EFFECTS OF A COPING-ORIENTED SUPPORTIVE PROGRAMME FOR PEOPLE WITH SPINAL CORD INJURY DURING INPATIENT REHABILITATION: A QUASI-EXPERIMENTAL STUDY

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Effects of a Coping-oriented Supportive Programme for People with Spinal Cord Injury during Inpatient Rehabilitation: A Quasi-experimental Study

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A thesis submitted in partial fulfilment of the requirements for the degree of

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CERTIFICATE OF ORIGINALITY

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LI Yan

Abstract of thesis entitled: "Effects of a coping-oriented supportive programme for people with spinal cord injury during inpatient rehabilitation: A quasi-experimental study" submitted by LI Yan for the degree of Doctor of Philosophy at the Hong Kong Polytechnic University in May 2018.

ABSTRACT

Background

People suffering from spinal cord injury (SCI) experience devastating loss of physical function, which often results in psychological distress and strained personal relationships. These issues present enormous challenges for healthcare professionals during the inpatient rehabilitation stage. Current research demonstrates the effectiveness of medical and physiotherapy approaches used in SCI inpatient rehabilitation (i.e., exercise programmes in enhancing physical function and treatment for medical complications caused by the injury). However, the effectiveness of psychosocial care during the earlier stages of inpatient SCI rehabilitation has not been adequately established. This is an important gap in evidence because a holistic bio-psychosocial model of SCI rehabilitation emphasizes dynamic interactions between physical, psychological and social factors and highlights the equal importance of psychosocial support to physical rehabilitation. Most of the available studies evaluating the effects of psychosocial care programmes for people with SCI were conducted in Western countries, and focused on patients with severe mental health problems (major depression, anxiety, and post-traumatic stress disorder), or specific co-morbidities (chronic pain and pressure ulcer). There is a paucity of SCI psychosocial intervention studies designed and implemented for Chinese people with mild to moderate levels of psychological distress. Such psychosocial care programmes would be promising to prevent potential deterioration of mental state. Such psychosocial care programmes could also consolidate people's psychological adjustment to SCI, promote active engagement in rehabilitation, and enhance people's psychosocial well-being and life satisfaction at post-injury.

Aim and Objectives

This PhD study aimed to test the effectiveness of a psychosocial care programme entitled "Coping-oriented supportive programme (COSP)" for Chinese people with SCI during their inpatient rehabilitation stage. The objectives of this study were to examine the effectiveness of the COSP for the SCI inpatients in two rehabilitation wards on their coping abilities, self-efficacy, mood status, social support, pain and life satisfaction, when compared with those receiving didactic education in another two rehabilitation wards.

Methods

This was a quasi-experimental study with two parallel groups (the COSP and the comparison group) using repeated measures. Participants were people with SCI in two rehabilitation hospitals (two SCI wards in each hospital). One ward from each hospital was selected for recruiting participants of the COSP, and the other wards served as the comparison group. The sample size for the main study was calculated as 50 for each group (assuming a medium effect size f=0.25, power of 80% and a significance level of 0.05). The COSP group received eight weekly group intervention sessions, and the comparison group received eight didactic education sessions. The primary outcomes were participants' coping ability (maladaptive coping and adaptive coping), and self-efficacy. The secondary outcomes included participants' mood status (anxiety and depression), social support (amount of social support and satisfaction of social support), and pain and life satisfaction. Outcomes were measured at baseline and immediately, one- and three months after the interventions. Both intention-to-treat (ITT) and per-protocol (PP) analysis were used. MANCOVA test followed with repeated-measures of ANCOVA was adopted for analysing the effects of the COSP on the primary outcomes and majority of the secondary outcomes. Some ordinal data of secondary outcomes were analysed using non-parametric tests (i.e., Mann Whitney U Test). Additional subgroup analyses were also performed to determine the influence of specific clinical/demographic factors (i.e., gender and injury type) on the COSP effects.

Results

Two SCI wards were allocated into the COSP and the other two SCI wards were allocated to the comparison group. A total of 99 patients with SCI were randomly selected from 161 eligible patients to participate in the study, with 50 in the COSP and 49 in the didactic education group. All 99 participants were included in the ITT analysis, and 71 participants (including those patients who had completed five or more intervention sessions and all the follow-up assessments) were included in the PP analysis. There was a statistically significant overall improvement in the majority of the psychosocial outcomes for SCI participants in the COSP. The ITT analysis of

MANCOVA tests (using participants' marital status, time since injury and medication intake as co-variants) indicated statistically significant effects (with moderate to large effect sizes; Partial Eta-Squared ranged from 0.09 to 0.36) on participants' maladaptive coping, anxiety, satisfaction of social support and life satisfaction at immediately after the intervention, 1- and 3-month follow-up; adaptive coping and depression at immediately after the intervention; self-efficacy at immediately after the intervention and 1-month follow-up. However, there was no statistically significant difference found in the amount of social support between the two study groups. The Mann-Whitney U tests indicated statistically significant effects of the COSP on overall life satisfaction (Q-LES-Q-SF, item 16 score) and pain (NRS score) at Times 2 and 3. Very similar results to the ITT analysis were found in the PP analysis. In addition, female participants indicated statistically higher scores on maladaptive coping in the three post-tests over three months follow-up. There were statistically significant differences found on most of the study outcomes (i.e. maladaptive coping, adaptive coping, anxiety, depression and life satisfaction) between the two injury types; participants with paraplegia indicated more adaptive psychosocial outcomes than those with tetraplegia.

Conclusion

This study pioneers a structured psychosocial care programme for Chinese people with SCI and filled several methodological and practical research gaps existing in the previous literature. Primarily, the study provided evidence on the effectiveness of the COSP in improving patients' psychological adjustment during inpatient SCI rehabilitation. The significant positive effects of the COSP on enhancing people's self-

efficacy, coping abilities, mood status and life satisfaction indicated the potential value of the integration of this psychosocial care programme into routine SCI inpatient rehabilitation. Future studies should train rehabilitation nurses to deliver the COSP during their day-to-day clinical practice and measure medium-long term patient outcomes using a multi-site cluster randomised controlled trial design.

Keywords: Spinal cord injury, Psychosocial care, Coping, Self-efficacy, Inpatient rehabilitation

Publications arising from the thesis

Refereed Journal Articles

Li, Y., Bressington, D., & Chien, W. T. (2017). Systematic review of psychosocial interventions for people with spinal cord injury during inpatient rehabilitation: Implications for evidence-based practice. *Worldviews on Evidenced-Based Nursing, 14*(6), *499-506.*

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The Best Oral Presentation Award. *The 21st East Asian Forum of Nursing Scholars (EAFONS) and 11th International Nursing Conference (INC), Seoul Korea (11-12 Jan 2018),* Korea: Korean Society of Nursing Science.

The Best Student Oral Presentation Award. *The 20th East Asian Forum of Nursing Scholars (EAFONS), Hong Kong* (9-10 March 2017), Hong Kong: School of Nursing, the Hong Kong Polytechnic University.

Trial Registration

This trial has been registered at ClinicalTrials.gov with an ID: NCT02672670 (February 3, 2016).

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List of abbreviations

ASIA	American Spinal Injury Association
ANCOVA	Analysis of Covariance
CBT	Cognitive Behavioural Therapy
CONSORT	Consolidated Standards of Reporting Trials
COSP	Coping-Oriented Supportive Programme
COPE	Coping Orientations to Problems Experienced Inventory
CSC	Clinically Significant Changes
CVI	Content Validity Index
EPHPP	Effective Public Health Practice Project
FIM	Functional Independence Measurement
HADS	Hospital Anxiety and Depression Scale
ICF	International Classification of Functioning, Disability and Health
ITT	Intention To Treat
LOCF	Last Observation Carried Forward
MANCOVA	Multivariate Analysis of Covariance
MMSE	Mini–Mental State Examination
MSES	Moorong Self-Efficacy Scale
PMP	Pain Management Programme
PP	Per Protocol
Q-LES-Q-SF	Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form
RCT	Randomised Controlled Trial
RCI	Reliable Change Index
SCI	Spinal Cord Injury

SSQ6	Six-item Social Support Questionnaire
NRS	Numerical Rating Scale

CHAPTER 1 BACKGROUND AND ORGANISATION OF THE THESIS

1.1 Introduction

This chapter provides an overview of the background information of spinal cord injury (SCI) and its consequences. The purposes and models of SCI inpatient rehabilitation are presented in Section 1.3. The current research status of the interventions/programmes regarding physical approaches for people with SCI is described, followed by a brief summary on the need and importance of psychosocial interventions (Section 1.4) for people with SCI during inpatient rehabilitation stage. Significance of the study is also described in Section 1.5, followed by an outline of the whole thesis organisation described in Section 1.6.

1.2 Spinal cord injury (SCI) and its consequences

1.2.1 Etiology of SCI

Spinal cord injury (SCI) is defined as a chronic neurological disorder, involving the cord that was severely lacerated, bruised, severed, or damaged due to some diseases (e.g., infective diseases, tumours) or trauma (Somers, 2001). Damage to the spinal cord results in short- to long-term, partial to full paralysis of voluntary muscles, loss of sensation, and reduced mobility and independence in daily activities, as well as impairment of social and normal life activities and psychological equilibrium, and hence substantial negative impacts on people’s quality of life (Middleton, Tran, & Craig, 2007; Somers, 2001).

Common causes of traumatic spinal cord injuries may include automobile or motorcycle accidents, sports, falls from high places, or dives into shallow water. The spinal cord may also be damaged by infective diseases, ischaemic insults, neoplastic disorders, multiple sclerosis, and tumours growing into the spinal cord, which are called non-traumatic spinal cord injuries (Richards, Kewman, & Pierce, 2000). SCI is classified as incomplete injury when there is “partial preservation of sensory and motor function found below the neurological level including the lowest sacral segment.” A complete injury is defined as when “there is an absence of sensory and motor function in the lowest sacral segment” (Maynard et al., 2007) (p. 267-p. 268).

Spinal cord injuries can also be divided into two types, and both of them reflect the regions and extents of people’s functioning. Tetraplegia refers to persons who sustain injuries to one of its eight cervical segments of the spinal cord; it leads to functional impairment in the arms, legs, and even the trunk and pelvic organs. Paraplegia pertains to those lesions occurring in the thoracic, lumbar, or sacral regions of the spinal cord; with which, arm function is remained, however, the trunk, legs and pelvic regions may be involved, which depends on the level of injury made (Maynard et al., 2007).

The American Spinal Injury Association (ASIA) has categorized the degree of SCI impairment into 5 grades (A-E): grade A refers to a complete injury, that is, “no sensory or motor function is preserved in the sacral segments S4-S5”; grade B means for an incomplete injury in which “sensory, but not motor function is preserved below the neurological level and includes the sacral segments S4-S5”; while grade C refers to another level of incomplete injury that “motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3”; in addition, grade D is an incomplete injury in which “motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade greater than or equal to 3”. Whereas, grade E is a normal condition, that is, “sensory and motor function is normal without any manifestation of injury on neurological function” (ASIA, 2003).

1.2.2 Incidence and prevalence of SCI

A comprehensive worldwide literature survey has demonstrated the incidence of SCI to lie between 10 and 83 per million people per year (Wyndaele & Wyndaele, 2006). The global prevalence of traumatic SCI was reported between 280 and 4,187 per million and a global incident rate of traumatic SCI is estimated at 23 TSCI cases per million (179,312 cases per annum) in 2007 (Chang & Hou, 2014). The estimated incidence of SCI in the US is about 40 cases per million population, and around 12,000 new cases per year (Centre, 2013). The incidence of traumatic SCI in Western Europe (16 per million) is slightly higher than Australian (15 per million) (Cripps et al., 2010). A systematic review on epidemiology of SCI in developing countries has indicated that: males comprised 83% of all the SCI population with a mean age of 32 years; the two main causes of SCI found are motor vehicle crashes (41%) and falls (35%); complete injuries were reported to be more common than incomplete injuries (complete SCI: 57%; incomplete SCI: 43%); whereas, paraplegia (59%) was found to be more common than tetraplegia (40%) (Rahimi-Movaghar et al., 2013).

The “International Campaign for Cures of Spinal Cord Injury Paralysis” stated that a conservative estimation of the worldwide prevalence of people with SCI-caused paralysis is over 2.5 million, with the highest prevalence of SCI, reported in China (Paralysis, 2004). It is also highlighted that with 60,000 new cases a year, China has more patients with SCI in the world (Qiu, 2009). According to a study conducted in Tianjin, China from 2004 to 2008, the incidence of SCI was estimated as 24 per million (Ning et al., 2010). The leading causes of traumatic SCI in this study are falls (57%) and land transport (34%). The male to female ratio was 5.6:1, and the frequency of tetraplegia (72%) was higher than paraplegia (28%). A study carried out in Beijing, Mainland China from 1982 to 2002 estimated that there were 1079 people who had traumatic SCI which provided an incidence of 60.6 per million. Compared with the incidence of 6.7 per million in Beijing from 1982 to 1986 (Li et al., 2011), with similar leading causes. The reasons for the steady increase in the incidence and prevalence of traumatic SCI in China may be due to the rapid economic development and modernisation, which has been parallel to high fall and heavy crush, increasing aging population with traumatic SCI, and many patients with traumatic SCI could be recorded nowadays with the development of healthcare system in rural areas (Qiu, 2009; Yang, et al., 2014).

The life expectancy at post-SCI is increased to be normal with the improvement of long-term medical rehabilitation care (Strauss, DeVivo, Paculdo, & Shavelle, 2006). A 50-year longitudinal study conducted in Sydney, Australia focused on the SCI survival showed that among 2,014 people, 80 people with tetraplegia (8%) and 40 people with paraplegia (4%) died within one year following the injury, with most people suffering from complete C1–4 injuries. Among those persons who can survive in the first year following injury, the 40-year survival rate was 47% for those with tetraplegia, and 62% for persons with paraplegia, respectively (Middleton et al., 2012). People's physical condition at post-SCI often alters their vocational, marital and social roles. The increased rates of depressed mood at 2-years post-SCI might be the reason that causes suicide, as one of the main leading causes of death after having SCI (Strauss, DeVivo, Paculdo, & Shavelle, 2006). However, other potentially treatable causes of death at post-SCI such as pneumonia and septicaemia have indicated significant reductions since 1980 (Soden et al., 2000).

1.2.3 Consequences of SCI

In the initial several weeks since the onset of SCI (i.e., acute phase), the survival of these patients is the concern of health professionals, and the patients are almost passive recipients of the medical treatment like skeletal traction or surgery, treatment of associated injuries (i.e., internal, brain), management of bladder and bowel, prevention of skin problems (Hagen, 2015). Following the injury, patients' body functions controlled by the spinal cord are interrupted and damaged at the distal level of the injury, which would lead to serious disability among them (Nas, Yazmalar, Sah, Aydin, & Ones, 2015). Most of them will be transferred to a rehabilitation centre after they have been observed to be medically stable over 6-12 weeks (Nas et al., 2015). Consequences of SCI bring damage to their independence and physical body function. The injury can also cause people various medical complications including chronic pain, neurogenic bladder and bowel, urinary tract infection, pressure ulcers, fracture, spasticity, deep vein thrombosis, autonomic dysreflexia, orthostatic hypotension, pulmonary and cardiovascular problems, and depression (Nas et al., 2015). The consequences caused by the SCI will be further illustrated by addressing the details in Chapter 2 (Section 2.2).

1.3 Inpatient rehabilitation of SCI

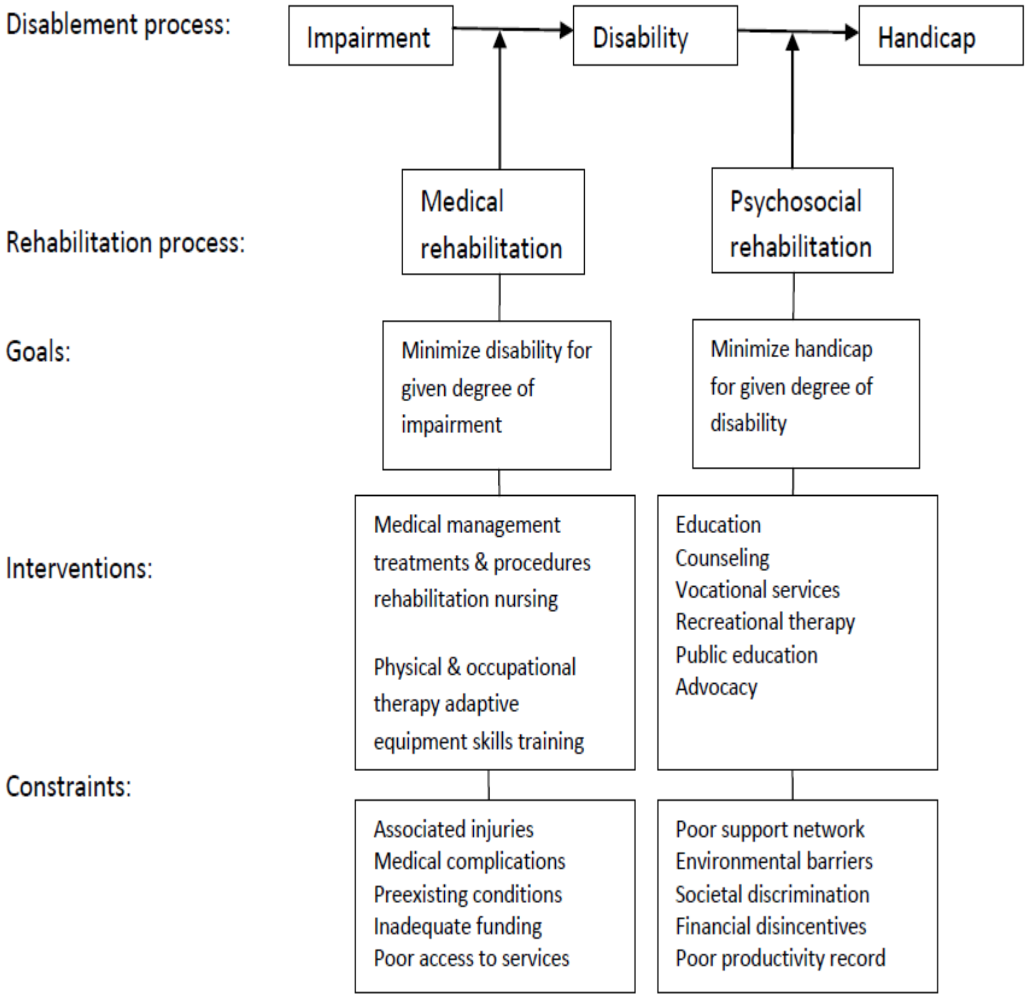
1.3.1 Purpose of inpatient rehabilitation

During patients' inpatient rehabilitation phase, patients with spinal cord injury need to acquire new knowledge and skills (i.e., daily living skills, adaptive equipment training) to adjust to their chronic physical disabilities and its associated psychological and social problems. The aim of the inpatient rehabilitation is to facilitate sufficient preparation for their reintegration into the community. A multidisciplinary team, including physicians, physiotherapists, occupational therapists, rehabilitation nurses, clinical psychologists, and social workers, is recommended to be equipped to fulfil these patients SCI rehabilitation needs. Nevertheless, the specific rehabilitation period for patients with SCI depends on not only the level of their injury but also their psycho-social circumstances (Kennedy, 2007).

1.3.2 Models of SCI rehabilitation

Models of SCI rehabilitation were reviewed and illustrated to understand the process/goals of SCI rehabilitation as well as the factors that could influence people's rehabilitation outcomes during the process. Using the terminology of rehabilitation medicine, the health issues can be regarded as within the context of impairment (physical/clinical health), disability (adaptive health), or handicap (role performance). In the early 1980s, Alexander and Fuhrer (1984) described the two interrelated biomedical and psychosocial models of rehabilitation that attempt to address the disability-related process of rehabilitation for people with SCI. Psychosocial rehabilitation aims to minimize the handicap for given degrees of disability by psycho-education, counselling and/or other psychotherapy, while the biomedical rehabilitation model emphasizes interdisciplinary efforts to prevent and treat physiologic and functional consequences of disability (Lanig et al., 1996). With different goals of biomedical and psychosocial rehabilitation, various interventions are thus essentially needed. The model of SCI rehabilitation initially suggested by Fuhrer (1987) is presented in Figure 1.1. The model can explain the patients' needs for both medical management and psychosocial aspects of limitations or handicaps caused by SCI.

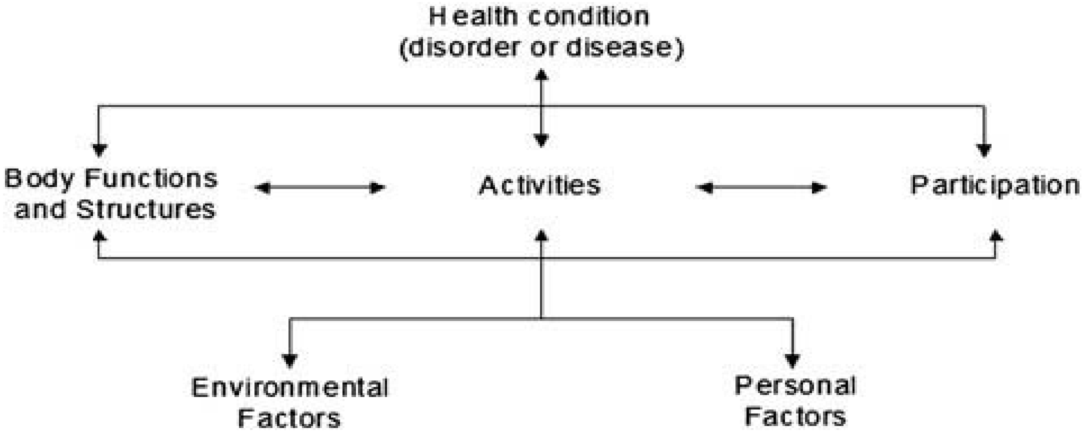
Figure 1.1 Model of SCI rehabilitation: adapted from (Fuhrer, 1987)



Nevertheless, many health professionals and researchers concluded that this model of rehabilitation is somewhat problematic and limited in functions of holistic care. This model adopted the “negative portrayal” of the consequences of disease, that is, “disability” and “handicap”, and the unidirectional (linear) connections among the components of the model could not reveal the interacted or related effects and relationships among people’s rehabilitation in their physical, psychological, and social aspects (Rosenbaum & Stewart, 2004). However, the multidimensional, bio-psychosocial approach, which is adapted from the framework of the “International Classification of Functioning, Disability and Health—(ICF)” could gain a better understanding of disability following SCI, as shown in figure 1.2 (Rosenbaum & Stewart, 2004). The strength of the ICF model is the shift in language from negative terms such as “impairment”, “disability”, and “handicap” to the neutral terms “body functions and structures”, “activities” and “participation”. In addition, one’s health condition would be emphasized as a dynamic interaction between environmental factors and personal factors, which is more comprehensive than the traditional notion that disability resided just within the individuals (Rosenbaum & Stewart, 2004). A holistic perspective of the bio-psychosocial model of SCI rehabilitation emphasizes the notion that biological, psychological and social processes are seen as integrative, integral and interactive in promoting and maintaining optimal health of the client, which has been substantially confirmed by recent applied research (Suls & Rothman, 2004).

Figure 1.2 The bio-psychosocial model of functioning, disability and health

(Source: Rosenbaum & Stewart, 2004)



1.3.3 Physical rehabilitation of SCI

Recent research demonstrates the clinical efficacy of biomedical approaches (i.e., medical complications, physical functioning, and exercises programmes) of SCI rehabilitation on people's functional improvement and health condition (Hicks et al., 2011). Various exercises programmes have been provided to be effective for people with SCI in improving their physical capacity and muscular strength (Hicks et al., 2011), as well as certain kinds of biomedical approaches for managing medical complications at post-SCI (McKinley, Gittler, Kirshblum, Stiens, & Groah, 2002).

