in-depth understanding of PFA concepts, 2) the presence of scenario-based simulation would facilitate a greater understanding of victims' situations and nurses' roles, and 3) that questions and answers could be more immediately and productively dealt with in a group and debriefing following the simulation when compared to the online mode. For each face-to-face simulation section in the programme, participant nurses would have a chance to role play as a disaster victim / survivor, with another nurse as the first aider for experiential learning. After each simulation exercise, the trainer will direct the group for a discussion and debriefing.

2. Wait-listed control arm: Participating nurses in this arm were not included in the PFA training, and the evaluations were performed based on their existing nursing education and professional experience, but they would be on a waitlist for the modified RAPID-PFA training after the study.

Modules	RAPID Topics	RAPID Activities
Module 1 (Introduction)	- Terms and Concepts - Historical Context of Psychological First Aid - People and Nurses in Disasters	- Two lectures used PowerPoint slides and oral presentation - Video viewing: Full demonstration of PFA in action
Module 2 (Reflective Listening/Rapport)	- Process of Active Listening - Exhibit Empathy - Understanding of the Disaster Victims' Experience	- Two lectures used PowerPoint slides and oral presentations

Modules	RAPID Topics	RAPID Activities
	- How Reflective Listening Works	- One simulation combined with role-play followed by debriefing and discussion.
Module 3 (Assessment)	- Exploring the individual's capacity for adaptive mental and behavioural functioning - Brief assessment of factors affecting the recovery of adaptive functioning (such as the ability to understand instructions and follow directions, the ability to express emotions in a healthful and constructive manner, social adaptability, and the ability to access interpersonal resources)	- One lecture used PowerPoint slides and oral presentation. - One simulation combined with role-play followed by debriefing and discussion.
Module 4 (Prioritization)	- Prioritization of assessed functional needs (a triage step intended to plan and guide the intervention for disaster victims with physical, psychological, and behavioural reactions, aiming to improve the ability of the victims to perform the basic activities of daily living)	Lectures used PowerPoint slides - One lecture used PowerPoint slides and oral presentation. - One simulation combined with role-play followed by debriefing and discussion.
Module 5 (Intervention)	- Addressing physical and medical needs, - Different techniques to reduce and minimise acute distress related to disasters	- One lecture used PowerPoint slides and oral presentation. - One simulation combined with role-play followed by debriefing and discussion.
Module 6 (Disposition)	How to ensure that disaster victims restore functional capacity to engage in the basic activities of daily living (may need a referral to other clinical or social support)	- One lecture used PowerPoint slides and oral presentation. - One simulation combined with role play followed by debriefing and discussion.
Module 7 (Self-Care and Wrap-up)	- Self-Care [all training sessions end with this module, covering signs and symptoms of stress, and several techniques to manage (and prevent) them] - Summary of the PFA training	- Two lectures used PowerPoint slides and oral presentations.

Table 4: Contents of the modified RAPID-PFA training programme

This PFA training programme provides health care professionals who may be asked, or volunteer, to respond in a time of emergency with a perspective on injuries and trauma

during disasters that are beyond the physical ones. Furthermore, the programme varies in its application in public health settings, the workplace, mass disaster venues, and during the demands of traumatic events, e.g., dealing with adverse psychological consequences following disasters (Everly & Lating, 2017). Permission was obtained from the original authors to use the RAPID-PFA training programme for modification.

The PFA trainer who was invited to conduct the training was a licensed psychologist from the organisation Médecins Sans Frontières/Doctors Without Borders (MSF), Doctors of the World, or World Vision, who had extensive experience as an emergency and trauma responder. The lecture used Microsoft PowerPoint, entailed group discussions, role-playing, and debriefing to encourage active participation and learning. With the modification, the trainer followed the RAPID-PFA guidebook (Everly & Lating, 2017) to deliver the programme. The original programme is in English, and the training was verbally conducted in Arabic with English terms for most of the titles and steps in the model. Arabic is the mother tongue of the participating nurses, and was the most suitable language for training. The scenarios and cases used were in Arabic for the simulation and role play. The researcher collaborated with the trainer for simulation and role play, and all steps according to the guidebook, in order to assure the fidelity of the training. The researcher also provided assistance in all of the training sessions.

4.5.4.4. Conducting the modified RAPID-PFA training with the five essential elements of mass trauma intervention

Core competencies of the modified and adopted RAPID-PFA training incorporated the five essential elements of immediate mass trauma intervention (*safety*, *calming*, *self- and collective efficacy*, *connectedness*, and *hope*) as identified by Hobfoll et al. (2007). These elements were addressed by the trainer during training sessions in this study. The

PFA would promote a sense of *safety* that may reduce symptoms of stress (Fox et al., 2012) as it helps in establishing a supportive relationship with survivors (Allen et al., 2010). Also, by supporting and promoting safety, there is a reduction in the acute and long-term negative effects of disasters (Fox et al., 2012). Therefore, in the current training, trainee nurses received information on how to promote safety and comfort to reduce distress and worry. For example, nurses learned to contact people who could offer support and ensure safety and other necessary items, such as shelter, food, and water.

Calming is the decrease in arousal and the restoration of equilibrium after atraumatic event (Hobfoll et al., 2007). Promoting calming can lessen anxiety and the risks associated with anxiety, such as high arousal and numbing (Quitangon & Evces, 2015). Knowledge of disaster-related psychological reactions will lead nurses to be calm, and by being calm, nurses are able to think logically and seek proper solutions. During the PFA training, nurses learn to listen well and to be calm. They are also advised to consider the verbal and non-verbal communication of those affected by disasters. This will be a great support to people in distress.

Collective efficacy refers to the social interactions in which communities promote perceptions of *self-efficacy* among their members. These communities foster the perception that others are available to provide support, and those individuals in the community can recognise their own strengths and resources (Hobfoll et al., 2007). The perceived *self-efficacy* of the nurses included in the interventional study is a construct of *collective efficacy* (Benight, 2004), which is the performance capability of a group of people (Bandura, 1995). *Self-efficacy* is based on self-regulation of thoughts, behaviour, and emotions (Pekevski, 2013). This will help nurses in the mastery of future

challenges and the management of distress (Baker & Cormier, 2015; Quitangon & Evces, 2015) to better cope with the adverse effects of disaster (hence contributing to psychological preparedness). In addition, *self-efficacy* predicts self-esteem (Hajloo, 2014; Harorani et al., 2018), as in improving *self-efficacy,* self-esteem will rise.

Connectedness aids in increasing the chances for knowledge essential to disaster response, and more social support activities, such as mutual instruction on coping strategies (Hobfoll et al., 2007; Quitangon & Evces, 2015). By this, a sense of self- and collective efficacy is enhanced (Benight, 2004; Pekevski, 2013), and may support *hope* (Hobfoll et al., 2007). During the PFA training, nurses learn how to mobilise their own coping resources and are encouraged to connect with available resources and support that they may need. Social support is important, and nurses were encouraged to look for and connect with others like their relevant spiritual communities for the support and resources they needed to keep their families together. All support gives positive reinforcement to nurses, so they are more psychologically prepared when delivering disaster relief (Loke & Fung, 2014).

The last element is *hope,* for nurses and victims, as assisting people who are in need may increase a sense of hope. Hope will lead to optimism that leads to positive psychological outcomes following a traumatic event (Baker & Cormier, 2015; Pekevski, 2013; Quitangon & Evces, 2015). Nurses who attended the PFA training learnt to instill and foster *hope in* themselves, their colleagues, and their families through believing they can recover from these events, feeling that they can control their future, and even perceiving that the worst is in the past.

4.5.5. Instrument

Pre- and post-testing for evaluation were conducted in English Language to determine if psychological first aid training with the modified RAPID-PFA could achieve the following outcomes in participants that represented capability in psychological preparedness for disaster, (a) psychological preparedness; and (b) promotion of a sense of self-efficacy, dispositional optimism, trait anxiety, and self-esteem, and a change in PTSD. The measurement for part two contains four sections (Appendix III), and needed approximately 15 - 20 minutes to complete.

The *first section* covers participant demographics, including age, gender, education level, specialty, marital status, workplace (hospital, clinic), working department, current position, years of work experience, and working hours per week. For the *second part*, a self-report survey used by Everly et al. (2014) was administered to 1) measure PFA-related acquired 'knowledge' (10 items: 4 multiple choice and 6 true/false); 2) assess perceived self-efficacy in the application of PFA 'skills' (10 items); and 3) evaluate 'attitude' (self-confidence) as a PFA provider (10 items). The items are structured in a 5-point Likert scale (1 = very unconfident, 2 = unconfident, 3 =confident, 4 = very confident, 5 = don't know; or 1 = very unprepared, 2 = unprepared, 3 = prepared, 4 = very prepared, 5 = don't know). Internal consistency (Cronbach's alpha) of the self-efficacy and self-confidence sub-scales are 0.90 and 0.87 respectively. Permission has been obtained from the Johns Hopkins Center for Public Health Preparedness to use its instrument as the second part. The *third* part contained the General Self-Efficacy Scale, Self-Esteem Scale, The Life Orientation Test (LOT), Sate-trait Anxiety Inventory (STAI), and PTSD Diagnostic Scale for DSM-5, explained in part one study (section 3.4.5). For the last part, psychological preparedness will be measured using the Psychological Preparedness for Disaster Threat Scale (PPDTS) (Zulch et al., 2012) as described in section 3.4.5.

4.5.6. Data analysis

Statistical analysis was performed using SPSS, version 25 (IBM, 2017). Descriptive statistics were used to summarise participant characteristics. Normality of the PPDTS distribution was evaluated with skewness and kurtosis from the Shapiro-Wilk test. The Alpha was set at the level of $p < .05$. Chi-square and Mann-Whitney U test were used to check for any significant group differences in demographics and outcome variables between the control and experiment groups at baseline.

As the CONSORT guidelines for trials reporting recommend that both intention-to-treat (ITT) and per protocol (PP) principles should be analysed and be reported to interpret the effect of an intervention (Schulz et al., 2010), both principles were used for analysis and were reported to assure robustness of the findings. A sensitivity analysis was conducted to compare the results between ITT and PP. The ITT refers to analysing all participants in a trial in the group to which they had been allocated (Ranganathan, Pramesh, & Aggarwal, 2016; Roshan & Zenda, 2018), while the PP refers to analysing the participants who strictly adhered to the protocol (Hernán & Robins, 2017; Roshan & Zenda, 2018).

For ITT, missing data were replaced by values generated through imputations. First, patterns of the missing data were analysed with the Missing Value Patterns chart, based on where the missing values were located, to determine whether multiple imputation was needed (Harel et al., 2018), and to detect the percentage of missing values that would guide the number of imputations to be used (IBM, n.d.; Rubin, 1987; Rubin, 1996). Since multiple imputation is an iterated process, the Mersenne Twister was used to generate random numbers in order to reproduce results for the next step. Multiple imputation was then performed using an automatic function scan of the data to check

for monotonicity. In the current study, the data were not monotonic. Therefore, the fully conditional specification (FCS) method (creating several "complete" sets of data) with the imputations by the number of the percentage of missing values was performed. During each imputation, the missing values were imputed and at the end of all imputations, the values were averaged together to estimate the variance of the missing values. Finally, the required number of imputed datasets was generated. In summary, these imputations were built based on prediction of the non-missing values.

Generalized Estimating equations (GEE) model was used to assess any changes in the outcome variables between the control and experiment groups across the pre- and post-test study period (i.e. group by time interaction effect). It is a statistical method that accounts for correlation of responses within subject for response variables that is flexible enough for use in analysing response variables that are not normally distributed (Harrison & Hulin, 1989). In addition, it accounts for within-subject correlation of longitudinal data and allows for missing data and time-varying covariates (Hanley et al., 2003). In addition, adjustments were made for within-subject correlations by modelling changes over time rather than using absolute values at different time points (Twisk, 2013). The GEE provides robust analysis for the choice of a better working correlation structure, i.e. choosing the correlation structure or the independent correlation structure (Zeger & Liang, 1986). Since this study utilised a non-equivalent control group design with pre- and post-measurements of the subjects that were correlated as a repeated measure, the use of an independent correlation structure that assumed independent measurements was inappropriate. In order to choose the best fit set of model term (intercept) of the correlation structure in the analysis, the one in the correlation structure AR(1) with a smaller value between the Quasi-likelihood under Independence Model Criterion (QIC) or Corrected Quasi-likelihood under

Independence Model Criterion (QICC) was preferred (Cleophas & Zwinderman, 2018; IBM, n.d.).

After checking the distribution of normality, subgroup analyses with Wilcoxon signed-rank test was used to evaluate any differences between the post-test mean scores of primary outcomes within the respective control and experimental groups. Mann-Whitney U test was also used to compare these scores at different time points between the groups. Effect size estimates were calculated for the mean differences using Cohen's d, relating the mean score differences to the pooled standard deviation (Cohen, 1988).

4.6. Ethical Considerations (for the two studies)

After ethical clearance approvals were received from the Human Subjects Ethics Application Review System (HSEARS) of The Hong Kong Polytechnic University, and An-Najah National University/Palestine (Appendix IV), nurses in the participating hospitals were informed about the study and its objectives, and invited to participate in the study. The participating nurses were fully informed that their participation was completely voluntary, and their refusal to participate or their leaving the study at any time would have no negative consequences. Written consent was obtained from each participant after their agreement to take part in the study, and randomisation and allocation of study arms was subsequently performed. In addition, confidentiality and anonymity (without names, only represented by numbers) of nurses' responses were ensured. The completed questionnaires were placed in sealed envelopes and stored in a locked cabinet in a confidential facility at Najah University where other researchers store their documents, which can only be accessed by the relevant researchers. For the online survey, all completed questionnaires were stored through mySurvey via PolyU.

Randomisation of the hospitals was performed to establish an equal chance for them to be chosen for each arm of this study. Participating nurses in the respective PFA training programme benefited from the training and learning the new concepts, and saw improvement in their psychological preparedness. As the control group did not receive PFA training at this time, for fairness and to maximise the benefits, control group participants are wait-listed to attend the PFA training (if they prefer) when a new training session is held. Exposure to risk or harm in this study was removed. As for non-maleficence, no harm or adverse effects were reported by the participants in this study.

CHAPTER FIVE

Psychological preparedness for disasters among nurses with disaster field experience: An online international survey (Results and Discussion)

5.1. Introduction

This chapter reports the results of the first part of this study. Descriptive statistics; primary and secondary outcome analyses for the effects of training on psychological preparedness for disasters (PPDTS) and other dependent variables, including general self-efficacy (GSE), optimism (LOT), self-esteem (SES), trait anxiety (T-Anxiety), and post-traumatic stress disorder (PTSD); and regression analysis are presented, followed by discussion of the results from this part of the study.

5.2. Results[1]

5.2.1 Sample characteristics

Eighty-eight nurses responded to the online survey, with 64% of participants being female and 83.5% who were working full-time. Most of the nurses were from Indonesia (25%), followed by the U.S. (19.3%) and China (13.6%). A total of 72% were married; 39.8% held a master's degree, while 45.5% were clinical registered nurses, 37.5% were nurse educators, 5.7% were heads of departments, and 3.8% were licensed practical nurses. Their mean age was 43 years (SD = 12.13), with mean work experience of 18.3 years (SD = 12.95). The mean number of times responding to disasters was six (SD = 7.86) (Table 5). In terms of training, 85.1% of participants reported that they had

[1] Results of the phase one study were published in,

Said, N. B., Molassiotis, A., & Chiang, V. C. (2020). Psychological preparedness for disasters among nurses with disaster field experience: An international online survey. *International Journal of Disaster Risk Reduction*, 46, 101533. doi:10.1016/j.ijdrr.2020.101533

received training related to disasters. Among them, all had training in general disaster preparedness (85.1%), 59.1% had training in psychological preparedness, 53.4% in stress management, and 53.4% in disaster mental health preparedness (Table 6).

Table 5: Sample demographic characteristics (n = 88)

Demographics	n	%	Demographics	n	%
Gender			**Educational Level**		
Male	24	27.3	Diploma	4	4.5
Female	64	72.7	Bachelor	25	28.4
			Master	35	40.9
Work Status			Doctorate	23	26.1
Full-Time	74	84.1			
Part-Time	14	15.9	**Marital Status**		
			Single	18	20.5
Country			Married	62	70.5
Indonesia	22	25	Divorced	5	5.7
USA	17	19.3	Other	3	3.4
China	12	13.6			
Malta	7	8	**Others**	**M**	***SD***
Australia	5	5.7	Age	42.58	12.13
Palestine	4	4.5	Work Experience (in years)	18.34	12.95
Hong Kong	3	3.4	How many times have you responded to a disaster?	6.06	7.86
Japan	3	3.4			
Cook Islands	3	3.4			
Belgium	2	2.3	**Disaster type of response**		
Nepal	2	2.3	Earthquake	1.23	1.83
Thailand	2	2.3	Hurricanes/Tropical Storms/Tornadoes/Severe Storms	1.01	2.13
Israel	1	1.1			
Pakistan	1	1.1			
Papua New Guinea	1	1.1	Floods	.94	1.82
Philippines	1	1.1	Tsunami	.39	1.21
South Korea	1	1.1	Wildfires	.18	.59
			Volcanic eruptions	.45	1.33
			Incidents of Mass Violence/Terrorism	.56	1.49
			War	.37	.97
			Others	1.02	2.42

Table 6: Types and formats of disaster preparedness training (n=88)

Types of training	Yes n (%)	Formats of Training							
		In person			Online			Both	
		n	%	Mean Hours	n	%	Mean Hours	n	%
Did you receive any kind of training related to disaster?	75 (85.1)								
Training 1: General disaster preparedness	75 (85.1)	64	85.3	30	8	10.6	9.3	3	4.1
Training 2: Psychological preparedness	52 (59.1)	39	75	36.7	9	17.3	61.2	5	7.7
Training 3: Stress Management	47 (53.4)	32	68.1	38.9	12	25.55	67.6	2	4.25
Training 4: Disaster mental health preparedness	47 (53.4)	29	70.3	38	10	21.2	58	3	6.4

Item	Was the training Formal or Self-learning?					
	Formal*		Self-learning		Both	
	N	%	N	%	N	%
Training 1: General disaster preparedness	65	86.6	8	10.6	2	2.8
Training 2: Psychological preparedness	39	75	13	25	0	0
Training 3: Stress Management	31	63.9	15	31.9	1	2.1
Training 4: Disaster mental health preparedness	28	68.1	11	23.4	3	6.4

* Formal refers to a training provided/directed by workplace.

5.2.2. Descriptive statistics of primary (psychological preparedness) and secondary (self-efficacy, optimism, self-esteem, trait-anxiety, and post-traumatic stress disorder) outcomes

To identify to what extent nurses are psychologically prepared for disaster response, descriptive statistics was conducted for study outcomes. Respondents reported moderate mean scores in the PPDTS (M =43.1, SD=13.54), GSE (M = 32.77, SD=4.96), LOT (M = 14.84, SD=2.99), SES (M = 31.95, SD=4.32), T-Anxiety (M = 39.05, SD=9.58), and PTSD (M = 8.41, SD=10.3) (Table 7). Approximately half of respondents reported high psychological preparedness in terms of PPDTS (49.3%), and moderate optimism (52.9%). There were only approximately 9% reported moderate to severe PTSD symptoms (Figure 10).

Table 7: Correlation matrix of PPDTS and GSE, LOT, SES, T-anxiety, PTSD, age, work experience, and times responding to disasters.

	PPDTS	**GSE**	**LOT**	**SES**	**T-Anxiety**	**PTSD**
			Mean (SD)			
	43.1 (13.54)	32.77 (4.96)	14.84 (2.99)	31.95 (4.32)	39.05 (9.58)	8.41 (10.3)
PPDTS (n = 73)	1.000					
GSE (n = 70)	.75**	1.000				
LOT (n = 70)	.40**	.39**	1.000			
SES (n = 69)	.55**	.56**	.50**	1.000		
T-anxiety (n = 70)	-.41**	-.51**	-.53**	-.76*˜	1.000	
PTSD (n = 77)	-.38**^^	-.21˜˜	-.20˜˜	-.42**˜	.29*˜˜	1.000

	PPDTS	**Age**	**Work Experience**	**Times responding to disasters[1]**
			Mean (SD)	
	-	42.58 (12.13)	18.34 (12.95)	6.06 (7.86)
PPDTS scores (n = 73)	1.000			
Age (n = 85)	.47**^	1.000		
Work Experience (n = 88)	.40**^	.81^^^**	1.000	
How many times have you ever responded to a disaster? (n = 88)	.41**^^	.41**^^^	.50**	1.000

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
˜ n = 69 ˜˜ n = 70 ^ n = 71 ^^ n = 73 ^^^ n =85
(1) How many times have you ever responded to a disaster?
PPDTS: Psychological Preparedness for Disaster Threat Scale, GSE: General self-efficacy, LOT: Life Orientation Test, SES: Self-esteem, T-anxiety: Trait-Anxiety, PTSD: Post-traumatic stress disorder.