It is suggested that the ultimate goal of SCI rehabilitation should focus on not only facilitating patients with physical/exercise skills in order to achieve the highest degree of independence, but also developing satisfying relationships and meaningful interactions with their social and living environment (Craig, 2008). However, the psychosocial care of people with SCI has not yet been adequately considered or attended and thus is less emphasized by health professionals, in comparison with aspects of biomedical rehabilitation (Middleton, Perry, & Craig, 2014). Extraordinary challenges in psychosocial health conditions were reported for people with SCI due to physical losses, strains on family role and relationships, and social limitations. Therefore, it recommends that all of the people with SCI need to be offered or involved in various psychosocial interventions as part of their earlier stage rehabilitation programme (Craig & Perry, 2008).

1.3.4 Psychosocial rehabilitation of SCI

Psychological and social issues have been indicated to have serious impacts on patients with SCI, with much somatic complaints and concerns of the disease and its prognosis (Mathew, Ravichandran, May, & Morsley, 2001). A longitudinal study conducted during inpatient SCI rehabilitation has demonstrated that non-somatic factors (e.g., "lack of self-confidence, poor concentration, indecisiveness, thinking about death, and wish to die") at baseline were significantly predictive of both the non-somatic and somatic factors (e.g., insomnia, lack of energy, and pain) at follow-up. This finding highlights the impact of non-somatic factors on the individual's holistic well-being at post-SCI (Krause, 2010). The psychosocial factors like coping strategies and social reliance contribute significantly to people's functional outcomes and rehabilitation effectiveness at post-SCI (Kennedy, Lude, Elfstrm, & Smithson, 2011a). The bio-psychosocial view on SCI has also been applied to its chronic pain condition, which could be treated by therapeutic interventions in considering the importance of psychological and social factors (Widerstrom-Noga, Felipe-Cuervo, & Yezierski, 2001). Pain management programme consisting of cognitive and behavioural strategies have also been found to be effective in lessening interference from pain and promoting people's sense of control of SCI chronic pain (Burns, Delparte, Ballantyne, & Boschen, 2013).

As illustrated in the literature review (i.e., Chapter 2), people sustaining SCI will need to adjust to various stressors, including not only a physical loss (i.e., paralysis, incontinence, and pain), but also social limitations, and strains in family roles and relationships (Middleton & Craig, 2008). The psychological adjustment process to the injury is found to be mediated by each individual’s cognitive appraisal and coping with those encountered stressful situations and events. Their demographic backgrounds (e.g., personality and age), psychological resources and coping with the encountered stressors are found to be the influencing factors to the psychosocial adaptation outcomes (i.e., emotional status, physical function, perceived social support and quality of life). Therefore, psychosocial interventions targeting on those modifiable factors (i.e., cognitive appraisal, coping and social support) are recommended to be provided to those people who suffer from the injury in the earlier stage, which could ultimately enhance their sense of mastery of their daily lives, and self-efficacy in dealing with stressful situations at post-SCI.

1.3.5 Statement of the research problem

The comprehensive literature review about psychosocial care for people with SCI (presented in Chapter 2, Section 2.7) will be providing us with a whole picture of the current research progress and evidence on this promising research area. Psychosocial care as a core component of SCI rehabilitation is a life-long process, especially in the earlier stage when people meet myriad new challenges and demanding situations. Without timely and adequate psychosocial support, people undergoing inpatient rehabilitation are at risk of developing mental illness caused by high levels of psychological distress, and around 30% people with SCI are reported to have developed severe depression and/or anxiety symptoms during their inpatient's rehabilitation stage

(Galvin & Godfrey, 2001). Psychosocial interventions are recommended to be matched to the level of each individual's needs at post-SCI.

Most of the psychosocial care programmes reviewed in Chapter 2 were designed in a more specialized way that focused on those people with high risk of adverse psychosocial outcomes at post-SCI (severe depression, anxiety, and PTSD), or those with specific psychosocial commodities (chronic pain and pressure ulcer). There is a lack of psychosocial interventions designed in a stress management or health promotion perspective in supporting the psychological adjustment process of people with SCI sustaining a mild or moderate psychological distress level. This warranted psychosocial care programme has its potential effects in promoting people's sense of mastery or self-efficacy in managing their daily lives at post-injury, mitigating severe mental illness, and promoting their life satisfaction in a long-term consideration by addressing those reviewed important influencing factors (i.e., cognitive appraisal, coping and social support) during their psychological adjustment process. It would also have its merits to be beneficial for the majority of people with SCI (60-70% people with SCI are in mild or moderate levels of psychological distress), thus can be considered to be incorporated into current clinical SCI rehabilitation care programme.

Although the disability movement and disabled persons' self-help organisations are emerging in China in recent years (Zhang, 2017), patients still face great challenges after they are discharged into the community. The infrastructure and community support systems (e.g., public transportation or accessibility, employment, community nursing, education, and housing) are less developed in China compared with Western countries. The typical Chinese culture issues (e.g., face-saving, Confucianism and social norms) might also influence their psychosocial status (a detailed discussion of cultural issues in Chapter 3). As most of the psychosocial interventions reviewed are conducted in Western countries, implementation of a culturally sensitive psychosocial intervention for Chinese people is essentially necessary with the consideration of the well-being of people with SCI in their healthcare or social context, and the improvement of the corresponding health care system.

1.4 Aim, objectives and hypotheses of the study

1.4.1 Aim of the study

This study aimed to evaluate the effectiveness of a coping-oriented supportive programme (COSP) in improving people's psychological adjustment and biopsychosocial health to spinal cord injury (SCI) during their inpatient rehabilitation over a 3-month follow-up.

1.4.2 Objectives of the study

The primary objective was to examine whether participants in the COSP could make significantly greater improvements in coping ability and self-efficacy than those in the comparison group at immediately after the intervention, 1- and 3-month follow-up.

The secondary objective was to examine whether participants in the COSP could make significantly greater improvements in mood, social support, life satisfaction and pain than those in the comparison group at immediately after the intervention, 1- and 3-month follow-up.

1.4.3 Hypotheses of the study

Hypothesis one: Participants in the COSP will make significantly greater improvements in coping ability and self-efficacy at immediately after the intervention, 1- and 3-month follow-up when compared to those in the didactic education group.

Hypothesis two: Participants in the COSP will make significantly greater improvements in mood, social support, life satisfaction, and pain at immediately after the intervention, 1- and 3-month follow-up when compared to those in the didactic education group.

1.5 Significance of the study

The potential benefits of the COSP are believed to be substantial for nursing practice, clinical research, and psychosocial interventions in the rehabilitation of people with SCI. First, this study will examine the effectiveness of the COSP for people with SCI under a widely used coping theory, supporting patients' psychological adjustment at post-SCI. A standardized psychosocial care programme will be established for these people with SCI undergoing inpatients rehabilitation, and particularly appropriate for Chinese culture, which can be further tested and used in different SCI rehabilitation care settings. In addition, the majority of patients with SCI may benefit from this psychosocial intervention programme due to its essence with a focus on a coping effectiveness perspective. This study also has the potential to contribute to improving the SCI rehabilitation service to become more holistic and comprehensive, which consists of both medical and psychosocial care, in addressing patients' bio-psychosocial needs at post-SCI. In addition, clinical trials regarding psychosocial interventions for people with SCI are limited worldwide. This quasi-experimental study with a comparison group would provide important and promising research evidence on the short to medium terms effects of the COSP to patients with SCI in their psychosocial functions. Future findings of this clinical trial can inform health professionals whether the COSP can be added to the routine care to enrich the rehabilitation care of SCI, not only for the Chinese society but also for western countries.

1.6 Organisation of the thesis

This thesis consists of eight chapters. Chapter 1 describes the background of the study with a brief introduction of SCI and its related consequences, as well as the inpatient rehabilitation of SCI. The aim, objectives and hypotheses of the study and the significance of the study are also presented. Chapter two (Literature Review) presents the detailed consequences of SCI and the illustration of the psychological adjustment to SCI guided by the stress and coping model. A comprehensive review of the psychosocial interventions for people with SCI was conducted, in order to identify research gaps and recommendations for this PhD study.

Chapter 3 presents the coping-oriented supportive programme (COSP) intervention including its background information, content, theoretical underpinnings, cultural considerations, and group logistics. Challenges in the COSP delivery as well as the role of the intervention provider, and group helper are also discussed in this chapter, followed by potential strategies in ensuring the fidelity of the COSP delivery. Chapter 4 outlines the methods of this study including the rationale of adopting quasi-experimental design, the study settings, the study sample, and the instruments for the study outcomes. Methods of the pilot study are also described in this chapter. In addition, methods for data collection and data analysis, as well as ethical considerations for this study are presented.

Chapter 5 reports pilot study results (including the content validity of the COSP intervention and its preliminary effectiveness test) and discusses the pilot study findings as well as its implications to the main study, followed by the results of the main study presented in Chapter 6. Apart from the effectiveness of the COSP, the study results also presented the findings on the comparison of COSP effects regarding gender and injury type.

Chapter 7 discusses the study findings reported in Chapter 6 in terms of the COSP effectiveness on the primary and secondary study outcomes, comparison of the intervention effects in different gender and injury sub-groups, and the intervention completion, fidelity and study attrition. The link between theoretical underpinnings and study findings are also discussed, followed by the reflections on study strengths and limitations. Study contribution to knowledge and its implications for practice, the policy as well as future research are described in Chapter 8, followed by a conclusion of the whole thesis.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

With the brief background information presented in the previous chapter, this chapter describes the consequences caused by SCI from a bio-psychosocial perspective. Models of psychological adjustment to the consequences of SCI are presented in Section 2.3. People's psychological adjustment processes to SCI are illustrated guided by the stress and coping model in Section 2.4. A comprehensive review of the psychosocial interventions for people with SCI is conducted (with details presented in Section 2.5), together with critical analysis on the effectiveness of the psychosocial care programmes presented in Section 2.6. The research gaps and recommendations identified during the review process are presented in Section 2.7.

2.2 Consequences of SCI from a bio-psychosocial perspective

In the initial several weeks since the onset of SCI (i.e., acute phase), the survival of these patients is the concern of health professionals, and the patients are almost passive recipients of the medical treatment like skeletal traction or surgery, treatment of associated injuries (i.e., internal, brain), management of bladder and bowel, prevention of skin problems (Hagen, 2015). During the rehabilitation stage of SCI, people would suffer from various stressors including short-term consequences (living in an inpatient rehabilitation setting, function loss, and medical complications, as well as feeling of hopelessness and helplessness, and sudden changes in social relationships), and long-term consequences (uncertainty of the future, loss of life aspirations, strains in family relationships, and employment issues) (Somers, 2001). SCI is an extraordinarily challenging event that will lead to drastic change and devastating loss in a person’s life. These losses mean that people with SCI may need more psychological and social supports to achieve successful psychosocial adaptation than other one-time traumatic events, or temporary injuries encountered by other people (Martz, Livneh, Priebe, Wuermser, & Ottomanelli, 2005). Apart from the multifaceted loss in physical functioning, the stressful life situations encountered by those people with SCI during the rehabilitation stage also include normal functional decline caused by medical complications, reduced abilities to perform various life activities, feeling less attractive, and poor social relationships (Galvin & Godfrey, 2001). The consequences or stressful situations encountered by people with SCI during the rehabilitation phase mainly include “health- or disability-related affairs” (45%), “family interaction and relationships” (32%), “caring burden on family members” (29%), “financial hardship” (27%), “work” (19%), “living situation” (17%), “embarrassment” (9%), “marital interaction and maintenance” (8%) (Chan, Lee, & Lieh-Mak, 2000).

It is also reported that the most frequently self-reported problems of people with SCI during rehabilitation phase were chronic pain, financial problems, spasticity, worries about the future, and their sexual lives (Krause, 2007). For Mainland China, it is indicated that “living in an accessible environment with government support”, “having material well-being and financial security”, “having good relationships with parents, spouse, children, and friends”, and “being able to contribute to society” are the most significant factors that can influence quality of life in people with SCI (Hampton, 2001).

Hampton & Qin-Hilliard (2004) also indicated that “good relationships with neighbours” and a “barrier-free environment,” are the unique factors that will influence people’s quality of life at post-SCI in Mainland China.

2.2.1 Health- or disability-related consequences

SCI leads to neurological impairment below the injury level of the spinal cord that will result in people’s loss of motor and sensory function. Certain degrees of functional loss is determined by the damage on the nerves at various spinal levels, which also further influence the specific instrument or device that people need to adopt to assist their daily life following SCI (Bryce, 2010). People with spinal cord injury at or above C-3 need a ventilator to assist breathing. People with C-4 injury retain breathing ability, but without normal functions in arms and hands, thus needing caregiver’s assistance for almost all daily activities. People with a C-5 level injury with extended ability to bend their arms often use a power wheelchair for mobility. Injuries below the C-6 level often require the person to adopt manual wheelchairs, with the exception of people who have injuries at the lumbar level and may be capable of walking for a short distance with various types of orthotic devices (Davis, 2015). SCI is a life-altering event, which is not only associated with loss of motor and sensory function but also related to functional loss of bowel and bladder, as well as sexual impairment. Bowel function loss will lead to incontinence and negatively impact on their psychological adjustment as well as the quality of life (Hicken, Putzke, & Richards, 2001). Loss of sexual function may threaten one’s self-esteem, and self-value as a sexual being resulting in emotional isolation, which will place the person at risk for social withdrawal and depressed mood (Hess & Hough, 2012).

The secondary complications of SCI, including urinary and bowel complications, chronic pain, spasticity, pressure ulcers, respiratory complications, cardiovascular complications, osteoporosis, and bone fractures, have profoundly negative impacts on functional independence and quality of life (Sezer, Akkuş, & Uğurlu, 2015). Chronic pain following SCI is a common medical complication with a high prevalence rate of around 75%, and approximately 27% are described as severe (Barrett, McClelland, Rutkowski, & Siddall, 2003). Chronic pain at post-SCI has a negative impact on patients' daily activities and is related to a decrease in self-rated health, as well as higher levels of depressive mood and psychological problems compared with patients with no pain (Ataoglu et al., 2013). Pressure ulcers are one of the most common reasons for unplanned hospitalization and damage to quality of life and participation in social activities (Sleight et al., 2016). Spasticity syndrome has been reported to negatively influence the quality of life of people with SCI through causing pain and fatigue, disturbing sleep and sexual activity, impeding rehabilitation efforts, as well as restricting activities of daily living (Adams & Hicks, 2005). Diabetes mellitus and kidney or urological disorders are also found to commonly occur in the SCI population, all of which have the potential to dramatically impact on not only their physical health but also their emotional well-being and quality of life (Javadi, Hafezi-Nejad, Vaccaro, & Rahimi-Movaghar, 2014).

2.2.2 Unmet role expectations and challenging social relationships

One of the major challenges faced by people with SCI relates the impact of the injury on their social relationships. People with SCI often find it difficult to fulfil their role expectation with partners, children and colleagues, which result in social role dissatisfaction and frustration (Chan et al., 2000). People with SCI may also face associated social stigma which presents relationship-related barriers and causes additional levels of stress (Chan et al., 2000). The partners of people with SCI are under extreme pressure to adapt and cope following the injury, which will correspondingly also affect their relationships (Kreuter, 2000). A large number of partners of SCI survivors suffer from the serious caring burden, and they are required to play a role not only as a lover, but also as a caregiver, which may create deleterious situation and conflicts (Post, Bloemen, & de Witte, 2005). A satisfying marital relationship is regarded as an important aspect in improving people's psychosocial adaptation to SCI, however, it is reported that the divorce or separation rate in people with SCI is higher than the general population (Arango-Lasprilla et al., 2009). The loss of body control may also bring embarrassment to people with SCI who receive unwanted attention brought about by bowel or bladder accidents (Davis, 2015). People with SCI cannot perform the same activities or tasks as competently as they did before the injury, thus low levels of re-employment and financial constraints after SCI are also commonly identified in this population (Ottomanelli et al., 2017).

2.3 Models of psychological adjustment to the consequences of SCI

SCI brings sweeping changes to a person's life, necessitating great encouragement and support for them to adjust to the consequences caused by the injury. Understanding the process and underlying mechanisms of people's psychological adjustment to SCI is a primary concern of health professionals, and is essential because such understanding would help to reveal the most important targets and ingredients of corresponding psychosocial interventions. People with SCI can only be sufficiently supported if health professionals know where to focus their endeavours during their routine SCI rehabilitation work.

2.3.1 Stage models of adjustment

Stage models dominate earlier research on psychological adjustment to SCI. The stages theory that examines emotional responses to grief associated with death and dying has been applied to the early examination of patients' emotional reactions and adjustment to SCI (Bracken & Shepard, 1980). According to the theory, patients work through a series of adjustment stages, including denial, anger, bargaining, depression, and acceptance. Another stage model also indicated three components including denial, depression and a "moratorium" or restitution stage (Stewart, 1978). The tasks of mourning theory describe the process that SCI survivors and their families would move from the shock of acute grief to acceptance, adjustment, and restructuring of their relationships (Worden, 1996). The implicit assumptions of stage theories are that depression and other prolonged psychological problems are natural personal responses of people being expected to be a regular grieving process at post-SCI (Buckelew et al., 1991). It can be concluded that almost all the stage theories promote the idea with final restitution, with which people's psychological adjustment was found to be predicted by people's time since injury following the injury (Buckelew et al., 1991).

2.3.2 Challenges to stage models

However, stage models/concepts for the interpretation of the psychological adjustment to SCI have been seriously criticized and challenged for its weak empirical support (Field-Fote, 2009). Since every patient has a unique experience at post-SCI, each may not follow any of the carefully thought out models of adjustment. Instead, they are likely to approach this brand new situation in the manner that seems to be the most relevant and will make the best efforts they can towards making physical and psychosocial adjustments (Hasler, 1990). Buckelew et al. (1991) revisited the stage theory using 106 participants with SCI's cross-sectional data, and the result did not support the relationship of those concepts within stage theory. No relationship was found between people's age and time since injury and their locus of control, self-efficacy, or other psychological problems. Stage theories have been criticized by many researchers for proposing that all individuals adhere to a narrowly defined set of responses, and they are also limited in clinical utility in treatment planning because they fail to account for and reveal how adjustment occurs as well as the true mechanism of the process (Field-Fote, 2009; Hammell, 1992). The mechanism of people's psychological adjustment to SCI cannot be simply explained by those emotional consequences described in the stage model, thus it is important to consider how psychosocial factors will influence the process and outcomes.

2.3.3 Stress and coping model

More recent research on people's psychological adjustment to SCI has moved on from stage theories to Lazarus and Folkman's stress and coping theory (1984) that emphasizes a dynamic process of cognitive appraisal and coping with the encountered stressors. SCI frequently challenges people's physical status, emotional balance, self-image, and relationships with family and friends, and also often involves preparing for an uncertain future (Sisto, Druin, & Sliwinski, 2008). Briefly, people experience stress when they assess their inner and outer resources to be insufficient, and they lack confidence in their abilities to cope. Lazarus and Folkman (1984) defined the evaluation of situations, events, and symptoms as "cognitive appraisal." Furthermore, an individual's responses are based on the appraisals and feelings evoked. Coping, in theory, is conceptualized as a person's efforts in behaviours and thoughts aimed at managing stress. The process-oriented coping includes both an individual's efforts to cope with the stressors and their interactions with external environments. Hence, this framework also has been labelled as a transactional theory of stress and coping (Kennedy & ebrary, 2007). Furthermore, outcomes of stress and coping may be on various physical, psychological and social aspects. The short-term physical part concerns people's physical arousal and level of stress hormones, whereas long-term this relates to their physical health in general. The psychological outcomes can include people's cognitive functions (e.g., concentration and memory), and emotional status (e.g., depression and anxiety), as well as psychological well-being and quality of life. Social outcomes can be explained as people's ability to work, engagement in activities, and relationships with others (Kennedy, 2007). There are increasing numbers of studies

(Barone & Waters, 2012; Kennedy, Kilvert, & Hasson, 2016; Tramonti, Gerini, & Stampacchia, 2014) that applied the stress and coping theory to describe people's psychological adjustment process at post-SCI, and these provide strong empirical evidence to guide the psychosocial dimensions of clinical practice. Some research evidence regarding this model (mainly addressing cognitive appraisal and coping concept) are discussed with more details in the following section.

2.4 Illustration of the psychological adjustment process guided by the stress and coping model

From Lazarus and Folkman's perspective, appraisal and coping are the mediating factors with regard to outcomes (Folkman, Lazarus, Gruen, & DeLongis, 1986). The coping process is influenced by coping resources and constraints, which act as the moderating effects to influence the various outcomes of stress and coping model (Kennedy & Ebrary, 2007a). With the knowledge of various stressors encountered by people with SCI (as described in Section 2.2), we reviewed various studies that can illustrate the application of the stress and coping model in psychological adjustment to SCI, to clearly understand this process and identify potential components for developing interventions for improving the psychosocial care of SCI rehabilitation.

2.4.1 Cognitive appraisal

According to the stress and coping theory (Folkman, Lazarus, Gruen, & DeLongis, 1986), patients' response to the injury begins with his/her cognitive process of appraisal, which means the patients could initially assess the situation regarding the impacts, threats and perceived ability to cope. After the primary appraisal, the patients will consider the effective resources that they have and find out if they can use these resources to manage the situation, which is then known as the secondary appraisal (Kennedy & Ebrary, 2007). The cognitive appraisal of encountered stressors for people with SCI has been highlighted to play a pivotal role in their psychosocial adaptation process, and changes in appraisals of control can act as the antecedent of the subsequent targeted coping efforts as well as psychosocial outcomes corresponding to the particular stressors (Folkman et al., 1986). Evidence from relevant literature has confirmed the statement mentioned in the stress and coping theory, that is, strong relationships were reported between appraisals, coping styles, mood and functional outcomes, which confirmed that those who appraised their problem as a "threat or loss" were more likely to endorse passive coping. This will also lead to poor mood as well as functional outcomes in the SCI population (Kennedy, Lude, Elfström, & Smithson, 2011). A structural equation model has shown that people with an internal locus of control adopted more adaptive coping strategies (acceptance, fighting spirit) resulting in increased well-being after the injury. Whereas, people with an external locus of control used a social reliance coping strategy leading to poor well-being (Elfström & Kreuter, 2006). A mixed-method study involving 55 women with SCI found that appraisals of the stressors in the context of loss might directly influence their life satisfaction (Lequerica et al., 2010). A qualitative study explored the experience of chronic neuropathic pain in SCI and indicated that learning to live with pain appears to be related to pain acceptance, which in turn will facilitate personal psychological adjustment and quality of life (Henwood & Ellis, 2004). These findings shed light on how intervention studies can target people's maladaptive beliefs and other negative cognitive appraisals of the physical symptoms of SCI in order to improve their day-to-day lives.

2.4.2 Coping

People who have sustained SCI need to cope effectively with the subsequent cascade of psychological stressors and changes. An individuals' coping responses are based on the appraisals and feelings evoked (Folkman et al., 1986), including their effects on behaviours, thoughts, and emotions aiming at managing stress.

Coping strategies (e.g., engagement coping and seeking social support), as well as coping resources (e.g., hope, sense of coherence), have positively been shown to predictive effects on people's psychosocial adaptation at post-SCI (Livneh & Martz, 2014). People's coping styles remained relatively stable over 10 years at post-injury and predicted one-third of the variance on depression (Pollard & Kennedy, 2007). The impact of coping strategies (classified as adaptive coping and maladaptive coping) on people's psychological adjustment or psychosocial adaptation to SCI has been explored/studied in various studies.

The most widely adopted adaptive coping strategies including cognitive constructing, problem-solving, planning, acceptance, humour, seeking social support, positive reframing, and emotional support/regulation were found to have positive effects on the mood status and quality of life of people with SCI (Anderson, Vogel, Chlan, & Betz, 2008; Smith et al., 2013). Findings from a qualitative study exploring SCI patients' experiences of their rehabilitation process indicated that participating in the treatment planning process and emotional coping are important influencing factors to the success of their rehabilitation, followed by other therapeutic factors such as access to information, feelings of vulnerability, and adjustment to a new life situation (Sand, Karlberg, & Kreuter, 2006). Better problem-solving capabilities were found to significantly predict better mental health, health prevention behaviour, as well as less medical complications (e.g., pressure sore occurrence) (Elliott, Bush, & Chen, 2006). The maladaptive coping strategies adopted by people with SCI including catastrophizing, feeling helplessness, expressing anger, behavioural disengagement and substance abuse have been reported to be predictive of higher levels of depression and anxiety, as well as lower levels of quality of life and well-being (Anderson et al., 2008; Smith et al., 2013; Wollaars, Post, van Asbeck, & Brand, 2007). Disengagement coping strategies (i.e., disability denial and avoidance) were found to be negatively associated with psychosocial adaptation to SCI (Bonanno, Kennedy, Galatzer-Levy, Lude, & Elfström, 2012). Similar findings were also identified in patients with persisting post-SCI pain, which revealed that pain catastrophizing would cause increased anxiety and depression, and less positive outcomes on their psychosocial adaptation (Nicholson Perry, Nicholas, Middleton, & Siddall, 2009).

Based on the evidence in supporting the crucial role of coping during people's psychological adjustment and psychosocial adaptation to SCI, it is suggested that facilitating people to establish effective problem-solving or coping strategies and other kinds of positive living training strategies at the early SCI rehabilitation stage is essential. Health professionals should therefore consider incorporating coping-focused psychosocial care programmes in order to improve the current clinical SCI rehabilitation services.

2.4.3 Health and well-being

Health and well-being following SCI are closely related to people's cognitive appraisal and coping with encountered stressful factors. People with SCI on average have higher levels of psychological distress, lower levels of mental health, physical health and life satisfaction, in comparison with the general population (Post & van Leeuwen, 2012). This following description is a summary of the main outcomes of the reviewed studies that examined patients' psychological adjustment to SCI from the cognitive and coping perspective.

Mental health

Depression and anxiety are two issues commonly studied by the researchers. A cohort study that assessed depression over a 5-year follow-up period has shown that around the first year of the illness, 22% of the SCI survivors had probable major depression, which decreases slightly to 20% after 5 years (Saunders, Krause, & Focht, 2012). A longitudinal analysis with 87 people with SCI has reported that 38% of participants reached the criteria for moderate depression at week 12 post-injury, and 35% reached the same level at 10 years follow-up (Pollard & Kennedy, 2007). This study also demonstrated a similar trend of anxiety in the SCI population (Pollard & Kennedy, 2007). These findings indicated that levels of depression and anxiety might be fairly consistent, without obvious fluctuation over time in people with SCI. Post-traumatic stress disorder (PTSD) indeed has a negative impact on long-term adjustment to SCI, as well as the whole rehabilitation process (Agar, Kennedy, & King, 2006). Most persons with SCI are at risk for developing PTSD, and a study examined a sample of 71 persons with SCI indicated that 11% of the participants met the criteria for PTSD (Otis, Marchand, & Courtois, 2012). Participants' PTSD was found to be positively correlated with depression ($r=0.70$, $p<0.001$) and anxiety ($r=0.57$, $p< 0.001$), as well as negatively associated with their quality of life ($r= -0.47$, $p< 0.001$) at post-injury (Wang, Tsay, & Elaine Bond, 2005).

Significant relationships were revealed between cognitive appraisals (e.g., self-efficacy, acceptance), coping and people's mood as well as emotional well-being in their SCI rehabilitation stage (Galvin & Godfrey, 2001). A moderately good fit between the predictive variables (i.e. demographic data, post-traumatic stress disorder, depression, and anxiety) and the psychosocial adaptation outcomes such as acknowledgement, adjustment and quality of life was identified (Martz et al., 2005). People with SCI who rated higher in avoidance coping have higher depression scores, greater role dissatisfaction and lower life satisfaction compared with those who have a higher internal locus of control and utilize more balanced coping strategies (Chan et al., 2000). People with higher levels of depression at post-SCI have increased chances to have longer hospital stays, lower confidence in managing the injury, and a lower quality of life and life satisfaction (Perkes, Bowman, & Penkala, 2014).

Physical health and functional independence

The improvement of people's functional independence and ability at post-SCI is the goal of inpatient rehabilitation. The functional independence measurement (FIM) has been used to measure people's functional ability post-SCI, and its score was found to be highly related with their cognitive appraisal and coping strategies (DeRoon-Cassini, De St Aubin, Valvano, Hastings, & Horn, 2009). Significant relationships between cognitive appraisal, coping and functional independence was found in SCI population in the rehabilitation stage (Kennedy et al., 2011). This finding confirms the important role of psychological contributions to their physical health. People's physical functioning was also found to be explained 30% by their coping strategies such as social reliance and problem-solving ability at post-SCI (Kennedy, Lude, Elfstrom, & Smithson, 2012). In addition to the contributions from people's psychosocial status to their physical health, greater social problem-solving skills and more adaptive coping following discharge from the inpatient SCI rehabilitation were found to be prospectively predictive of a lower occurrence rate of medical complications (i.e., pressure sores) at post-injury (Elliott et al., 2006).

Quality of life, life satisfaction and well-being

Quality of life for people with SCI has been conceptualised as their subjective well-being, achievement in life and utility of public equipment, for which the scores in SCI population are all found lower than the average person (Dijkers, 2005). People with SCI have been reported to have a poorer quality of life than healthy controls across various domains of physical functioning (Arango-Lasprilla, Nicholls, Olivera, Perdomo, & Arango, 2010). A longitudinal study investigated the changing psychosocial morbidity in people with SCI and found that earlier perceived poor quality of life could predict later higher psychological distress, depression and psychological well-being (Charlifue & Gerhart, 2004).

Coping and cognitive appraisal were found to have a significant contribution to the variation in their quality of life (Kennedy, Lude, Elfstrom, & Smithson, 2010). People's appraisal on the situations caused by SCI as challenging are found to explain 41% of the variance in their quality of life (Kennedy et al., 2012), with more negative appraisal indicating large potential for developing psychological distress and maladaptive coping styles, as well as subsequent lower life satisfaction (Mignogna, Christie, Holmes, & Ames, 2015). An exploratory study on 279 participants showed that less helplessness in SCI, greater acceptance, less catastrophizing, and lower levels of anger can significantly contribute to the prediction of higher well-being (Wollaars et al., 2007). Higher scores on escape-oriented coping were related to lower levels of quality of life in SCI population (Smith et al., 2013). The subjective well-being measured by the quality of life and life satisfaction has shown a good fit in a structural equation model (from a cross-sectional study) that explored the relationships of coping, self-worth, and subjective well-being for people with SCI during their rehabilitation stage (Miller Smedema, Catalano, & Ebener, 2010).

2.4.4 Factors influencing the psychological adjustment process

Severity of injury and physical function

Some researchers found no relationship between the extent of injury/disability and people's negative affect such as psychological distress, depression, or anxiety. Research findings also showed that the severity of SCI was not clearly associated with these patients' coping with the disability (Kennedy, Duff, Evans, & Beedie, 2003) and the impairment itself has not yet been found to contribute to poor mental health (van Leeuwen, Hoekstra, van Koppenhagen, de Groot, & Post, 2012). A cross-sectional study revealed that medical injury severity had no relationship with people's mental health condition at post-SCI, but perceived loss of physical functioning was inversely associated with their psychological well-being (Deroon-Cassini, De St. Aubin, Valvano, Hastings, & Horn, 2009). In line with these findings, a higher level of dispositional optimism and more positive assessment of their mental health were reported in people with tetraplegia whose range of disability is usually wider that that in paraplegics (Rostowska & Kossak, 2011). However, there are also research findings suggesting a positive relationship between people's functionality and psychosocial adaptation outcomes at post-SCI (Martz et al., 2005). In addition, better motor condition and lower severity of injury were found to be associated with much stronger beliefs and perceived self-efficacy in managing problems caused by the injury (McMillen & Cook, 2003). The impact of injury severity and function level on psychological adjustment and psychosocial adaptation to SCI need to be further examined in future studies.

Traumatic SCI versus Non-traumatic SCI

Findings from a qualitative study suggested that people who sustained a non-traumatic SCI may need special consideration and interventions to address their psychosocial problems (Jannings & Pryor, 2012). Participants with non-traumatic SCI in this study expressed their fear of their future and uncertainty of their injury, for which they were not being able to attribute the cause of their injury to an event, and they did not know how to prevent a recurrence of their injury. In contrast, results from a cross-sectional study demonstrated that the aetiology had no relationship with quality of life outcomes after SCI (Migliorini, New, & Tonge, 2011). An earlier cross-sectional study also demonstrated that the prevalence of negative mental health outcomes (i.e., depression, anxiety and psychological distress) in respondents with non-traumatic SCI did not differ from those with traumatic SCI (Migliorini, New, & Tonge, 2009). Lude, Kennedy, Evans, Lude, & Beedie (2004)'s study also showed that the disparity of distress level was not found between non-traumatic SCI and traumatic SCI group at up to 6 months at post-SCI. The study reviewed the information obtained with the need assessment checklist at two-time points during patients' rehabilitation that compared the rehabilitation outcomes between patients with Traumatic and non-traumatic SCI (Kennedy & Chessell, 2013). And the findings suggest that similar psychosocial interventions aiming to promote patients' psychological well-being during the SCI rehabilitation process could be effective in both people with traumatic SCI and non-traumatic SCI (Kennedy & Chessell, 2013).

Age and time since injury

One study indicated that depression symptoms were found to be more severe among people in middle age relative to younger or older people with SCI, and their physical functioning declined faster than older people (Alschuler et al., 2013). Consistently, a U-shaped association between age and depression for people with and without disabilities is reported, the explanation for this finding may be due to the relatively high societal performance expectation for people who are in their middle age (Alschuler et al., 2013). Another cross-sectional study indicated that being injured in a late-life stage was associated with a lower overall level of subjective well-being, poorer health condition, and being less active in daily lives (Krause, 2007). As we cannot make a certain conclusion on the influence from age to people's psychosocial status, the effects of people's age on their psychosocial outcomes at post-SCI need to be re-considered and examined in each specific study. Concerning time since injury, there are some preliminary findings showing that longer duration of SCI is significantly related to a higher prevalence of task-oriented coping strategies, which can be beneficial to psychosocial adaptation and quality of life (Tramonti et al., 2014). This implies that earlier (inpatient) stage psychosocial care is essentially needed and important for people with SCI.

Gender, marital status and race

Research findings showed that gender is a significant predictor of mental health and well-being in people with SCI. Being a woman or having good communication skills seems to predict favourable psychological outcomes (van Leeuwen et al., 2012). The overall life satisfaction of Chinese people with SCI has also been found to be higher in women after adjusting for all of the other confounding factors (Chen et al., 2008). Also, women with SCI were found to be more likely to adopt problem-solving, positive statement coping strategies than men, which may lead to better psychosocial adaptation (van Leeuwen et al., 2012). In contrast to these findings, an exploratory study showed that women reported higher scores on depressive symptoms and psychological distress, and greater problems in coping than males (Krause, 2007). The above-mentioned studies on gender difference in subjective well-being and adaptive outcomes at post-SCI report contradictory and inconclusive findings, which need to be further explored in people with SCI using a larger sample from more diverse cultural contexts.

Marital maladjustment is commonly noted in people with SCI (Chan et al., 2000). Divorce or change in marital status is found to be inversely related to psychological status and quality of life (Burns, Hough, Boyd, & Hill, 2009). Lower self-rated quality of life and higher self-rated handicap was found among people with SCI who are single or living alone than matched married counterparts (Putzke, Elliott, & Richards, 2001). The intuitive understanding of these findings is that an individual’s marital relationship would be considered an important source of social support during this adjustment period (Tramonti et al., 2014). Besides, people’s racial differences can influence their marital status after injury but also on their long-term employment status and psychosocial adaptation (Arango-Lasprilla et al., 2009). Nevertheless, the effects of marital status, race and gender on people’s psychosocial adaptation to SCI may be related to relevant cultural backgrounds/social environment and this needs to be further explored in different social/societal circumstances.

Educational level

People with a lower education level were found to have a higher possibility of experiencing anxiety and negative psychosocial outcomes at post-SCI (Krause et al., 2009), and a significantly lower score for mental health domain of the quality of life (Gurcay, Bal, Eksioglu, & Cakci, 2010). The researchers of the study (Gurcay et al., 2010) also interpreted that education was the most important impact factor to determine the type of employment, which is also a specific concern for people with SCI during their community reintegration. It is also suggested that people with the level of education beyond high school had a significantly higher score for the mental health domain of the quality of life than those with a lower education level after they were spinal cord injured (Krause et al., 2009). Another interpretation of the negative predicting effects from educational level is that less educated participants (people with SCI) are probably more likely to use escape-avoidance coping and on the other hand, less likely to use positive appraisal, problem-solving strategy and active support seeking (Barone & Waters, 2012).

Personal and psychological resources

The adjustment process following SCI is somewhat affected by people's psychological resources or personal traits. A systematic review has categorized psychological resources into seven groups, including self-efficacy, self-esteem, intellects, sense of coherence, and other personal traits (Peter, Muller, Cieza, & Geyh, 2012). Similarly, another systematic review has concluded that people's internal attributes, including locus of control, self-worth, hope, sense of coherence, and purpose in life, can make a contribution to their better quality of life at post-SCI (van Leeuwen et al., 2012). Particularly, self-efficacy and self-esteem are found to be consistently associated with lower levels of loneliness experienced by people with SCI (Tzonichaki & Kleftaras, 2002), less social reliance and disengagement coping styles (Bonanno et al., 2012), as well as improved psychological status, mental health and psychosocial adaptation to SCI (Bonanno et al., 2012; Peter et al., 2012; Peter et al., 2015). Hope, as one kind of personal resource and positive expectation for people with SCI is a universal experience, which has been found to be positively associated with better psychosocial adaptation and well-being (Kortte, Gilbert, Gorman, & Wegener, 2010; Livneh & Martz, 2014; Lohne & Severinsson, 2004).

Social support and resources

Social support is defined as "an exchange of resources between individuals intended to enhance the well-being of the recipient" (Muller, Peter, Cieza, & Geyh, 2012). Schaefer, Coyne, & Lazarus (1981) identified three dimensions of social support: emotional support, which involves "intimacy and receiving reassurance"; tangible support, or the "provision of direct aid and services"; and informational support, which includes "advice concerning solutions to one's problems and feedback about one's behaviour" (p. 381). Social support with its moderating effects on stress processing means that supportive interactions among people and their living context are protective against the health conditions of experiencing stress (Kennedy & Ebrary, 2007), and perceived social support may boost efforts toward resolution of stressful situations with its function as one kind of coping resource.

People with SCI who are at risk of suffering from psychological problems are characterized by having low perceived social support (Chan et al., 2000). people's social support could positively predict their physical and mental health, coping effectiveness, psychological adjustment and subjective well-being (Muller et al., 2012). Those with lower social support are found to be more vulnerable to the negative influence or impact of stressful encounters on their psychological status (Rintala, Rohinson-Whelen, & Matamoros, 2005). Decreasing effects on people's life satisfaction at post-SCI from chronic pain was found to be moderated by their perceived social support (Widerström-Noga, Felix, Cruz-Almeida, & Turk, 2007). Sufficient emotional social support can lead to the better psychological functioning and greater life satisfaction in SCI population (Kennedy, 2007). Due to the negative relationship observed between loneliness and life satisfaction in people with SCI, adequate social support is essential to prevent feelings of loneliness (Tzonichaki & Kleftaras, 2002).

2.4.5 Self-efficacy and its relationship with coping

Self-efficacy has been defined as "an individual's convictions or confidence about his or her abilities to mobilize the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context" (Stajkovic &

Luthans, 1998), p.66. According to Bandura's self-efficacy theory, an individual's expectations of personal-efficacy play a crucial role in determining whether coping behaviour will be initiated, how much energy or efforts will be spared, and the sustaining and maintaining time of their coping efforts when they face stressful situations or life difficulties (Bandura, 1977). Self-efficacy is considered as one of the most important factors to reveal people's motivation and confidence to "carve out" their future in a long-term run (Middleton & Craig, 2008), and thus make a crucial contribution to the successful psychosocial adaptation to SCI (Kim & Cho, 2017). A higher level of self-efficacy in life-situation management could contribute and ensure a higher substantive engagement in adaptive coping when people are faced with stressful situations (Galvin & Godfrey, 2001). Self-efficacy has been found to have consistently positive relationships with psychological adjustment to SCI and better mental health, as well as better quality of life and well-being (Peter et al., 2012).

Theoretically, improved self-efficacy can be attributed to strong behavioural reinforcements through more frequent use of adaptive coping strategies and less use of maladaptive coping strategies (Marks & Allegrante, 2005; Kennedy & Ebrary, 2007). Learning from consequences following certain types of behaviour or performance is conceived as a cognitive process, form which people's self-efficacy to a specific task or situation will be altered by behaviour reinforcement to gain beneficial consequences and avoid negative consequences (Galvin& Godfrey, 2001). This illustration is in line with the claim that participants' self-efficacy and coping are inter-related and interactive with each other within the dynamic stress and coping model (Folkman et al., 1986). Coping-based interventions (i.e., coping effectiveness training) were found to significantly improve self-efficacy and positive states of mind for people living with HIV (Chesney, Chambers, Taylor, Johnson, & Folkman, 2003), stroke (Ch'Ng, French, & Mclean, 2008) or other types of physical disabilities (Marks & Allegrante, 2005; Villanueva, Fitch, Quadir, Raju Sagiraju, & Alamgir, 2017).

In conclusion, two crucial factors (i.e., self-efficacy and coping) that act as the important mediators in revealing the mechanism of people’s psychological adjustment to SCI are suggested to be the focus in developing psychosocial interventions. Such interventions could be beneficial to enhance the sense of mastery and confidence/engagement in managing various stressful situations at post-SCI. Improved self-efficacy and coping would also help to reduce the chance of developing mental illness (i.e., depression and anxiety) as well as severe physical problems, and to gain wider improvements in different aspects of psychosocial health conditions. Whereas, those influencing factors including people’s demographic factors (i.e., age, gender, marital status, race, and educational level), injury-related factors (severity of the injury, physical function and time since injury), personal or psychological resources, and social support should be considered when evaluating the intervention effects due to their various degrees of impacts on the psychological adjustment process.

2.5 Comprehensive review of psychosocial interventions for people with SCI

This review performed by our research team aimed to ascertain the types/nature and effects of psychosocial interventions for people with SCI during inpatient rehabilitation.

The findings could inform us of the future development of effective psychosocial interventions on SCI inpatient rehabilitation care, and their efficacy testing.

2.5.1 Search strategy

A systematic search of relevant literature, published in English or Chinese from January 1985 to March 2017 was conducted with six databases (Scopus, MEDLINE, Science Citation Index Expanded, PsycINFO, CINAHL, and the China academic journal full-text database). The literature search covered the year of 1985 and onwards due to an increasd attention to the research topic on the psychosocial conditions of patients with SCI found over the past three decades. The keywords adopted for the search included: "Spinal cord injur*" or "paraplegia" or "tetraplegia" AND "Psycho* intervention" or "psycho* therapy" or "psycho* treatment" or "cognitive behavio* therapy" or "cognitive behavio* treatment" or "cognitive therapy" or "behavio* therapy" or "psycho-education*" or "coping" or "peer mentoring" or "self-management" or "problem solving" or "social skill*" or "skill* training" or counselling AND "Mood" or "stress" or "depression" or "anxiety" or "emotion*" or "mental health" or "self-efficacy" or "locus of control" or "quality of life" or "life satisfaction". Reference lists of identified articles were also reviewed to find any additional relevant articles. Only full research reports published in professional peer-reviewed journals were included in the review.

2.5.2 Study selection

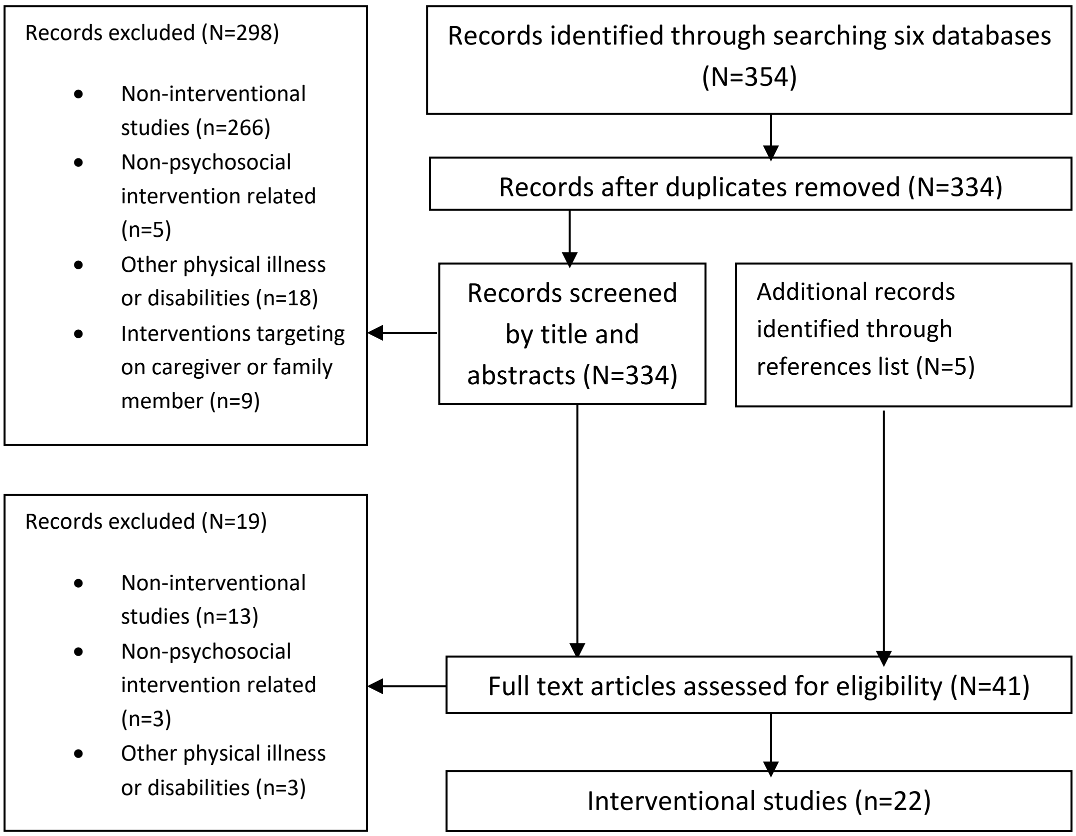
Inclusion criteria

Design: this review included experimental studies (i.e., RCT), and quasi-experimental studies (non-RCT with a non-equivalent comparison group, and/or pre-post-tests design) of psychosocial interventions for people with SCI. **Study population:** studies involving adult participants at the rehabilitation stage were included. **Interventions:** interventional studies that adopted single or combined psychosocial approaches such as cognitive behavioural therapy, skill training, psycho-education, supportive intervention, and/or counselling were included. These psychosocial interventions were conducted within the usual SCI care context in which pharmacological and medical treatments were also provided.