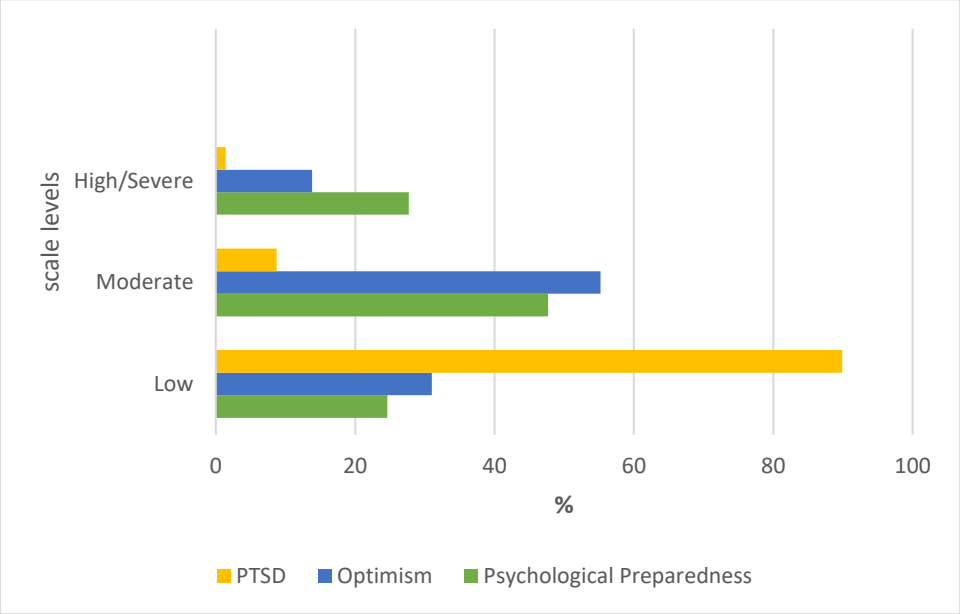

Figure 10: PPDTS and Optimism, and PTSD Levels

5.2.3. Psychological preparedness for disasters (PPDTS)

The effects of different types of training on PPDTS (psychological disaster preparedness) were investigated. Significantly higher PPDTS was found in the psychological preparedness trained group (U = 259, $p < 0.001$), as well as the disaster mental health preparedness trained group (U = 390, $p = 0.02$). The PPDTS scores were significantly higher in females ($U = 323.5$, $p = 0.028$).

To evaluate the extent of the psychological preparedness of nurses with disaster field experience in relation to self-efficacy, dispositional optimism, trait anxiety, and self-esteem, the correlations between PPDTS and GSE, LOT, trait anxiety, SES, and PTSD were investigated. There was a strong and statistically significant correlation between PPDTS and GSE ($r_s = 0.75$, $p < 0.01$), which reflects higher psychological preparedness being associated with higher self-efficacy. There were also moderate and significant correlations between PPDTS and LOT ($r_s = 0.40$, $p < 0.01$), and SES ($r_s = 0.55$, $p <$

0.01), which means that higher psychological preparedness was associated with optimism and self-esteem. This association was at a moderate level; whereas the PPDTS and trait anxiety scores and PTSD scores were inversely correlated (r_s = -0.41, p < 0.01, r_s = -0.38, p < 0.01 respectively) meaning that higher psychological preparedness was associated with lower trait anxiety and PTSD, and this association was at a moderate level (Table 7). In addition, there were significant correlations between PPDTS and age, work experience, and the number of times responding to disaster ($p < 0.01$). It may be concluded that nurses higher in age, work experience, and number of times responding to disaster show high psychological preparedness. From these results, the relationships between PPDTS and other variables were established (Figure 11).

For the effects of different types of training on PTSD, GSE, LOT, SES, and T-anxiety scores, the results showed that only GSE was significantly higher in nurses who had attended training in psychological preparedness (U = 357, p = 0.005), as well as training in disaster mental health preparedness (U = 418, p = 0.024). It may be concluded that with training in psychological and disaster mental health preparedness, nurses achieve higher self-efficacy scores.

The differences in PPDTS according to educational level, current job position, and workplace were examined. There was a significant difference in PPDTS scores between different levels of education [H(3) = 11.32, p < 0.01], with a mean rank score of 46.61 for those who held a doctorate, compared to 25.68 for bachelor graduates respectively (p = 0.01). This means that nurses with a doctoral education have higher psychological preparedness, i.e., with more education, nurses gain better psychological preparedness.

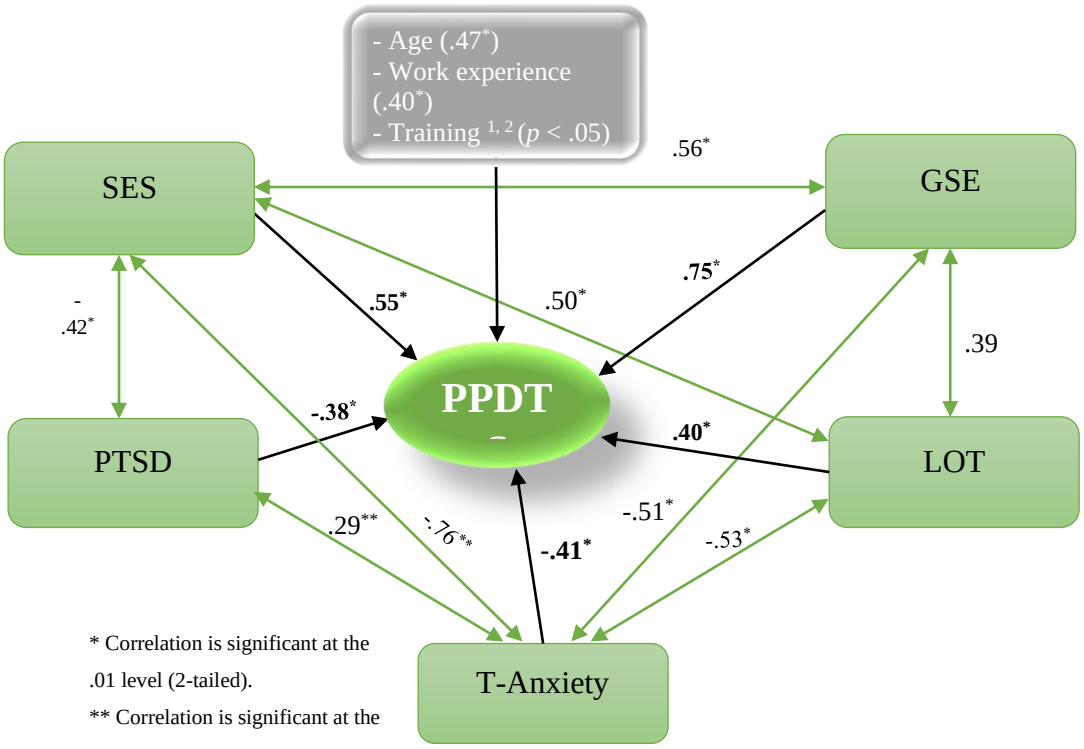

Figure 11: Relationships between PPDTS and other variables

Female nurses had received more training than male nurses in psychological preparedness (64.1% vs 45.8%, p < 0.05), and disaster mental health preparedness (57.8% vs 41.7%, p < 0.05); whereas training in general disaster preparedness (87.5% vs 79.2%), and stress management training (53.1% vs 54%) was similar in the two groups. Gender was found to have a significant impact on PPDTS (p = 0.034), and LOT (p = 0.027), with female nurses reporting higher mean scores than their male counterparts in PPDTS, LOT, and GSE (59.23 vs 49.77, 15.21 vs 13.77, and 33.36 vs 31.05 respectively). Trait anxiety (38.48 vs 40.72) and PTSD (8.01 vs 9.51) were lower in females compared to males, while SES was similar in females and males (31.97 vs 31.93), with no statistical significance observed.

5.2.4. Regression analysis

Despite the relatively small size of current sample, it is important to understand how much the dependent variable (primary outcome) has changed given the presence of different independent variables, and may lead to accurate and precise understanding of the association between these variables. According to G*power programme (Faul et al., 2009), the minimum sample size when effect size is 0.15, $\alpha = .05$, and to achieve 95% power for a multiple regression on 11 independent variables, was 74 respondents. Therefore, multiple regression analysis (Table 8) was used to examine whether GSE, LOT, SES, trait anxiety, PTSD, age, work experience, gender, education level, psychological preparedness training, and disaster mental health preparedness training significantly predicted PPDTS. Results of the regression analysis indicated that GSE, SES, gender, and psychological preparedness training were predictors that explained 64% of the PPDTS variance [$R^2 = 0.64$, $F(13, 53) = 9.79$, $p < 0.01$].

Table 8: Multiple Regression of the predictors of PPDTS

Variable	B	SE B	β	T	*p*
(Constant)	43.38	19.43	-	-2.23	.030
GSE	1.1	.27	.41	4.03	.000
LOT	.11	.42	.02	.26	.800
SES	.96	.38	.31	2.54	.014
Trait-anxiety	.23	.17	.16	1.35	.183
PTSD	-.2	.11	-.15	-1.74	.088
Age	.28	.15	.27	1.9	0.064
Work Experience	-.16	.14	-.16	-1.18	0.245
Gender	5.93	2.34	.2	2.53	0.014
Psychological preparedness training	-11.8	3.39	-.45	-3.48	0.001
Disaster mental health preparedness training	5.49	3.3	.21	1.66	0.102
Education levels					
LNP	2.98	5	.05	.6	0.554
Master	.63	2.88	.2	.23	0.822
Doctoral	1.32	3.28	.05	.4	0.690

PPDTS: Psychological Preparedness for Disaster Threat Scale, GSE: General self-efficacy, LOT: Life Orientation Test, SES: Self-esteem, T-Anxiety: Trait-Anxiety, PTSD: Post-traumatic stress disorder, LPN: Licensed practical nurse.

5.2.5. Summary

The results of part one suggested that nurses' need for psychological preparedness training and pre-disaster planning in order to strengthen their disaster response. Psychological first aid (PFA) training could ensure better adequacy of their knowledge and understanding of psychological preparedness and skills to be applied during a time of disaster. The results that were obtained proved to be in compliance with the adopted theoretical framework of Malkina-Pykh and Pykh (2015). The performed analyses confirmed the positive relationships between psychological preparedness and self-efficacy, dispositional optimism, and self-esteem; and negative relationships with T-anxiety and PTSD. Furthermore, the results of this part indicate the importance of these variables being focused for the content of the psychological first aid training performed in part two. The results also indicate that age, work experience, gender, and previous training in psychological preparedness and disaster mental health preparedness had contributed to psychological preparedness. These independent variables were compared at baseline between groups in the next part of evaluating the effects of psychological preparedness in responding to disasters after the psychological first aid training offered to Palestinian nurses.

5.3. **Discussion**

5.3.1. Introduction

This study identified the levels of psychological preparedness, with approximately half of the participating nurses perceiving a moderate to high level of psychological preparedness (Said et al., 2020). Psychological preparedness was related to experience (e.g. times responding to disasters), and age. It was also related to number of personality

variables, such as self-efficacy, self-esteem, trait-anxiety, and dispositional optimism; PTSD; types of training received; and gender.

5.3.2. Psychological preparedness in nurses with disaster relief experience

The development of psychological preparedness constitutes the main step protecting from the development of mental health problems, either for victims or nurses themselves, after a disaster. In this regard, psychological preparedness in international nurses with disaster relief experience was investigated in this first part of the study, with the aim of identifying to what extent nurses are psychologically prepared for disaster (Said et al., 2020), and to obtain results to be used to inform a better training intervention structure for the next part of this study.

Psychological aspects of disaster nursing were highlighted as important and a primary focus, in order to improve the psychosocial and mental health and well-being of nurses who assist in disasters (Agarwal et al., 2020; Ranse et al., 2014). Psychological preparedness is required in order to have success in disaster response and recovery efforts, and to limit the psychological impact of disasters (Guterman, 2005). There are also other studies highlighting the importance of psychological preparedness, and responders in these studies identified the need for psychological preparedness (Li et al., 2015; Yin et al., 2011; Xue et al., 2020; Yan et al., 2015). Despite the importance of this kind of preparedness, there is a limited number of studies that directly evaluate psychological preparedness and the effects of training for better disaster preparedness (i.e. Malkina-Pykh & Pykh; Zulch et al., 2013).

Participating nurses in this part of the study reported moderate levels of psychological preparedness. Generally speaking, nurses in different studies (Alzahrani & Kyratsis,

2017; Brewer et al., 2020; Li et al., 2015; Wenji, 2015) reported weak to moderate preparedness for disasters, including psychological preparedness. Similarly, in Li and colleagues' (2017) study, nurses reported a lack of psychological preparedness for the 2013 Ya'an earthquake. Given the weakness of such preparedness, it is important to enrich disaster preparedness with mental health preparation. James et al. (2020) and Welton-Mitchell, James, Khanal, and James (2018) found that the integration of mental health with disaster preparedness will have a positive effect on individuals, and may reduce symptoms associated with depression, anxiety, and PTSD. As a result, preparedness and mental health would be improved in those individuals. Nurses in the online survey had slightly more psychological preparedness when compared to those in the aforementioned studies. This may be due to different reasons. For example, nurses in our study had frequently participated in disaster relief. Furthermore, almost half had received training in psychological preparedness and disaster mental health preparedness. There were also two-thirds who had received training in disaster preparedness, in addition to having vast work experience. It seems these factors contributed to psychological preparedness in the respondent nurses.

In this study, individual differences were investigated to find any effect on psychological preparedness. There was a significant correlation between psychological preparedness and the number of times nurses had previously responded to disasters. This result is consistent with previous literature that indicated that prior experience with disasters meant having a higher perceived level of disaster preparedness, including the psychological aspects (Brewer et al., 2020; Usher et al., 2015a). The online survey also found a significant correlation between psychological preparedness and age, with older nurses having higher psychological preparedness. While this result is consistent with Usher et al. (2015a) and Özteki'n et al (2016), Brewer et al. (2020) found no correlation

with age. Given these results, it is most likely that individual differences, such as work experience and number of times responding to previous disasters, in terms of age, contributed to improvement in psychological preparedness. Different explanations of the contribution of these individual differences in psychological preparedness are raised. For example, disaster experience may help nurses in developing coping mechanisms, and these mechanisms contributed to having greater coping capacity, seeking more support, providing individuals with a realistic expectation of disasters, and motivating them for more preparedness (Boylan & Lawrence, 2020; Clode, 2010). Age also has an influence, as older individuals may have better knowledge related to disasters, how to be well prepared, and may have less emotional vulnerability. Therefore, older individuals could report greater psychological preparedness than those who are younger (Boylan, 2016; Clode, 2010).

5.3.3. Psychological preparedness, personality variables, and post-traumatic stress disorder (PTSD) in nurses with disaster relief experience

The current study adopted the Malkina-Pykh and Pykh (2015) framework, which holds that personality variables, including self-efficacy, dispositional optimism, self-esteem, and trait anxiety are key elements in the assessment of psychological preparedness. The literature has reported that PTSD has an adverse psychological effect on healthcare responders, in particular nurses who respond to disasters, and it is considered to be a negative psychological outcome (Naushad et al., 2019). Given the importance of investigating PTSD as an outcome rather than a personality variable, PTSD was added to the current study's theoretical framework. Furthermore, the literature has reported that the presence of PTSD could negatively influence preparedness for future disasters

(James et al., 2020; Thormar et al., 2013), possibly leading to more mental health problems.

5.3.3.1. Self-efficacy

Psychological preparedness was related to self-efficacy. Overall, nurses reported moderate to high mean self-efficacy. The presence of self-efficacy means greater ability to handle difficult situations (Jonson et al., 2017). This may explain why nurses' self-efficacy has a strong and positive correlation with PPTDS scores (Said, Molassiotis, & Chiang, 2020). Results related to self-efficacy were similar to Boylan (2016) and Clode (2010), who reported that self-efficacy can influence psychological preparedness, as efficacy is an important psychological attribute shaping the responses of individuals in a positive way when responding to disasters or emergency situations (Uhm et al., 2019; Yip et al., 2013). Through building or enhancing self-efficacy, nurses could improve their ability to connect to different resources and have more confidence in handling difficult situations, such as those arising from disasters (Yip et al., 2013); and this will enhance and support such preparedness (Errett et al., 2012).

5.3.3.2. Self-esteem and dispositional optimism

Similar to the study by Malkina-Pykh and Pykh (2015), the current study demonstrated a positive and moderate association of dispositional optimism and self-esteem in nurses with psychological preparedness. With higher optimism and self-esteem, people may also be less prone to neuroticism, which leads to lower emotional intensity and less anxiety (Bastianello, Pacico, & Hutz, 2014). Self-esteem serves as a buffer against the impact of negative influences, and may reduce mental health and social problems (Mann et al., 2004). Self-esteem may also reduce the chance of PTSD (Adams &

Boscarino, 2006), as it would enhance psychological coping capacity (Boylan, 2016) and contribute to the presence of higher psychological preparedness (Said et al., 2020). Most nurses in the online survey had a moderate level of dispositional optimism and self-esteem. It may be that optimistic people tend to have higher self-esteem (Scheier & Carver, 1985). Furthermore, optimism can contribute to a positive relationship with coping, in that it will enhance cognitive and emotional function (Karademas, 2006). Additionally, people with higher levels of optimism may even have less psychological distress and greater resilience to potential post-disaster psychopathology (Goldmann & Galea, 2014).

5.3.3.3. Trait-anxiety

The current study has found that psychological preparedness was negatively correlated with trait-anxiety. This finding is consistent with Malkina-Pykh and Pykh (2015), in that most nurses in the online survey had low levels of trait-anxiety. Anxiety is positively associated with traumatic exposure, and negatively associated with optimism and self-esteem (Besser et al., 2014). From the online survey, nurses with lower anxiety reported the presence of dispositional optimism and self-esteem (Said et al., 2020). Also, as revealed by this study, optimism may contribute to less anxiety and depression (Zeidner & Hammer, 1992). Similar to Thormar and colleagues (2013), the online survey (Said et al., 2020) found that age had an effect on anxiety, in that being older was predictive for lower anxiety. It appears that older individuals may accumulate the necessary knowledge and coping capacity (e.g. seeking support once needed) to combat anxiety. Moreover, work experience correlated inversely with trait-anxiety. It seems that with more experience, nurses are able to find strategies to reduce or prevent the

anxiety related to disasters. Therefore, reducing anxiety is important, since anxiety negatively affects preparedness (Mishra & Suar, 2012).

5.3.3.4. Post-traumatic stress disorder (PTSD)

Psychological preparedness was negatively correlated with PTSD. Our study showed that PTSD was moderately correlated with personality variables such as trait anxiety, and it had strong inverse correlations with general self-efficacy, dispositional optimism, and self-esteem (Said et al., 2020). It seems that trait anxiety may predict the development of PTSD (Hensley & Varela, 2008; Roberts et al., 2016). While the presence of dispositional optimism may have served as a protective factor against such symptoms (Conversano et al., 2010), trait anxiety has a negative effect on people exposed to a traumatic event. In particular, people with various degrees of self-confidence may experience higher or lower anxiety, which can influence episodes of post-traumatic stress symptoms and somatic symptoms that exert a negative effect on cognitive functionin g (Zeidner & Hammer, 1992).

Severity of PTSD appears to correspond to only 9% of nurses (Said et al., 2020), who reported moderate to severe symptoms of PTSD in the online survey (Figure 10). This level of PTSD is less than in other studies of nurses after a disaster experience. For example, Zhen et al. (2012) reported that 30% of the nurses who had responded to the Wenchuan earthquake relief experienced PTSD symptoms, with younger nurses reporting more psychological complaints compared to older ones (45% vs 35%). In Gaza following the military conflict in 2009 (Shamia, Thabet, & Vostanis, 2015), 19.7% of nurses experienced PTSD, and among them, 78.4% had witnessed severe injuries and deaths while at work. Nurses in this study reported less PTSD severity

compared to other studies, which may be due to different reasons. For example, the study showed that nurses had moderate levels of optimism; and optimism could protect against the development of PTSD (Conversano et al., 2010). Moreover, the presence of optimism and self-esteem can reduce psychological distress (Shaheen, 2015). As nurses in this study reported moderate levels of self-esteem, this may also reduce the severity of PTSD symptoms. On the other hand, being older and having more work experience could interfere with PTSD development. The mean work experience was 18 years. Nurses with more experience and knowledge of PTSD would have more ability to manage their stressors, especially those related to disaster relief (Tang et al., 2017). In addition, training related to disaster preparedness could introduce nurses to the knowledge and skills needed to handle the negative consequences of disasters, such as PTSD (Mishra & Suar, 2012), and as a result, nurses would experience less PTSD.

5.3.3.5. Theoretical framework of the current study

The current study conceptually adopted the disaster psychological preparedness framework of Malkina-Pykh and Pykh (2013). The online survey results were in line with the underpinning theoretical framework. As mentioned earlier in this discussion, PTSD was added to the adopted framework (Said et al., 2020). The integration of PTSD with the personality variables (self-efficacy, self-esteem, dispositional optimism, and trait anxiety) of the Malkina-Pykh and Pykh (2013) framework provided a new framework to assess the psychological preparedness of nurses for disaster. The new framework was used to guide the assessment of psychological preparedness in the online survey. It was found a useful guide in assessing nurses' psychological preparedness for disasters in relation to how each variable attributed to such preparedness. In addition, the integrated framework may be replicated and considered

a foundation for the further development of a measurement instrument for psychological preparedness in future studies.

In summary, psychological preparedness is an important component of a comprehensive disaster response. The findings of the current study reveal the need to enhance psychological preparedness. In addition, building and enhancing self-efficacy, self-esteem, and dispositional optimism; and minimising trait anxiety and PTSD can contribute to enhancing psychological preparedness. It is important for nurses to acquire the essential skills to face adverse psychological situations (Sijbrandij et al., 2020; Brooks et al., 2018; Guterman, 2005), which can help them to better care for others and for themselves during stressful situations such as a disaster (Said et al., 2020). This study therefore advances a new framework with an additional element (PTSD) introduced into such framework for investigating psychological preparedness of nurses for disasters. This is not only proposed as measurement of the included elements, and an attempt to include appropriate elements to study psychological preparedness. The survey (study one) adds to the limited body of evidence on nurses' psychological preparedness for disaster from the perspectives of nurses in a larger number of countries. The impact of self-efficacy, self-esteem, dispositional optimism, trait anxiety, and PTSD experience on psychological preparedness for disaster should be evaluated with a larger sample in future, to further substantiate the preliminary findings of this survey (Said et al., 2020).