Exclusion criteria

Articles without available full-text versions were excluded from this review. Studies that focused on family members or caregivers, interventions neither containing nor measuring patients' psychological and social conditions, patients with other physical illnesses or disabilities, or containing samples of children or older people (aged >65 years) only, were also excluded. The flowchart of the literature search and selection process is outlined in **Figure 2.1.**

Figure 2.1The flow diagram on searching and identifying the literature



2.5.3 Quality assessment

A quality assessment was conducted using the EPHPP (Effective Public Health Practice Project) instrument (Thomas, Ciliska, Dobbins, & Micucci, 2004). The components and details of the instrument are provided in **Table 2.1.** This instrument demonstrates the ability to "adapt the most current methods of systematic literature reviews of effectiveness to interventional studies in a variety of study designs" (p. 176). The overall rating for the study quality is determined by assessing the six component ratings (i.e., "selection bias, design, confounders, blinding, data collection methods, and withdrawals and dropouts"). For example, concerning selection bias, the 'strong' rating refers to a study sample that is "very likely to be representative of the target population and where there was greater than 80% participation rate". Whereas, a 'moderate' rating means that "the sample is somewhat likely to be representative of the target population and their participation rate was 60-79%", and the study was rated as 'weak' whenever the sample selection was not stated. Moreover, if there was clear blinding of the outcome assessor and study participants to the intervention status and/or research questions, the rating on "blinding" is 'strong'. Blinding of either outcome assessor or study participants is rated as 'moderate', and it is rated as 'weak' if "both the outcome assessor and study participants were aware of intervention status and/or research question" (Thomas et al., 2004) (p. 176-177).

The detailed information on the rating criteria can be found in (Thomas et al., 2004)'s study. For the overall quality assessment, those without 'weak' ratings and at least four 'strong' ratings are considered 'strong (S)'. Those with "less than four strong ratings and one weak rating are considered moderate (M)"; and finally, those with "two or more weak ratings are considered weak (W)" (p. 180). Results of quality assessment for the reviewed articles are presented in **Table 2.2**. Studies with overall strong and moderate quality ratings were summarized and reviewed. None of the reviewed studies was rated as weak and all of the study findings were synthesized. The assessment of study quality was used to contextualize the studies in relation to their methodological strengths and weaknesses, and thus be informative in analysing the findings critically.

Table 2.1 Quality assessment components and ratings for EPHPP instrument (adapted from (Thomas et al., 2004)'s study)

“COMPONENTS	STRONG	MODERATE	WEAK
Selection bias	Very likely to be representative of the target population and greater than 80% participation rate	Somewhat likely to be representative of the target population and 60-79% participation rate	All other responses or not stated
Design	RCT and CCT	Cohort analytic, case-control, cohort, or an interrupted time series	All other designs or design not stated
Confounders	Controlled for at least 80% of confounders	Controlled for 60-79% of cofounders	Confounders not controlled for, or not stated
Blinding	Blinding of outcome assessor and study p0articipatns to intervention status and/or research question	Blinding of either outcome assessor or study participants	Outcome assessor and study participants are aware of intervention status and/or research question
Data collection methods	Tools are valid and reliable	Tools are valid but reliability not described	No evidence of validity or reliability
Withdrawals and dropouts	Follow-up rate of > 80% of participants	Follow-up rate of 60-79% of participants	Follow-up rate of <60% of participants or withdrawals and dropouts not described”

Table 2.2 Quality assessments for reviewed interventional studies regarding psychosocial care of SCI

No./Author	Selection bias	Design	Confounders	Blinding	Data collection methods	Withdrawals and dropouts	Total quality	Overall
1. Craig et al. (1997)	M	S	S	M	S	S	S	6 S
2. Kennedy et al. (1999)	M	S	S	M	M	S	M	16 M
3. Phillips et al. (2001)	M	S	S	M	W	M	M	
4. Kennedy et al. (2003)	M	S	S	M	M	M	M	
5. Kemp (2003)	M	S	S	M	S	S	S	
6. Shanmugham (2004)	S	S	S	M	W	M	M	
7. Budh (2006)	W	S	S	M	M	S	M	
8. Kanhan (2006)	W	S	S	M	M	S	M	
9. Ducknick (2009)	M	S	S	M	S	S	S	
10. Arbour (2009)	M	S	S	M	S	S	S	
11. Dorstyn (2010)	M	S	S	M	S	S	S	
12. Perry (2011)	W	M	M	M	S	S	M	
13. Migliorini (2011)	W	M	M	M	M	S	M	
14. Heutink (2012)	W	S	S	M	S	S	M	
15. Ljungberg (2011)	M	W	M	M	M	M	M	
16. Dorstyn (2012)	S	S	S	M	W	S	M	
17. Hough (2013)	W	M	M	M	M	S	M	
18. Burns (2013)	W	M	M	M	S	M	M	
19. Houlihan (2013)	M	S	S	M	W	S	M	
20. Heutink (2014)	S	W	M	M	S	S	M	
21. Chen (2015)	W	S	S	M	M	S	M	
22. Guest (2015)	S	S	S	M	S	S	S	

Notes: S= “strong”
M= “moderate”
W= “weak”

2.5.4 Data extraction and synthesis

Data were extracted and summarized independently by one reviewer using a template developed specifically for this review. The extracted data were then checked by another reviewer. The study information is summarized in Table 2.3, and details of the interventions used in the reviewed studies are summarised in Table 2.4. A narrative approach was adopted to summarize the study results without conducting meta-analysis due to the heterogeneity of the types/nature of the interventions, study outcomes and study settings among the reviewed studies. For studies with a lack of sufficient information for calculating the effect sizes, their outcomes were discussed with a few conclusive statements.

2.5.5 Characteristics of the studies and interventions

Of the 22 reviewed studies, 21 studies that focused on various psychosocial interventions for people with SCI were conducted in Western countries, namely Australia (n=5), the UK (n=2), the US (n=9), Sweden (n=1), Canada (n=1), and the Netherlands (n=2). Only one study was conducted in Asia (Taiwan). For the study design, there were 8 randomized controlled trials, 8 non-randomized controlled trials, 2 cohort studies, 2 quasi-experimental non-controlled studies, and 2 case studies. After assessing the study quality by the EPHPP instrument (Table 2.1), six studies were rated as strong, 16 studies were rated as moderate.

Table 2.3 Summary of the interventional studies in relation to psychosocial care of people with SCI (adapted from (Li, Bressington, & Chien, 2017))

No./Author/country	Study design	Target population	Outcome measurements	Main findings
1 Craig et al. (1997) Australia	Non-RCT	▪ N = 69; ▪ N treatment = 28 ▪ Age (M): 31 ▪ Sex: 83%male ▪ Tetraplegia: 51.5% ▪ Incomplete: 30.5% ▪ Newly injured (time since injury not stated) ▪ Range of depression ▪ Participation rate: 76% ▪ Attrition rate: 3.6%	▪ Pre, post and one-year follow up: Depression (the Beck Depression Inventory), anxiety (the State-Trait Anxiety Inventory), self-esteem (the Rosenberg Self-Esteem scale), perception of control (the Locus of Control Behaviour Scale) ▪ Two years follow up: depression, anxiety, locus of control, re-admission, drug usage, relationships, social discrimination, self-reports of adjustment	▪ Depression: No overall significant differences, but significant differences for those have a high level of depression (f=6.78, $p<0.01$). ▪ Anxiety: No overall significant differences, but significant differences for those have high level of anxiety (f=10.29, $p<0.01$) ▪ Perception of control: no overall significant differences, but significant differences for those who initially perceived life as externally controlled (f=4.94, $p<0.05$). ▪ Significant differences in re-admission (x^2=3.93, $P<0.05$), drug usage (x^2=4.12, $P<0.05$), self-report adjustment (x^2=12.0, $p<0.01$).

2. Kennedy et al. (1999) The UK	Non-RCT	▪ N = 38; ▪ N treatment = 19 ▪ Age (M): 34 ▪ Sex: 76% male ▪ Tetraplegia: 50% ▪ Incomplete: 29% ▪ Newly injured (Average time since injury=4 month) ▪ Range of depression ▪ Participation rate: 60% ▪ Attrition rate: 0%	▪ Pre, post and six-week follow-up: Depression (the Beck Depression Inventory), Anxiety (the State Anxiety Inventory), Coping (the Coping Orientations to Problems Experienced scale)	▪ The intervention group showed significantly greater reductions in levels of depression (f=8.34, p<. 01) and anxiety (f=3.52, p<0.01). ▪ No evidence for greater change for coping strategies.
3. Phillips et al. (2001) The US	RCT	▪ N = 111; N treatment (video) = 36; N treatment (telephone) = 36 ▪ Age (M): 35 ▪ Sex: 80% male ▪ Tetraplegia: N/A ▪ Incomplete: N/A ▪ Newly injured (time since injury not stated) ▪ Range of depression ▪ Participation rate: N/A ▪ Attrition rate: 42%	▪ Pre, post, one-year follow-up: health care utilization, skin scores, employment status, and self-report measure. Quality of life (the quality of well-being scale, QWB). Depression (the Centre for Epidemiologic Studies Depression Scale)	▪ QWB: at one-year discharge, scores for the intervention arms together (both video and telephone) were significantly higher for the intervention groups compared to standard care. ▪ CES-D: scores across groups were not significantly different at week 9. At 1 year, telephone and control groups were no longer screening positive for depression, and those in the video group continued to exhibit with high depressive symptoms. ▪ Mean annual hospital days were 3.00 for the video group, 5.22 for the telephone group, and 7.95 for the standard care group.

4. Kennedy et al. (Kennedy, 2003) The UK	Non-RCT	▪ N = 85; N treatment = 45 ▪ Age (M): 34 ▪ Sex: 81% male ▪ Tetraplegia: 54% ▪ Incomplete: 42% ▪ Newly injured (time since injury intervention=22.5 weeks, control=17.4 weeks) ▪ Range of depression ▪ Participation rate: 60% ▪ Attrition rate 0%	▪ Pre, post and six-week follow-up: Depression (the Beck Depression Inventory), Anxiety (the State Anxiety Inventory), Coping (the Coping to Orientations to Problems Experienced Scale), Self-perception (Self-Perception Scale) (no control group data)	▪ The intervention group showed significantly greater reductions in levels of depression (f=18.46, p<. 01) and anxiety (f=15.28, p<0.01). ▪ No evidence for greater change in coping strategies. ▪ There was a significant decrease in the discrepancy between participants “ideal” self and “as I am”, and between “as I would be without the injury” and “as I am” following the intervention and at follow-up.
5. Kemp (2003) The US	Non-RCT	▪ N=43 ▪ N treatment= 28 ▪ Age (M)=42 ▪ Sex: 74% male ▪ Tetraplegia: 37% ▪ Incomplete: not stated ▪ Newly injured (time since injury 18 years) ▪ Participants have all major depressive disorder ▪ Participation rate: 77%	▪ Pre, post: Depression (The older adult health and mood questionnaire), Presence of depression (the Hamilton depression rating scale), number of activities (the community activities checklist), life satisfaction (the life satisfaction scale)	• A significant reduction in depressive symptoms occurred in the treatment group, whereas there was no significant change in the non-treatment group. • At the end of 6 months, 30% of participants had no depression, 42% had minor depression, and 29% still had major depression, but to a lesser degree. • Community activities increased significantly over the treatment period, as did life satisfaction.

6. Shanmugham (2004) The US	RCT	▪ N=51 ▪ N treatment= 18 ▪ Age (M)=37.6 ▪ Sex: 88% male ▪ Tetraplegia: 35% ▪ Incomplete: 24% ▪ Newly injured (time since injury not stated) ▪ people with pressure ulcer ▪ Participation rate: 100% ▪ Attrition rate: 22%	▪ Pre, post: social problem-solving abilities (Social Problem Solving Inventory-Revised), Psychosocial impairment (The Psychosocial Functioning section of the Sickness Impact Profile-SIP), Health locus of control beliefs (The multiple dimensional Health Locus of Control Scale)	▪ Persons assigned to a brief problem-solving intervention did not differ on any measure from participants in a control group. ▪ Packaged intervention protocols that do not attend primarily to immediate and unique needs of each participant are likely to have little or no effects.
7. Budh (2006) Sweden	RCT	▪ N=38; N treatment=27, ▪ Age (M) = 52.2 ▪ Sex: 63.2% male ▪ Tetraplegia: 50% ▪ YPI=11.6 years ▪ people with neuropathic pain ▪ Participation rate: N/A ▪ Attrition rate: 0%	▪ Pre, post, 3,6,12 month follow-up: pain intensity and pain unpleasantness (Boorg CR 10 Scale), quality of sleep (sleep questionnaire), quality of life (Nottingham Health Profile), life satisfaction (Life Satisfaction Scale), Mood (Hospital Anxiety and Depression), sense of coherence (Sense of Coherence Instrument), Use of the healthcare system.	▪ Levels of anxiety and depression in the treatment group decreased compared with baseline values ▪ A tendency towards better quality of sleep was seen ▪ Patients in the treatment group improved regarding sense of coherence and depression in comparison with control group

8. Kanhan (2006). The US	Non-RCT	▪ N = 76; ▪ N treatment = 54 ▪ Age (M): 49.3 ▪ Sex: 51% male ▪ Injury: 54% SCI, 46% stroke, cerebral palsy, rheumatoid arthritis and others ▪ Major depression ▪ Participation rate: N/A ▪ Attrition rate: 0%	▪ Pre, post: Depression (The older adult health and mood questionnaire), life satisfaction (the life satisfaction scale), number of activities (the community activities checklist).	▪ Treatment group improved significantly on all three measures. Average depression scores declined 50% ($p<0.001$). ▪ There was a non-significant 12% decline in the comparison group.
9. Ducknick (2009) The US	RCT	▪ N = 41 ▪ N (CET) = 21 ▪ Age (M): 53 ▪ Sex: 97.5% male ▪ Tetraplegia: 55% ▪ Incomplete: 70% ▪ Newly injured (time since injury 53.1 days) ▪ Range of depressive symptoms ▪ Participation rate: 55% ▪ Attrition rate: 14.6%	▪ Pre, post, 3-month follow-up: anxiety (State Anxiety Inventory), depression (The Centre for Epidemiologic Studies Depression Scale), adjustment (The Adaptation to Disability Scale-Revised)	▪ No significant outcomes were found between CET and the SGT (active alternative control). However, CET participants completed fewer interventions sessions than SGT participants, with similar mood and adjustment outcomes reported.

10 Arbour-Nicitopoulos (2009) Canada	RCT	▪ N= 44; N (ACP)=22 ▪ Age (M)= 50 ▪ Sex: 68% male ▪ Tetraplegia: 53% ▪ Incomplete: 59% ▪ Time since injury 14.5 years ▪ people with chronic pain ▪ Participation rate: 67% ▪ Attrition rate: 4.3%	▪ Pre, 5 weeks, 10 weeks: LTPA (leisure-time physical activity) intentions, coping self-efficacy (3 items with general barriers self-efficacy, facility barriers self-efficacy, and scheduling self-efficacy)	▪ Persons in the ACP conditions indicated significant greater LTPA intentions (F=5.53, p<. 03) ▪ A significant difference for coping self-efficacy beliefs (F=6.0, p < .01)
11 Dorstyn (2010) Australia	Non-RCT	▪ N = 24; N treatment = 11 ▪ Age (M): 49 ▪ Sex: 83% male ▪ Tetraplegia: 42% ▪ Incomplete: 21% ▪ Newly injured (time since injury 6 months) ▪ Range of depressive symptoms ▪ Participation rate: 60% ▪ Attrition rate: 20%	▪ Pre, post, 3 months: FIM (The functional independence measure), DASS-21 (The depression, anxiety and stress scales)	▪ Depression scores for treatment participants showed a significant time effect, with worsening symptoms reported at three-month follow-up.

12. Perry (2011) Australia	Non-RCT	▪ N=36; ▪ N treatment=19; ▪ Age (M)= 43.8 ▪ Sex: 78% male ▪ Tetraplegia: 39% ▪ Incomplete: 64% ▪ Time since injury 5yeas ▪ Range of Depressive symptoms ▪ Participation rate: N/A ▪ Attrition rate: 5.2%	▪ Pre, post: self-efficacy (Moorong Self-efficacy scale), Coping (Spinal cord lesion-related Coping strategy questionnaire), Pain response (pain response self-statement scale: catastrophizing subscale), pain self-efficacy (pain self-efficacy scale), Mood (Hospital and Anxiety Depression Scale), Quality of life (Medical outcomes study short form health survey-12)	▪ The PMP group showed an overall improvement in mood and life interference due to pain at the end of the PMP when compared with usual care group. ▪ Within the PMP group, there was a significant improvement over time in anxiety and pain catastrophizing.
13. Migliorini (2011). Australia	Case study	▪ N=3 ▪ Case 1 was a 65-year-old male with complete paraplegia. ▪ Case 2 was a 53-year-old male with incomplete paraplegia. ▪ Case 3 was a 41-year-old female with incomplete paraplegia ▪ Participation rate: N/A ▪ Attrition rate: 0%	▪ Mood (Depression, anxiety and stress scale-short version), Subjective well-being (Personal wellbeing index 4 edition), Emotional consequences (The spinal cord lesion emotional wellbeing questionnaire), structural clinical interview for DSM disorder	▪ The online program was acceptable, and they all showed some improvement in symptoms. ▪ They all had a strong sense of independence and felt this would have been questioned if they sought therapy.

14. Heutink (2012) The Netherlands	RCT	▪ N=61, ▪ N treatment=31 ▪ Age (M)=58 ▪ Sex: male 63% ▪ Tetraplegia: 30% ▪ Incomplete: 64% ▪ Time since injury 5 y ▪ All participants have neuropathic pain ▪ Participation rate: 30% ▪ Attrition rate: 0%	▪ Baseline, 3-, 6-month follow-up: Primary outcomes were pain intensity and pain-related disability (Chronic Pain Grade questionnaire), and secondary outcomes were mood (Hospital Anxiety and Depression Scale), participation in activities (Utrecht Activities List), and life satisfaction (Life Satisfaction Questionnaire)	▪ The analyses showed significant changes over time on both primary (t1–t2), and 2 out of 4 secondary outcomes (both t1–t2 and t1–t3). ▪ Significant intervention effects (Time Group interactions) were found for anxiety and participation in activities, but not for the primary outcomes. ▪ Subsequent paired t-tests showed significant changes in the intervention group that were not seen in the control group: decrease of pain intensity, pain-related disability, anxiety, and an increase of participation in activities.
15. Ljungberg (2011). The US	Pre-post	▪ Mentor: N=5 ▪ Age (M): 34.8 Male: 60% Tetraplegia: 60% Time since injury 11.8 years ▪ Mentee: N=37 ▪ Age (M): 35.4 Male: 76% Tetraplegia: 38% time since injury<1 year ▪ people with ranges of depression ▪ Participation rate: N/A ▪ Attrition rate: 35%	▪ Baseline, 6-, 12-month assessment: Self-efficacy (Generalized Perceived Self-Efficacy), hospitalization	▪ Sixty-seven percent showed improved self-efficacy score between the two-time points. Medical complications and doctor visits all decreased significantly between 0–6 months and 7–12 months. ▪ The programme was well received by all mentees who felt they could connect well with their peer mentor.

16. Dorstyn (2012). Australia	RCT	▪ N=40 ▪ N treatment=20 ▪ Age (M)=53 ▪ Sex: male 70% ▪ Tetraplegia: 40% ▪ Incomplete: 64% ▪ Time since injury 5m ▪ Ranges of depression ▪ Participation rate: 90% ▪ Attrition rate 3%	▪ Baseline, 12-week, 3-month follow up: Psychosocial outcomes: depression anxiety stress scale-21, Mini international neuropsychiatric interview, spinal cord lesion emotional wellbeing and coping strategies questionnaires, and the multidimensional measure of social support, cost-effectiveness and clinical feasibility	▪ Tele counselling participants reported clinical improvements in depression and anxiety and aspects of coping, however, threes treatment gains were not significant compared with control group ▪ Treatment effects were minimal at 3-month follow-up ▪ Delivery related outcomes including participation rate and cost analyses were all positive
17. Hough (2013) The US	A Case study	▪ N=7 male veterans with SCI/D, age 32-51 ▪ Participation rate: N/A ▪ Attrition rate: 0%	▪ Pre, post: general wellbeing, self-esteem, depression, anxiety, and social skills	▪ All participant reported positive experiences in the group and improvement in targeted areas.

18. Burns (2013), The US	Pre post	▪ N=17 Persons with traumatic or non-traumatic SCI and Chronic Pain of at least 6-month duration ▪ Age (M)= 48 ▪ Male: 70% ▪ Tetraplegia: 50% ▪ Incomplete: 80% ▪ Time since injury 8 Y ▪ Participation rate: N/A ▪ Attrition rate: 23%	▪ Pre, post, 3-, 12-month follow-up: Pain (Multidimensional pain inventory SCI), Coping inventory of Stressful Situation, Pain Stages of Change questionnaire, Life Satisfaction Questionnaire	▪ After participation in an interdisciplinary pain program, persons with SCI and chronic neuropathic pain demonstrated increased involvement in learning and maintenance of coping strategies for chronic pain. Participation also led to less pain interference in daily life and a greater sense of control over one's life
19. Houlihan (2013) The US	RCT	▪ N=142 persons with spinal cord injury (N=106) and muscle sclerosis (N= 36) ▪ Community outpatient rehabilitation ▪ Participation rate: 60% ▪ Attrition rate: 6.3%	▪ Pre, post: pressure ulcer rate, depression (The Patient Health Questionnaire), Health-care utilization (Cornell Service Index)	▪ A statistically significant difference was observed in the 6-month severity of depression between the intervention and control groups (d=0.56), p=. 038

20. Heutink (2014), the Netherlands	Long-term pre-post test	▪ N=29 ▪ Age (M)=56.5 ▪ Sex: male 72.4% ▪ Tetraplegia: 38% ▪ Incomplete: 48% ▪ Time since injury 5.4 y ▪ All participants have neuropathic pain ▪ Participation rate: 94% ▪ Attrition rate; 0%	▪ Pre, post, 6-, 9-, 12-month follow-up: Pain-related disability (Chronic pain grade questionnaire). Mood (Hospital anxiety and depression scale), participation in activities (Utrecht activities list), and life satisfaction (Life Satisfaction Questionnaire)	▪ The analyses showed significant improvements on pain intensity (pre-post, pre-12month follow-up), and pain-related disability (pre-post, pre-9month follow-up, and pre-12month follow up), anxiety and participation in activities (pre-post, pre-6month follow up, pre-12month follow-up)
21. Chen (2015) Taiwan, China	Non-RCT	▪ N=59 ▪ N treatment=28 ▪ Age (M)=47 ▪ Sex: male 75% ▪ Tetraplegia: ▪ Incomplete: 40% ▪ Time since injury 3 month ▪ people with ranges of depression ▪ Participation rate: N/A	▪ Pre, post: self-perception (self-perception Scale), Self-efficacy (Moorong Self-efficacy Scale)	▪ The experimental group exhibited a considerably greater improvement in self-perception than did the control group

22. Guest (2015) Australia	Non-RCT	▪ N=88 ▪ N treatment =50 ▪ Age (M)=43 ▪ Sex: male 70% ▪ Tetraplegia: 39% ▪ Incomplete: 52% ▪ Time since injury: Not stated, SCI inpatient first admission ▪ people with ranges of depression ▪ Participation rate: 97% ▪ Attrition rate: 8%	▪ Baseline, 6-month post-injury, resilience (The Connor-Davison Resilience Scale), Self-efficacy (The Moorong Self-efficacy Scale), Depression and anxiety (The Hospital Anxiety and Depression Scale, HADS)	▪ The addition of GCBT to psychosocial rehabilitation did not result in improved resilience compared with the ICBT group.

Note: RCT=Randomised Controlled Trial, Non-RCT=Non-Randomised Controlled Trial

Data of the experimental studies were extracted in terms of the research design, research population, components of the interventions adopted, outcome measures and main findings (Table 2.3). Some details of the interventions used in the reviewed studies in terms of its approach, structure and delivery settings, and dosage are also summarized (Table 2.4).

Table 2.4 Details of the interventions (adapted from (Li et al., 2017))

No., author/country	Intervention approach and main technique	Intervention delivery (structure of setting)	Dosage of intervention and follow-up
1 Craig et al. (1997) Australia	▪ CBT ▪ Cognitive-behavioural theory ▪ Relaxation techniques, cognitive restructuring, skills training, psycho-education	▪ A psychologist and an occupational therapist ▪ Group (4-5 people) face-to-face ▪ SCI ward	▪ 10 sessions ▪ 1.5-2h weekly ▪ 10 weeks ▪ Pretest, posttest, one-year follow-up, two-year follow-up
2. Kennedy et al. (1999) The UK	▪ CET ▪ Stress and coping theory ▪ Appraisal training, coping skills training, social skills training, relaxation, activity scheduling	▪ Psychologist ▪ Group (6-9 people) face-to-face ▪ Rehabilitation hospital	▪ 7 sessions ▪ 1-1.15h twice per week ▪ 3.5 weeks ▪ Pretest, posttest, 6-week follow-up
3. Phillips et al. (2001) The US	▪ Education ▪ N/A ▪ A structured review of skin care, nutrition, bowel and bladder routines, psychosocial issues and discussion of any equipment needs	▪ Rehabilitation nurses ▪ Individual ▪ Home based	▪ 7 sessions ▪ 30-40mins weekly for 5 weeks, biweekly for a month ▪ 9 weeks ▪ Pretest, posttest, 1 year after the intervention
4. Kennedy et al. (Kennedy, 2003)	▪ CET ▪ Stress and coping theory	▪ Psychologist ▪ Group (6-9 people) face-to-face ▪ Rehabilitation hospital	▪ 7 sessions ▪ 1-1.15h twice per week ▪ 3.5 weeks ▪ Pretest, posttest, 6-week follow-up

The UK	▪ Appraisal training, coping skills training, social skills training, relaxation, activity scheduling		
5. Kemp (2003) The US	▪ CBT ▪ Cognitive-behavioural theory ▪ Psycho-education, problem-solving, activity scheduling, coping skills	▪ Psychologist ▪ Individual face-to-face ▪ Outpatients of a rehabilitation centre	▪ 16 sessions ▪ Once per week for two months, twice per month for 4 months ▪ 6 months ▪ Pretest, posttest
6. Shanmugham (2004) The US	▪ Problem-solving training ▪ Cognitive-behavioural theory ▪ Problem-solving training consisting of individual psycho-educational sessions that meet every other day for a total of eight session	▪ Not stated ▪ Individual face-to-face ▪ Rehabilitation centre	▪ 8 sessions ▪ 0.5-1.5h every day ▪ Around 1 week ▪ Pretest, posttest
7. Budh (2006) Sweden	▪ PMP ▪ CBT theory ▪ Psycho-education on pain knowledge, behavioural therapy sessions, relaxation, stretching, light exercise and body awareness training.	▪ Not stated ▪ Group (all participants) face-to-face ▪ SCI Unit in the hospital	▪ 10 sessions ▪ 1.5 h education; 1.5 h CBT; 1 h relaxation/stretching; 1 h body awareness training biweekly ▪ 20 weeks ▪ Pretest, posttest, 3,6,12 months
8. Kanhan (2006)	▪ CBT ▪ Cognitive-behavioural theory ▪ Psycho-education, problem-solving, activity scheduling, coping skills	▪ Psychologist ▪ Individual face-to-face ▪ Outpatients of a rehabilitation centre	▪ 16 sessions ▪ Once per week for two months, twice per month for 4 months ▪ 6 months ▪ Pretest, posttest
9. Ducknick (2009) The US	▪ CET ▪ Stress and coping theory ▪ Appraisal training, coping skills training, social skills training, relaxation, activity scheduling	▪ Psychologists ▪ Group face-to-face ▪ Rehabilitation centre	▪ 7 sessions ▪ 1-1.15h twice per week ▪ 3.5 weeks ▪ Pretest, posttest, 3-month follow-up

10. Arbour-Nicitopoulos (2009) Canada	▪ Action and coping Planning ▪ Not stated ▪ Action planning intervention with coping plans for barriers	▪ The researcher ▪ Individual face-to-face ▪ Community-based	▪ 3 sessions ▪ 20-30 mins per five weeks ▪ 10 weeks ▪ Baseline, 5 weeks, 10 weeks (continuous intervention)
11. Dorstyn (2010) Australia	▪ CBT ▪ CBT model ▪ Psycho-education, problem-solving, activity scheduling, cognitive appraisal, peer professionals available to the participants	▪ Psychologists ▪ Individual face-to-face ▪ Inpatient rehabilitation	▪ 11 sessions ▪ 30-60 mins biweekly ▪ 22 weeks ▪ Baseline, 5 weeks, 3-month follow-up
12. Perry (2011) Australia	▪ PMP ▪ Cognitive behaviour model ▪ Psycho-education, relaxation, goal setting, pacing and upgrading of activities, cognitive restructuring	▪ Interdisciplinary team ▪ Group face-to-face ▪ Inpatient pain management centre	▪ 10 sessions ▪ Total for 45 hours, weekly ▪ Pretest, posttest
13. Migliorini (2011). Australia	▪ ePACT ▪ CBT model ▪ e-CBT: altered thinking, problem-solving, pleasant activity scheduling, goal setting, relaxation	▪ Online programme ▪ Individual ▪ Community-based	▪ 10 modules and 4 information pages ▪ Pretest, posttest
14. Heutink (2012) The Netherlands	▪ PMP ▪ Bio-psychosocial model, Activating-belief-consequences model ▪ Psycho-education, cognitive reconstructing, goal setting, relaxation, social skills training	▪ Multidisciplinary team ▪ Group face-to-face ▪ Rehabilitation centre	▪ 10 sessions ▪ 3 h weekly ▪ 10 weeks ▪ Baseline, 3-, 6-month follow up
15.	▪ Peer Mentoring	▪ Peer mentor	▪ Total: one year

Ljungberg (2011). The US	▪ Social support ▪ Mentor-mentee contact/meeting	▪ Individual face-to-face ▪ Community-based	▪ Weekly contacts between mentor and mentee were continued for three months, three months of biweekly contacts, and six months monthly contact ▪ Pretest, posttest
16. Dorstyn (2012). Australia	▪ Tele-counselling programme ▪ Motivational interviewing ▪ Coping skills, psycho-education, activity scheduling, relaxation technique	▪ Psychologists ▪ Individual tele counselling ▪ Community-based	▪ 12 sessions ▪ 20 mins weekly ▪ 12 weeks ▪ Pretest, posttest, 3-month follow-up
17. Hough (2013) The US	▪ Psycho-education ▪ Dating and relationship psycho-educational group for veterans with spinal cord injury	▪ Psychologists ▪ Group face to face ▪ Community-based	▪ 12 sessions ▪ 60 mins weekly ▪ 12 weeks ▪ Pretest, posttest
18. Burns (2013), The US	▪ PMP ▪ Cognitive-behavioural model ▪ Psycho-education, CBT, self-management (goal setting, coping skills, exercise, relaxation)	▪ Multidisciplinary team ▪ Group face to face ▪ Rehabilitation hospital	▪ 5 sessions ▪ 2.5h biweekly ▪ 10 weeks ▪ Pre, post, 3, 12-month follow-up
19. Houlihan (2013) The US	▪ Telehealth intervention-CareCall ▪ Trans theoretical model, social cognitive theory ▪ Psycho-education, CBT, screening and referrals	▪ Automated, interactive voice response system ▪ Individual online ▪ Community-based	▪ Weekly automatic calls from the CareCall for 6 months and could call into CareCall anytime ▪ Non-adherence is defined as missing three consecutive weekly calls ▪ Baseline, 2-, 4-, 6-month follow-up
20.	▪ PMP	▪ Multidisciplinary team	▪ 10 sessions

Heutink (2014), the Netherlands	▪ Biopsychosocial model, Activating-belief-consequences model ▪ Psycho-education, cognitive reconstructing, goal setting, relaxation, social skills training,	▪ Group face-to-face ▪ Rehabilitation centre	▪ 3 h weekly ▪ 10 weeks ▪ Baseline, 3-, 6-month follow up
21. Chen (2015) Taiwan, China	▪ Education ▪ Social cognitive theory, super-link system theory ▪ Education	▪ DVD-based ▪ Individual ▪ Rehabilitation centre	▪ 3 parts (No. of sessions) ▪ 110 mins in total ▪ Pretest, posttest
22. Guest (2015) Australia	▪ Group CBT ▪ CBT ▪ Psycho-education, cognitive restructuring, mindfulness, anxiety management skills, such as breath rate control and visualization, problem-solving, communication and assertion skills.	▪ Psychologist ▪ Group face to face ▪ Rehabilitation centre	▪ 8 sessions ▪ 2 h weekly ▪ 8 weeks ▪ Baseline, 2 weeks prior to discharge (around 6-month post-injury), 6-month post discharge of living in the community (approximately 12-month post injury)

Note: CBT=Cognitive-Behavioural Therapy, CET= Coping Effectiveness Training, PMP= Pain Management Programme

Study population

The sample size of the reviewed intervention studies ranges from three to 142 participants, consisting of a total number of 1,139 people with SCI. The attrition rate of the reviewed studies ranged from 0% to 42%. The sub-types of the SCI population reviewed mainly include people with chronic pain (Heutink et al., 2012; Heutink et al., 2014; Norrbrink Budh, Kowalski, & Lundeberg, 2006; Perry, Nicholas, & Middleton, 2010), major depressive disorder (Kahan, Mitchell, Kemp, & Adkins, 2006; Kemp, Kahan, Krause, Adkins, & Nava, 2004; Krause, Broderick, & Broyles, 2004), pressure ulcers (Shanmugham, Elliott, & Palmatier, 2004). The other studies targeted on SCI populations with wide ranges of depression or anxiety, as well as participants who are not specifically defined.

Theoretical underpinnings of interventions

Various theories related to psychology and/or sociology were adopted to be the theoretical underpinnings of those interventions reviewed. The main theoretical underpinnings of research in this area are dominated by cognitive psychology, with the emphases on cognitive behaviour theory (Craig, Hancock, Dickson, & Chang, 1997; Kahan et al., 2006; Kemp et al., 2004; Norrbrink Budh et al., 2006; Shanmugham et al., 2004), cognitive stress and coping theory (Duchnick, Letsch, & Curtiss, 2009; Kennedy et al., 2003; King & Kennedy, 1999), and social cognitive theory (Chen, Wu, & Lin, 2015; Houlihan et al., 2013). The bio-psychosocial model (Heutink et al., 2012; Heutink et al., 2014) was often used in interventions regarding pain management for people with chronic SCI pain. Social support theory (Ljungberg, Kroll, Libin, &

Gordon, 2011) has been employed in interventional studies targeting on social skills training for people with SCI.

Intervention approaches

The most commonly adopted psychosocial approaches or techniques were cognitive and behavioural approaches [e.g., cognitive restructuring (n=12), activity scheduling (n=10), relaxation techniques (n=12), goal setting (n=3), and problem-solving (n=6)], psycho-educational approach (n=20) and skills training (e.g., social skills training (n=8), coping skills training (n=10), and body awareness training (n=1)]. Additionally, peer mentoring (n=2) was also employed as one psychosocial approach.

Comparisons

Of the 22 studies reviewed, 16 studies are randomised controlled studies or controlled studies without randomisation included a comparison group (to the intervention group). Twelve studies adopted the treatment as usual group as the comparison, and two studies used historical control group, while another two studies used active control groups (i.e., didactic education or other psychosocial care programmes).

Delivery of intervention

Nearly half of the reviewed psychosocial intervention programmes were delivered by psychologists (n=9), with one study conducted by a rehabilitation nurse, and the other pain management programmes implemented by a multidisciplinary rehabilitation team. The interventions of 13 included studies were delivered in a rehabilitation hospital during the inpatient stage, and 9 studies were conducted in home/community-based format or for outpatients of SCI clinics. Of those 13 inpatient studies, 9 studies were delivered in a group face-to-face format and only one study in individual face-to-face session. Whereas, most of the outpatient intervention programmes were delivered in an individual face-to-face format (n=7), and only one study in a group format. Almost all of the intervention programmes reviewed provided a clear description and sufficient information of the intervention, which means that other researchers could probably replicate or build on those programmes in designing future psychosocial intervention programmes for people with SCI.

Dosage of the interventions and length of follow-up

The number of the sessions involved in the interventions ranges from three to 16. Most of the interventions were delivered on a weekly basis (n=11), with others conducted biweekly (n=3) or twice per week (n=3).The duration of the each individual session from the whole programme ranged from 0.5 hours to 3 hours, with most interventions , stayed within 2 hours. The whole duration of the programmes ranged from 3.5 weeks to 6 months. The follow-up period of the participants after the intervention was very diverse, from immediately post-intervention (n=7), 6-weeks (n=2), to 2 years (n=2).

2.5.6 Outcomes of the studies

Guided by the stress and coping model for revealing the mechanism of people's psychological adjustment to SCI (Galvin & Godfrey, 2001), the study outcomes can be grouped and discussed under the three crucial components of the theory: cognitive appraisal, coping and psychosocial adaptation (Kennedy & Ebrary, 2007).

Cognitive appraisal

Cognitive appraisal is a dynamic process where a person evaluates a specific life event/situation and determines their personal meaning of and sense of control over the situation (Folkman et al., 1986). Perception of control measured by the Locus of Control Behaviour Scale (Craig et al., 1997) showed significant improvements (d= 0.55) for patients with SCI who initially perceived their life as being externally controlled over the 2 years follow-up. A significant decrease in the discrepancy between people's self-perception on SCI was found at post-test and at 6-week follow-up (Kennedy et al., 2003). The study adopted a DVD-based health education program and showed a considerably greater improvement of self-perception (d=0.83, using the Self-Perception Scale) in the experimental group than the control group immediately after the intervention (Chen, Wu, & Lin, 2015). One study of brief cognitive-behavioural therapy reported that participants in the treatment group with pressure ulcer at post-SCI did not indicate any significant change in their health locus of control beliefs, using the Multiple Dimensional Health Locus of Control Scale, compared to the treatment as usual group (Shanmugham et al., 2004) at post-test.

Self-efficacy was measured in two studies by using The Moorong Self-Efficacy Scale and demonstrated a small difference (d=0.05) between the intervention and usual care group in one study (Chen et al., 2015) and very minimal changes observed in the two study groups in another study at post-test (Perry et al., 2010). The experimental group of (Kim & Cho, 2017)'s study showed a significantly greater improvement in self-care knowledge and self-efficacy behaviours for pressure ulcer prevention than the comparison. Whereas, the multi-component pain management program for people with SCI could significantly improve their sense of coherence (d=0.68) measured with the Sense of Coherence Instrument when compared with usual care (Norrbrink Budh et al., 2006) over the 12-month follow-up. Personal resilience measured by the Connor-Davison Resilience Scale did not show significant improvements in both the intervention (group cognitive-behavioural therapy) and control (usual inpatient rehabilitation service) group immediately after the intervention (Guest, Craig, Nicholson Perry, et al., 2015) at post-test. Significant improvement (d=0.58) of pain catastrophizing using the Pain Response Self-statement Scale was also reported in (Perry et al., 2010)'s pain management program at post-test. One study using the Generalized Perceived Self-efficacy Scale has shown significant effects at two-time points (0-6 months and 7-12 months) of the intervention (Ljungberg et al., 2011) over the 6-month follow-up.

Coping

Coping is defined as "constantly changing cognitive and behavioural efforts to manage a specific external and/or internal demand that are appraised as taxing or exceeding the person's resources" (p.178) (Folkman et al., 1986). Coping ability was measured in three studies, in which two of them (with the Coping Orientations to Problems Experienced Scale) did not show significant changes in the coping strategies of patients with SCI who participated in the coping effectiveness training (Kennedy et al., 2003; King & Kennedy, 1999). Similarly, another study of pain management program using the Spinal Cord Lesion-related Coping Strategy Questionnaire (SCL CSQ) did not find any significant difference on coping effectiveness between the treatment and usual care group (Perry et al., 2010). A study using SCL CSQ reported statistically significant improvements in coping strategies in the tele-counselling group in comparison with the control group who received standard care (Dorstyn, Mathias, Denson, & Robertson, 2012). The Coping Inventory of Stressful Situation assessed in one study reported increased involvement in learning the maintenance of coping strategies for chronic pain in the intervention group compared to the treatment as usual group (Burns et al., 2013).

Mental health and well-being

Adaptation or adjustment outcomes are thought to be generated from the coping process. Better coping is postulated to result in less intense stress reactions and improved mental health, life satisfaction/quality of life and social participation (Peter et al., 2014).

Mood. Depression or mood state was a common outcome used to measure success of psychological adjustment. Two studies (Norrbrink Budh et al., 2006; Perry et al., 2010) using the Hospital Anxiety and Depression Scale showed significant improvements of mood (d=0.75 and 0.48, respectively) among participants in pain management program, compared with the treatment as usual group. Similarly, depressive symptoms (measured with the Depression, Anxiety and Stress Scale, DASS-21) were found much improvement in (Dorstyn, Mathias, & Denson, 2010)'s study of cognitive-behavioural therapy over the 3-month follow-up. The other two studies of coping effectiveness training (Kennedy et al., 2003; King & Kennedy, 1999) also reported a significant reduction in depressive symptoms (d=0.96 and 0.92, respectively) using the Beck Depression Inventory, when compared to the historical control group over the 3-month follow-up. However, no statistically significant differences on depression scores (using the Centre for Epidemiologic Studies Depression Scale) were found between the intervention and control groups in (Duchnick et al., 2009)'s study. Whilst (Craig et al., 1997)'s study did not show any significant reduction of depressive mood in cognitive-behavioural therapy group, except for those with moderate to severe levels of depression at recruitment (d=0.65) over the two-year follow-up.

No significant differences in the depression scores (assessed by the Centre for Epidemiologic Studies Depression Scale) were found between the intervention and control group in (Duchnick et al., 2009)'s study over the 3-month follow-up. Two studies adopted the Older Adult Health and Mood Questionnaire for measuring depression and both of them found a significant reduction in levels of depression in the treatment group, whereas, there were no significant changes in the non-treatment group (Kahan et al., 2006; Kemp et al., 2004) immediately after the intervention.

Anxiety. Four studies adopted the State Anxiety Inventory, with two of them (Kennedy et al., 2003; King & Kennedy, 1999) showing significant reductions in levels of anxiety (d=0.62 and 0.74, respectively) among those in the coping effectiveness training programs, compared to the control groups. Two studies (Heutink et al., 2012; Heutink et al., 2014) reported significant effects of the multidisciplinary cognitive-behavioural programs on the anxiety sub-scale of the Hospital Anxiety and Depression Scale in patients with chronic pain caused by SCI over the 6-month follow-up. One study reported no significant effects of the intervention on levels of anxiety (Duchnick et al., 2009), and the study by (Craig et al., 1997) only detected significant differences (d=0.79) for those having a high level of anxiety at baseline.

Quality of life and/or life satisfaction. Improvement in quality of life and/or life satisfaction was reported in four studies. Norrbrink Budh et al. (2006)'s study showed positive trends (but no significant effects) over the 12-month follow-up in the cognitive and behavioural intervention group towards a better quality of life (using the Nottingham Health Profile), as well as a better quality of sleep (using the Sleep Questionnaire) compared with the treatment as usual group. Significant improvement of the quality of life (d=0.80) was also found in the pain management program using the Medical Outcomes Study Short Form Health Survey-12 (Perry et al., 2010) at post-intervention. The Life Satisfaction Scale was used in three studies; in which, the participants in the cognitive-behavioural intervention groups showed a positive trend or a significant improvement in life satisfaction at post-intervention (Burns et al., 2013; Heutink et al., 2012; Heutink et al., 2014; Kahan et al., 2006; Kemp et al., 2004; Norrbrink Budh et al., 2006). A small but significant intervention effect (d=0.20) on the level of participation in life activities (using the Utrecht Activities List) were found in (Heutink et al., 2012)'s study for the pain management group. Scores of the Quality of Well-being Scale were significantly higher for the intervention group compared with the standard care at one-year discharge from the inpatient rehabilitation of SCI (Phillips, Vesmarovich, Hauber, Wiggers, & Egner, 2001) at 6-month follow-up.

Other outcomes

Pain intensity and pain unpleasantness (measured by the Borg CR 10 Scale) did not show significant improvements in the pain management programme when compared with the usual care in (Norrbrink Budh et al., 2006)'s study. In addition, the cognitive-behavioural pain management program in (Heutink et al., 2012)'s study did not demonstrate a significant effect on pain intensity (using the Chronic Pain Grade Questionnaire). However, a significant improvement in pain perception (d=0.33) was achieved in the longer-term (9-12 months) follow-up in (Heutink et al., 2014)'s study; whereas, significant differences in re-admission ($x^2=3.93$, $P<0.05$), drug usage ($x^2=4.12$, $P<0.05$), self-report adjustment ($x^2=12.0$, $p<0.01$) were also noticed in (Craig et al., 1997)'s study. One participant in the control group of (Kim & Cho, 2017)'s study developed a pressure ulcer, while none of the participants in the intervention group developed a pressure ulcer, however, this difference on pressure ulcer between groups was not statistically significant. One study also showed increased communities activities over the treatment period of the intervention group (Kemp et al., 2004). In addition, no serious adverse events (mortality and/or suicidal cases) occurred during the study period of the reviewed interventional studies, with only some cases dropped out due to uncomfortable feelings when receiving the interventions.

2.6 Critical analysis of the effectiveness of the psychosocial care programmes

Previous psychosocial interventions can be classified as inpatient-based and outpatient-based programmes and are conducted either in the early stage of rehabilitation or at a later stage after community reintegration. Psychosocial care programmes during people's earlier stage of rehabilitation are essentially needed and important for the consideration of its timely support as well as long-term meaningfulness (Craig & Perry, 2008; Middleton et al., 2014). The research gaps and recommendations for our study were mainly explored from the research evidence of the earlier (inpatient) psychosocial care programmes. Evidence for earlier (inpatient) psychosocial interventions from previous interventional studies include group-based CBT (Craig et al., 1997; Guest, Craig, Nicholson, et al., 2015), individual-based CBT (Dorstyn, Mathias, & Denson, 2010), coping effectiveness training (Duchnick et al., 2009; Kennedy et al., 2003; King & Kennedy, 1999), problem-solving intervention (Shanmugham et al., 2004), DVD-based education programme (Chen et al., 2015) and pain management programmes (Burns et al., 2013; Heutink et al., 2012; Heutink et al., 2014; Norrbrink Budh et al., 2006; Perry et al., 2010).

The eight non-RCTs mainly used non-equivalent comparison group design; one of them adopted a single-group pre- and post-test design. The results of these studies with poor study design and quality might not reveal the actual intervention effects for SCI. Some studies with relatively small sample sizes (Dorstyn, Mathias, & Denson, 2010; Heutink et al., 2014; King & Kennedy, 1999; Perry, Nicholas, & Middleton, 2010) are very likely to reduce the statistical power in detecting the significant findings. The failure in controlling most of the confounding factors of Perry et al.’s (2010) study may also bias the study results. Due to the nature of the psychosocial interventions used, the participants in the reviewed studies could not be truly blinded to their group allocation or interventions received. The participants’ attendance and completion rates of the interventions were generally acceptable; their attrition rates ranged between 0% and 22% in the studies. The majority of the studies measured short- to medium-term (up to 6 months) intervention effects and only three studies indicated a longer-term (at least 1 year) follow-up.