5.3.4. Disaster preparedness training of nurses

An important question to ask is whether training for psychological preparedness, or disaster mental health preparedness, would enhance nurses' dispositional optimism, self-esteem, and self-efficacy; and reduce anxiety and PTSD while and after responding to disasters. Findings from this study showed that training for psychological

preparedness and disaster mental health preparedness were significantly correlated (Figure 11), and both may significantly enhance psychological preparedness. In addition, nurses received more general disaster preparedness training than those with training for psychological preparedness. Training in general disaster preparedness and psychological preparedness was more common in female than in male nurses. The results also showed that nurses who received psychological preparedness training through self-learning were two times more than general disaster preparedness. The issues around disaster related training (on psychological preparedness, general disaster preparedness, and disaster mental health preparedness) among nurses with disaster relief experience and self-learning are discussed below.

5.3.4.1. Disaster related training among nurses with disaster relief experience

Disaster mental health preparedness and psychological preparedness aim to protect individuals from adverse psychological effects arising from disasters. Receiving training for such preparedness is important for a better disaster response, and protecting against the negative psychological consequences of disaster (Roudini, Khankeh, & Witruk, 2017). Approximately half of respondent nurses in the online survey were trained in psychological preparedness, and a similar proportion was trained in disaster mental health preparedness.

The literature did not specify training that aids psychological preparedness (Brooks et al., 2018). In the current study, nurses who responded to the survey did not highlight or mention which specific psychological training (e.g. psychological first aid training) that they were involved in. Therefore, the lack of such information limits the ability to

critique the relationship between the particular types of training for psychological preparedness.

Both disaster mental health preparedness or psychological preparedness training have an aim to prepare individuals mentally for coming chaotic events or disasters, mitigate long-term consequences, and be able to respond to immediate emotional distress (Roudini, Khankeh, & Witruk, 2017). While both these targets of training have similarities, the current study results show significant correlation between both kinds of preparedness training and psychological preparedness. The integration of mental health and disaster preparedness in intervention is effective in improving individuals' mental health and preparedness (James et al., 2020). There is a need to focus on the mental health aspect to develop disaster preparedness.

As reported in the results chapter, approximately half of nurses had received psychological preparedness training, and this proportion was still less than those trained in general disaster preparedness. The smaller proportion of training in psychological preparedness compared to general disaster preparedness in the nurses in the online survey may be due to the nurses believing that their role mainly involved physical care in a disaster response, and their focus was on their patients rather than on themselves. For example, although Alzahrani and Kyratsis (2017) found that only 20% of participating nurses considered that their main role during a disaster was to provide psychological care, approximately 30% of the nurses who participated in another descriptive study considered psychological care their second priority after saving lives, with 24% considering a need for psychological domain skills training to ensure nurse competence in disaster relief (Yan et al., 2015). On the other hand, the familiarity of

nurses in Japan with psychological interventions and their ability to implement them, was found to be low (M=2.04, SD=1.006) on a scale of "1" (lowest) to "6" (highest) (Özteki'n et al., 2016). Only around 13% of nurses perceived an educational need for "peri-trauma counseling", and 3.5% for "post-traumatic psychological care" (Labrague et al., 2017). Also, in another study, nurses reported that they felt unprepared in relation to performing a focused PTSD health assessment, and felt only moderately prepared to provide education on coping skills, stress, abnormal functioning related to trauma, post-disaster physiological interventions such as support groups and debriefing, and the management of PTSD signs and symptoms (Brewer et al., 2020). Nurses were even found to be under stress and faced different psychological problems themselves, and were in need to be psychologically prepared (Xue et al., 2020). Therefore, in addition to general disaster preparedness, improving nurses' psychological preparedness through training is a priority in disaster preparedness.

Female nurses had more training in general disaster preparedness and psychological preparedness than their male counterparts. This may be because female nurses have higher needs related to training (Wu et al., 2019). This need may arise from the fact that females have a limited role in planning responses and in overall decision-making processes (Cvetković et al., 2018). It is also possible that females, who typically have more housekeeping responsibilities, need to have more training related to disasters in order to respond to disasters and keep their families safe (Cvetković et al., 2018). In addition, male nurses may tend to work extra shifts or overtime, so they have less time to participate in preparedness training. Overall, disaster mental health preparedness and psychological preparedness could be integrated into any disaster preparedness plans, to ensure that nurses are well trained in the psychological aspects of disaster preparedness for an effective disaster response.

5.3.4.2. Self-learning in training

Self-learning appears to be more common, as such training is mostly available online, self-directed, and more convenient to use. This may also indicate a lower availability of formal training for psychological preparedness, or that general disaster preparedness training indeed has less of a focus on the psychological aspects of disaster preparedness (Said et al., 2020). Training for nurses, such as with simulated disaster exercises, may enhance self-efficacy (Jonson et al., 2017), and can contribute to better psychological preparedness. This kind of pedagogy can be practically used for such training, as in the part two study, in order to pursue stronger outcomes (Said et al., 2020).

5.3.5. Gender differences among nurses with disaster relief experience

Notably from the survey (Said et al., 2020), female nurses showed higher psychological preparedness and self-efficacy, lower trait anxiety, and relatively less experience of PTSD. These results can be explained by their higher dispositional optimism than males, and their more open and willing nature to share their feelings and thoughts with others (Sharma & Kaushik, 2016). This may be a result of better social support, as females usually perceive more social support than males (Kendler, Myers, & Prescott, 2005) and optimism is positively correlated with seeking social support (Scheier, Weintraub, & Carver, 1986). Being more open and optimistic may help them in actively seeking advice and support from others, contributing to the alleviation of PTSD and anxiety. In contrast, some male nurses may prefer to keep their emotions and thoughts inside (Said et al., 2020), and try to solve problems by themselves (Sharma & Kaushik, 2016). It might also be the training that female nurses received, and more disaster relief experience compared to male nurses in this study, playing a positive role in improving

self-efficacy, dispositional optimism, and self-esteem with better psychological preparedness.

5.4. Limitations

Study one recruited participants through an international online survey, it was conducted in the English language. However, some nurses from different countries might have found English challenging to respond to, which may have led to their non-participation in the study. Second, the study had a relatively small sample size despite of using an electronic survey that might reach larger population with snowball sampling to maximise the participation. The small sample size may induce a decrease in statistical power. Third, there may have been self-selection bias that impact on generalization of results from the online survey (Althubaiti, 2016; Kidd, Colley, & Dennis, 2019), as respondent nurses who have been affected by psychological reactions may not have been willing to respond. Availability of resources such as computers may also have affected the willingness of potential participants to join the study, especially when their available computers are shared between clinical colleagues (Kidd, Colley, & Dennis, 2019). Furthermore, self-reported data, as in this study, inherently reflect self-perceptions that can be biased (Althubaiti, 2016). Despite the fact that the survey was anonymous, there is a possibility that respondents want to show good qualities such as having high self-esteem (Rosenman, Tennekoon, & Hill, 2011). For example, if a respondent nurse had attempted to maintain a consistent model of self (e.g. always having a positive self-view), this would lead to a biased self-assessment. It is also unclear whether there were recall biases when participants are asked to report previous experiences (Althubaiti, 2016). Lastly, the study is a survey, which does not assume a cause and effect relationship in training and psychological preparedness (Said et al., 2020). With possibility of the aforesaid bias, the quality of evidence substantiated from

this study may be questionable. Further investigation that overcomes the sources of bias will be needed. Overall, better design and way the data are corrected and analysed, and accurate report of the results can influence the quality of survey (Lau & Kuziemsky, 2017; Turk et al., 2018).

5.5. Implications

5.5.1. Implications for practice

Hospitals and healthcare institutions have a major role to play in disaster preparedness. They must ensure that disaster emergency plans address the unique health care needs of nurses related to psychological aspects, and overcome the barriers and challenges that hinder proper pre-disaster planning for an effective response (Khankeh et al., 2011). In addition, they must identify suitable strategies (e.g. cooperation with other concerned organisations) for improving disaster preparedness, in particular the psychological aspects (Roudini, Khankeh, & Witruk, 2017). Integrating psychological preparedness into disaster preparedness policies and practices may help individuals cope with the psychological distress experienced during or after a disaster, and could strengthen disaster management practices overall (Zulch et al., 2012). There is also a need to establish strategies designed to monitor and evaluate the effectiveness of activities that aim to improve psychological preparedness.

For hospital administrators, it is important to consider assessing PTSD and trait anxiety in staff nurses who have been involved in a disaster response, in order to provide support and consultations to those who may suffer from such symptoms (Said et al., 2020). This will enable them to continue providing effective care and prevent them from developing mental health issues.

As revealed by the study results, it is recommended that hospitals and healthcare institutions need to place more emphasis on enhancing self-efficacy, self-esteem, and dispositional optimism, and minimising trait-anxiety and PTSD by providing more continuous education opportunities and relevant support groups. Hospitals could have continuous plans to investigate and improve those personality variables and PTSD accordingly, and to evaluate the efficiency and effectiveness of these plans.

5.5.2. Implications for education

Nursing curricula at the post-graduate, graduate, and undergraduate levels should be updated according to new evidence in the disaster preparedness field, and appropriate continuing education programmes (Aliakbari et al., 2014; Bahrami, Aliakbari, & Aein, 2014; Mishra & Suar, 2011) could be offered in order to introduce nurses to the new evidence, in particular the psychological evidence, related to disaster preparedness. These continuing education programmes may also help nurses increase their knowledge of disaster mental health and their comfort in discussing mental health issues arising from disasters (Cianelli et al., 2013). Disaster education could also reduce the adverse effects of anxiety (Mishra & Suar, 2012). Simulated disaster scenarios could be integrated with such curricula for nursing education, in order to strengthen nurses' preparedness for disasters (Tzeng et al., 2016).

Psychological preparedness can be also included as a learning outcome of post-graduate, graduate, and undergraduate nursing programmes. Additionally, nursing education can focus on the outcome variables that have been found to have effects on improving psychological preparedness. These include self-efficacy, self-esteem, dispositional optimism, trait-anxiety, and PTSD.

In connection with pre-disaster planning to strengthen nurses' disaster response, hospitals should assess nurses' training needs in disaster preparedness (Aliakbari et al., 2014), and offer better psychological preparedness training opportunities (Bahrami, Aliakbari, & Aein, 2014). These may either be face-to-face or online. The training should have the goal of developing psychological preparedness along with general disaster preparedness, including, but not limited to, disaster planning in the workplace and community, and the skills needed during a disaster for proper assessment and communication (Said & Chiang, 2020).

5.5.3. Implications for research

As the online survey faced different limitations, it is important in future studies to overcome them. With relevant language translation of the tools, the study can be replicated in countries suffered from frequent disasters. It is likely that more nurses will join the study without a language barrier. This may ensure larger sample size that increased the statistical power. In addition, a longitudinal study is highly recommended for future research. This would help in eliminating the common method variance (CMV) bias that may arise (Rindfleisch et al., 2008).

Communicating target nurses through emails, phones, and any possible mean of communication to encourage them to participate in such study in future in a random selection to minimize self-selection effects aiming to reduce the bias related to self-selection (Sutton & Edlund, 2019). Finally, to minimize the recall bias, it is important to consider a shorter recall period when assessing nurses in future (Althubaiti, 2016).

5.6. Key findings that inform the application of study two

The results of the international online survey (part one) provide an overview of psychological preparedness for disaster, as perceived by nurses in different countries with disaster relief experience. This part was important in determining to what extend nurses are prepared psychologically for disasters, to identify effect of previous training on improving such preparedness, and to evaluate other effects of the included independent variables (self-efficacy, dispositional optimism, self-esteem trait-anxiety, and PTSD) on preparedness. The modified framework adopted to inform the survey (Figure 4) was successful in evaluating psychological preparedness for disasters. The findings so discovered provide promising preliminary evidence of the importance of considering self-efficacy, self-esteem, optimism, trait-anxiety, and PTSD in assessing psychological preparedness. Findings of this study also shown that greater psychological preparedness was linked to training in psychological preparedness. Psychological preparedness of nurses can be defined as a state of awareness, anticipation and readiness for any unexpected and emotional arousal from disasters. This preparedness can be enhanced in the presence of self-efficacy, self-esteem, and dispositional optimism; and with less trait anxiety and PTSD. After the survey was completed, the findings were used to inform the second part of this study. These findings substantiated the three objectives set for the next part. First, the findings proved the positive relationship of psychological preparedness with self-efficacy, dispositional optimism, and self-esteem; and negative relationship with T-anxiety and PTSD. Second, the findings showed that previous training in psychological preparedness and disaster mental health preparedness had contributed to psychological preparedness.

As the online survey emphasised the positive correlation of psychological preparedness with psychological preparedness training (as outlined in Chapter Five), and the modified framework as presented offered a means for measuring and evaluating

psychological preparedness and understanding its place in the course of intervention application, researchers of this study continued as planned for the conduction of a training programme that would enhance the psychological preparedness of nurses. Such training should provide individuals with the needed skills that limit the psychological consequences of those events (Guterman, 2005). After reviewing the literature, psychological first aid (PFA) training has been found to be one of the programmes that may have positive impact on psychological preparedness for disasters, which would be provided by professional healthcare workers in general (Everly et al., 2014). In addition, PFA training is considered to be an early intervention that aids in psychological support during disasters and chaotic events (Pekevski, 2013; Shultz & Forbes, 2014). It can improve knowledge and understanding of psychosocial support strategies (Sijbrandij et al., 2020). Therefore, the training was considered to be a way to improve the psychological preparedness of nurses in disasters, and was implemented in part two of this study to evaluate the effectiveness. Furthermore, the personality variables included in the online survey were used in the assessment of psychological first aid training outcomes.

CHAPTER SIX

Psychological First Aid Training of Nurses for Disaster Preparedness: A non-equivalent control group study
(Results and Discussion)

6.1. Introduction

The findings from a scoping review (Chapter two) revealed the paucity of research concerning nurses' psychological preparedness for disasters. Nurses need to be prepared psychologically to confront disaster and provide psychological support. This is essential in preparing for unpredictable disasters. The review showed that there was no consensus related to particular training that would improve psychological preparedness of nurses for disasters. Studies included in the review applied a variety of programmes. In search of the benefits of appropriate training, this study investigated psychological first aid (PFA) training capacity that would improve psychological preparedness of nurses for disasters.

In this chapter, participant characteristics and the effects of the PFA training programme on primary and secondary outcomes are presented after the GEE analysis. The sensitivity analysis, and post hoc analyses are followed with the summary of results. Discussion of the results are then provided with critical analysis and comparison with the literature. At the end of this chapter, limitations of the part two study and implications are raised.

6.2. Results

According to sample size calculations, the number of nurses required was 84 nurses for each study group. After simple randomisation of five hospitals into the experimental (n = 3) and control (n = 2) arms, all 168 nurses who were invited to take part in this study agreed to join. Therefore, a total of 168 nurses was allocated into the two respective

study groups, in which 84 nurses were conveniently allocated to each arm (Table 9). In the experimental group, nine nurses dropped out at baseline. A total of 75 nurses ultimately joined and completed the training programme, with a completion rate of 100%. All filled in the questionnaires at baseline, but six empty questionnaires were received after the intervention (69 were completed). In the control group, there were also nine drop-outs, and 75 nurses returned the questionnaires at baseline, with 68 questionnaires returned post-test. Figure 12 illustrates the flow of recruitment, group allocation, and post-test of participants in accordance with CONSORT guidelines. Data were analysed based on the ITT principle for 75 nurses in the experimental group and 75 nurses in the control group.

Table 9: Formation of the experimental and control groups

	Experimental arm (n = 3)			**Control arm (n = 2)**		
Hospital type / Unit	ER	ICU	Surgical	ER	ICU	Surgical
Public Hospital 2	6	11	10			
Private Hospital 1	9	14	5			
Private Hospital 2	8	15	6			
Number of nurses recruited	84					
Public Hospital 1				11	15	10
University Hospital				15	21	12
Number of nurses recruited				84		

ER: Emergency Department, ICU: Intensive Care Unit, Surgical: Surgical Departments

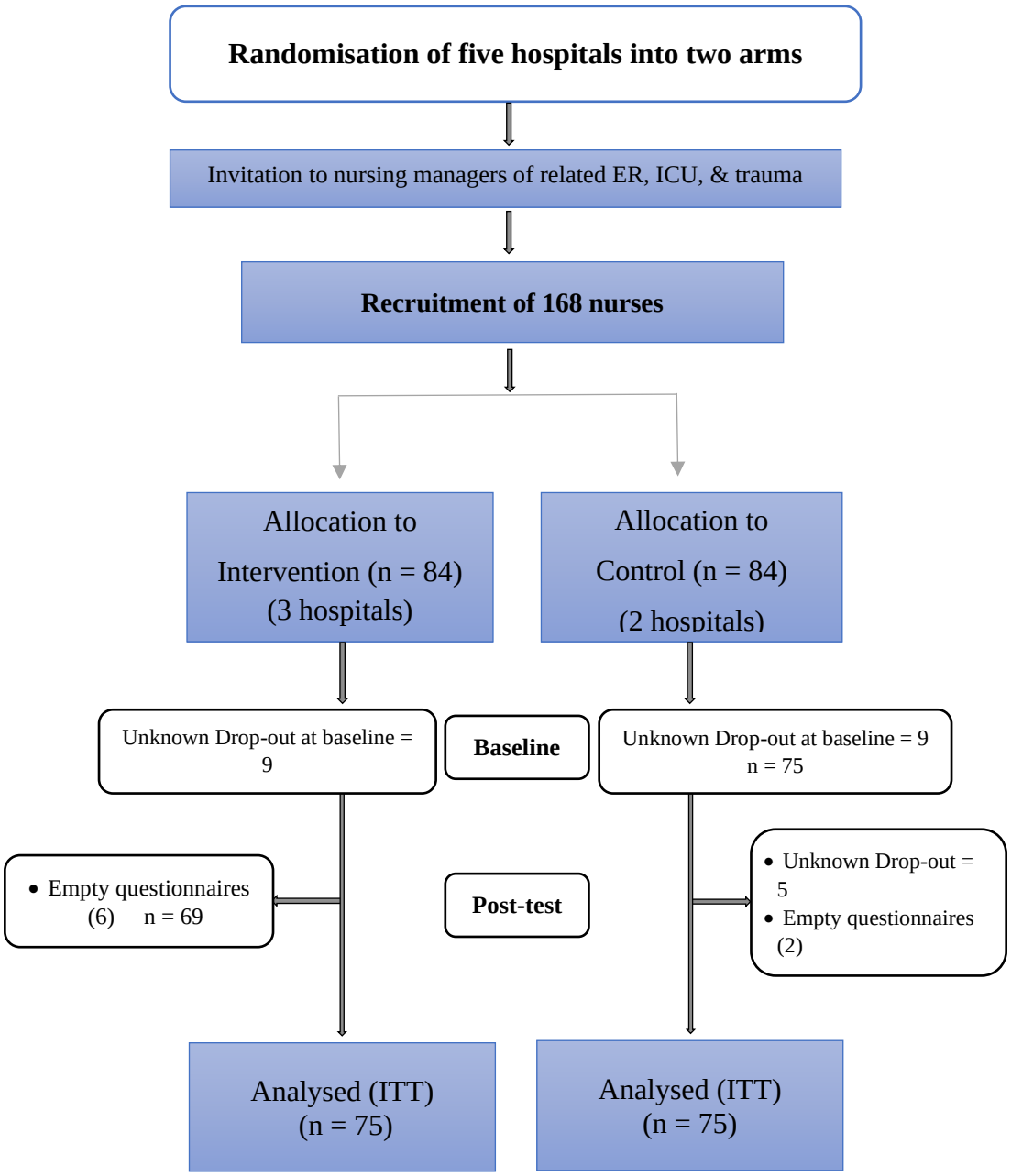

Figure 12: Recruitment and number of participants at baseline and post-test

6.2.1. Participant characteristics

Summary of participant demographic characteristics (n = 75 nurses for each group) at baseline by group is shown in Table 10. There were no significant differences between groups in terms of age, gender, marital status, and work experience at baseline. A majority of participants had a bachelor's degree (57.3% and 61.3% in respective groups), with few nurses having received disaster training in the control group (4%) or

experimental group (4%). In the control group, 41.3% of nurses were from public hospitals and 58.7% from a university hospital. On the other hand, there were 69.3% from private hospitals and 30.7% from public hospitals in the experimental group. Only the workplace was significantly different between the experimental and control groups at baseline ($p < 0.001$).

Table 10: Profile of participant demographic characteristics by group at baseline

Demographics	**Control n = 75**	**Intervention n = 75**		
	Mean (SD)/ No. (%)	Mean (SD)/ No. (%)	χ^2/U	*p*
Age	28.72 (5.59)	28.49 (7.96)	2266	.052
Work Experience	6.57 (5.01)	6.75 (7.36)	2418.5	.137
Gender			.027	.870
Male	47 (56)	45 (52.2)		
Female	37 (44)	39 (46.4)		
Marital Status			3.56	.313
Single	41 (54.7)	47 (62.7)		
Married	31 (41.3)	28 (37.3)		
Divorce	2(2.7)	-		
Education level			.62	.733
Diploma	27 (35.5)	26 (34.7)		
Bachelor	43 (57.3)	46 (61.3)		
Master	5 (6.7)	3 (4)		
Workplace			97.19	.000
Public Hospital	31 (41.3)	23 (30.7)		
Private Hospital	0	52 (69.3)		
University Hospital	44 (58.7)	0		
Work Department			1.54	.464
ER	27 (36)	20 (26.7)		
ICU	32 (42.7)	36 (48)		
Surgical department	16 (21.3)	19 (25.3)		
Current Position			.73	.865
Registered Nurse (RN)	48 (64)	44 (58.7)		
Licensed practical nurse (LPN)	23 (30.7)	25 (33.3)		
Ward Manger (Head of Department)	3 (4)	4 (5.3)		
Educator	1 (1.3)	2 (2.7)		
Did you experience disaster? (Yes)	3 (4)	3 (4)	.000	.988
Did you receive any kind of training related to psychological preparedness (Yes)	0	3 (4)	3.06	.08

Demographics	Control n = 75	Intervention n = 75		
	Mean (SD)/ No. (%)	Mean (SD)/ No. (%)	χ^2/U	*p*
Did you receive any kind of training related to disasters in general? (Yes)	5 (6.7)	11 (14.7)	2.52	.113

ER: Emergency Department, ICU: Intensive Care Unit, $\chi^{2:}$ Chi Square, U: Mann-Whitney

The outcome variables of PPTDS (primary outcome), PFA evaluation (attitudes, skills, and knowledge), GSE, LOT, T-Anxiety, SES, and PTSD were also compared between groups at baseline. Attitudes, skills, knowledge, T-Anxiety, and PTSD were found to be significantly different between the two groups ($p < .05$) (Table 11).