Significant short-term positive effects of the reviewed interventions during the inpatient SCI rehabilitation were found on a few cognitive (appraisal) and emotional (mood) outcomes, with relatively less significant long-term outcomes such as pain intensity or related disability and quality of life reported in the literature. However, the intervention effects on the above-mentioned outcomes were inconclusive due to very diverse intervention approaches adopted and varied outcomes or measurement tools used in the reviewed studies. Due to the heterogeneity of the studies, findings were synthesized narratively without conducting meta-analysis. The relatively wide range of approaches used across (and within) different intervention programs also makes it difficult to establish their therapeutic mechanisms or active ingredients.

For the specific intervention techniques, cognitive restructuring or appraisal, coping and relaxation skills (and problem solving) training and activity scheduling are relatively commonly employed techniques in those reported effective interventions and thus may be their active ingredients. In addition, a common factor across the studies reviewed is their supportive group format, which can provide opportunities for members to share experiences and learn from others with similar health problems. This appears to be a promising intervention modality for patients with chronic illnesses during their rehabilitation process (Wilson et al., 2008). A group coping effectiveness training program for SCI was compared to an active control group (supportive group therapy) with similar positive effects found in both groups (Duchnick et al., 2009). This finding supports the potential therapeutic effects of group-based interventions. However, no individual study tested the efficacy of a single active ingredient or component of a psychosocial intervention for these patients with SCI. Therefore, it is recommended to explore the therapeutic mechanism or active ingredients of psychosocial intervention in SCI, using a combination of quantitative (e.g., experimental) and/or qualitative approaches.

Psychosocial interventions can be designed for specific patients with SCI showing various degrees of psychological distress, maladaptation or other health problems. The nature, duration and intensity of the intervention used for SCI rehabilitation should be matched with these patients' psychosocial health needs (Middleton, Perry, & Craig, 2014). As mentioned above, most of the target populations/samples of the reviewed studies had high levels of psychological distress (e.g., depression and anxiety) or co-morbidities such as pain or pressure ulcer (Kim & Cho, 2017; Shanmugham et al., 2004). Studies on patients with co-morbidities caused by SCI suggest that psychosocial intervention can improve not only patients' emotional/mood state but also their medical complications. In contrast with this, there were no significant differences in patients' psychosocial outcomes in the reviewed studies between those with and without co-morbidities of other physical and mental illnesses. Indeed, it is important to further investigate the ways and degree that the presence of co-morbidities can affect the effects of psychosocial intervention for people with SCI in future research.

Most intervention programs were delivered by extensively trained health professionals (mainly psychologists). Similar psychosocial interventions (e.g., cognitive-behavioural and stress reduction programs) were delivered by nurses with in-service training in other illnesses such as cancer and serious mental illness (Chien & Bressington, 2015; Goedendorp et al., 2010). It is quite possible that nurses (or health care workers) can be trained to provide such interventions effectively in caring for their patients with SCI. Empowering and equipping rehabilitation nurses with skills in conducting structured psychosocial interventions for patients with SCI may improve their treatment accessibility and acceptability. It is worth to note that a majority of people (70%-80%) in the SCI rehabilitation phase present with mild to moderate levels of depression and/or anxiety. The "grass-roots" and user-friendly psychosocial interventions should be designed and conducted by frontline rehabilitation nursing staff in order to be tailor-made for satisfying the adjustment and psychosocial needs of most patients during SCI inpatient rehabilitation (Craig, Tran, & Middleton, 2009; Middleton & Craig, 2008).

It is noteworthy that only one intervention study was conducted in Asia (Taiwan), while the other 10 studies were conducted in developed Western countries. Moreover, most study outcomes focused on psychosocial variables, including cognitive appraisal, coping, mood status, and/or other adaptation outcomes (e.g., quality of life or life satisfaction). In light of the bio-psychosocial model and contributions of psychosocial health to SCI rehabilitation and patients' independence in daily living (Kennedy et al., 2011), physical health outcomes (e.g., functional independence) may also be useful and valid to evaluate the effects of psychosocial interventions.

The review found some promising evidence that psychosocial interventions, consisting of cognitive-behavioural and/or cognitive restructuring techniques, coping skills and relaxation training, can improve cognitive appraisal and psychosocial adaptation of people with SCI during the rehabilitation process. However, the generalisability of those research findings to the wider SCI population is uncertain, as most reviewed studies had major methodological limitations and were conducted with subgroups of patients sustaining SCI (e.g., those with clinical depression and/or anxiety) in a few developed countries. Future research in this topic should adopt more robust study design to test the potentially effective approaches to psychosocial intervention for these patients in early stages of rehabilitation, with diverse socio-cultural and clinical backgrounds and levels of psychological distress. Psychosocial interventions provided for people with SCI during inpatient rehabilitation can improve their mood and sense of control by enhancing their cognitive appraisals and psychological adjustment to SCI. It is important and essential to integrate an effective psychosocial intervention into the usual SCI inpatient rehabilitation at the earliest possible opportunity for the majority of patients with SCI who have mild to moderate levels of psychological distress. The nature, duration and intensity of psychosocial intervention in SCI inpatient rehabilitation should be designed according to their psychosocial needs, thus ensuring optimal treatment effects or outcomes.

2.7 Research gaps and recommendations

Based on the research evidence regarding psychosocial interventions for people with SCI, research gaps and recommendations for this PhD study were identified and presented as follows.

The need to improve psychosocial rehabilitation for people with SCI

Psychosocial interventions for people with SCI, which play a pivotal role in improving their psychosocial adaptation outcomes, have not been addressed very well in the current rehabilitation care settings. It is crucial to consider the development and incorporation of an effective psychosocial intervention programme into SCI's bio-psychosocial rehabilitation process, in adjunct to the well-established biomedical rehabilitation programme. This psychosocial care programme could support their psychological adjustment to SCI, improve their psychosocial outcomes and adaptation, as well as mitigate the occurrence of severe mental illness as a longer-time benefit with clinical importance. If a person with SCI has been diagnosed with severe mental health problems or disorders (such as "major depression, post-traumatic stress disorder or bipolar disorder, suicide ideation, or psychotic disorders"), they are recommended to be referred to the specialised psychosocial care services (Craig & Perry, 2008; Espie et al., 2007; Middleton et al., 2014).

Recommendation for providing psychosocial care in the earlier rehabilitation stage

Psychosocial care as a core component of people's SCI rehabilitation is a life-long process, especially at the earlier rehabilitation stage when patients meet a myriad of new challenges and stressful situations (Craig & Perry, 2008). Timely and adequate psychosocial interventions for supporting patients' psychological adjustment process thus play a crucial role in leading success to patients' rehabilitation and long-term well-being (Kennedy et al., 2012). Immediate psychosocial care needs should be provided upon inpatient admission, with all the efforts to cultivate a supportive and healing environment, promote active rehabilitation engagement as well as to promote their mental health and psychosocial well-being (Middleton et al., 2014).

A lack of "front-line" psychosocial care programmes

It is crucial to consider the level and intensity of the psychosocial care which is anticipated to be matched with the level of each individual's psychosocial needs caused by SCI and various problems that different people may encounter (Middleton et al., 2014). For those with mild (to moderate) and early depressive or anxious states, educational and supportive intervention should be provided in order to enhance people's sense of mastery and self-efficacy in managing their daily life at post-SCI (Craig & Perry, 2008). Most of the reviewed interventional studies regarding psychosocial care for people undergoing inpatient SCI rehabilitation tend to be specialised programmes targeting on particular kinds of SCI population (e.g., people with chronic pain, depression and pressure ulcer). Considering the fact that most of the people (70%-80%) in the rehabilitation phase are in mild or moderate depression or anxiety, it would be meaningful and beneficial to design a “grass-root” psychosocial intervention programme for those people who are much more representative of the whole SCI population, neither in a specialized centre, or nor conducted by a trained psychological or behavioural rehabilitation staff (e.g., rehabilitation nurses) in SCI intervention.

Stress and coping theory in guiding the intervention development

The stress and coping theory illustrated in the earlier part of this literature review also highlights that the required psychosocial intervention programme should ultimately aim to empower patients with adaptive coping skills to deal with those encountered challenges and stressors caused by SCI, thus minimising the risk of mental and post-traumatic stress disorders. Further research is thus suggested to focus on those psychological protective factors or outcomes (i.e., self-efficacy, problem-solving, coping ability), in order to improve people’s overall mood status and well-being at post-SCI.

Cognitive appraisal and coping as core components of the psychosocial care programme

The literature review revealed the mechanism of people’s psychological adjustment process at post-SCI, which suggested potential components for developing effective psychosocial interventions for this population. Peoples’ cognitive appraisal of the consequences or stressful situations caused by SCI acts as an antecedent in guiding their decision on the subsequently adopted coping strategies. Psychosocial interventions targeting on cognitive appraisal and coping are anticipated to have promising and encouraging effects in supporting people's psychological adjustment to SCI. Particularly, successful inpatient psychosocial rehabilitation would not only provide timely support to SCI survivors' early psychological adjustment, but also has its profound and long-term effects in preventing avoidable hospital admissions and presentation of chronic illness (i.e., medical complications and mental illness) (Craig & Perry, 2008). Ultimately, people with SCI are expected to become an actively participating and productive member of the society (Martz & Livneh, 2007).

A lack of culturally sensitive psychosocial programme in Asia

The comprehensive literature review indicates that there is limited research evidence on the effectiveness of psychosocial interventions for SCI populations in both developed and developing countries, particularly in Asian countries (i.e., Chinese population). Implementation of a culturally appropriate and sensitive psychosocial intervention programme in a Chinese cultural context is essentially necessary for the consideration of people's well-being at post-SCI, as well as for the improvement of the current health care system in a specific culture.

Health professionals' focusing more on psychosocial care for people with SCI

SCI rehabilitation in the clinical settings needs extensive efforts from a multidisciplinary team including physicians, occupational therapists and physiotherapists, rehabilitation nurses, social workers, and psychologists (Middleton et al., 2014). In addition, health professionals with knowing the SCI disease information and who are more familiar with SCI care in the rehabilitation setting can also reduce the barriers to engage with psychosocial care for people with SCI. Therefore, SCI rehabilitation staff are suggested to be provided with sufficient training, in order to be adequately taking the role of undertaking the psychosocial care services for patients with SCI during their earlier stage of rehabilitation. The continuous and ongoing staff development also need to be provided to maintain and strengthen the capacity to work on the complex and more chronic mental problems (Craig & Perry, 2008).

Rehabilitation nurses working in the SCI wards have the opportunity to meet frequently with clients and they are encouraged to provide holistic nursing care in biological, cognitive, emotional, intellectual and spiritual aspects (Brillhart, 2005; Dossey, Certificate, Keegan, & Association, 2012). Rehabilitation nurses are expected to play an important role in stimulating and supporting the patients' fight process (Angel, Kirkevold, & Pedersen, 2009). Rehabilitation nurses with professional training could also conduct a psychosocial intervention for people with SCI, and they can also make referrals of those participants with several mental illnesses to the psychiatric department (Phillips et al., 2001). It is thus recommended that registered nurses with extensive experience working in SCI rehabilitation would be the most appropriate health professionals to deliver this "first-line" psychosocial care programme (i.e., the COSP intervention), especially for those people who have not reach clinical mental disorder at post-SCI.

Benefits of group intervention for people with SCI

Group intervention is the most common approach of delivering psychosocial interventions during patients' rehabilitation process (Zanca et al., 2013). The group would provide an opportunity for each member to learn from peers and interact with others in a similar situation. It also serves the purpose to reduce the demands for health professionals in delivering the intervention from time to time, which also reduce the time and cost in the intervention delivery (Zanca et al., 2013). Meanwhile, the group interventions also sometimes foster a sense of responsibility, universality and cohesion among participants to not let one another down (Dobson, 2009). In addition, it is suggested that group interventions are less stigmatising than individual sessions for the participants as group members shared the similar situations and were deemed as "in the same boat" (Bieling, McCabe, & Antony, 2006; Yalom & Leszcz, 2005). Those features mentioned above together make group intervention become a desirable approach for implementing psychosocial interventions in clinical care settings (Yalom & Leszcz, 2005). Group learning can indeed provide participants with the beneficial opportunity by experiences sharing, self-reflection, and encouragement or support from peers during inpatient rehabilitation.

A need for more rigorous research design

There were limited rigorously designed clinical trials found in investigating the effects of psychosocial interventions for people with SCI during their inpatient rehabilitation, especially in the Chinese context. More rigorous clinical trials (i.e., randomised controlled trials or quasi-experimental studies using parallel study groups) are recommended for SCI populations with different socio-demographic and clinical backgrounds to enhance the validity and generalization of any effective psychosocial intervention.

The research gaps and recommendations indicated in this Chapter suggested the essential need for developing a “front-line” psychosocial intervention care programme for people with SCI sustaining mild to moderate levels of psychological distress during their inpatient rehabilitation. A group-based psychosocial care programme entitled coping –oriented supportive programme was established and evaluated in this PhD study. Details of the COSP intervention will be presented and discussed in Chapter 3.

CHAPTER 3 THE COPING-ORIENTED SUPPORTIVE PROGRAMME

3.1 Introduction

This chapter describes the psychosocial intervention- Coping-oriented Supportive Programme (COSP) that has been validated and evaluated in this PhD study. The content of this chapter covers the background information (Section 3.2) and related research evidence (Section 3.3) of the COSP. Cultural considerations relevant to the content of the COSP and its delivery are reviewed and analysed (Section 3.4). Group logistics and processes of the COSP (Section 3.5), the content of the COSP (Section 3.6) as well as challenges in the COSP delivery (Section 3.7) are also described, respectively. The role of the COSP facilitator and group helper are clarified and described (Section 3.8), followed by the methods for monitoring the fidelity of the COSP and its supervised practices (Section 3.9).

3.2 Background information of the COSP

The COSP aims to address the knowledge gaps identified and summarised in Chapter 2, that is, to design a protocol-based psychosocial intervention programme for people with SCI undergoing inpatient rehabilitation. It aims to facilitate adaptive coping skills/strategies that would enhance people's self-efficacy and perceived controls in managing different stressful situations related to or caused by SCI, and thus support the values of psychological adjustment process to the success of rehabilitation in SCI. This COSP is a manualised, psychosocial care intervention that could be implemented in the SCI rehabilitation wards by health professionals in a multidisciplinary care setting (e.g., rehabilitation nurses). It also additionally acts as a preventive intervention with the optimal purpose to mitigate the occurrence or onset of serious mental health problems for people with SCI.

Theoretical underpinnings of the COSP are dominated by the (Folkman et al., 1986)'s transactional stress and coping theory that has been examined empirically to be the most appropriate and evidence-based one in illustrating people's psychological adjustment to SCI (see details in Chapter 2). Bandura (1977)'s self-efficacy theory and Cobb (1976)'s social support theory were also adopted in conjunction with the stress and coping theory to guide the development of this COSP in addressing the psychosocial adjustment of the post-SCI health issues, which has been discussed in detail in section 3.3.1. The educational content and psychotherapeutic approaches used in the programme are mainly based on the DVD-based educational programme (Chen et al., 2015), Kennedy (2008)'s CET programme, and the psychosocial care programmes in the reviewed intervention studies, as well as the literature regarding basic knowledge of SCI and stressors encountered after SCI.

3.3 Theoretical underpinnings of the COSP

The theoretical underpinnings of the COSP were dominated by (Folkman et al., 1986)'s stress and coping theory. Due to the diverse stressful situations that a person with SCI will encounter, the coping model has been considered as the most commonly accepted and adopted framework in understanding the mechanism of people's psychological adjustment to SCI (refer to more details of the theory illustration in Chapter 2). The consequences of SCI that may cause high levels of stress to people with SCI are not only their physical losses (e.g., paralysis, pain and incontinence) but also the social limitations and strains in family roles and relationships (Kennedy, 2007). People with SCI can experience higher levels of distress, and lower levels of emotional well-being and life satisfaction, in comparison to the general population (Post & van Leeuwen, 2012). Patients' responses to the injury begin with their cognitive process of appraisal, which means the patients could initially assess the situation in terms of the impacts, threats and perceived the ability to cope. After the primary appraisal, the patients will consider the effective resources that they have had and find out whether they can use the resources to manage the situations in relation to SCI, which is then known as the secondary appraisal (Kennedy & Ebrary, 2007).

According to the stress and coping theory (Folkman et al., 1986), individuals' coping responses are based on the appraisals and feelings evoked. For instance, if the person's first appraisal about the situation is quite serious and he could do nothing to manage the situation, he will use avoidance-focused coping like denying the fact, avoiding situations or activities that highlight issues raised by the injury and abusing drugs or alcohol. In this way, the person may feel comfortable in a short time. However, since the problem has not been solved, the person will likely experience psychological distress like depression, anxiety, sense of hopelessness and helplessness (Kennedy & Ebrary, 2007). In addition, he may withdraw socially from others around him and disengage from rehabilitation. Therefore, the secondary appraisals towards those negative emotional impacts will result in poor psychological outcomes in self-neglect, negative stress reactions, and long-term emotional problems, and sometimes even alcohol or drug abuse. On the contrary, someone may appraise the situation as manageable or changeable. This can result in more positive emotions and hope for the future, and the use of positive coping strategies like problem-solving, acceptance (accepting the situation) and positive reframing (focus on the positive possibilities of the situation), he will learn how to tackle problems, manage them, and work out a way of continuing to lead to a satisfying life.

The person's sense of self-efficacy will also be enhanced with positive coping (Kennedy & Ebrary, 2007). The health condition and psychological well-being of people with SCI are the main outcomes resulting from their cognitive appraisal and ability to cope with encountered stressful events. Outcomes of stress and coping model covers the people's mental health, physical health, and quality of life or life satisfaction at post-SCI. Tirch & Radnitz (2000) suggested six categories of cognitive distortions following SCI. These include "an overly negative view of the self and others negative appraisals about self-worth following injury"; "expectations of rejection from others and inadequacy"; "the expectation of consistent failure"; "development of excessive personal entitlement"; and "an overdeveloped sense of vulnerability". Coping strategies (e.g., engagement coping and seeking social support) and coping resources (e.g., hope and sense of coherence) have been shown to positively predict psychosocial adaptation among people with SCI (Livneh & Martz, 2014). A number of coping strategies that were associated with positive adjustment, which included "accepting the reality of the injury having occurred", "availability of high quality social support", "the capacity to engage in positive reappraisal”, and “engagement in planned problem-solving”, have been tested with positive results (Kennedy et al., 2012). Some maladaptive coping strategies including “behavioural and mental disengagement”, “alcohol and drug use ideation”, “denial”, “escape-avoidance coping strategies”, “focusing on and venting of emotions”, and “inadequate or low social support” are found to be associated with poor adjustment. Adaptive strategies are encouraged/facilitated and maladaptive ones are replaced.

Self-efficacy has been defined as “an individual’s convictions or confidence about his or her abilities to mobilize the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context” (Stajkovic & Luthans, 1998), p.66. According to Bandura’s self-efficacy theory, an individual’s expectations of personal-efficacy play a crucial role in determining whether coping behaviour will be initiated, how much energy or efforts will be spared, and the sustaining and maintaining time of their coping efforts when they face stressful situations or life difficulties (Bandura, 1977). Learning from consequences following certain types of behaviour or performance is conceived as a cognitive process, from which people’s self-efficacy to a specific task or situation will thus be altered by behaviour reinforcement to gain beneficial consequences and avoid punishing outcomes (Bandura, 1977). This point of view was also consolidated in King & Kennedy (1999)’s study which proposed coping-based psychological intervention to deal with emotional problems for people sustaining a SCI. Participants’ perceived self-efficacy or self-mastery in dealing with the stressful situation caused by SCI can be improved by benefits gained from the therapeutic components of the intervention in changes of cognitive appraisal of the injury and experiencing effective coping strategies (King & Kennedy, 1999).

Self-efficacy has been found to have consistently positive relationships with psychological adjustment to SCI and better mental health, as well as better quality of life and well-being (Peter et al., 2012). Self-efficacy is also regarded as the derivative construct of Bandura's earlier social cognitive theory, wherein learning is viewed as "knowledge acquisition through cognitive processing of information" (p.63) (Stajkovic & Luthans, 1998). It is also suggested that self-efficacy is one of the most important factors to be considered when dealing with the psychosocial impact of SCI, with which people would have improved motivation and confidence to "carve out" their future in a long-term run (Middleton & Craig, 2008). The concept of "observing behaviour in others" proposed in social cognitive theory was also adopted in the COSP (with DVD showing role models who successfully adapted to SCI provided in the first session). Participants are anticipated to benefit from learning from role models that have successfully adapted to their injury in order to contribute to the improvement of self-efficacy (Chen et al., 2015; Syx, 2008). With the empirically solid association of the main components of this psychosocial care programme, patients' self-efficacy in managing daily lives at post-SCI was, therefore one of the main outcome measures used to reveal the effectiveness of the COSP.

Informed by the literature review in Chapter 2, social support is one kind of coping resource that plays a pivotal role in people's psychological adjustment process to SCI. A systematic review indicated that the role of social support in people with SCI showed a positive association between an individual's social support and their physical health, psychological adjustment and life satisfaction (Muller et al., 2012). Cobb (1976) defined social support as "information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations" (p.300). Social support with its moderating effects on life stress means that supportive interactions have their protective effects against the health consequences of stressors. Schaefer et al. (1981) identified three dimensions of social support: emotional support, which includes receiving reassurance and interpersonal intimacy; tangible support, which means directly providing help and services; and informational support, which includes suggestions in relation to ways or ideas to manage one's problems and comments or feedback to one's action. Social support as one of the important coping resources used by people with SCI and this is mainly addressed in the last phase of the COSP. The social support theory was adopted and these three dimensions were discussed in the COSP, in order to better facilitate people's coping skills at post-SCI.

3.4 Cultural considerations relevant to the content of the COSP and its delivery

Nearly all of the psychotherapeutic treatments or interventions that are utilised in China are Western in origin (Moodley, Gielen, & Wu, 2013). However, there are great differences in the way Chinese people may perceive and manage illness-related stressors when compared with people from western countries. Therefore, relevant cultural considerations and modifications of such psychosocial interventions to suit the unique Chinese culture are essential.

Conservative in expression of feelings. Chinese people are found to be more conservative in their expression of feelings than people from Western cultures (Chan et al., 2000); they are seldom willing to discuss their mood, thoughts, and less eager to acknowledge their internal conflicts and stressful events to outsiders (Chan et al., 2000; Lin, 2002). Many Chinese people may regard themselves as a source of burden and resentment and thus they would seldom communicate with family members about their illness and its relevant psychological impacts (Lin, 2002). Exploring the deep personal feelings or emotions at the beginning of the psychosocial intervention process is not recommended, and some threatening issues (e.g., sexuality) are more appropriate to talk about during the later stage of the whole group intervention process (Chan et al., 2000). During the COSP delivery, group participants were asked to share their thoughts and emotions/feelings by interacting with other group participants after they had been familiarised with each other at the later stage of the intervention. In addition, a safe environment with confidentiality reassurances was provided to the group participants to ensure their open and willingness in sharing their views and feelings.

Chinese people often show less concern (conservative in expressing their feelings) about sexual problems at post-SCI (Chan et al., 2000). This is because sex gains less attention (and lower priorities) in a marital relationship among patients where one spouse suffers from a physical disability, as the other factors regarding patients' disability and medical complications are likely to be treated in a more serious manner (Lin, 2002). In addition, patients are more likely to suppress their sexual desires after being injured, and they markedly reduce their expectations for sexuality as it was frequently seen as a luxury for them (Chan et al., 2000). Therefore, sexuality or other personal issues were discussed in the later stage of the intervention, and patients' preference for discussing specific issues was asked in advance.