Table 11: Outcome variables by group at baseline

Outcome variable	Total n = 150	Control n = 75	Intervention n = 75		
	Mean (SD)	Mean (SD)	Mean (SD)	*U*	*P*
PPDTS	32.99 (8.27)	32.39 (7.37)	33.48 (8.74)	2613	.453
PFA Evaluation					
Attitudes	21.26 (3.83)	21.57 (3.33)	20.63 (3.94)	2258	.036
Skills	21.43 (3.66)	22.08 (3.12)	20.33 (3.46)	1952.5	.001
Knowledge	4.29 (1.49)	4.55 (1.3)	3.89 (1.31)	1957	.001
GSE	25.79 (5.33)	25.97 (5.57)	25.63 (5.09)	2749.5	.812
LOT	20.97 (3.63)	21.28 (3.77)	20.79 (3.51)	2634.5	.501
T-Anxiety	47.3 (5.27)	46.29 (5.5)	48.14 (4.68)	2254.5	.048
SES	27.26 (3.79)	27.75 (4.09)	26.76 (3.32)	2441.5	.202
PTSD	21.09 (14.53)	24.75 (13.72)	19.29 (14.12)	2131.5	.010

U: Mann-Whitney

Symptom severity of PTSD between groups at baseline and post-test is shown in Figure 13. The results showed that approximately 48% of nurses in the control group had moderate PTSD, and 8% severe, at baseline. Those with moderate PTSD decreased to 46% and those at the severe level remained at 8% post-test. On the other hand, 65% of nurses in the intervention group had mild to minimal, and 8% severe, PTSD at baseline. There was respectively an increase to 69.3% of the mild to minimal level, and a decrease in the severe level to 4% post-test.

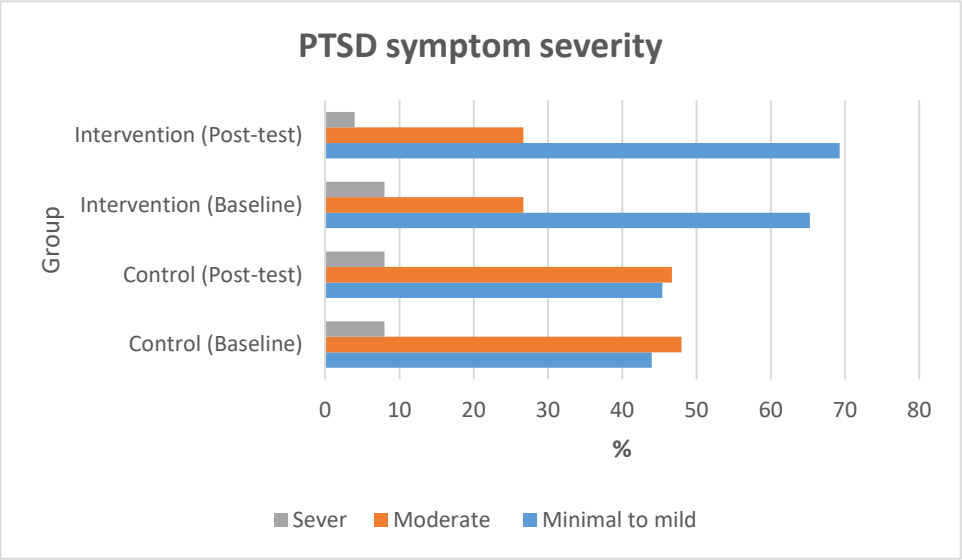

Figure 13: PTSD symptom severity among study groups

6.2.2. Primary outcome – PPDTS

Generalized Estimating equations (GEE) model was conducted with the ITT principle to assess any difference in psychological preparedness (PPDTS) between the control and experimental groups across the pre-test and post-test study periods (group and time interaction effect). This evaluated the extent of nurses' psychological preparedness before and after the PFA training, and evaluated nurses' self-efficacy, self-esteem, dispositional optimism, and trait-anxiety with PFA training compared to the control group. In the current study, the percentage of missing values was 8%. Therefore, based on the fully conditional specification (FCS), eight imputations were conducted with eight sets of substituted missing values generated for analysis. The covariates included the attitudes, skills, and knowledge of PFA evaluation, T-Anxiety, and PTSD. Although the workplace was also significantly different between the groups at baseline, there were also similarities between those places, such as a commitment to creating plans and policies to assure the quality of care provided to patients and regulating staff performance; creating a work environment to enhance staff satisfaction and productivity; staff development through ongoing training, workshops, and continuing education; staff financial stability in salary and promotions; and continuous

development, such as community and organisational relations. Furthermore, all hospitals included in the study have emergency departments, intensive care units, and trauma units. In this regard, workplace is not included as a covariate for analysis with GEE.

Regarding the goodness of fit of the working correlation structures (GEE analysis based on ITT principle), the Independence Model Criterion for the correlation structure as an autoregressive process [AR(1)] was considered. The Quasi-likelihood under Independence Model Criterion (QIC) and Corrected Quasi- likelihood under Independence Model Criterion (QICC) for AR(1) were 18,333.27 and 18,332.51 respectively for the primary outcome (PPDTS). As a model criterion with a smaller value is preferred (IBM, n.d.), the QICC was therefore selected for analysis.

The GEE estimates of adjusted mean and standard error (SE) of psychological preparedness (PPDTS) for the two study periods among the experimental and control groups was 37.81 (SE = 0.86, 95% CI 36.12 – 39.49) and 32.64 (SE = 0.95, 95% CI 30.77 – 34.51) respectively. The PPDTS did not differ significantly between groups (B = -3, 95% CI -8.66 – 2.66, p = 0.298), and there was no significant difference by time effect between groups (B = .01, 95% CI -.56 - .58, p = 0.968). However, there was a significant difference in group by time effect in PPDTS between the control and experimental groups across baseline and post-test (B = 4.9, 95% CI 1.16 - 9.74, p = 0.013) (Table 12). This means there was a significant effect for the psychological first aid training, i.e. for everyone unit increase in the training, there was about a 4.9 increase in the PPDTS score.

Table 12: General equation estimation model of psychological preparedness (PPDTS), GSE, LOT, T-Anxiety, SES, PFA Evaluation (Attitudes, Skills, and Knowledge), and PTSD by group and time effect (adjusted model using ITT)

Outcomes	Parameter Estimates of the GEE models											
	Group Effect				Time Effect				Group by Time effect			
	B (95% CI)	*SE*	*Wald* χ^2	*p*	B (95% CI)	*SE*	*Wald* χ^2	*p*	B (95% CI)	*SE*	*Wald* χ^2	*p*
PPDTS	-3 (-8.66-2.66)	2.89	1.1	.298	.01 (-.56-.58)	.29	.002	.968	4.9 (1.16-9.74)	2.19	6.19	.013
GSE	-2.3 (-5.32-.73)	1.54	2.22	.136	.1 (-.14-.35)	.13	.66	.418	2.3 (.18-4.41)	1.08	4.53	.033
LOT	-.09 (-2.8-2.63)	1.39	.004	.003	.25 (-.026-.52)	.14	3.15	.076	.16 (-1.76-2.08)	.98	.03	.009
T-Anxiety	9.12 (4.88-13.36)	2.16	17.75	.000	1.36 (.29-2.44)	.55	6.16	.013	-7.33 (-10.66--3.99)	1.7	18.53	.000
SES	-.87 (-3.52-1.78)	1.35	.41	.843	.23 (-.21-.67)	.22	1.06	.008	.08 (-2.01-2.17)	1.07	.01	.938
PFA Evaluation												
Attitudes	-6.74 (-12.03--1.45)	2.7	6.24	.012	.1 (-.19-.39)	.15	.47	.492	6.65 (2.31-11)	2.22	9.02	.003
Skills	-7.86 (-13--2.16)	2.91	7.29	.007	.25 (-.06-.55)	.15	2.53	.112	6.86 (2.14-11.57	2.41	8.12	.004
Knowledge	-5.04 (-6.49--3.59)	.74	46.12	.000	.04 (-.13-.21)	.09	.2	.622	4.68 (3.63-5.73)	.53	76.62	.000
PTSD	-7 (-14.98-.97)	4.07	2.97	.085	-.92 (-1.69--.16)	.39	5.57	.018	1.53 (-4.07-7.12)	2.86	.29	.593

PPDTS: Psychological Preparedness for Disaster Threat Scale, GSE: General self-efficacy, LOT: Life Orientation Test, SES: Self-esteem, T-anxiety: Trait-Anxiety, PTSD: Post-traumatic stress disorder, PFA: Psychological First Aid, ITT: Intention-to-Treat.

The GEE estimates of adjusted mean of psychological preparedness (PPDTS) over time, with covariates between the control and intervention groups after estimates of standard errors, are shown in Figure 14. The level of psychological preparedness increased significantly in the intervention group from baseline to post-test, while the control group remained unchanged.

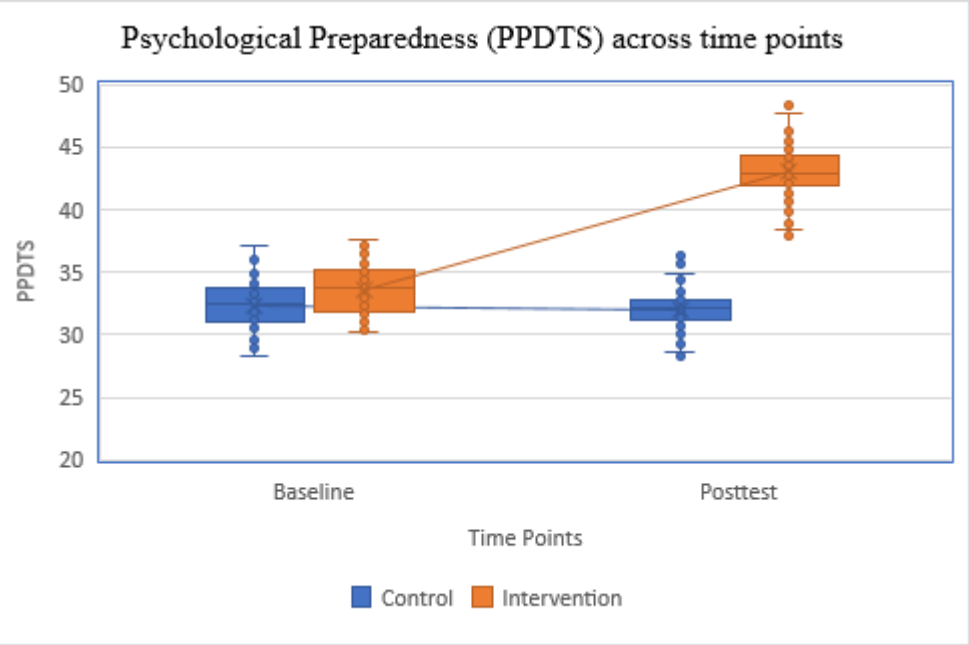

Figure 14: Levels of psychological preparedness (PPDTS) for intervention and control groups before and after training

6.2.3. Secondary outcome – LOT

The optimism (LOT) differed significantly between groups (B = -.09, 95% CI -28-2.63, p = 0.003), and group by time (B = .16, 95% CI (-1.76-2.08, p = 0.009). The results revealed a significant effect for the PFA training, as for every one point increase in the pretest LOT score, there is an approximate 0.16 increase in the LOT score post-test. However, when controlling the time effect, the LOT reduced by 0.09 point, which is trivial. Figure 15 shows the significant increase of LOT from baseline to post-test in the intervention group, while the control group remained unchanged.

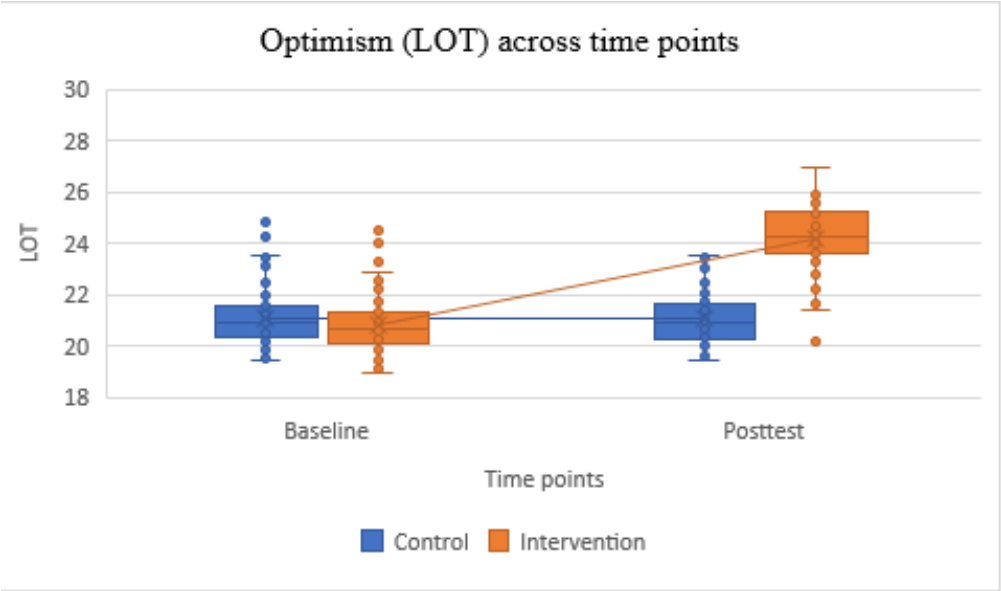

Figure 15: Levels of optimism (LOT) for intervention and control groups before and after training

6.2.4. Second outcome – SES and GSE

The self-esteem (SES) by time effect indicated a significant difference (B = .23, 95% CI -.21-.67, p = 0.008). In addition, the group by time effect differed significantly in self-efficacy (GSE) (B = 2.3, 95% CI .18-4.41, p = 0.033) (Table 12). These results indicate there is a significant effect for the PFA training, for every one unit increase in the training there is a 2.3 increase in the GSE score at post-test. When controlling for group membership, the SES increased by 0.23 point. Figure 16 shows the increase in SES from baseline to post-test of the intervention group, without a change in the control group. Figure 17 shows a significant increase in GES in the intervention group from the baseline to post-test, while the control group remained unchanged.

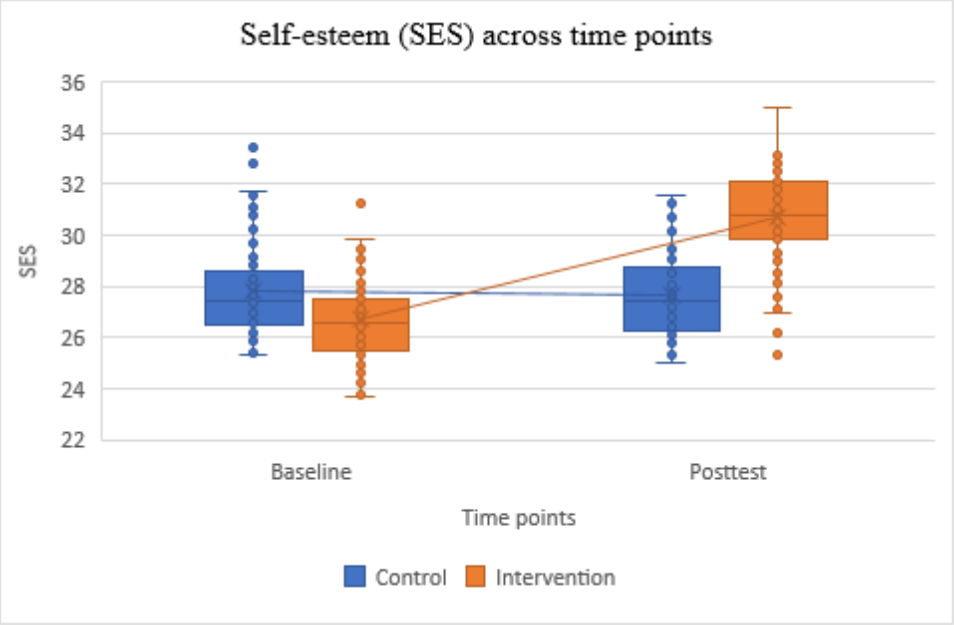

Figure 16: Levels of self-esteem (SES) for intervention and control groups before and after training

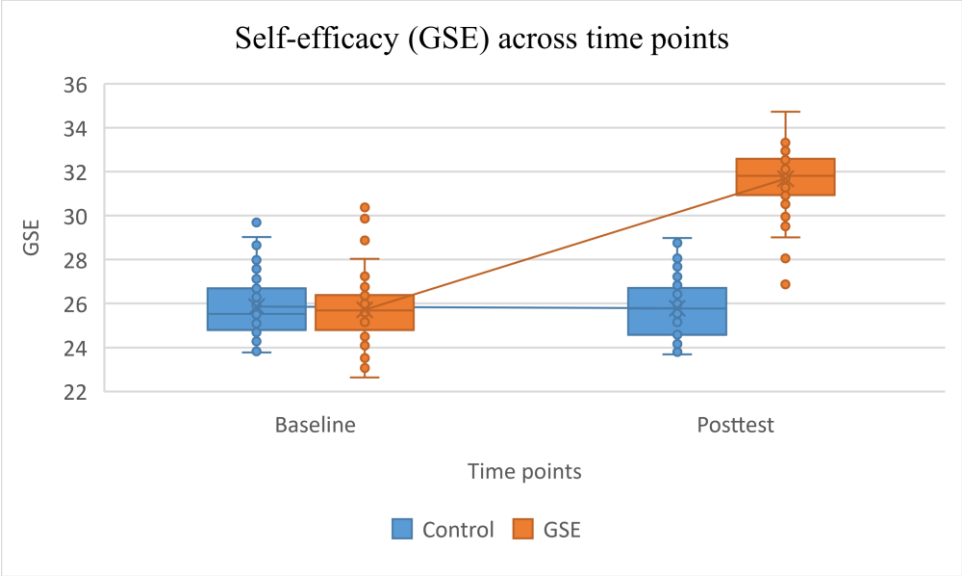

Figure 17: Levels of self-efficacy (GSE) for intervention and control groups before and after training

6.2.5. Sensitivity analysis

Although the adjusted model (using the ITT principle) increased estimation precision of the intervention effect by time, sensitivity analysis was conducted to compare the original model (using the per protocol / PP principle) to assess the robustness of the findings. Table 13 presents the GEE results of the original model.

For the original model with PP (Table 13), the results were consistent with those of the ITT model, except that PPDTS did not differ significantly in group by time effect (B = -.265, 95% CI -7.05-6.52, p = 0.939). Optimism (LOT) also did not differ significantly between groups (B = -2.82, 95% CI -7.38-1.74, p = 0.225), and group by time (B = 3.01, 95% CI -.69-6.71, p = 0.111). This means that the PFA training did not impose an effect on PPDTS and LOT. Whereas, self-esteem (SES) was statistically significant in the group, and group by time effects respectively (B = 4.72, 95% CI .78-8.66, p = 0.019; B = -3.1, 95% CI -6.13-.005, p = 0.05). The results reveal there is a significant effect for the PFA training, as for every one unit increase in training, there is a 4.72 increase in the SES score post-test when controlling for time, and which decreased by 3.1 points when considering time and group membership. Essentially, for the primary outcome (PPDTS), the ITT model is stronger in group by time effect, which was significant (Table 12) when compared to the original model. The group by time effect of GSE was also found to be significant when compared with those of the original model.

Table 13: General equation estimation model of psychological preparedness (PPDTS), GSE, LOT, T-Anxiety, SES, PFA Evaluation (Attitudes, Skills, and Knowledge), and PTSD by group and time effect (original model using PP)

Outcomes	Parameter Estimates of the GEE models											
	Group Effect				Time Effect				Group by Time effect			
	B (95% CI)	*SE*	*Wald* χ^2	*p*	B (95% CI)	*SE*	*Wald* χ^2	*p*	B (95% CI)	*SE*	*Wald* χ^2	*p*
PPDTS	-.622 (-9.93-8.68)	4.75	.017	.896	.744 (-.07-1.57)	.42	3.09	.079	-.265 (-7.05-6.52)	3.46	.006	.939
GSE	.18 (-6.05-6.41)	3.18	.003	.955	.33 (-.18-.85)	.26	1.62	.203	-.02 (-5.02-4.98)	2.55	.000	.994
LOT	-2.82 (-7.38-1.74)	2.33	1.47	.225	.04 (-.47-.56)	.26	.03	.868	3.01 (-.69-6.71)	1.89	72.54	.111
T-Anxiety	12.99 (7.39-18.59)	2.86	20.65	.000	2.19 (1.22-3.16)	.49	19.6	.000	-7.25 (-11.54--2.97)	2.19	10.99	.001
SES	4.72 (.78-8.66)	.31	.5.5	.019	.82 (.23-1.41)	.31	7.5	.006	-3.1 (-6.13-.005)	1.6	.3.83	.050
PFA Evaluation												
Attitudes	-2.46 (-5.3-.38)	1.45	2.88	.090	-.12 (-.02-.25)	.07	2.92	.088	2.81 (.53-5.1)	1.18	5.82	.016
Skills	-14.19 (-16.8--11.5)	1.37	107.6	.000	-.07 (-.20-.03)	.06	.2.18	.140	12.63 (10.85-14.41)	.91	193.4	.000
Knowledge	-5.39 (-6.25--4.53)	.55	151.5	.000	.1 (-.01-.21)	.06	3.22	.973	5.26 (4.82-5.7)	.22	547.1	.000
PTSD	-3.68 (-17.26-9.89)	6.92	.28	.595	.080 (-.51-.67)	.30	.07	.792	-3.94 (-15.92-8.04)	6.11	.42	.519

PPDTS: Psychological Preparedness for Disaster Threat Scale, GSE: General self-efficacy, LOT: Life Orientation Test, SES: Self-esteem, T-anxiety: Trait-Anxiety, PTSD: Post-traumatic stress disorder, PFA: Psychological First Aid, PP: Per protocol.

6.2.6. *Post hoc* analysis

6.2.6.1. *Post hoc* analysis of the primary outcome

The means of PPDTS out of a total score of 60 on the PPDTS scale among nurses in the control were 32.32 at baseline (T0) and 31.96 post-test (T1) ($z = -5.45$, $p > .05$); whereas 33.52 in the experimental group at baseline increased to 43.09 at T1 ($z = 6.6$, $p < 0.05$). No significant change was seen in the control group over time within-group. Subgroup analysis between-group showed statistically significant differences between the experimental and control groups in PPDTS at post-test ($U = 3772$, $p < 0.05$), with the experimental group having a higher mean rank. In comparison with the subgroup analysis results obtained by the GEE, there was also a significant difference between the experimental and control groups in PPDTS post-test (Wald $\chi^2 = 13.04$, $p < 0.05$). Descriptive statistics and differences between groups post-test of the other outcomes (GSE, LOT, and SES) at T0 and T1 for each group are provided in Table 14.

Table 14: Between group differences for primary and secondary outcomes (after multiple imputation of missing data)

	Group (n=75 for each group)	**Pre-test M (SD)**	**Post-test M (SD)**	**(Wilcoxon signed-rank test) Z (*p*)**	**Difference between groups post-test (Mann–Whitney test) U**	**Difference between groups post-test (GEE) Wald χ^2**
PPDTS	Experimental Control	33.52 (9.01) 32.32 (7.51)	43.09 (8.1) 31.96 (7.63)		3772*	13.04*
Attitudes in PFA	Experimental Control	20.6 (3.91) 21.56 (3.33)	31.56 (3.58) 21.48 (3.36)	7.9** 1.8	-	-
Skills in PFA	Experimental Control	20.31 (3.43) 22.16 (3.13)	31.36 (3.71) 22.16 (3.28)	7.9** 2.2	-	-
Knowledge in PFA	Experimental Control	3.91 (1.3) 4.51 (1.3)	9.33 (1.19) 4.49 (1.32)	8** 1.9	-	-
GSE	Experimental Control	25.61 (5.11) 25.85 (5.56)	31.79 (3.48) 25.79 (5.55)		3809.5*	1.78*

	Group (n=75 for each group)	**Pre-test M (SD)**	**Post-test M (SD)**	**(Wilcoxon signed-rank test) Z (*p*)**	**Difference between groups post-test (Mann–Whitney test) U**	**Difference between groups post-test (GEE) Wald χ^2**
LOT	Experimental	20.79 (3.56)	24.25 (3.53)		4368.5*	.08*
	Control	21.07 (3.71)	21.09 (3.78)			
T-Anxiety	Experimental	48.43 (4.55)	38.35 (5.42)	7.9**	-	-
	Control	46.44 (5.64)	47.79 (4.68)	4.02		
SES	Experimental	26.69 (3.32)	38.35 (5.42)		1397*	1.6*
	Control	27.79 (4.14)	27.69 (4.08)			
PTSD	Experimental	18.73 (14.4)	16.88 (12.77)	6**	-	-
	Control	23.52 (14.38)	23.21 (14.42)	.42		

* = p as < 0.05, ** p as < 0.01

PPDTS: Psychological Preparedness for Disaster Threat Scale, PFA: Psychological First Aid, GSE: General self-efficacy, LOT: Life Orientation Test, SES: Self-esteem, T-anxiety: Trait-Anxiety, PTSD: Post-traumatic stress disorder

6.2.6.2 *Post hoc* analysis of the secondary outcomes

As the evaluation of psychological first aid (PFA) that contains three subscales (attitudes, skills, and knowledge), T-Anxiety, and PTSD were significantly different between the two groups at baseline, the subgroup analysis between-groups at T1 was not performed, as these variables were significantly different at baseline.

6.2.6.2.1 General self-efficacy (GSE)

The mean score of GSE out of a total score of 40 among nurses in the control group was 25.85 at T0 and 25.79 at T1, whereas the score was 25.61 in the experimental group at T0 increasing to 31.79 at T1 (Table 12, Figure 17). There was significantly higher GSE in the experimental compared to the control group post-test (U = 3809.5, $p < 0.05$). Results of the subgroup analysis by GEE also indicated a similar difference in GSE at T1 between groups (Wald $\chi^2 = 1.78$, $p < 0.001$).

6.2.6.2.2 The Life Orientation Test (LOT)

The Life Orientation Test (LOT) measured generalised optimism among the participant nurses. The mean score of LOT out of a total score of 40 among nurses in the control group was 21.07 at T0 and 21.09 at T1 at baseline, whereas it was 20.79 in the experiment group at baseline, increasing to 24.25 at T1 (Table 12, Figure 15). There was statistically higher LOT in the experimental group compared to the control group post-test (U = 4368.5, $p < 0.05$), in which the experimental group had a higher mean rank. Results of the subgroup analysis by GEE also indicated the difference in LOT at T1 between groups (Wald $\chi 2 = .08$, $p < 0.001$).

6.2.6.2.3. Self-Esteem (SES)

The mean score of SES out of a total score of 40 among nurses in the control group was 27.79 at baseline and 27.69 at T1, whereas it was 26.69 in the experimental group at baseline, increasing to 38.35 at T1 (Table 12, Figure 16). There was significantly higher SES in the experimental group compared to the control group post-test (U = 1397, $p < 0.05$). Results of the subgroup analysis by GEE also indicated the difference in SES at T1 between groups (Wald $\chi 2 = 1.6$, $p < 0.001$).

6.2.7. Effect size estimates

The effect size from this study was calculated based on Cohen's *d* as $(M2 - M1) / SD_{pooled}$, whereas SD_{pooled} is $\sqrt{((SD_1^2 + SD_2^2) / 2}$. The mean score of PPDTS at post-test of the control was M1 (31.96), and M2 of the experimental group was 43.09. With standard deviations of 7.63 and 8.1 respectively, the Cohen's *d* was 1.41, representing a large effect size.

6.2.8. Summary

The results of second part of the study was presented. Five hospitals were randomly arranged to form two arms of the study. There was a total of 168 nurses who had agreed to join the study and were allocated in convenience into the control and experiment groups (n = 75 for each group after attrition at baseline) to investigate the effect of a PFA training programme on psychological preparedness. Descriptive statistics were established, and normality of the distribution of psychological preparedness (PPDTS) was evaluated by the Shapiro-Wilk test based on the observation of skewness and kurtosis. The results indicated that the sample was not normally distributed. Chi-square and Mann-Whitney U test (Table 7 & 8) were used to check any significant differences in demographics and outcome variables between the control and experimental groups at baseline. The workplace, PFA evaluation (on attitudes, skills, and knowledge), T-Anxiety, and PTSD were significantly different ($p < 0.05$) between the two groups.

Generalized Estimating equations (GEE) were used to assess any changes in the outcome variables between the control and experimental groups across the pre- and post-test period (i.e. group by time interaction effect). The outcomes were analysed based on the intention-to-treat (ITT) principle. The findings (Table 11) revealed that the PFA training imposed a significant effect on PPDTS, since the group-by-time effect was significant ($p < 0.05$). On the other hand, LOT differed significantly between groups ($p < 0.05$), as well as the group by time effect ($p < 0.05$). The SES had a significant difference by time effect only ($p < 0.05$). In addition, GSE differed significantly in group by time effect ($p < 0.05$).

Multiple imputation by fully conditional specification (FCS) was performed to substitute the missing data. Sensitivity analysis (Table 12, Table 13) was performed to compare the results generated between two models based on the intention-to-treat (ITT) and per protocol (PP) principles. The sensitivity analysis revealed that the adjusted GEE model (ITT) had essentially similar group, time, and group by time effects among the outcome measures, except with better LOT's group and group by time effects, GSE's group by time effect, but less SES group and by group by time effects, when compared to the original model (PP). Significant group by time effect of PPDTS as the primary outcome was only observed in the adjusted model. Robustness of the results was confirmed by using the adjusted GEE model that included covariates and the use of the intention-to-treat principle.

For *post hoc* analysis (Table 14), the means of PPDTS showed greater improvement in the intervention group than in the control group of PPDTS post-test (T1) (M = 43.09 and 31.96 respectively, $p < 0.01$). There were also statistically significant differences between the experimental and control groups in PPDTS, GSE, LOT, and SES post-test ($p < 0.05$).

6.3. Discussion

6.3.1. Introduction

In this chapter, the results of the second part of the study are discussed in detail. The focus of this part was the investigating of psychological preparedness before and after psychological first aid training. Comparison of the findings from the training for the psychological preparedness of nurses is noted. The findings of psychological first aid training application in the interventional study is discussed in terms of its effect on psychological preparedness for disasters, and other outlined personality variables

among nurses in both the intervention and control groups. The limitations of this part are outlined. In addition, implications and recommendations for practice and policymakers, future research, and education are stated.

6.3.2. Psychological preparedness following psychological first aid (PFA) training

In the second part, through a non-equivalent control group study, the modified RAPID-PFA training was found to improve nurses' psychological preparedness for disaster as the outcome variable. The findings by GEE analysis revealed that psychological preparedness differed significantly in group by time effect between the two groups across baseline and post-test. Psychological preparedness was significantly different ($p < 0.05$) between the experimental and control groups at post-test as revealed by *post hoc* analysis, in which the experimental group demonstrated better psychological preparedness, with male nurses having higher psychological preparedness. The significance of the training between groups can also be reflected by the effect size, which was found to be large in the experimental group rather than in the control group.

The results of this study are similar to Schafer, Snider, and van Ommeren (2010), in that trainees following PFA training felt confident and more prepared to work with distressed people in a disaster. Chandra et al. (2014) also found that PFA training increased the confidence of medical service group volunteers (including nurses) to help individuals with psychological distress, as well as their preparation for disaster situations; and the capability to provide support for those with psychological problems following a disaster. On the other hand, PFA training improved trainees' knowledge and understanding of the roles and responsibilities of PFA helpers, and the practical application of psychosocial support strategies during an acute crisis (Sijbrandij et al., 2020). The Cheung RCT (2015) also found that PFA pre-disaster training was effective

in providing the necessary skills (self-care and mutual support) in preparing for disaster response among Auxiliary Medical Service (AMS) personnel, including nurses. The PFA training had a positive effect on nurses' disaster preparation part scores on the disaster preparedness perception scale (Kilic & Simsek, 2019). When comparing effect sizes, the current study showed a large effect size, as mentioned previously in the results chapter, in that the PFA training was statistically significant in improving psychological preparedness, whereas the other studies (Cheung, 2015; Chandra et al., 2014; Kilic & Simsek, 2019; Schafer, Snider, and van Ommeren, 2010; Sijbrandij et al., 2020) did not report the effect size in their results. Given the large effect size, it would indicate a large difference between the control and interventional groups, with the interventional group having better outcomes. This is considered favourable evidence for the intervention effect in this study, compared to the other studies (Cheung, 2015; Chandra et al., 2014; Kilic & Simsek, 2019; Schafer, Snider, and van Ommeren, 2010; Sijbrandij et al., 2020). Considering PFA as a disaster education programme could help in advancing psychological preparedness in the community in general (Morrissey & Reser, 2003), and disaster education could enhance the public's cognitive awareness to mitigate the effect of disaster (Faupel & Styles, 1993).

Since nurses demonstrated improvements in their psychological preparedness, it is considered that they are able to remain calm (alleviating anxiety and distress) and think clearly, enabling them to identify individuals who may require assistance (Guterman, 2005), as well as be better able to support their colleagues (Brooks et al., 2018). In addition, by increasing literacy on PFA concepts through training, nurses can promote social engagement both for themselves, and for individuals in need of this. The core of PFA is to provide practical help to address the immediate needs and concerns of victims, including care providers themselves (Brymer et al., 2006). Nurses can prevent

additional psychological traumatisation. With their PFA capacity to handle problems and cope with disaster difficulties, nurses will see faster psychological recovery (Pekevski, 2013).

6.3.3. Effectiveness of the PFA Intervention: PFA knowledge, skills, and attitudes

The political conflict in Palestine is complex, requiring nurses to be well-prepared for daily situations that can be unpredictable. Furthermore, limited resourses add to nurses' stressors, so that different levels of psychological support are required. The PFA training was delivered to a sample of Palestinian nurses working in trauma-related departments.

Training nurses in psychological first aid may lead to better psychosocial support for trauma victims as well as for nurses themselves (Guterman, 2005; Schafer, Snider, & van Ommeren, 2010). Following the training, nurses in the intervention group showed increases in PFA concepts in terms of knowledge, skills, and attitudes. The control group had no change in these aspects. The results, related to knowledge of PFA application, are similar to Cheung's (2014) study, which found improved PFA knowledge following PFA training. In the study by Schafer, Snider, and van Ommeren (2010), staff trained in acute emergencies reported significant benefits from the PFA orientation. And in another study, a significant increase in knowledge and readiness as the outcome of the PFA training was related to the principles and techniques of PFA application (Akoury-Dirani et al., 2015). Skills and attitudes were improved, as they reported they were able to apply the PFA principles in their work and in their personal lives, and also felt positive about the ways in which they interacted and had contact with people. They had more understanding of the psychological assistance they could provide, and more confidence in helping people experiencing emotional distress. The

demonstration of PFA training in these studies supports the effectiveness of PFA training to provide psychological assistance when needed. Given the differences in attitudes, skills, and knowledge at baseline between groups in the current study, the increases in these outcomes in the PFA group compared to the control after training might suggest only a certain degree of enabling the trained nurses to support themselves and others in a time of disaster (Guterman, 2005; Kılıç & Şimşek, 2019).

Nurses in the current study seemed to have benefited from the education, such as information on coping, effective contacting and engaging with survivors, and addressing immediate safety, needs, and concerns. In particular, the PFA training offered in the Palestinian context for this study was modified in its content, with real experiences of the Palestinian community as scenarios for simulation learning. This training motivated the trainee nurses and was found to be effective in enhancing their psychological preparedness for disaster, and their attitudes toward the application of PFA for future events. As noted by Morrissey and Reser (2003), psychologically prepared individuals can focus on situational preparedness, such as household planning for disasters. In turn, they can reduce the risk of injury or death, as the safety of those inside the home is ensured. They are also able to manage their feelings and concerns during a stressful disaster and have the confidence to deal with this type of situation. Studies have also suggested that people with higher psychological preparedness tend to have more effective stress management during a disaster event and decreased mental health problems in the aftermath (Morrissey & Reser, 2003; Roudini, Khankeh, & Witruk, 2017). Hence, the PFA training of nurses not only enhances the mental health support they provide to victims during disasters, but also the mental health of nurses themselves. Following the provision of PFA training to Palestinian nurses, it is expected that these nurses would apply psychological first aid in the future.

In summary, nurses on the frontline, as care providers and leaders, need to help disaster survivors in a variety of ways, such as reducing stress and long-term psychological problems, enhancing coping, and referring them to the appropriate mental healthcare resources as needed, as well as promoting the well-being and self-care of nurses themselves. Nurses need to be psychologically prepared to mitigate the impact of conflicts and disasters. The PFA training could ensure better adequacy in terms of their knowledge and understanding of psychological preparedness and skills to be applied during a disaster. Therefore, opportunities to learn and practise these skills are important for nurses.

6.3.4. Personality variables (self-efficacy, optimism, self-esteem, and trait-anxiety), and post-traumatic stress disorder (PTSD)

Apart from the primary outcome of examining the impact of PFA training on improving nurses' psychological preparedness in a disaster, it was hypothesised that the PFA training may also improve personality variables and minimise the development of PTSD. As directed from the online survey results, these personality variables and PTSD are predictive variables for assessing psychological preparedness. Therefore, the included personality variables and PTSD were emphasised during the PFA training, and investigated to determine the effect of PFA on improving these outcomes.

6.3.4.1. Self-efficacy

In the intervention group, nurses' self-efficacy increased significantly after the training, while the level of self-efficacy in the control group remained unchanged, and males showed higher self-efficacy. In some ways, these results are similar to studies by Cheung (2014) and Kılıç and Şimşek (2019), which found a significant increase in the self-efficacy of the intervention group to provide emotional support to survivors during

a disaster. Self-efficacy is a sense of an individual's belief that his/her acts will lead to positive outcomes (Bandura, 1995), able to complete his/her task successfully (Akhtar, 2008), and that efficacy could be increased in the presence of experience from previous similar situations (Jonson et al., 2017). Nurses trained in PFA can help reduce the psychological effects of traumatic events. This appears to be due to improvements in skills and attitudes in applying PFA to provide assistance in reducing initial post-traumatic distress and short- and long-term adaptive functioning.

The self-efficacy of nurses in the current study following PFA training was very similar to the mean of self-efficacy in this study's online survey (Said et al., 2020), taking into consideration that the surveyed nurses had vast disaster experience and different types of training, such as disaster mental health preparedness, which enabled them to acquire higher self-efficacy. For nurses' training, simulated disaster exercises and experiential learning may enhance self-efficacy (Jonson et al., 2017), which may contribute to better psychological preparedness for disasters. In addition, appropriate and innovative pedagogy can be effective in such training to pursue stronger outcomes (Said et al., 2020). It is important that nurses acquire the essential skills to face adverse psychological situations, which can help them to better care for others (Said et al., 2020), as well as care for themselves, during stressful situations such as disasters (Guterman, 2005).

The presence of self-efficacy means a greater ability to handle difficult situations (Jonson et al., 2017), while self-efficacy could also be influenced by psychological responses through influencing coping behaviours (Bandura, 1977). The findings from the current study demonstrated that PFA training can provide a self-reported enhancement of nurses' capacity to offer PFA in times of emergency, and these findings were similar to a study by McCabe et al. (2011). Such an increase in self-efficacy must

be interpreted with caution, as this improvement might be highly dependent on situational factors, such as the occurrence of critical incidents. Unmanaged stress from these incidents may affect the ability to make good decisions and judgements (Guterman, 2005), which affect memory and the ability to concentrate and pay attention to the tasks that nurses are working on. Nurses may experience a change in their beliefs about positive outcomes incerta in stronger traumatic events, which may alter their degree of self-efficacy (Bandura, 1994; Jonson et al., 2017). As the results were self-reported of psychological preparedness and the ability to provide PFA when disaster strikes, the long-term sustainability of the improvements remains unknown. Nevertheless, self-efficacy might be highly related to effectively provide the component activities of PFA in the real world of disaster settings (McCabe et al., 2011). Self-efficacy has also recently been used in other studies to capture the effectiveness of psychological first aid training (Chandra et al., 2014; Everly et al., 2014; Kılıç & Şimşek, 2019).

6.3.4.2. Dispositional optimism, self-esteem, and trait anxiety

Findings of this study's online survey demonstrated that psychological preparedness would be greatly influenced by dispositional optimism and self-esteem. There was also a moderately reverse association between trait anxiety with psychological preparedness. These findings are similar to the intervention group following the PFA training in this study's second part. This suggests that with PFA training for better psychological preparedness, nurses could enhance their status in terms of dispositional optimism and self-esteem, and reduced anxiety. Such improvements can be interpreted as a set of characteristics moving together: as one improves, the other one follows. For example, with higher optimism and self-esteem, people may be less prone to neuroticism, which leads to lower emotional intensity and less anxiety (Amstadter et

al., 2016; Bastianello, Pacico, & Hutz, 2014; Kan et al., 2014). The psychosocial support, through a PFA practice, is able to reduce anxiety and other negative psychological reactions and promote optimism (Australian Red Cross & Australian Psychological Society, 2020; Everly et al., 2014; Hobfoll et al., 2007). Since this study succeeded in achieving the goals of PFA in improving psychological preparedness, it is possible that the PFA enhanced optimism and reduced trait-anxiety.

Self-esteem also serves as a buffer against the impact of negative influences, and may reduce mental health problems, such as PTSD (Adams & Boscarino, 2006; Mann, Hosman, Schaalma, & De Vries, 2004), which may contribute to the presence of higher psychological preparedness. Optimistic people tend to have higher self-esteem (Scheier & Carver, 1985), which may prevent depression and anxiety (Shaheen, 2015), and constitute a positive relationship with coping that will enhance cognitive and emotional function (Karademas, 2006). People with higher levels of optimism may even have less psychological distress and greater resilience to potential post-disaster psychopathology (Goldmann & Galea, 2014).

Optimism and self-esteem were found to be significantly different by gender that they were higher in male nurses, who also experienced lower trait anxiety. It is possible that improved psychological preparedness had the effects of improving more the status of optimism and self-esteem, and lowering trait anxiety. The better scores of these outcomes in males compared to females are possible related to their higher self-efficacy and optimism that these contribute to develop self-esteem to buffer against anxiety (Patton, Bartrum, & Creed, 2004). Females may have more family roles and maternal

responsibilities (Zheng et al., 2020) that these increase the possibility for them to have depression and lower optimism (Schneider et al., 2011).