"Expert" expression for the group facilitator. It is noted that in psychological therapy, Chinese people expect direction and advice from the "expert", for which they might value less of their own role in practising the intervention skills and act only as passive recipients of the intervention content (Chen & Davenport, 2005). Some modifications were considered in the first session to clarify and elaborate the roles of the therapist and participants, as well as the partnership and collaborative relationship with the individual patients as the participants in the intervention. It is also noted that Chinese people tend to follow rules and boundaries that are defined by the therapist when doing psychosocial interventions, which is the expectation for the therapist to maintain their image of an authority figure with expertise (Tseng, 1999). Therefore, the participants were reminded that they were the 'experts' in their lives and the ones can consider and address their own life problems with the support from the facilitator, and other health professionals. Participants were encouraged to seek other professionals' help for some specific health problems as required.

"Harmony maintenance" in social relationship. Two central characteristics of social relationships in Chinese people are maintaining harmony and "face-saving" during social interactions (Lin, 2002). To remain in interpersonal harmony, Chinese people often show much concern for emotional restraint and self-control and avoidance of aggressive persuasion techniques. Guided by interpersonal norms, Chinese people's verbal exchanges usually avoid confrontational and argumentative styles of communication (Chen, 2001). Harmony is considered to be the cardinal value of the Chinese culture, which means that human communication maintains a harmonious atmosphere and conflicting relationships are not appreciated, and the conflicting relationships obey the harmonious notion in the Chinese culture background (Chen, 2002). It is suggested that Chinese people could adopt more gentle assertion training instead of straightforward confrontation (Lin, 2002). "Harmony" as one typical characteristic of Chinese culture was explained in the COSP, which reminded participants to be aware of the possible impacts of being assertive, that is, to achieve a longer-term harmonious relationship with people around them (Chen, 2001). Chinese people may also have difficulties with radical confrontation, assertive training, and straightforward discussion about some sensitive issues such as difficulties in family relationships and sexual health problems (Lin, 2002). Thus they were facilitated the importance of being assertive (assertiveness training in the seventh intervention session of the COSP) and sometimes necessary utilisation of radical confrontations.

"Face-saving" in social relationship. The concept "face", called "*mianzi"* in Chinese people, or dignity in other people eyes, is also regarded as in a crucial position in

Chinese culture (Tseng & Wu, 2013). People's face can be given, lost, earned or taken away based on one's action or behaviour. Perhaps the whole family's faces will be lost due to one of the family members' wrongdoings (Tseng & Wu, 2013). "Face-work" is argued as a typical Chinese "conflict-preventive mechanism" and a "cultural force" that forms specific Chinese communities. Therefore, Chinese people would often use almost all possible ways (e.g. make concessions) to give a face to their counterparts, in order to avoid causing an emotional uneasiness and thus to achieve the harmonious relationship with each other (Chen, 2002). People would sometimes emotionally extricate themselves from the whole big family system as they thought they might lose the faces of the whole families due to their disability. This action might be able to save other families' face without carrying the negative impact from that particular family member (Ino & Glicken, 2002). "Face-saving" was discussed in the COSP, and participants' corresponding negative thoughts and actions due to face-saving were explored and eventually replaced with more rational thoughts and cognition.

Social norms guided by Confucianism. Confucianism has left a deep imprint on modern Chinese cultural values (Bond, 2010). Confucianism often emphasizes people's capability and responsibilities of contribution to society, which might also influence individual's perceived quality of life at post-SCI as they may perceive that they are unable to make significant contributions to the society when suffering from SCI (Bond, 2010; Hampton, 2000). It is recognized that Chinese people may benefit from changing their irrational thoughts that are bound up in their strictly adherent behaviours to the current social norms (Hodges & Oei, 2007). Therefore, participants' negative thoughts such as “lacking of or low contribution to society or family” resulted from people with SCI were addressed in the group sessions to let them redefine their “contribution to society/family”. Thus, participants’ negative thoughts of “contribute nothing” were replaced with more rational thoughts of new family/societal roles and contributions according to their physical condition.

“Collectivism” in Chinese culture. Chinese people often make decisions or deal with life problems under the influence of parents, teachers, supervisors, or elders; and they are greatly influenced by external factors such as the other people’s attitudes or values rather than internal control of themselves (Lin, 2002). The Asia worldview values social collectivism as “a social order is essentially family-based and interpersonally or collectively oriented” (p. 38), and Chinese people often have a collective notion of “self” that is highly influenced by their family and the specific cultural context (Ino & Glicken, 2002). Adaptive coping responses in Chinese people occur at multiple levels of the community or social organization, rather than only focusing on individuals. Therefore, the researcher should be aware of the influences from multiple levels of social groups such as family and working place and integrate a variety of community resources when implementing the psychosocial intervention such as the COSP for the Chinese people.

“Fatalism voluntarism” as a typical Chinese coping strategy. The traditional coping pattern of “fatalism voluntarism” has been a common strategy adopted by Chinese people (Cheng, et al., 2013), which means people accept what is given to them, and also emphasize active engagements in their life (Chui & Chan, 2007). It is suggested

that “fatalism voluntarism” as a positive-coping strategy could facilitate Chinese people to comprehend life vicissitudes, meanwhile, it also reminds them to maintain confidence and hope for a better future, although with certain types of difficulties presented (Chui & Chan, 2007). The idea of “fatalism voluntarism” is supported by one Chinese saying “Do whatever is humanly possible, and leave the rest to what is fated by heaven”. The philosophical roots underpinning the Chinese concept of “fatalism” carries the same meaning of “*Ming”* as depicted in Chinese, which also highlights that Chinese people are expected to exert efforts to enhance the chance to a better fate, although “subordinate to *Ming”*(Cheng, Sit, Twinn, Cheng, & Thorne, 2013). This “fatalism voluntarism” also fits the two-core cognitive-behavioural based (that is cognitively they accept their life status, and behaviourally they actively exert effects to live a better life) principle (Chui & Chan, 2007). Hence, fatalism voluntarism was incorporated into the intervention as the culturally relevant adaptive coping strategy for Chinese people. In addition, Chinese people have been found to be less experienced in using humour as the coping strategy for conflict (Chui & Chan 2007), and alternatively, they would rather use suppression in dealing with some unacceptable circumstances. Therefore, using “humour” might not be an appropriate adaptive coping strategy for Chinese people with SCI, and thus was not incorporated and discussed during in the COSP intervention.

3.5 Group logistics and processes of the COSP

The COSP evaluated in this study includes educational approaches for teaching relevant content related to the intervention components, and some psychotherapeutic approaches such as cognitive re-constructing, relaxation, social skills training, as well as homework to facilitate participants' practice in their daily lives. The COSP intervention evaluated in this study was delivered in a small group format that accommodated 4-5 participants only, in order to effectively facilitate the interactions within the group and encourage collaborative learning approaches. Group participants were explained that they were expected to commit for the duration of the program. Group members of the COSP met two or three times per two weeks for a total of eight sessions, and sessions last for around 1 to 1.5 hour each. Participants were also encouraged to keep in contact with each other personally. The group was closed, meaning no new participants were accepted after the group started. Each group session was built on the themes explored in the previous week. Sessions began with a review of learnt materials and issues raised during the previous meeting, and the homework performed, as well as the participants' progress of adjustment or coping skills gained. Homework was assigned to the participants if some of the content delivered in the group sessions were deemed as necessary to have practice in their daily lives. Participants' completion of their homework was reviewed at the beginning of the next group session other verbally (if some of the group members were not able to take notes of their practice) or reading their notes taken on their practice of those skills learnt in the group sessions.

Group-based intervention has been proposed as perhaps the most promising psychosocial treatment modality for people receiving commonly healthcare and post-acute rehabilitation services (Wilson et al., 2008). There are a few issues that would be able to lead to a successful therapeutic group, and the following explanations on the ground rules of the group intervention are adapted from (Kennedy, 2008)'s handbook of coping effectiveness training for people with SCI. The nurse researcher also informed participants of these issues in the first group session of the COSP. First, all participants were expected to attend all sessions and show up on time. If some of the participants were late or would not be able to attend a meeting, they were required to contact the group facilitator prior to the start of the session. Second, successful groups respect the confidentiality of what is shared in the group. What was said in the COSP delivery was required to stay in the group. In addition, every group participant should feel comfortable sharing with the rest of the group. Taking turns and being respectful of other participants is an important rule and was emphasized from the very beginning of the intervention. If a particular group participant was monopolizing the discussion, the group facilitator would give that member a reminder and then allow some else to speak. Some people need to hear others and learn how to stand back.

In addition, honesty is another rule that should be established from the beginning. The group facilitator did encourage group participants to be honest, open and frank. It is essential to allow all participants to express their views, while reminding them to keep an open mind. When participants disagreed with the facilitator or the other group members, the group facilitator would remind the participants that differing viewpoints were valuable to the group because they enrich the discussion. Importantly, the group facilitator also allowed the participants to know that they were required to participate in the group exercises and complete all at-home assignments. Finally, the group provides an excellent chance for social skills learning, which is quite important for the intervention participants as they would often encounter many social difficulties due to their disability. With those ground rules addressed in the group process, participants were encouraged to interact and discuss with each other about the intervention content presented in the education process, and share their experiences in managing stressful situations, and thus to maximize the mutual learning and support in the group.

3.6 Content of the COSP

Group learning sessions of the COSP aim to facilitate people's coping strategies in dealing with various demands of SCI, in order to build and enhance their sense of mastery or self-efficacy when they face certain types of stressors. There are in total eight sessions of the COSP under four phases. The phases of the COSP (as shown in Figure 3.1) were designed to fit the main four concepts within the theoretical underpinnings of the COSP: phase one: orientation and encouragement (session 1); phase two: cognitive appraisal (session 2); phase three: coping strategies (session 3-6); and phase four (session 7-8): social support. The programme protocol for the group facilitator is provided in Appendix 1. The outline of the programme content is described in Table 3.1. Meanwhile, a pamphlet (as described in Appendix 2) for introducing the purpose as well as the brief content of each group session was provided to intervention participants at the beginning of each group session. Over the eight sessions of COSP, participants were expected to understand the stressors caused by SCI, learn by observing successful models, problem-solving skills or strategies, ways of challenging negative thoughts, how to set up a system of social support, and guided imagery relaxation, and/or mindfulness exercise to manage emotions. They were facilitated or trained in learning the importance and benefits of being assertive and ways of effectively dealing with those individuals who may not understand their disability. The final goal was to effectively promote and socially validate the belief that many aspects of SCI are indeed manageable, which would be revealed by measuring participants' self-efficacy in dealing with stressful life situations.

In the **first group session**, we provided an overview of the programme, gave practical information about group meetings, set ground rules for the group, provided basic knowledge of SCI (stressors caused by SCI), and facilitated practical role model for patients with SCI. During this initial session, participants were facilitated to be aware of their current situation at post-SCI, particularly to identify the stressful situations or events caused by the injury. Additionally, a DVD-based intervention involving previous patients with SCI sharing their successful experiences in their daily lives was provided for the participants, in order to encourage the participants to have a bright view of their future life and to enhance their self-efficacy in managing their own daily life. Within the first session, participants were also educated about their role in managing their injury, thus they were encouraged to address their own life problems as the "experts" and be active in using strategies facilitated by the COSP. The participants were educated about the intervention process and reframed the within-session roles. Although the researcher was deemed as the 'expert' facilitator during the intervention process, the participants were also regarded as the 'experts' in their lives and the ones can consider and address their own life problems with the support from the facilitator, as well as other health professionals. It is thus suggested being better not to explore the deep personal feelings or emotions at the beginning of the psychosocial intervention process, and more threatening issues (e.g., interpersonal relationships, sexuality) are more appropriate to talk about during the later stage of the whole group intervention process.

The second session started with an introduction to cognitive stress and coping theory to the participants; meanwhile, this can help in guiding them to identify their stressors encountered. Participants were asked to recapture those stressful situations experienced before, and describe the particular stressor, inner feeling, thoughts, as well as body sensations. Participants were guided to learn to break down or analyse a complex stressor, and further examine whether the stressor is changeable or not. The two main components (i.e., problem-focused coping and emotion-focused coping) of the COSP were introduced. Participants were informed that effective problem-solving is found to be positively associated with better mental health, illness prevention behaviour, as well as less medical complications (Muller et al., 2012). If the stressor (challenging situation) assessed by the participants was changeable, they would be encouraged to adopt a few problem-solving strategies starting from the **third group session**. On the other hand, if the situation or problem was assessed as unchangeable, participants would be trained to use emotion-focused coping in the **fourth session**, and this helps them to accept and live with SCI.

During the **third session**, problem-solving skills and evidence of their successful use were first introduced didactically, followed by group participation in working through one or two sample problems from their lived experiences presented by the group facilitator. Group participants were then encouraged to and assisted to plan for and practice problem-solving in their daily lives. This process involved teaching them to use a structured, step-by-step approach to solve problems as follows (Belzer, D'Zurilla, & Maydeu-Olivares, 2002; Bieling et al., 2006). First ("define the problem"): participants are encouraged to replace problems that they describe in vague or general terms with a list of more specifically defined problems. Second ("brainstorming possible solutions"): let the participants list as many solutions to the problem as possible, without filtering, censoring, or judging solutions that come to mind. Third ("evaluate possible solutions"): participants are taught to evaluate the advantages and disadvantages of each solution generated in the last step. Then, after excluding those impossible or impractical implemented solutions, they would retain reasonable options. Fourth ("choosing the best solutions"): participants should select the best solution from their list, based on the evaluation completed the last step. Last ("implementing the solution"): upon implementing the solution, the participants may encounter various obstacles. If this occurs, he or she should use the sample problem-solving approach to get around any problems that arise along the way (Bieling et al., 2006).

After reviewing participants' practice of problem-solving skills, managing emotion was introduced and addressed in the **fourth session**. Participants were taught several techniques that have been widely and effectively used in regulating emotions for people with SCI. Activity scheduling as one kind of behavioural activation intervention, by which patients are able to learn to monitor the changes in their mood in relation to certain types of pleasant daily activities, and then they may gradually increase the frequency of performing pleasant activities that could increase the amounts of social interactions and thus achieve improvements of their mood status (Cuijpers, Van Straten, & Warmerdam, 2007). Activity scheduling is first initiated by (Lewinsohn & Atwood, 1969) in a case study which demonstrated that the benefits of activity scheduling in positive feelings achieved from higher levels of social engagement and pleasant activity. Significantly positive association were also found between participants' use of activity scheduling and depression outcomes in a mixed methods analysis of 597 depressed elderly (Riebe, Fan, Unützer, & Vannoy, 2012). Pleasant activity scheduling could raise patients' energy level and this is likely to lead to better concentration and less fatigue, while it can also provide both functional and cognitive benefits (Latimer, Ginis, & Arbour, 2006). Activity scheduling has been shown to reduce depression in the SCI population, which aims to improve participants' self-esteem as well as self-efficacy through participation in planned pleasant activities (Martin Ginis et al., 2011). Activity scheduling as one major component of the fourth session has been increasingly recommended for people suffering a physical health condition with co-morbid depression (Perkes et al., 2014). Participants were encouraged to list out their pleasant activities to fill out the activity schedule in the patients' pamphlet (Appendix 2).

During the fourth sessions, several relaxation training exercises (such as deep breathing training and small guided imagery exercises) adapted from Kennedy (2003)'s CET programme and Craig (2012)'s "surviving and thriving" programme was also adopted as the emotion-based coping strategies, and thus help to reduce participants' anxiety level. The relaxation exercises were designed as manualized which is easy to be trained and implemented (See details of the scripts for relaxation exercises in Appendix 1). Relaxation training have positive effects on the emotional adjustment variables (i.e., depression, anxiety and hostility) for patients with chronic diseases in the hospitals (Luebbert, Dahme, & Hasenbring, 2001). Significantly positive effects of relaxation training were also found for people with SCI in reducing their anxiety level and pain (Cardenas & Jensen, 2006). In addition, the relaxation exercises can help the participants achieve stable levels of mood, and thus facilitate appropriate use of activity scheduling which requires stable levels of mood.

For the **fifth session**, participants were encouraged to monitor the relationships between thoughts, affect, and behaviour, and then evaluate the validity and viability of these associations in their life situation regarding SCI and its impacts. This was also in line with the specific cultural needs of Chinese people that they might be more likely to share their thoughts and emotions after getting familiar with each other. Challenging negative beliefs and replacing cognitive distortions with rational and realistic perspectives were also integral components in the therapeutic process of this session. Common thinking errors were provided to participants, and ways to challenge those distorted thoughts were the focus of this session. Participants were taught how to use thoughts records to identify the thoughts that accompany them and replace them with more rational thoughts. "Face-saving" was discussed in the COSP, and participants' corresponding negative thoughts and actions due to face-saving were explored and eventually replaced with more rational thoughts and cognition. It is recognized that Chinese people may benefit from changing their irrational thoughts that are bound up in their strictly adherent behaviours to the current social norms (Hodges & Oei, 2007). Therefore, those negative thoughts about their lacking or low contribution to society or family resulted from people with SCI were addressed in the group sessions to let them re-define their “contribution to society/family”. Participants’ negative thoughts of “contribute nothing” due to their disability were replaced with more rational thoughts about new family/societal roles and contributions according to their physical condition.

The **sixth session** focused on the understanding of the importance of adaptive coping in SCI management. After reviewing all the coping strategies discussed in the previous sessions, participants were encouraged to think about both the adaptive coping and maladaptive coping strategies they were using. Group participants were also asked to continue using those adaptive coping strategies and discontinue using maladaptive coping strategies. The strategy for being flexible in choosing the matched coping response to a particularly stressful situation is quite important as the effectiveness of those adopted coping strategies can be largely determined by the consequence that whether or not there is a “fit” between the particular stressful situation and the coping strategy (Kennedy & Ebrary, 2007). Importantly, although research findings encourage more problem-focused coping and less emotion-focused coping that can lead to better psychosocial adaptation, the exception also remained due to the “match” or “mismatch” between specific tasks and people’s coping responses (Moos & Holahan, 2007). The adaptive coping strategies facilitated in this session were also considered to fit with the Chinese culture (as we have modified the COSP to be culturally sensitive to the study participants). The match between the stressors and coping strategies were emphasized to the group participants in this session.

Social support as one of the important coping resources was the theme of the **seventh and eighth session**. People with overt physical disabilities are likely to confront a few social biases and difficulties due to their physical losses. The **seventh group session** focused on social skills training. Participants were trained for various social skills in the last session including non-verbal communication skills, conversation skills, assertions skills, and protective skills such as how to deal with criticism. In addition, sexuality issues were discussed in the seventh session. Considering the specific cultural issue that Chinese people might be conservative in discussing highly private issues, sexuality was presented in a didactic educational way with written materials provided.

The Asia worldview values social collectivism as "a social order is essentially family-based and interpersonally or collectively oriented" (p. 38), and Chinese people often have a collective notion of "self" that is highly influenced by their family and the specific cultural context (Ino & Glicken, 2002). Since adaptive coping responses in Chinese people occur at multiple levels of the community or social organization, rather than only focusing on individuals. The researcher should be aware of the influences from multiple levels of social groups such as family and working place, and integrate a variety of community resources when implementing the psychosocial intervention such as the COSP for the Chinese people. Special offers were also provided to the family members if they would like to join the intervention sessions. This is because family members were deemed as good resources for providing help and support to the patients, and they can assist the patients in coping with stressful situations caused by SCI (Sue & Sue, 1990). The collectivism also implies the benefits of group or family psychological intervention for Chinese people, which also shed light on the group intervention in this programme. While in the eighth session, after explaining to the group the definition and types of social support, participants were taught how to obtain and maintain social support, which is regarded as one important coping resource during the psychological adjustment process. Specifically, the concept "self-efficacy" was discussed in this session, from which participants were encouraged to promote their self-efficacy beliefs. In addition, in the last session, family members or caregivers of the participants joined the group discussion as invited in the seventh session, from which the importance of building satisfactory relationships was emphasised as well.

The original authors of the referred programmes gave permission for selected areas of content to be used and translated, as required for the Chinese participants in this study. This intervention pamphlet was translated by the researcher into Chinese, and then back translated into English by an independent English translator. The two translators compared the original and back-translated version to evaluate their content or textual equivalence. Any discrepancy found on the back-translated version was modified with the consensus among the translators and researcher, and its related text in Chinese was amended with an agreement between them. Finally, a third bilingual nursing researcher checked the equivalence of the translation of the intervention protocol. Content validation of the COSP was performed before testing its effectiveness with patients in the SCI rehabilitation wards. Details of the validation process of COSP and its preliminary evaluation will be reported in Chapter 4. Before evaluating the COSP in our main study, amendments and improvements of COSP were made according to the comments generated by content validation, as well as patients' feedback during the pilot testing stage.

Table 3.1 Phases of the coping-oriented supportive programme (Adapted from Li, et al., 2017b)

Phases	Objectives	Content & cultural considerations	Home assignments
Phase one: **Orientation and Encouragement** (1 session)	**Session one:** • To provide overview of the programme • To give practical information about group meetings • To provide basic knowledge of SCI • To facilitate practical role model for SCI patients to imitate	• Provide an overview of the programme to the participants with addressing the content, the goal of the intervention, elaborating the role of the researcher and patients themselves. • Encourage group members to attend all the meetings and show up on time; emphasize the importance of talking and listening to others, as well as the promise of confidentiality. • Explain to the group about what is SCI, classification of SCI, health-related disability and medical complications at post-SCI, and psychosocial consequences related to SCI. • Show the group of previous patients with SCI sharing their successful experiences by playing DVD. *(cultural consideration: reframe roles of researcher and patient so that the research is the expert in intervention, and patient is the expert in their life)*	N/A
Phase two: **Cognitive appraisal** (1 session)	**Session two:** • To discuss stress and its relates to SCI • To present the cognitive model of stress and coping • To improve SCI patients' ability to break down complex stressors into a specific one, and	• Discuss stress and stress reactions, ask the participants to identify their own stress reactions (e.g., low mood, negative thinking, poor sleep, muscular tension, and general fatigue). • Discuss the stressors caused by SCI, and explain to the group about how their thoughts and interpretations about the stressors that will finally lead to stress reaction; and using figures and examples to illustrate the cognitive theory of stress and coping.	Ask group members to think about their personal signs of stress and take record; Ask participants to identify their stressors that can be changed and those that are unchangeable.

	distinguish between the changeable and unchangeable aspects of the stressor. • To introduce the concept of “adaptive coping”	• Teach the participants the way of breaking down stressors by using the example “Ignore by the staff in the ward”. The situations will be divided into details by asking questions (who is involved? What is the situation/context? Where are these situations likely to occur? When did they last occur and are they likely to occur again?). • Explain the concept of two types of coping (i.e., problem-focused coping and emotion-focused coping) to the group, and discuss the “fit/match” between the changeability of stressors and coping strategies.	
Phase three:	**Session three:**		
Coping strategies (4 sessions)	• To discuss and practice problem-solving	• Explain to the group of problem-solving strategy: the first step is to identify the problem and goal to be achieved. Describe the problem and its context (e.g., where, how, who, what)--generate possible solutions--assess the advantages and disadvantages of each solution—select the best solution—develop a plan to carry out your preferred solution—review your problem outcome. • Using examples (e.g., a person on the street was asked why he is in a wheelchair) to illustrate how to adopt problem-solving strategies. • List some common problem-solving scenarios (relationship scenarios, wheelchair-access situations, and other’s reactions to your disability); and encourage the participants to think about their life problems.	Use the problem-solving worksheet to work through as many sample scenarios as they can.