6.3.4.3. Post-traumatic stress disorder

Although only 8% of nurses reported severe PTSD symptoms in each group of the interventional study, PTSD was significantly different at baseline between the intervention and control groups ($p < 0.05$), as the control group had higher symptoms. The PTSD levels in this study's groups were less than for other nurses. For example, Jung et al. (2020) found that approximately 57% of nurses experienced PTSD, with 25% experiencing full PTSD, and 32% experiencing some level of PTSD. In another study, 10.6% had high PTSD (Russe, Baldwin, & Walsh, 2020). Kim and Yeo (2020) also found a high risk of PTSD in 57.2% of the nurses working in trauma units. In the presence of PTSD, nurses' performance can be greatly affected. In contrast, the 8% of the severe PTSD symptoms among Palestinian nurses in this study was similar to the reported severe PTSD symptoms (9%) among nurses who joined the online survey, which was then published (Said, Molassiotis, & Chiang, 2020). The lower level of severe PTSD symptoms among Palestinian nurses in the interventional study could be due to different reasons. For instance, with the presence of optimism, the findings revealed that nurses included in this study reported a medium level of optimism and relatively low trait-anxiety, and these were negatively and positively related to PTSD respectively (Jakšić et al., 2012). It is therefore possible that lower PTSD was related to optimism and less trait-anxiety in this sample. It is also possible that the disaster training, as reported by nurses in the international online survey, had an influence in strengthening their ability to decrease the chance of PTSD development following a disaster. It is unknown whether the period of assessment for PTSD following a disaster has an influence. For examples, Jung et al. (2020), who conducted a survey (using the

Event Scale - Revised) shortly after the Middle East respiratory syndrome (MERS) epidemic, found that approximately one-quarter of nurses reported severe PTSD. In another study (Shamia, Thabet, & Vostanis, 2015), conducted two years after the end of the 2009 Gaza war (using the Arabic version of the Posttraumatic Stress Disorder Checklist), approximately 20% of nurses reported "high PTSD". The proportions of PTSD reported in Jung et al. (2020) and the Shamia, Thabet and Vostanis (2015) studies were much higher than the reported "high PTSD" (8%) in the current study.

Furthermore, the role of social support may exert an influence. Zhang et al. (2020) revealed that nurses who demonstrated social support reported less PTSD, and self-esteem was also found to be a protective factor against the development of PTSD. Given the context of the Palestinian culture, where there is social cohesion, family support, and community support, people remain in solidarity with one another in extreme and difficult conditions. While nurses receive social support, it is expected that they also receive caring, which could contribute to a decrease in PTSD, and a positive impact on psychological well-being (Sato et al., 2018). Therefore, it is expected that nurses with these characteristics can exhibit lower levels of severe PTSD.

Another explanation for less PTSD is that nurses may have good levels of resilience. Alkaissi et al. (2019) found that approximately 40% of the surveyed Palestinian nurses in one hospital had high resilience. Although the surveyed nurses may not be a representative sample for the high proportion, resilience is known to be negatively related to PTSD (Zhang et al., 2020). Resilience could be an important trait to protect against PTSD in the current study. However, the interventional study did not assess resilience and its relationship to PTSD. Resilience could be assessed in relation to PTSD and other outcome variables in future studies.

Post hoc analysis of the part two study showed that nurses' level of PTSD was improved following PFA training, while it remained unchanged among nurses in the control group. The reduction in PTSD may be related to different reasons. For example, as trait anxiety may predict the development of PTSD (Hensley & Varela, 2008), it is observed there was a decrease in T-anxiety following the PFA training. The presence of dispositional optimism may also have served as a protective factor against such symptoms (Conversano et al., 2010). On the other hand, people with various degrees of self-efficacy may experience higher or lower levels of anxiety (Said et al., 2020). This efficacy can control disturbing thoughts (Bandura, 1994) and influence episodes of post-traumatic stress symptoms and somatic symptoms that exert a negative effect on cognitive function (Zeidner & Hammer, 1992). As anxiety is positively associated with traumatic exposure, and negatively with optimism and self-esteem (Besser et al., 2014), nurses with lower anxiety reported an increase in optimism and self-esteem in the current study.

In this study, female nurses showed significantly less experience of PTSD than male nurses at baseline. Nevertheless, Shamia, Thabet and Vostanis (2015) and Naushad et al. (2019) found that female nurses had reported significantly more PTSD than male nurses, even when they experienced significantly fewer traumatic events than males (cited in Said et al., 2020). Female nurses were twice as likely to develop PTSD following a traumatic experience when compared to male nurses (Shamia et al., 2015). The difference in female nurses in terms of PTSD may be explained by different issues. First, regarding the nursing work environment and its pressure and stresses, male nurses in Palestine are in higher demand for night shifts, and the culture of double-day duty ("double shifts") than female nurses. Furthermore, due to cultural issues and adherence to the custom of males to care for a large family, males typically shoulder a heavier

burden for the family's financial issues. They must meet their family's needs, and some are also responsible for extended families and are expected to be the head of the household (IMEU, 2006). Given this burden on male nurses, higher PTSD might have associated with being male nurses when compared to females at baseline. Following the PFA training, male nurses reported higher scores in psychological preparedness, self-efficacy, optimism, and self-esteem, and lower scores in trait-anxiety and PTSD. Other outcomes were similar in males and females. It seems that male nurses benefited more from the PFA programme training. It is possible that the training better enabled them to acquire and improve self-efficacy, optimism, and self-esteem, and these traits also helped to reduce their trait-anxiety and PTSD.

6.3.5. Pedagogy of the PFA Training

The influence of the PFA training is seen as promising in supporting nurses psychologically for disaster. Pedagogically, using experiential learning, such as scenario and role-playing, would enhance nurses' skills related to the field of training and provide authentic learning opportunities (Cant et al., 2020). Debriefing and psychological safety are also important concepts to be considered in such training, combined with experiential learning. Additionally, in the presence of multidisciplinary collaboration, there is an opportunity for expanded knowledge related to the experiential learning (Campbell, 2012).

6.3.5.1 Experiential learning (scenario-based and role play)

Experiential learning methods (e.g. based on role play and scenarios) focus on having participating nurses learn new skills through experience and practising the learnt skills during the given scenarios (Kolb, 2015; Yardley, Teunissen, & Dornan, 2012). Palestinian nurses are practising in a unique context, with experiential and cultural

differences in psychological distress, of daily traumas and injuries surge due to conflicts in the region, and caring for the people affected The modified PFA training scenarios in this study were developed based on the real experiences of nurses, patients, and people in the Palestinian community.

The PFA training's success may be attributed to the variety of methods included in the training, such as the group discussions and simulation role play exercises, which enhanced nurses' learning and understanding of PFA concepts. With these methods, nurses may be able to retrieve and apply PFA concepts to real life, enhancing their critical thinking ability to problem solve in stressful situations arising from disasters (Everly et al., 2010; Kılıç & Şimşek, 2018). Nurses have been given practice opportunities during the training through these scenarios to practise dynamic and flexible problem solving when facing complex conditions. Such modifications in the PFA training would have helped them to optimise deeper learning experiences from daily living conditions, which may improve their execution of effective decision making under uncertain conditions, and the application in practice (Verkuyl et al., 2019; Verkuyl et al., 2020) to deal with these kinds of conflict situations.

The training focused on providing opportunities for dynamic and interactive application of both theory and necessary skills through scenario-based learning. Embedding scenario-based exercises by role playing the content may enable learners to cope with different disaster scenarios, where they can acquire and practise their ability to problem solve and think critically (Austin et al., 2014; Strout et al., 2017), and may demonstrate motivation and self-directedness (Strout et al., 2017). Role playing can contribute positively to the learning process (Erturk, 2015; Moreno-Guerrero et al., 2020; Sims, 2002), and is effective in engaging learners in the experiential learning paradigm (Movius, 2008; Waters, 2016). Through this, nurses will be exposed to a real-world

situation (Austin et al., 2014) that requires them to contribute with their acquired knowledge and skills for practising PFA. For example, trainees achieved the PFA training goals through sharing experiences, role playing, and self-reflection (Akoury-Dirani et al., 2015). Similar to these findings, in another study it was found that PFA training, through didactic and scenario-based exercises, significantly improved trainee confidence in providing psychological assistance for future disasters (Lee et al., 2017). Furthermore, nurses' discussion sessions with one another during the scenario learning may motivate and facilitate their cognitive and affective learning more effectively, as well as their development of psychological preparedness. The PFA training's positive effect was noted among nurses in the experimental group, while the control group remained unchanged. The study results suggested that trained PFA nurses had a positive performance for future application (Schafer, Snider & van Ommeren, 2010); Akoury-Dirani et al., 2015). The PFA training programme's success may rely on focusing the content around experiential learning.

6.3.5.2. Debriefing and psychological safety

Another important aspect in the PFA training is debriefing. Debriefing is important to increase self-awareness and personal reflection (Verkuyl et al., 2020). According to Reierson et al., (2017), debriefing sessions are considered an essential component of simulation-based learning, in which participants in a simulation-based learning scenario express their reflections, feedback, and knowledge development. The debriefing included in the PFA training had the possibility of improving learning, self-awareness, and reflections of thoughts, feelings, and attitudes towards the topics included in each scenario and discussion sessions. Furthermore, debriefing learners could create critical reflections and clarify learners' thinking and assumptions (Forneris et al., 2015; Glatts, 2019).

During debriefing, trainee nurses had the opportunity to think critically and rationalise ("stimulating their brain activity") the scenario situation. This helped them solve problems andmake decisions based on what they had learned in each scenario (Glatts, 2019). In addition, it is possible that debriefing helps to build confidence, as nurses had the freedom to discuss and reflect on the scenario topic, which may have helped them to trust their abilities and judgment. Once these thoughts are voiced, the cognitive reasoning becomes obvious (Reierson et al., 2017), allowing learners to gain confidence in expressing their thoughts on their learning experience (Glatts, 2019). Forneris et al. (2015) also demonstrated a positive effect, in which the learning experience and clinical reasoning of learners were enhanced following debriefing sessions. However, learners can also exhibit negative experiences related to their participation in simulation and debriefing. This may include a feeling of stress while participating in the simulation and debriefing, as they are at the centre of attention of their peers and trainer once they contribute to the learning process. Fear of peer evaluation, and interpersonal relationships with colleagues could be affected, as they may have different beliefs and thoughts than their peers when sharing their opinions during discussions and debriefing (Ko & Choi, 2020; Lateef, 2020). For a proper debriefing, psychological safety should be ensured.

Psychological safety is a state in which learners feel safe and can easily speak up to share their thoughts, perceptions, and opinions, without the potential for retribution or embarrassment, in order to achieve better learning (Edmondson, 1999; Lateef, 2020). During PFA training, the trainer and researcher actively tried to establish a safe environment through an introduction and orientation before each simulation, in addition to reminding all trainee nurses that what they said is their reflection and they have the freedom to express their feelings and opinions. Rudolph, Raemer, and Simon (2014)

argued that a pre-simulation briefing, such as an introduction and orientation, could exert a significant impact on learners' engagement during a simulation, e.g. an instructor's encouragement and guidance is important to provide a comfortable environment for learners to participate in the session (Ko & Choi, 2020; Kolbe et al., 2019). Other qualities, such as asking for feedback from learners, providing constructive feedback to learners, and being flexible during the exercises, could also lead to a safe learning environment (Lateef, 2020; Kolbe et al., 2019; Turner & Harder, 2018). Given the need for psychological safety as outlined, observation by the researcher and the trainer during this PFA training concluded that trainee nurses were actively engaged in both the simulations and debriefing. There was also no report of any negative consequences observed regarding opinions, beliefs, and the expression of thoughts, during the training. It is believed that psychological safety in the trainee learning experience during training was achieved.

6.3.5.3. Multidisciplinary collaboration

The PFA training in this study was mainly delivered by a psychologist. Multidisciplinary collaboration involving different personnel was encouraged in this study. First, there was the presence of a psychologist, who was the trainer. Second, stakeholders at the hospital level (e.g. hospital manager and continuing education unit head), who encouraged nurses to join the training and facilitated the training process. Third, nurse managers, who collaborated with stakeholders to facilitate the training process and followed the nurses who joined the training. Fourth, the researcher, who is also a nurse and academic, who had engaged in the entire training process and assisted the trainer in preparing the scenarios, led the discussion in each session, and provided any further information required by the trainee nurses. This collaboration contributed to success in delivering the PFA training without obstacles, and facilitated nurse

recruitment. Therefore, it is important to have continuity in such a collaboration, to support the PFA and psychological care for disaster victims and for nurses themselves.

The collaboration may provide an opportunity to create a visible relationship between various occupations (Digregorio et al., 2019), in order to disseminate the PFA programme and help strengthen and improve healthcare providers', in particular nurses', psychological preparedness. In addition, the collaboration can create a system to carry out psychological care activities for other nurses, and in the community alongside other community supporters, such as mental health nurses. Therefore, local health authorities and policymakers must build a support system in the region, not just after a disaster, but also before a disaster, so that the skills and competencies required for psychological preparedness could be improved in advance. At this stage, nurses and other healthcare providers could understand disaster response planning, become trained in PFA, and equip themselves with the competencies needed for a successful response to disasters (Rafferty-Semon, Jarzembak, & Shanholtzer, 2017). In summary, multidisciplinary collaboration can enhance the organisation and delivery of PFA training, in order for nurses to increase their knowledge of psychological support for disaster victims and strengthen their psychological preparedness.

6.3.6. Intervention study methodological considerations

6.3.6.1. Intervention study feasibility

To successfully complete the intervention, different factors must be considered, including recruitment and retention rate, intervention delivery, and completion of outcome measures (El-Kotob & Giangregorio, 2018). During the study's part two, 84 nurses were invited for each arm and all agreed to join (recruitment rate = 100%).

However, nine nurses dropped out of each arm at baseline. The attendance rate was 75/84 (89 %) for each study group; and the retention rate was 68/75 (90.7%) and 69/75 (92%) for the intervention and control groups respectively. This indicates high recruitment and retention rates of nurses who joined and completed the study. Intervention delivery duration was two hours per week for each group of nurses in the intervention arm, which enabled nurses to join without interrupting their work duties in their respective hospitals. The relatively short duration facilitated them in participating without any problems with their managers. Furthermore, the PFA training was delivered by the same trainer, which ensured training fidelity.

For data collection, all nurses who joined the PFA training filled in the questionnaires pre- and post-test, but seven empty questionnaires were received post-test. As shown by the improvements in psychological preparedness and other investigated outcomes following the PFA training, it is considered that the training goals have been achieved for the participating nurses. The achievement may be attributed to their motivation and the effectiveness of the trainer. First, it was observed that nurses actively participated in the training scenarios, discussions, and role playing. Second, at the beginning of the study, nurses thought that the study outcomes and training would benefit them in future, which they verbally expressed. Most essentially, the training was delivered by a specialised trainer in a multidisciplinary collaboration, and the pedagogy included different methods, such as theoretical knowledge and experiential learning.

6.3.6.2. Intention-to-treat (ITT)

The ITT analysis showed a significant effect of the PFA training on psychological preparedness as a primary outcome; and self-efficacy, optimism, trait-anxiety, and PFA evaluation as secondary outcomes. Whereas per protocol (PP) analysis did not show a

significant effect on psychological preparedness. The ITT helps by not losing a balance between the respective groups, in that the comparability of the two groups is not affected. It is also believed that ITT analysis, with missing values imputed, helps to maintain the sample size and study power, hence minimises type I error (Gupta, 2011; Roshan & Zenda, 2018).

6.3.6.3. Safety

There was no physical harm, or any other adverse effects observed from participating nurses during the PFA training. Nurses were not exposed to pain, injury, illness, or impairment caused by another, such as incidence of work-related injuries; nor psychological harm as they were not embarrassed, frightened, offended, or emotionally disturbed. Nurses were asked to contribute to the learning process as they preferred, and they could stop or withdraw at any time if they felt uncomfortable. In addition, nurses were not exposed to any ethical harms, as the study adhered to the ethical considerations outlined earlier in the methodology chapter.

6.4. Limitations

There are limitations in study two. First, methodologically, quasi-experimental design that involved non-random selection of the included samples may lead to bias to treatment effects (Shadish, Luellen, & Clark, 2006). The study only represented a number of self-selected hospitals that were accessible and willing to encourage their nurses to join the study. This was performed for convenience to reduce the time required to search for other hospitals and trauma units for recruitment. The process might have affected internal validity as no random selection of more target hospitals involved (Maciejewski, 2020). However, the researchers tried not to have systematic differences

between participated nurses in order to reduce selection bias. Although the selected hospitals were assigned randomly to control and experiment groups before the sample allocation that might reduce the extent of bias, generalization of the results needs to be further investigated. The sample size was relatively small, which usually decreases the statistical power (Anderson, Kelley, & Maxwell, 2017) and interfere generalization of the results (Green, 2010). It is expected that a study with better power could generate more reliable outcomes, and further research should include other nurses from different countries to substantiate the findings. Second, the results were limited to immediate feedback before and immediately after the PFA training. Longer-term effects of the PFA training programme are unknown. Follow-up is important to ensure the effectiveness of intervention used in the study (Hill et al., 2016; Salkind, 2010). Third, the link between psychological and general preparedness for disaster was not assessed. It is possible that both types of preparedness have a connection, and that one may interfere with the motivation to prepare in another.

Fourth, as the nurses appeared highly motivated to join the study, the study was at risk of self-selection bias (Moss, Melamed, & Wright, 2019) that may have affected validity of the findings. Proper randomisation can allow better control of more potential covariates. On the other hand, as the set of evaluation tools was written in the English language, there were some difficulties for the participating Arabic-speaking nurses to fully interpret and understand each question. This could be considered as a language barrier (Squires, Sadarangani, & Jones, 2020). As a result, instrumentation effects can threaten validity (Lopez Bernal, Andrews, & Amirthalingam, 2019). It is important to bridge these barriers in order to have valid responses from better understanding of the questionnaire contents.

It is also possible that the missing data may induce bias (Sterne et al., 2016; Waddington et al., 2017). Finally, the study did not include a process evaluation about the experiences of trainee nurses for better PFA delivery in the future. Despite the limitations, the study has important findings that add considerations for future research.

6.5. Implications

6.5.1. Implications for practice and policymakers

The study indicated a significant improvement in psychological preparedness after PFA training delivery. It is suggested that the application of PFA training to improve nurses' psychological preparedness should be made by encouraging and negotiating with health administrators and policymakers to adopt the training, which incorporates group discussions and simulation role play exercises of the PFA concepts and practice. An action plan needs to be formulated to facilitate the promotion for stronger attention to the psychological preparedness of nurses (Said & Chiang, 2020). In the plan, emphasis should also be placed on knowledge development, including pedagogy and research development (Achora & Kamanyire, 2016). Nurses' coping capacities to alleviate the effects of disasters is another focus. These capacities could include positive adaptation, seeking help and support once needed (e.g. family and community), and spiritual coping (Akbar et al., 2016; Ribeiro et al., 2015). Health administrators and policymakers, from the outcomes of implementing the plan and assessing the training effectiveness, can continuously reflect upon and improve the development of nurses in disaster preparedness. This may ensure the sustainability of PFA in order to achieve better responses by nurses to the impact of disasters. Regular and frequent updating of PFA training is necessary.

In addition to PFA training, different forms of psychological support should also be provided to nurses (Errett et al., 2012; Everly et al., 2010). This includes support for nurses who could be affected by disasters, e.g. providing counselling services from mental health professionals, and access to other professional support from external organisations. Through psychological support, healthcare facilities may also offer assistance to those at high risk of developing mental health problems during the first days or weeks of a disaster. These strategies could include capacity building, competence development of nurses (Kılıç & Şimşek, 2018; Park & Kim, 2017), understanding stressors and the ability to manage them (Errett et al., 2012; Guterman, 2005), adjusting affected nurses' routine work if high stress levels were to continue, and promoting and enabling psychosocial well-being (Guterman, 2005). The planning and establishment of infrastructure for psychosocial support is therefore required. Health administrators and policymakers should adopt a plan of action that focuses on investment and building nursing capacity to combat the negativity of disasters and their related psychosocial consequences. In summary, this includes the building of technical capacities and decision making in managing disasters, and supportive services to address nurses' psychosocial issues.

6.5.2. Implications for education

There is a need for nurses to receive more and better education and training in disaster preparation (Said & Chiang, 2020). The findings of this study provide insights for the education sector. This education may be planned and prepared by staff, such as nurse educators in various disciplines with specific expertise, e.g. mental health nurses and psychologists, and the curriculum and content can be designed based on robust guidelines and standards of competence developed by the International Council of

Nurses (Labrague et al., cited in Said & Chiang, 2020). These important and necessary nursing core competencies were developed by the International Council of Nurses for an effective disaster and emergency response (International Council of Nurses, 2019).

Learning and teaching strategies that drive nurses to develop their critical thinking skills and competence should also be incorporated into such a programme. In addition, disaster education with a focus on psychological issues should be strengthened in the curriculum at the bachelor's level. The training programme should be regularly updated or renewed (Said & Chiang, 2020) and should focus on different types of disasters, consistent with individual national plans and healthcare systems (Errett et al., 2012).

Psychological preparedness training, such as PFA, could be incorporated into the curricula of nursing and other healthcare providers with a multidisciplinary perspective. Nursing educators must be prepared to teach and train nursing students in the area of disaster preparedness (Kalanlar, 2018), and in particular the psychological aspect. Through incorporating PFA training in nursing education, nurses could receive better exposure to disaster preparedness and in particular, psychological preparedness responses (Said & Chiang, 2020). After engaging in PFA training, students can learn about concepts that prepare them psychologically for future disasters (Guterman, 2005). Also, it may encourage them to participate in future professional development opportunities to increase their effectiveness in the disaster area (Cheung, 2014).

For PFA training, fostering multidisciplinary collaboration with psychologists, mental health nurses, and other experts is important. This collaboration will enrich students with the knowledge and skills required in disaster areas, and this could be achieved through the aforementioned collaboration. Multidisciplinary collaboration could also

help in implementing evidence-based education to support the transition of nursing students from university life to practice. Multidisciplinary collaboration has been demonstrated to be effective in improving the skills of nursing students and the competencies required for nursing practice (Beard et al., 2015; Yang et al., 2017). It was also found that nurses' disaster knowledge and confidence improved significantly following scenario-based simulation education involving expert personnel (Levoy, DeBastiani, & McCabe, 2018).

6.5.3. Implications for Research

Future studies can be considered to identify and recommend the most appropriate training to achieve psychological preparedness. Good preparedness, including the psychological dimensions, can be a positive support to nurses in the first place, and hence to their caring for the community (Roudini, Khankeh, & Witruk, 2017). This may also help to meet the psychological needs of disaster victims and nurses. More studies with larger samples with the randomized controlled trial by design are therefore warranted to investigate the effects of specific training for psychological preparedness of nurses for disasters. It would also add strength if combining the quantitative with qualitative approaches in order to have more and in-depth results about the appropriate education, from participant's perspective, to be used to improve such preparedness. Tools for the assessment of psychological preparedness should be translated and validated to the target population's language for these studies. This allow nurses better understanding of each question in those tools, allowing for accurate answers and better validity of the studies. Studies of better design are hence robust to examine the effects of such training on trainees' performance in knowledge and skills, and acquisition of attitudes about psychological preparedness. Furthermore, research can be more

sophisticated in investigating whether similar findings are generated involving the PFA training of nurses from different specialties. This will help to establish evidence if PFA training can be generalized yet specified for broad application. Follow-up is also needed to understand the effects of such intervention for longer time (Hill et al., 2016). On the other hand, general disaster preparedness may be investigated alongside psychological preparedness. It is possible that both types of preparedness is related that one can influence the other. Following this line of understanding, recommendations may be better suggested in order to have the optimum preparedness for disasters. Strategically, future research could also be conducted to assess whether there are existing barriers related to nurses' participation in disaster planning for better preparedness (Al Thobaity, Plummer & Williams, 2017).

Optimising the pedagogy of scenario-based learning (with simulation) for PFA training is important. The qualitative approach to further examine and reflect on nurses' performance, following the scenario-based pedagogy in the programme, to inform the development of PFA training in the future, is warranted. The studies may help in gaining further opinions and suggestions in developing the scenarios in order to improve them for more effective training. Research is also needed to determine if ensuring nurses' psychological safety may promote debriefing during the simulation training. The process in which a simulation is implemented, with a view to psychological safety, requires examination to determine best practices. In this regard, the qualitative approach would also help in generating useful information to optimise the simulation in terms of the debriefing duration, and whether it is better to video record the simulation with scenarios for use during debriefing. The skills of the debriefing facilitator applied in a reflective discussion with nurses, and the relationship between psychological safety and learning behaviours, should be investigated to

identify if these factors would affect PFA training in terms of improving psychological preparedness. Finally, education of nurses for research capacity building could be introduced in order to develop evidence-based practice through research before, during, and after disasters (Usher et al., 2015b).

CHAPTER SEVEN

CONCLUSIONS

7.1. Conclusions

The current study primarily aimed to evaluate psychological preparedness in nurses. The findings provide promising preliminary evidence of the importance of considering self-efficacy, self-esteem, optimism, trait-anxiety, and PTSD in assessing psychological preparedness. The study found a significant correlation of training in psychological preparedness and disaster mental health preparedness with psychological preparedness for disasters. This indicates that training for psychological preparedness and disaster mental health preparedness may significantly enhance psychological preparedness. It was also revealed that nurses had less training in psychological preparedness than in general disaster preparedness. In particular, male nurses received relatively less training in disaster and psychological preparedness, as well as disaster mental health preparedness, when compared to female nurses. Appropriate training could influence self-efficacy, dispositional optimism, and self-esteem; and reduce anxiety and PTSD symptoms. The results highlight the importance of considering psychological preparedness in future disaster planning and training for nurses. From this part of the study (Said et al., 2020), results of the relationship between psychological preparedness (PPDTS) and different trainings as preliminary findings are presented with caution due to the limitations. The findings imply the need to investigate the effect of PFA training on psychological preparedness for disaster in terms of self-efficacy, self-esteem, optimism, trait anxiety, and PTSD. In response, a second part of the study with a non-equivalent group control design was conducted.

In the second part, a modified PFA training programme was employed with pre- and post-test by two arms with the aim of improving nurses' psychological preparedness for disaster. This study added to the body of research on psychological preparedness for disaster by investigating the effect of PFA training on psychological preparedness, in relation to the personality variables of self-efficacy, dispositional optimism, self-esteem, and trait anxiety, as well as PTSD experience. It was found that PFA training was an effective training method for improving psychological preparedness, and the personality variables included self-efficacy, optimism, and self-esteem. Being the covariates in the model, knowledge, skills, and attitudes in PFA application also increased post-test. It appears that PFA training may enable nurses to gain the psychological capacity to provide care and support to patients and survivors during a disaster, in addition to promoting their own mental well-being.

The PFA training included scenarios-based simulation learning, role playing, and debriefing after the use of each scenario, each of which was developed based on real situations. The scenario-based learning through simulation had the capacity to encourage critical thinking, and trigger nurses to reflect on how the knowledge and skills they acquired could be applied in real-life situations, and to solve problems with appropriate decision making. In addition, nurses were able to practice the learnt skills in a risk-free environment, helping them to build self-efficacy before facing real situations in a time of disaster.

The Palestinian nurses in this study, who face a unique situation as they deal with daily political conflicts, indicated benefits from the PFA training they had received. Nurses trained in PFA may be able to alleviate the psychological effects of the conflict there, meet the psychological needs of the people affected, and care for themselves. The

incorporation of real experiences in the PFA training with the scenario-based simulation and debriefing, improved psychological preparedness, and this may enhance their ability to face psychological adversity.

Healthcare administrators and policymakers could adopt PFA training on a regular basis to consolidate nurses' psychological preparedness, or even other healthcare workers, for disaster. They may also update the national plan to support healthcare providers, in particular nurses, for such training. Nursing educators may need to align the national plan with the syllabus and curriculum of disaster education in undergraduate or post-graduate nursing studies.

Future research should employ rigorous study designs, such as randomised control trials, with sufficient power to further examine the effects of PFA training on trainee knowledge, skills, and attitudes acquisition and performance, as well as their psychological preparedness following the implementation of this training. In addition, further research will determine if similar findings are generated from studies involving nurses from different departments. This will help to validate the findings that prior evidence is substantiated as being both valid and broadly applicable, so that the results can be generalised to larger population. Opinions and suggestions from nurses could be obtained through qualitative studies, to further develop the PFA training.

Finally, multidisciplinary collaboration is encouraged for disaster education and training in preparing nurses for disasters. A collaborative approach can strengthen the pedagogy, which is believed to advance nursing education, and enhance the psychological aspects of disaster preparedness.

7.2. Implications

In conclusion, the current research has several important implications for practice, education, and research. For practice and policymakers, first, it is evident that the concept of psychological preparedness for disaster must be focused and emphasised among nurses and other healthcare providers. Second, nurses should be adequately equipped with knowledge and skill competencies for general and psychological preparedness. Third, hospitals should invest to prepare their nurses and have a focus on the psychological issues that exist before and after disasters. Fourth, policymakers must ensure that disaster preparedness education is well integrated into undergraduate nursing curricula and higher educational institutions. Fifth, psychological preparedness training should be provided to nurses at all levels with frequent updating. Among this training is psychological first aid (PFA) training.

For education, the current study findings support the use of PFA as a training method to improve psychological preparedness. Therefore, it is possible to adopt such training in nursing education and a requirement for nurses once they start to work in hospital.

For research, future studies using a stronger study design with larger samples are required to substantiate the role of self-efficacy, self-esteem, dispositional optimism, trait-anxiety, and PTSD in improving psychological preparedness. A qualitative study approach can be used to explore the possible barriers in addressing psychological issues related to disaster preparedness, and the experience of PFA training for future improvement when planning for PFA training.

Regarding future PFA application, the employed PFA training was conducted based on experiential learning (including scenario-based learning, role playing, and debriefing).

With this method, nurses could gain a better understanding and acquisition of much-needed skills for psychological preparedness. However, some important points could be improved in the future. First, conducting a peer assessment of skills that will be demonstrated in the role play, such as using gestures, posture, facial expressions, eye contact, active listening to the audience, and responding appropriately. Second, since the original PFA training was in English, the trainer made her efforts to translate and contextualise the content to fit the specificities of the current situation in Palestine and to fit the language of participating nurses. Improvement can also be achieved through inviting a panel of psychologists and mental health nurses to translate such a programme into a standard PFA programme that would fit the Palestinian context. It is possible to adjust the training materials based on participants' baseline knowledge of the contents of such a programme. For example, assessing nurses for their knowledge of screening tools available for detecting emotional distress. If the nurses in the class reported low knowledge of these tools, then the content of the PFA training programme could contain in-depth information about assessment and assessment tools of emotional distress.

Overall, the findings of this study showed that nurses with more self-efficacy, self-esteem, and dispositional optimism, and less trait-anxiety and PTSD, would have higher psychological preparedness. The findings recommended relevant further training for nurses to strengthen their psychological preparedness, focused on the outcomes of disaster psychological preparedness, self-efficacy, self-esteem, dispositional optimism, trait-anxiety, and PTSD. The modified RAPID-PFA training was delivered to a sample of nurses in Palestine, and compared to a control group. Both groups had a pre- and post-test evaluation. From this part of the entire study, it was found that the interventional group had higher scores in disaster psychological preparedness, as well

as in self-efficacy, self-esteem, and dispositional optimism; and lower scores in trait-anxiety and PTSD than those in the control group. The results suggest preliminary evidence that PFA training has a promising effect on improving nurses' psychological preparedness for disasters.

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APPENDICES

Appendix I

Checklist for Reporting Results of Internet E-Surveys (CHERRIES)

Item Category	*Checklist Item*	*Explanation*
Design	Describe survey design	Describe target population, sample frame. Is the sample a convenience sample? (In "open" surveys this is most likely.)
IRB (Institutional Review Board) approval and informed consent process	IRB approval	Mention whether the study has been approved by an IRB.
	Informed consent	Describe the informed consent process. Where were the participants told the length of time of the survey, which data were stored and where and for how long, who the investigator was, and the purpose of the study?
	Data protection	If any personal information was collected or stored, describe what mechanisms were used to protect unauthorized access.
Development and pre-testing	Development and testing	State how the survey was developed, including whether the usability and technical functionality of the electronic questionnaire had been tested before fielding the questionnaire.
Recruitment process and description of the sample having access to the questionnaire	Open survey versus closed survey	An "open survey" is a survey open for each visitor of a site, while a closed survey is only open to a sample which the investigator knows (password-protected survey).
	Contact mode	Indicate whether or not the initial contact with the potential participants was made on the Internet. (Investigators may also send out questionnaires by mail and allow for Web-based data entry).

	Advertising the survey	How/where was the survey announced or advertised? Some examples are offline media (newspapers), or online (mailing lists – If yes, which ones?) or banner ads (Where were these banner ads posted and what did they look like?). It is important to know the wording of the announcement as it will heavily influence who chooses to participate. Ideally the survey announcement should be published as an appendix.
Survey administration	Web/E-mail	State the type of e-survey (e.g., one posted on a website, or one sent out through e-mail). If it is an e-mail survey, were the responses entered manually into a database, or was there an automatic method for capturing responses?
	Context	Describe the website (for mailing list/newsgroup) in which the survey was posted. What is the website about, who is visiting it, what are visitors normally looking for? Discuss to what degree the content of the website could pre-select the sample or influence the results. For example, a survey about vaccination on a anti-immunization website will have different results from a web survey conducted on a government website
	Mandatory/voluntary	Was it a mandatory survey to be filled in by every visitor who wanted to enter the website, or was it a voluntary survey?
	Incentives	Were any incentives offered (e.g., monetary, prizes, or non-monetary incentives such as an offer to provide the survey results)?
	Time/Date	In what timeframe were the data collected?
	Randomization of items or questionnaires	To prevent biases items can be randomized or alternated.

	Adaptive questioning	Use adaptive questioning (certain items, or only conditionally displayed based on responses to other items) to reduce number and complexity of the questions.
	Number of Items	What was the number of questionnaire items per page? The number of items is an important factor for the completion rate.
	Number of screens (pages)	Over how many pages was the questionnaire distributed? The number of items is an important factor for the completion rate.
	Completeness check	It is technically possible to do consistency or completeness checks before the questionnaire is submitted. Was this done, and if "yes", how (usually JAVAScript)? An alternative is to check for completeness after the questionnaire has been submitted (and highlight mandatory items). If this has been done, it should be reported. All items should provide a non-response option such as "not applicable" or "rather not say", and selection of one response option should be enforced.
	Review step	State whether respondents were able to review and change their answers (eg, through a Back button or a Review step which displays a summary of the responses and asks the respondents if they are correct).
Response rates	Unique site visitor	If you provide view rates or participation rates, you need to define how you determined a unique visitor. There are different techniques available, based on IP addresses or cookies or both.
	View rate (Ratio of unique survey visitors/unique site visitors)	Requires counting unique visitors to the first page of the survey, divided by the number of unique site visitors (not page views!). It is not unusual to have view rates of less than 0.1 % if the survey is voluntary.

	Participation rate (Ratio of unique visitors who agreed to participate/unique first survey page visitors)	Count the unique number of people who filled in the first survey page (or agreed to participate, for example by checking a checkbox), divided by visitors who visit the first page of the survey (or the informed consents page, if present). This can also be called “recruitment” rate.
	Completion rate (Ratio of users who finished the survey/users who agreed to participate)	The number of people submitting the last questionnaire page, divided by the number of people who agreed to participate (or submitted the first survey page). This is only relevant if there is a separate “informed consent” page or if the survey goes over several pages. This is a measure for attrition. Note that “completion” can involve leaving questionnaire items blank. This is not a measure for how completely questionnaires were filled in. (If you need a measure for this, use the word “completeness rate”.)
Preventing multiple entries from the same individual	Cookies used	Indicate whether cookies were used to assign a unique user identifier to each client computer. If so, mention the page on which the cookie was set and read, and how long the cookie was valid. Were duplicate entries avoided by preventing users access to the survey twice; or were duplicate database entries having the same user ID eliminated before analysis? In the latter case, which entries were kept for analysis (e.g., the first entry or the most recent)?
	IP check	Indicate whether the IP address of the client computer was used to identify potential duplicate entries from the same user. If so, mention the period of time for which no two entries from the same IP address were allowed (e.g., 24 hours). Were duplicate entries avoided by preventing users with the same IP address access to the survey twice; or were duplicate database entries having the same IP address within a given period of time eliminated before analysis? If the latter, which entries were kept for analysis (e.g., the first entry or the most recent)?
	Log file analysis	Indicate whether other techniques to analyze the log file for identification of multiple entries were used. If so, please describe.

	Registration	In “closed” (non-open) surveys, users need to login first and it is easier to prevent duplicate entries from the same user. Describe how this was done. For example, was the survey never displayed a second time once the user had filled it in, or was the username stored together with the survey results and later eliminated? If the latter, which entries were kept for analysis (e.g., the first entry or the most recent)?
Analysis	Handling of incomplete questionnaires	Were only completed questionnaires analyzed? Were questionnaires which terminated early (where, for example, users did not go through all questionnaire pages) also analyzed?
	Questionnaires submitted with an atypical timestamp	Some investigators may measure the time people needed to fill in a questionnaire and exclude questionnaires that were submitted too soon. Specify the timeframe that was used as a cutoff point, and describe how this point was determined.
	Statistical correction	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for the non-representative sample; if so, please describe the methods.

Appendix II

Research Questionnaire

A Survey of Nurses on Psychological Preparedness for Disasters (Part One)

Dear colleagues

You are invited to participate in a disaster preparedness study conducted by a PhD candidate, Mr. Nizar SAID, who is supervised by Associate Professor Dr Vico Chiang, and co-supervised by Professor Alex Molasiotis of the School of Nursing in The Hong Kong Polytechnic University. The project has been approved by the Human Subjects Ethics Sub-committee (HSESC) of The Hong Kong Polytechnic University (HSESC Reference Number: HSEARS20190118001).

The disaster preparedness study has the purpose for investigating the outcomes of a psychological first aid (PFA) training programme, with the aim of this Part One specifically to 1) investigate psychological preparedness for disasters among nurses with disaster field experience, and 2) evaluate the extent of psychological preparedness of nurses with disaster field experience in relation to self-efficacy, dispositional optimism, trait anxiety, and self-esteem. The results obtained from this survey will be useful to inform the structure of the PFA training for further study in the next part. This study will involve completing a questionnaire, which will take you about twenty minutes to complete. The questionnaires contain five sections.

The study should not result in any undue discomfort. All information related to you will remain confidential and will be identifiable by codes only known to the researchers. You have every right to withdraw from the study before or during the study without penalty of any kind.

If you would like to obtain more information about this study, please contact Mr. Nizar Said [tel. no.: (852) 3400-3792 / email: nizarsaid@] or Dr Vico Chiang [tel. no.: (852) 2766-6683 / email: vico.chiang@].

If you have any complaints about the conduct of this research study, please do not hesitate to contact Miss Cherrie Mok, 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 as well as the HSESC Reference Number.

Thank you very much for your interest in participating in this study.

Dr. Vico Chiang
Chief Investigator

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡
Tel 電話 (852) 2766 5111 Fax 傳真 (852) 2784 3374
Email 電郵 polyu@polyu.edu.hk
Website 網址 www.polyu.edu.hk

Consent

I hereby consent to participate in the captioned research.

I understand that information obtained from this research may be used in future research and published. However, my right to privacy will be retained, i.e. my personal details will not be revealed.

The study as set out in the attached information sheet has been fully explained. I understand the benefit and risks involved. My participation in the study is voluntary.

I acknowledge that I have the right to question any part of the study and can withdraw at any time without penalty of any kind.

I declare that I read the information above and I would like to join the study. *

□ Yes □ No

I declare that I am a nurse and participated in at least one disaster relief work on-site or in the related clinical setting (e.g. hospital). *

□ Yes □ No

* If No, please do not proceed with the survey.

Section I: Personal Particulars

Q1. Age:				
Q2. Gender:	1. Male	2. Female		
Q3. Country:				
Q4. Marital status:	1. Single	2. Married	3. Divorce	4. Others (please specify):
Q5. Education level:	1. Diploma (2 years)	2. Bachelor	3. Master	4. Doctorate
Q6. Are you working:	1. Full time	2. Part time		
Q7. Current Position:	1.Ward Manager	2. Registered Nurse	3. Nursing Educator	4. Licensed Practical Nurse (LPN)
	5. Others (please specify):			
Q8. Working Department	1. ER	2. ICU	3. Surgical	4. Maternity
	5. Orthopaedic	6. Paediatric	7. Others (please specify):	
Q9. Work place	1. Public	2. Private	3. University Hospital	4. Humanitarian organization
	5. Others (please specify):			
Q10. How many times have you ever responded to disasters?				
Q11. Type of disaster you responded to	1. Earthquake	2. Hurricanes/ Tropical	3. Floods	4. Storms/ Tornadoes/ Severe Storms
	5. Tsunami	6. Wildfires	7. Volcanic eruptions	8. War
	9. Incidents of Mass Violence/Terrorism		10. Others	
Q12. Did you receive any kind of training related to disasters?	1. Yes	2. No	If Yes; When was the last training you received? Date:	
Q13. Training 1: General disaster preparedness	1. Yes	2. No	If Yes, was the training 1. in-person 2. online format	

	Was the training 1. Formal 2. Self-learning		Duration of the training in hours:
Q.14 Training 2: Psychological preparedness	1. Yes	2. No	If Yes, was the training 1. in-person 2. online format
	Was the training 1. Formal 2. Self-learning		Duration of the training in hours:
Q15. Training 3: Stress management	1. Yes	2. No	If Yes, was the training 1. in-person 2. online format
	Was the training 1. Formal 2. Self-learning		Duration of the training in hours:
Q16. Training 4: Disaster mental health preparedness	1. Yes	2. No	If Yes, was the training 1. in-person 2. online format
	Was the training 1. Formal 2. Self-learning		Duration of the training in hours:

Section II: PTSD Diagnostic Scale for DSM-5

Instructions: Below is a list of problems that people sometimes have after experiencing a traumatic event. Write down the most distressing traumatic event that you checked on the last page:

_____.

Please read each statement carefully and tick the number that best describes how often that problem has been happening and how much it upset you over THE LAST MONTH. Rate each problem with respect to the traumatic event that you wrote above

No	Question	0 Not at all	1 Once a week or less/a little	2 2 to 3 times a week/somewhat	3 4 to 5 times a week/very much	4 6 or more times a week/severe
1	Unwanted upsetting memories about the trauma					
2	Bad dreams or nightmares related to the trauma					
3	Reliving the traumatic event or feeling as if it were actually happening again					
4	Feeling very EMOTIONALLY upset when reminded of the trauma					
5	Having PHYSICAL reactions when reminded of the trauma (for example, sweating, heart racing)					
6	Trying to avoid thoughts or feelings related to the trauma					
7	Trying to avoid activities, situations, or places that remind you of the trauma or that feel more dangerous since the trauma					
8	Not being able to remember important parts of the trauma					
9	Seeing yourself, others, or the world in a more negative way (for example ”I can’t trust people,” “I’m a weak person”)					
10	Blaming yourself or others (besides the person who hurt you) for what happened					
11	Having intense negative feelings like fear, horror, anger, guilt or shame					
12	Losing interest or not participating in activities you used to do					
13	. Feeling distant or cut off from others					
14	Having difficulty experiencing positive feelings					
15	Acting more irritable or aggressive with others					
16	Taking more risks or doing things that might cause you or others harm (for example, driving					

No	Question	0 Not at all	1 Once a week or less/a little	2 2 to 3 times a week/somewhat	3 4 to 5 times a week/very much	4 6 or more times a week/severe
	recklessly, taking drugs, having unprotected sex)					
17	Being overly alert or on-guard (for example, checking to see who is around you, being uncomfortable with your back to a door)					
18	Being jumpy or more easily startled (for example when someone walks up behind you)					
19	Having trouble concentrating					
20	Having trouble falling or staying asleep					
DISTRESS AND INTERFERENCE						
21	How much have these difficulties been bothering you?					
22	How much have these difficulties been interfering with your everyday life (for example relationships, work, or other important activities)?					

SYMPTOM ONSET AND DURATION

23. How long after the trauma did these difficulties begin? [Circle one]

a. Less than 6 months

b. More than 6 months

24. How long have you had these trauma-related difficulties? [Circle one]

a. Less than 1 month

b. More than 1 month

Section III: Psychological Preparedness for Disaster Threat Scale (PPDTS)

1 = not at all true of me - 4 = exactly true of me		1	2	3	4
1	I am familiar with the disaster event preparedness materials available to me				
2	I know which household preparedness measures are needed to stay safe in a disaster situation.				
3	I know how to adequately prepare my home for the forthcoming disaster event.				
4	I know what to look out for in my home and work place if an emergency weather situation should develop.				
5	I am familiar with the disaster warning system messages used for disaster event.				
6	I am confident that I know what to do and what actions to take in a disaster situation.				
7	I would be able to locate the disaster event preparedness materials in a disaster-warning situation easily.				
8	I am knowledgeable about the impact that disaster event can have on my home.				
9	I know what the difference is between a cyclone warning and a cyclone watch situation.				
10	I am familiar with the weather signs of an approaching storm or cyclone.				
11	I think I am able to manage my feelings pretty well in difficult and challenging situations.				
12	In a severe disaster event, I would be able to cope with my anxiety and fear.				
13	I seem to be able to stay cool and calm in most difficult situations.				
14	I feel reasonably confident in my own ability to deal with stressful situations that I might find myself in.				
15	When necessary, I can talk myself through challenging situations.				

Section IV

A. General Self-Efficacy Scale (GSE)

No.		Not at all true	Hardly true	Moderately true	Exactly true
1	I can always manage to solve difficult problems if I try hard enough				
2	If someone opposes me, I can find the means and ways to get what I want				
3	It is easy for me to stick to my aims and accomplish my goals				
4	I am confident that I could deal efficiently with unexpected events				
5	Thanks to my resourcefulness, I know how to handle unforeseen situations				
6	I can solve most problems if I invest the necessary effort				
7	I can remain calm when facing difficulties because I can rely on my coping abilities				
8	When I am confronted with a problem, I can usually find several solutions				
9	If I am in trouble, I can usually think of a solution				
10	I can usually handle whatever comes my way				

B. The Life Orientation Test (LOT)

No.		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	In uncertain times, I usually expect the best					
2	It's easy for me to relax					
3	If something can go wrong for me, it will					
4	I'm always optimistic about my future					
5	I enjoy my friends a lot					
6	It's important for me to keep busy					
7	I hardly ever expect things to go my way.					
8	I don't get upset too easily					
9	I rarely count on good things happening to me					
10	Overall, I expect more good things to happen to me than bad					

C. State-Trait Anxiety Inventory (STAI)*
(Only 21-40 items to measure the trait-anxiety)

No.	Item	Almost Never	Some - time	often	Almost Always
21	I feel pleasant				
22	I feel nervous and restless				
23	I feel satisfied with myself				
24	I wish I could be as happy as others seem to be				
25	I feel like a failure				
26	I feel rested				
27	I am calm, cool, and collected				
28	I feel that difficulties are piling up so that I cannot overcome them				
29	I worry too much over something that really doesn't matter				
30	I am happy				
31	I have disturbing thoughts				
32	I lack self confidence				
33	I feel secure				
34	I make decision easily				
35	I feel inadequate				
36	I am content				
37	Some unimportant thoughts runs through my mind and bothers me				
38	I take disappointments so keenly that I can't put them out of my mind				
39	I am a steady person				
40	I get in a state of tension or turmoil as I think over my recent concerns and interests				

D. Self-Esteem Scale

No.		Strongly Agree	Agree	Disagree	Strongly Disagree
1	On the whole, I am satisfied with myself				
2	At times I think I am no good at all				
3	I feel that I have a number of good qualities				
4	I am able to do things as well as most other people				
5	I feel I do not have much to be proud of				
6	I certainly feel useless at times				
7	I feel that I'm a person of worth, at least on an equal plane with others				
8	I wish I could have more respect for myself				
9	All in all, I am inclined to feel that I am a failure				
10	I take a positive attitude toward myself				

Section V

1. Tell us how we can improve psychological preparedness of nurses for better prepared for disasters, please.

2. Anything you want to add

3. If you like to join the lucky draw, please provide your email

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Appendix III

Research Questionnaire

Psychological First-Aid Training of Nurses for Disaster Preparedness:

A non-equivalent control group study (Part Two)

#:

Dear colleagues,

You are invited to participate in a study conducted by Nizar SAID, who is a PhD candidate of the School of Nursing in The Hong Kong Polytechnic University. The Human Subjects Ethics Sub-committee (HSESC) of The Hong Kong Polytechnic University (HSESC Reference Number: HSEARS20190118001), and the IRB from An Najah National University have approved the project (Reference Number: XXX).

After a survey as Part One of the research project, the aim of this study is to determine if psychological first aid (PFA) training may achieve, (a) psychological preparedness of nurses for disasters; and (b) promotion of a sense of self-efficacy, dispositional optimism, trait anxiety, and self-esteem that represent one's own capabilities in psychological preparedness to disasters. The study will involve your participation in the PFA training which will take about 9 hours (2 hours per week), and completion of a set of questionnaires before and after the training. The questionnaires will take you about twenty minutes to complete, which are designed to obtain demographic information; knowledge about disaster preparedness; self-efficacy; self-confidence as a PFA provider; psychological preparedness for disasters; self-efficacy; individual differences in optimism versus pessimism; anxiety level as a personal characteristic; and self-esteem.

The study should not result in any undue discomfort. All information related to you will remain confidential and will be identifiable by codes only known to the researcher. You have every right to withdraw from the study before or during the study without penalty of any kind.

If you would like to obtain more information about this study, please contact Mr. Nizar Said [tel. no.: 059959 / email: nizarsaid@] or Dr Vico Chiang [tel. no.: (852) 2766-6683 / email: vico.chiang@].

If you have any complaints about the conduct of this research study, please do not hesitate to contact Miss Cherrie Mok, 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 as well as the HSESC Reference Number.

Thank you.

Dr. Vico Chiang

Chief Investigator

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡
Tel 電話 (852) 2766 5111 Fax 傳真 (852) 2784 3374
Email 電郵 polyu@polyu.edu.hk
Website 網址 www.polyu.edu.hk

CONSENT TO PARTICIPATE IN RESEARCH

(Psychological First-Aid Training of Nurses for Disaster Preparedness:

A Randomized Control Trial)

I _____ hereby consent to participate in the captioned research conducted by Nizar Said, a PhD candidate supervised by Associate Professor Dr. Vico Chiang, and co-supervisor Professor Alex Molasiotis.

I understand that information obtained from this research may be used in future research and published. However, my right to privacy will be retained, i.e. my personal details will not be revealed.

The study as set out in the attached information sheet has been fully explained. I understand the benefit and risks involved. My participation in the study is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without penalty of any kind.

Name of participant:

Signature of participant:

Name of researcher: Nizar Said

Signature of researcher: NIZAR SAID

Date:

Section I: Personal Particulars

<table>
<tr><td colspan="5">Q1. Age:</td></tr>
<tr><td>Q2. Gender:</td><td>1. Male</td><td>2. Female</td><td colspan="2"></td></tr>
<tr><td>Q3. Marital status:</td><td>1. Single</td><td>2. Married</td><td>3. Divorce</td><td>4. Others (please specify):</td></tr>
<tr><td>Q4. Education level:</td><td>1. Diploma (2 years)</td><td>2. Bachelor</td><td>3. Master</td><td>4. Doctorate</td></tr>
<tr><td>Q6. Are you working:</td><td>1. Full time</td><td>2. Part time</td><td colspan="2"></td></tr>
<tr><td rowspan="2">Q7. Current Position:</td><td>1.Ward Manager</td><td>2. Registered Nurse</td><td>3. Nursing Educator</td><td>4. Licensed Practical Nurse (LPN)</td></tr>
<tr><td colspan="4">5. Others (please specify):</td></tr>
<tr><td>Q8. Working Department</td><td>1. ER</td><td>2. ICU</td><td>3. Surgical</td><td></td></tr>
<tr><td>Q9. Workplace</td><td>1. Public</td><td>2. Private</td><td>3. University Hospital</td><td></td></tr>
<tr><td colspan="5">Q10. How many times have you ever responded to disasters?</td></tr>
<tr><td rowspan="3">Q11. Type of disaster you responded to</td><td>1. Earthquake</td><td>2. Hurricanes/ Tropical</td><td>3. Floods</td><td>4. Storms/ Tornadoes/ Severe Storms</td></tr>
<tr><td>5. Tsunami</td><td>6. Wildfires</td><td>7. Volcanic eruptions</td><td>8. War</td></tr>
<tr><td colspan="2">9. Incidents of Mass Violence/Terrorism</td><td colspan="2">10. Others</td></tr>
<tr><td>Q12. Did you receive any kind of training related to disasters?</td><td>1. Yes</td><td>2. No</td><td colspan="2">If Yes; When was the last training you received?
Date:</td></tr>
<tr><td rowspan="2">Q13. Training 1: General disaster preparedness</td><td>1. Yes</td><td>2. No</td><td colspan="2">If Yes, was the training
1. in-person 2. online format</td></tr>
<tr><td colspan="2">Was the training
1. Formal 2. Self-learning</td><td colspan="2">Duration of the training in hours:</td></tr>
</table>

Q.14 Training 2: Psychological preparedness	1. Yes	2. No	If Yes, was the training 1. in-person 2. online format
	Was the training 1. Formal 2. Self-learning		Duration of the training in hours:
Q15. Training 3: Stress management	1. Yes	2. No	If Yes, was the training 1. in-person 2. online format
	Was the training 1. Formal 2. Self-learning		Duration of the training in hours:
Q16. Training 4: Disaster mental health preparedness	1. Yes	2. No	If Yes, was the training 1. in-person 2. online format
	Was the training 1. Formal 2. Self-learning		Duration of the training in hours:

Section II: PFA survey

Psychological First Aid

<<Location>>

<<Training Date>>

For each statement, indicate your level or confidence or preparedness with a check mark in the appropriate box.

Please fill in every box.

Attitudes ***How confident are you in your ability to:***	**Very Confident**	**Confident**	**Unconfident**	**Very Unconfident**	**Don't Know**
1. Listen actively and communicate with those in distress					
2. Assess the need for intervention					
3. Prioritize and respond to basic human needs					
4. Explain coping techniques to those in need					
5. Recognize those who need referral to mental health clinicians					
6. Use self-care techniques					
7. Assist those in need of Psychological First Aid					
8. Personally rebound from a crisis					

9. Personally cope with extreme stress					
10. Be resilient					
<u>Skills</u> ***How prepared are you to:***	**Very Prepared**	**Prepared**	**Unprepared**	**Very Unprepared**	**Don't Know**
1. Listen actively and communicate with those in distress					
2. Assess the need for intervention					
3. Prioritize and respond to basic human needs					
4. Explain coping techniques to those in need					
5. Recognize those who need referral to mental health clinicians					
6. Use self-care techniques					
7. Assist those in need of Psychological First Aid					
8. Personally rebound from a crisis					
9. Personally cope with extreme stress					
10. Be resilient					

Knowledge Assessment

Instructions: For each of the following questions, circle the correct answer. NOTE: There is **only one** correct answer.

1. The first course in psychological first aid was developed in:

    a. 1992
    b. 1944
    c. 2001
    d. 1954

2. The factor most predictive of resiliency after a disaster is:

    a. Social support
    b. Your experience working with panicked crowds
    c. If you've helped others in emergencies previously
    d. None of the above

3. According to Maslow, which of the following must be met before anything else can be done?

    a. Safety
    b. Physical needs
    c. Support
    d. Self-esteem

4. True or False: Psychological first aid is treatment for Post-Traumatic Stress Disorder (PTSD).

5. True or False: Stress can be contagious.

6. True or False: Event-based psychological triage is superior to response-based triage.

7. True or False: Peri-traumatic dissociation is the best predictor of PTSD.

8. True or False: Physical casualties will always outnumber psychological casualties.

9. True or False: Resilient leadership refers to the psychological immunity of the leader during crisis.

10. Human resiliency seems built upon all of the following factors, except...

    a. Optimism

    b. Tenacity

    c. Financial resources

    d. Social support

Section III, IV, and V contains same assessment tools used in study part one as indicated in Appendix II

Ethical Approval

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

To	Chiang Chung Lim Vico (School of Nursing)		
From	Vaelimaeki Maritta Anneli, Chair, Departmental Research Committee		
Email	maritta.valimaki@	Date	29-Jan-2019

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 01-Mar-2019 to 28-Feb-2020:

Project Title:	Psychological First Aid Training of Nurses for Disaster Preparedness: A Randomized Control Trial
Department:	School of Nursing
Principal Investigator:	Chiang Chung Lim Vico
Project Start Date:	01-Mar-2019
Reference Number:	HSEARS20190118001

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 case 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 Human Subjects Ethics Sub-committee in advance of any changes in the proposal or procedures which may affect the validity of this ethical approval.

Vaelimaeki Maritta Anneli

Chair

Departmental Research Committee

Ethical approval 2

An-Najah
National University
Health Faculty of medicine&
Sciences
IRB

جامعة النجاح
الوطنية
كلية الطب وعلوم الصحة
لجنة اخلاقيات البحث العلمي

IRB Approval Letter

Study Title:

"Psychological First Aid Training of Nurses for Disaster Preparedness: A Randomized Control Trial"

Submitted by:
Nizar Said

Supervisor:
Dr. Vico Chung Lim Chiang, Professor Alex Molasiotis.

Date Reviewed:
13th April. 2019

Date Approved:
25th April 2019

Your Study titled **"Psychological First Aid Training of Nurses for Disaster Preparedness: A Randomized Control Trial"** with archived number (12) April 2019 was reviewed by An-Najah National University IRB committee and was approved on **25th April 2019.**

Hasan Fitian, MD

IRB

IRB Committee Chairman
An-Najah National University

نابلس - ص.ب 7 أو 707 || هاتف 2342902/4/7/8/14(09) (970) || فاكسميل 2342910 (09) (970)

Nablus - P.O Box :7 or 707 | Tel (970) (09) 2342902/4/7/8/14 | Faximile (970) (09) 2342910 | E-mail : hgs@

Appendix V

Invitation Email for part one study

Information for members

RE: Psychological preparedness for disasters among nurses with disaster field experience (an Online Survey)

Dear Colleagues,

You are cordially invited to participate in a disaster preparedness study conducted by a PhD candidate, Mr. Nizar SAID, who is supervised by Associate Professor Dr Vico Chiang, and co-supervised by Professor Alex Molasiotis of the School of Nursing in The Hong Kong Polytechnic University. The project has been approved by the Human Subjects Ethics Sub-committee (HSESC) of The Hong Kong Polytechnic University (HSESC Reference Number: HSEARS20190118001).

The disaster preparedness study has the purpose to investigate the outcomes of a psychological first aid (PFA) training programme, with the aim of this phase I as a survey to 1) investigate psychological preparedness for disasters among nurses with disaster field experience, and 2) evaluate the extent of psychological preparedness of nurses with disaster filed experience in relation to self-efficacy, dispositional optimism, trait anxiety, and self-esteem.

The results obtained from this survey will be useful to inform the better structure of the PFA training for further study in the next phase. This study will involve completing a questionnaire, which will take you about twenty minutes to complete. The questionnaires contain five sections.

The study should not result in any undue discomfort. All information related to you will remain confidential and will be identifiable by codes only known to the researchers.

As a participant, you should have participation in at least one disaster relief work on-site or in the related clinical setting (e.g. hospital).

We would be very grateful if you may also further spread the online survey link for other nurses whom you know and have disaster field experience to join the study.

In order to appreciate your participation in this survey, three free registrations for the upcoming Asia Pacific Emergency and Disaster Nursing Network (APEDNN) conference in September 2019 at Hong Kong will be offered. If you would like to join this lucky draw, please provide your email address at the end of this survey.

The survey link: https://www.polyu.edu.hk/mysurvey/index.php/693374?lang=en

Sincerely Yours,
Mr. Nizar Said
MSN, BSN, RN
PhD Candidate

Correspondence letters for part two study

An- Najah
National University
Faculty of Medicine & Health Sciences
Department of Nursing

بسم الله الرحمن الرحيم

جامعة النجاح
الوطنية
كلية الطب وعلوم الصحة
دائرة التمريض

التاريخ: 07/05/2019

حضرة د.حسن فتيان المحترم، رئيس قسم الدراسات العليا للعلوم الطبية والصحيه، ،

الموضوع: الموضوع: تسهيل مهمة الطالب نزار بلال سعيد لمشروع تخرج دكتوراة في علوم التمريض

تحية طيبة وبعد،

أرجو من حضرتكم التكرم بالموافقة والإيعاز لمن يلزم بمخاطبة كل من:

1. د. أمل ابو عوض المحترمة / مدير عام التعليم الصحي في وزارة الصحة
2. د. رياض عامر المحترم / المدير الطبي - مستشفى النجاح الوطني الجامعي

لتسهيل إجراء البحث المخصص لمرشح الدكتوراة أ. **نزار بلال سعيد** من برنامج علوم التمريض من جامعة بوليتكنك هونغ كونغ والمبتعث من كلية الطب وعلوم الصحة في جامعة النجاح الوطنية. مؤكدين لكم بأن كافة المعلومات التي سوف يتم جمعها هي لأغراض البحث العلمي فقط، وسوف يتم الحفاظ على السرية التامة وعدم استخدام هذه المعلومات لأغراض أخرى.

Title of Research: Psychological First Aid Training of Nurses for Disaster Preparedness: A Randomized Control Trial

العنوان باللغة العربية: الإسعاف الاولي السيكولوجي للتمريض من اجل تحضيرات الكوارث

المشرفون: Prof. Alex Molasiotis, Dr. Vico Chiang

المستشفيات المطلوبة للعمل البحثي: مستشفى رفيديا الحكومي الجراحي + مستشفى النجاح الوطني الجامعي أقسام Trauma سيتم انتقاء عينة التمريض بطريقة عشوائية لمجموعتين، المجموعة الأولى سيتم تدريبها على الإسعاف الاولي السيكولوجي، والمجوعة الثانية ستكون للمقارنة ولن تحصل على أي تدريب. سيتم تعبئة أدوات القياس (الاستبيان) قبل وبعد التدريب لكلا المجموعتين وذلك في الفتره الواقعه ما بين 2019/05/19 ولغاية 2019/07/30 .

مرفق: IRB + المختصر وصفحة عنوان المشروع (Abstract and first page)

وتفضلو بقبول وافر الاحترام والتقدير ، ،

د.عائدة القيسي

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An-Najah
National University
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جامعة
النجاح الوطنية
مكتب نائب الرئيس للشؤون الأكاديمية

الرقم: ن ك ص/١٤أيا/٢٠١٩
التاريخ: ٢٠١٩/٥/٢٢

حضرة الدكتوره أمل أبو عوض المحترمه
مدير عام التعليم الصحي

تحية طيبة وبعد،

الموضوع: تسهيل مهمة

تهديكم جامعة النجاح الوطنية أطيب التحيات ونعلمكم بأن نزار بلال سعيد طالب دكتوراه في علم التمريض وهو بصدد اعداد الأطروحة الخاصة به والتي بعنوان"

"الاسعاف الأولي السيكولوجي للتمريض من أجل تحضيرات الكوارث"

ولاتمام الاطروحة يحتاج إلى المساعدة في انتقاء عينه التمريض بطريقة عشوائية لمجموعتين الأولى سيتم تدريبها على الاسعاف الأولي السيكولوجي والمجموعة الثانية ستكون للمقارنة ولن تحصل على أي تدريب، وسيتم تعيين ادوات القياس(استبيان) قبل وبعد التدريب لكلا المجموعتين وذلك في الفترة ما بين ٢٠١٩/٥/٢٢- ٢٠١٩/٧/٣٠ يرجى من حضرتكم الايعاز للمعنيين في مستشفى رفيديا الحكومي- نابلس تسهيل مهمة الطالب، علما بأن المعلومات ستستخدم لاغراض البحث العلمي فقط وستتم المحافظه على السرية التامة.

شاكرين لكم حسن تعاونكم.

مع وافر الاحترام.

نائب الرئيس للشئون الأكاديمية

د. محمد العمله

نسخه: كلية الطب وعلوم الصحة.
نسخه: دائرة التمريض.
نسخه: الملف.

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مكتب نائب الرئيس للشؤون الأكاديمية

الرقم: ن ك ص/١٤أيا/٢٠١٩
التاريخ: ٢٠١٩/٥/٢٢

حضرة الدكتور عبد الكريم البرقاوي المحترم
المدير الطبي مستشفى النجاح التعليمي الجامعي

تحية طيبة وبعد،

الموضوع: تسهيل مهمة

تهديكم جامعة النجاح الوطنية أطيب التحيات ونعلمكم بأن **السيد نزار بلال سعيد** طالب دكتوراه في علم التمريض وهو بصدد اعداد الأطروحة الخاصة به والتي بعنوان"

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شاكرين لكم حسن تعاونكم.

مع وافر الاحترام.

نائب الرئيس للشئون الأكاديمية

د. محمد [redacted]

نسخه: كلية الطب وعلوم الصحة.
نسخه: دائرة التمريض.
نسخه: الملف.

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