Session four:

• To describe the emotional reactions and present cognitive model of emotions • To facilitate group participants' relaxation training and pleasant activity scheduling	• Explain to the group the common emotional reactions to SCI, and the cognitive model of emotions. • Adopt relaxation exercises to reduce anxiety • Activity scheduling: illustrate and introduce the three steps of doing pleasant activity: decide what, when, how, and with who—set realistic goals—commit you to doing it and do it. • List the sample pleasant activities to the participants, and let them think about what kind of activities that they can do/prefer to do.	Ask a group member to choose three pleasant activities they would like to engage in over the next week and fill out the pleasant activity schedule in the workbook. Instruct group members to practice relaxation techniques by themselves.

Session five:

• To provide information about negative automatic thoughts and review common thinking errors at post-SCI • Review steps for challenging negative thoughts	• Explain to the group about the common negative beliefs in SCI population, and explain to the group about the emotional and action consequences following negative thinking. • List the common thinking errors, and let the participant find evidence for these thinking errors, and then guide them to find out more realistic and more rational thoughts. *(Cultural consideration: discuss harmonious, face-saving and Chinese social norms, as well as its relates to negative thoughts, let participants be aware of the Chinese cultural influences on them)*	Ask the participant to use thought record to identify the thoughts that accompany them and replace them with more rational thoughts when they experience strong emotions. Facilitate and encourage group members to think about coping strategies they generally use and think of one adaptive strategy that they can continue using and one maladaptive strategy they can replace.

	Session six: • To review general information about stress, appraisal and coping • To review coping strategies, and discuss maladaptive coping	• Review the participants about stress and coping theory. • Review the two types of coping (problem-solved and emotion-focused), and provide additional coping strategies that might helpful to the participants. • Explain to the group of the concept of maladaptive coping by listing out examples, and encourage them to think whether they adopted these strategies and consider more helpful alternatives. *(Cultural consideration: discuss "fatalism voluntarism" as one Chinese culture related coping strategy to participants; do not use humour as one coping strategy in the Chinese context).*	
Phase four: **Social support and future** (2 sessions)	**Session seven:** • To discuss the importance of social skills • To facilitate participants' good communication skills, assertions skills, conversation skills and protective skills. • To encourage effective communication with family members, and to provide didactic	• Explain to the group about the importance of social skills. • Teach and practice (role-play) communication skills, conversation skills, assertion skills, and protective skills. • Encourage family members to join the group communication if they prefer, and provide didactic education about sexuality issues at-post SCI *(cultural consideration: invite family members or caregivers to join the session considering the collectivism in the Chinese culture; provide sexuality*	Ask participants to practice social skills with people around them (e.g., hospital staff, friends and family, and SCI friends)

information and knowledge regarding sexuality issues.	*issues in a did active way as Chinese people might be conservative in talking about high private issues)*	
Session eight:		
• To know the importance and different types of social support, and provide strategies for obtaining and maintaining social support • To discuss the importance of self-efficacy and provide participants the self-efficacy beliefs • To end the programme	• Explain to the group the importance of social support, and different types of social support. • Discuss how to obtain and maintain social support. • Guide participants to assess their social networks and resources that they can seek help when needed. • Encourage effective communication between SCI patients and their family members/partners/carers. • Provide local helpline (medical care, psychiatric department referral, and local ambulance and police emergency ring, local association for disabled people, financial support solutions or organizations). • Explain the importance of self-efficacy in managing their life at post-SCI, and provide examples of self-efficacy beliefs, as well as discuss how self-efficacy can protect the participants. • End the programme, and encourage participants to practice what they have learnt in the programme to their daily lives.	Ask participants to practice the skills learnt in this programme and keep contact with group members if preferred.

3.7 Challenges in the COSP delivery

Many issues can arise when running a group programme. The progress of a group is a dynamic and evolving process that often produces changes in the group for the functioning of its participants during the group sessions. Yalom & Leszcz (2005) described a number of different "problem patients" that might present a challenge to the group, including the "quiet and silent" type, "overbearing" type, "helper", "disbeliever", "drifter", or "not-appropriate-for-group" member (Bieling et al., 2006; Yalom & Leszcz, 2005). The common prototypes for challenging participants within a psychosocial group intervention are presented in Table 3.2.

The most common prototypes of patients that the researchers encountered are the quiet and silent type, which is also in line with the Chinese culture as discussed earlier. In order to encourage effective participants' communication and improve the quality of the group process, the group facilitator had used direct questions to explore participants' ideas and feelings as well as link experience to other participants in the group. The group facilitator also tried to let the participants talk with persons around them or with another person first and they would be able to talk with other participants in the group.

The group facilitator also encountered some group participants who are the non-appropriate-for-group types who dominated the conversations with severe negativity. For example, several participants said the best thing to do after SCI is to commit suicide, and they thought their situation is worse than death. In this case, the group facilitator had challenged this statement and normalized participants' thoughts of suicide by letting them know that people usually thought about or consider suicide after a major trauma, but most of them move on from this. If there are participants who are not appropriate for the group intervention, it would be necessary to have them leave the group. However, we did not encounter those extreme cases during the study process. Some of the participants in our group did monopolise group time with his or her own experience, or some of them even persistently interrupt others when they were talking. The group facilitator did use some containment strategies to deal with this problem, including subtle and overt containment strategies. The facilitator used subtle strategies to not reinforce the continued talking by asking questions, nodding, or making eye contact. The facilitator also asked a question from another participant to address the current issue raised by one participant to shift the attention and focus. If these subtle strategies were not enough, more overt strategies were adopted, that was to interrupt the participants directly and remind them of the rules of participation, and stated clearly that everyone in the group had the opportunity to talk (Bieling et al., 2006; Kennedy, 2008).

Table 3.2 “Specific characteristics/prototypes of group members and their management during a group session (Adapted from Bieling’s (2006) handbook)

Prototype	Description	Actions to intervene/change
Quiet and silent type	▪ Group participation in minimal ▪ Prefers to sit in silence	▪ Use the group to help draw out. ▪ Ask direct questions to help facilitate interaction. ▪ Try to link experiences to other group members’ experience. ▪ When appropriate, process thoughts and feelings about being in the group.
Overbearing type	▪ Monopolizes group time ▪ Has no difficulty sharing information	▪ Use containment strategies to help balance group time. ▪ May use subtle management strategies (i.e. not reinforcing continued talking with questions or eye contact) ▪ May eventually require more overt management strategies, such as stopping the person midstream (e.g., “I am going to stop you there so we can hear from others”)
The helper	▪ Always giving advice that may or may not be helpful ▪ May talk in generalities using “we” and “I”. ▪ May focus on others and not on own issues.	▪ Encourage the person to reflect on personal experience and speak in the first person. ▪ If advice helpful, then reinforce and direct the person to how he or she can focus on his or her own issues. ▪ If advice is not helpful (e.g. “if you are anxious about going, then don’t go”), then process within the group (e.g., “what do group members think about that idea?” or “how does that idea fit with the goals of the group”).
The Disbeliever	▪ A pessimistic person who doesn’t really buy into treatment. ▪ May have already tried CBT a number of times ▪ May challenge the therapist and the therapy.	▪ “Roll with resistance” (Miller & Rollnick, 2002): do not engage in the argument: agree/validate member’s feelings, and then shift direction to emphasize personal responsibility and choice.
The Drifter	▪ Sometimes show up and sometimes does not. ▪ Does not appear to be committed to the group.	▪ Address in group for encouragement of attending each session ▪ May need to have an individual meeting for encouragement and explanation about the importance of attendance at group sessions.
The not-appropriate-	▪ Somehow this member made it through screening	▪ Use management and containment strategies.

for-group member	▪ Problematic in group because his or her issues may be different from those of the rest of the group ▪ Often due to problematic personality features (e.g. paranoia) or other conditions that require immediate attention	▪ Acknowledge that his or her needs may be different from those of the group and shift focus to what the individual may gain from group participation. ▪ May need to discontinue group and find alternative treatment option if the person is too disruptive or treatment needs have shifted.”

3.8 Role of the COSP facilitator and the group helper

Role of group facilitator

The group facilitator was responsible for running the sessions and guiding group discussion. A variety of anecdotes and examples were prepared ahead of time and used to facilitate discussion during each session. Planning is crucial for a successful group session. The nurse researcher had demonstrated competence in the delivery of the COSP. This was ensured by using a well-validated intervention protocol, being well-prepared for the concepts and techniques of stress management skills with participation in a short CBT course, ongoing discussion and consultation with experts in psychosocial care for people with SCI (i.e., Dr. Kennedy, Dr. Craig), supervised practice with an experienced clinical psychologist, and evaluation of audiotapes from some selected therapy sessions.

The following principles are required for a group facilitator when delivering psychosocial intervention (Bieling et al., 2006; White & Freeman, 2000). (Those principles were adapted from Bieling et al.,’s handbook for group cognitive behavioural therapies). First, the group facilitator can enhance the positive, therapeutic factors influencing the group process such as encouraging openness and encouraging supportive feedback between group participants, as well as observe and assist in establishing important connections between group participants. Moreover, the group facilitator is responsible for “keeping the group on track through the agenda”. In addition, the group facilitator should use a warm and empathetic style during group learning.

Role of group helper

Having a group help (a trained nurse or research assistant) can assist in gathering the participants and help in the process of group discussion (e.g., troubleshooting). A rehabilitation nurse trained by the researcher was the group helper in delivering the COSP. A short debriefing session was provided at the conclusion of each group session during which difficulties and issues that arose in the group were summarized as well as the plan for managing them was made (Bieling et al., 2006). The principles for the group helper were also adapted from Bieling et al., (2006)’s handbook. The roles including their responsibilities in not the group interactions and process factors. The group helper may also help the group facilitator to do a reflection on the group process, and in this way they can share any important observations in relation to the use of techniques or process and plan for whatever necessary corrective actions as needed. The helper could also help to collect feedback and do the fidelity checklist for the group session together with the group facilitator by listening to the record of the group sessions (Lepore et al., 2014). Importantly, the rehabilitation nurse as the group helper can also help to observe patients’ medical status and take actions when necessary.

3.9 Fidelity of the COSP implementation

A rigorous study requires the intervention to be delivered as faithfully as it was intended. Intervention fidelity means the degree to which the implementation of an intervention is faithful to its plan (Polit & Beck, 2008), and good fidelity requires the intervention to be delivered with truly addressing the theory and objectives underlying the research (Dumas, Lynch, Laughlin, Smith, & Prinz, 2001). The improvement of intervention fidelity can enhance both the trial's internal and external validity by reducing random and unintended variability in delivering the intervention. Generally, intervention fidelity covers five aspects, which are, proper **design** of the interventional study, **training** of intervention provider to ensure the interventionist's competency in delivering the specific content of the programme, the process of the programme **delivery** with strengthening intervention provider's adherence of the standardized protocol, participants **receipt** of the intervention, as well as their **enactment** to those skills learnt in the intervention (Bellg et al., 2004; Hoffmann et al., 2014). Solutions were taken for addressing all those five aspects throughout the study period, and those issues will be discussed and summarised in detail in the discussion chapter. As the COSP intervention has eight group sessions in total, and five or more session's attendances will be counted as one successful completion (Kennedy, et al., 2003). Particularly, the interventions completion rates are determined.

The group helper and the research assistant assessed intervention fidelity after each session of the group intervention. This COSP is a standardized intervention with detailed procedures manual of the content. Items on the fidelity checklist are the main topics of each session provided in Table 3.1. The fidelity checklist (Appendix 3) that is rated on the scale of 1-7 (1 means poor fidelity and 7 means high fidelity), as recommended by Kennedy (2008) in his CET manual. In-between the group sessions of the programme, there was a debriefing meeting between the group helper and research assistant to perform the fidelity checking of the intervention. It would be expected that the average fidelity statistics to be above 80% (or 5.6 on the 7-point scale used on the fidelity form) (Dumas et al., 2001). This fidelity check can provide the nurse researcher with information relevant to their performance, and act as the supportive or corrective feedback, in order to make the nurse researcher be aware of the importance of intervention-protocol adherence, and thus correction can be taken by the nurse researcher to improve the intervention delivery and maximize its fidelity.

In summary, this chapter described the background, cultural considerations, group logistics and process, content of the COSP. Difficulties and challenged encountered, as well as fidelity issues of the group sessions were also discussed and presented. The next chapter will focus on the research methods in relation to the specific study procedure of testing the effectiveness of the COSP in the real clinical situations.

CHAPTER 4 METHODS

4.1 Introduction

This chapter describes the methods used for this PhD study. In Section 4.2, the study design, the main reasons for choosing a quasi-experimental study and strategies for achieving two homogeneous study groups are described. The study settings of four SCI rehabilitation wards and sample of people with SCI during the inpatient rehabilitation care are presented in Sections 4.3 and 4.4, respectively. There is a description of intervention programmes used in this PhD study in Section 4.5, while the full details of the COSP have been described in Chapter 3 (Section 3.6). The outcome measures or instruments used in our study are summarised in Section 4.6, followed by the description of the methods of the pilot study (Section 4.7). Ethical considerations for this study are then summarised in Section 4.8; and finally, data collection procedure and data analysis strategies are described (Sections 4.9 and 4.10, respectively).

4.2 Study design

4.2.1 Study aim and hypotheses

Aim of the study

This study aimed to evaluate the effectiveness of a coping-oriented supportive programme (COSP) in improving people's psychological adjustment and biopsychosocial health to spinal cord injury (SCI) during their inpatient rehabilitation over a 3-month follow-up.

Hypotheses of the study

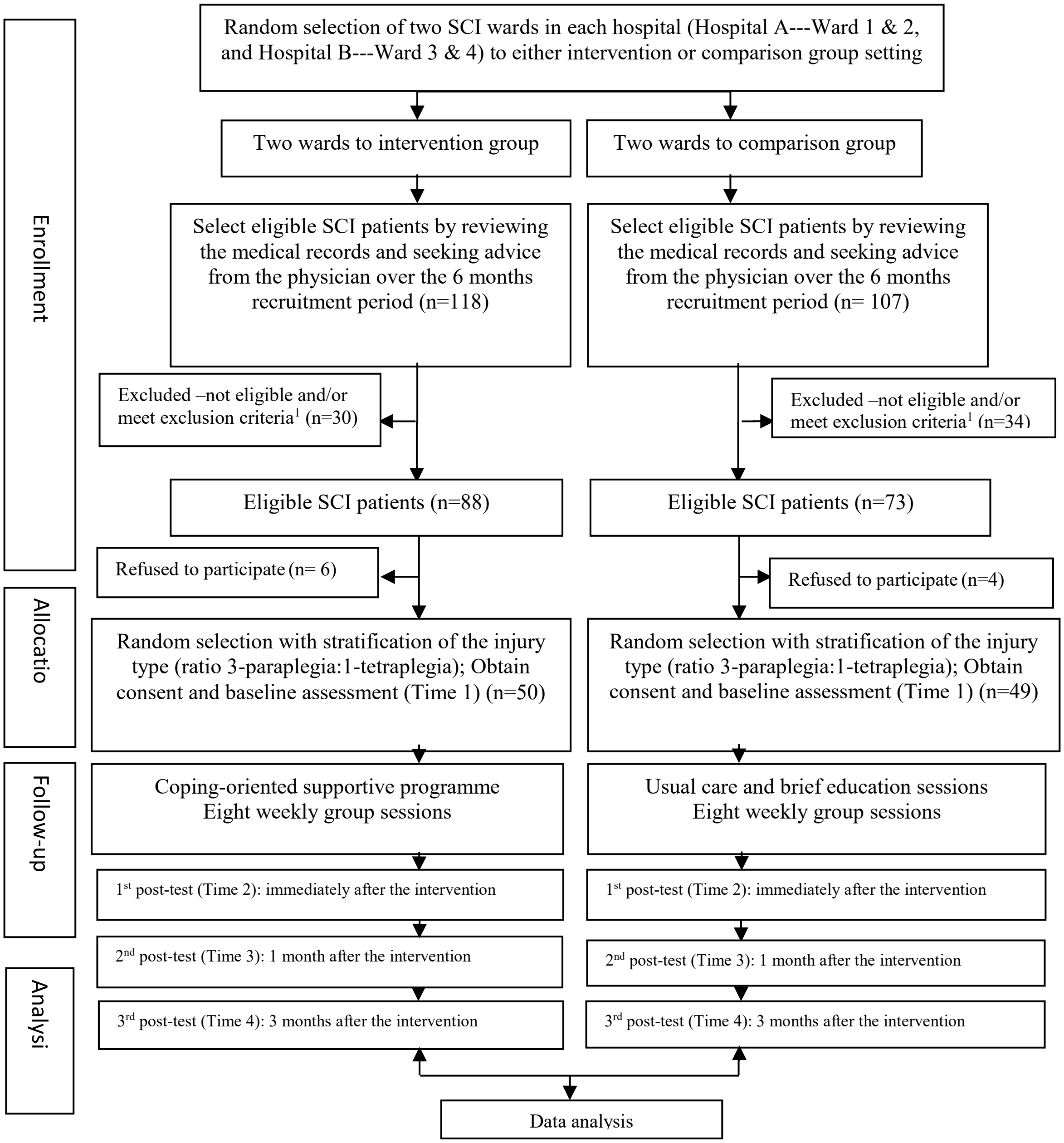
Hypothesis one: Participants in the COSP will make significantly greater improvements in coping ability and self-efficacy at immediately after the intervention, 1- and 3-month follow-up when compared to those in the didactic education group. Hypothesis two: Participants in the COSP will make significantly greater improvements in mood, social support, life satisfaction, and pain at immediately after the intervention, 1- and 3-month follow-up when compared to those in the didactic education group.

4.2.2 Overview of the study design

A quasi-experimental method with repeated-measures, comparison group design was adopted for this PhD study. The true randomisation was not performed in the study mainly due to several practical issues, including a high risk of intervention contamination if consisting of both treatment and control group participants in the same ward and not having so many eligible patients for subject randomisation in each ward.

Outcome measures were examined at baseline, immediately following the intervention, 1- and 3- month follow-up to compare the intervention effects between groups over a short- and medium-term. The SCI wards were randomly allocated to one of two study groups, either the COSP or usual care (comparison) group, in order to reduce the subjective bias of participants' allocation into the treatment used. The study was designed as an open-labelled clinical trial, for which the participants recognised the interventions they were receiving and self-reported on the outcome questionnaires, although the outcome assessors were blind to the group allocation. However, the researcher did not see or contact the data set until the data entries were completed by the research assistants (outcome assessor). Due to the essence or nature of the psychosocial intervention, the researcher who conducted the intervention could not be concealed to the participants in the intervention group, but not involved in the group assignment procedure (which was performed by an independent personnel/staff). The flow diagram of the procedure of this study is summarised in Figure 4.1. The detailed study flowchart concerning the follow-ups and final results will be presented in the results chapter (Chapter 6).

Figure 4.1 Flowchart of the study procedure



Notes:

SCI: spinal cord injury

[1] Not eligible if meet one of these criteria: a, **HADS-D** >9 and/or **HADS-A** >9; suffer from severe pain (**NRS**>7); c, Time since injury >2 years; d, Cognitive impaired (**MMSE**<23); e, medically unstable or physically unable; f, Will discharge soon within 2 months; g, Age >65

Rationale for adopting quasi-experimental design

The study was intended to be conducted in two rehabilitation hospitals (with details described in section 4.3-study settings). Of each hospital, there were two SCI wards available for this research. Patients with SCI in the rehabilitation ward have a high chance to meet each other frequently and share information with each other or observe the conduction of the intervention in the ward. The practical issues in the clinical settings of this study did not allow the performance of true random allocation of the study participants into two groups due to the large probability of contamination of the psychosocial interventions in nature (Keogh-Brown et al., 2007).

In order to minimise intervention contamination, the two SCI wards in each hospital were randomly selected to have one ward for the intervention group participants' recruitment and another ward for the comparison group. We have also considered alternative methods of using cluster randomised controlled trial, however, the limited SCI wards (i.e., only four) and potential numbers of participants we could approach for this study (with details described in section 4.4-study sample) did not fulfil the requirement for performing a clustered randomised controlled trial (Campbell, Elbourne, & Altman, 2004).

The main advantage of a quasi-experimental study is its practicality and feasibility in a specific clinical context (Polit & Beck, 2008). This research method, in comparison with the randomised controlled trial, is more likely to be acceptable to patients as there is indeed some evidence showing people's increasing unwillingness of being randomised during participation in the clinical trial (Gross & Fogg, 2001). The term "comparison" rather than "control" is often used in describing the study group of quasi-experimental study due to the nature of this research method, whereby some known or unknown confounding factors cannot totally be controlled in or balanced between two study groups and thus in this proposed study, true randomisation effects cannot be achieved (Polit & Beck, 2008). The lack of random allocation of the study participants into the two study groups might lead to non-equivalent tests that bring treats to the internal validity of the study findings, as well as its future generalisability to a larger population. In addition, pre-existing factors or other unknown confounding factors are not taken into account in this quasi-experimental study, which might also bring threats to the study findings.

Strategies for achieving more equivalence between two study groups

Strategies for minimising the selection bias were adopted to control the main potential confounding factors in order to reduce the non-equivalence of the two study groups lacking true randomisation in this PhD study. This could improve the rigour of the study (or findings), and strengthen the inferences with regard to cause-and-effect relationships between the intervention and patient outcomes.

First of all, the main factors influencing patients' psychological adjustment process at post-SCI were reviewed (in Chapter 2) and provided the researcher with the important confounding factors of the intervention effects from the relevant literature, mainly including type of injury, gender, functional independence, and social support (Chapter

2, Section 2.4). Adopting stratified sampling method and co-variance analysis by using these influencing factors or characteristics could minimise some of their confounding effects on the interventions/outcomes. Nevertheless, the lack of true randomisation would make the conclusions regarding cause-and-effect tested in this quasi-experimental study become less compelling than that informed by a randomised controlled trial. The researcher had tried to reduce the differences on baseline characteristics and outcome scores between the two study groups but there would be uncontrolled confounding factors influencing the study outcomes, thus lowering the internal validity of the findings (Higgins et al., 2011; Polit & Beck, 2008). On the other hand, it is important to note that the quasi-experimental design can be the most feasible and realistic evaluation of treatment effects in a controlled trial within a clinical setting such as the inpatient rehabilitation wards under study.

The stratified sampling method was adopted in this study. In the first level/stage, stratifying pairs of SCI wards in the rehabilitation hospital under study was performed in order to avoid the intervention contamination within each of the four inpatient settings/wards. The main characteristics of the study settings (wards) were compared and matched (e.g., the characteristics and rehabilitation policies and procedures of treatment and care) between the two pairs of wards in the two rehabilitation hospitals under study (i.e., Ward A in Hospital 1 paired up with Ward B in Hospital 2; and Ward B in Hospital 2 paired up with Ward A in Hospital 2). In the second stratum, stratification of the injury type (tetraplegia and paraplegia) was performed in the study groups in order to eliminate its effects between groups on the patient outcomes. This might also increase the representativeness of the sample by recruiting patients with tetraplegia and paraplegia in proportion to the target SCI population in terms of their types of injury and thus likely to enhance the generalisability of the findings in this study. In the third stratum, an even size of the male and female participants between groups was made in order to minimise the gender effect. It is because female and male patients might react differently to SCI (female participants indicating more utilisation of the adaptive coping strategies) (Burns et al., 2009) (also with detailed illustration on the gender differences in Section 2.4.4). Apart from injury type and gender, statistical analysis was also taken into consideration of the known confounding factors (i.e., functional independence, gender, and injury type) at baseline and the use of the analyses of covariance tests for analysing the patient outcomes in this study.

4.2.3 Operational definitions

There are several key concepts used in this quasi-experimental study, including psychosocial care, coping, self-efficacy, mood status, social support, life satisfaction and inpatient rehabilitation. The meaning of those concepts used in this study is explained as follows.

Psychosocial care or interventions in this study was adopted from the bio-psychosocial model of SCI rehabilitation (Mathew et al., 2001), which means those interventional strategies adopted mainly focus on individuals' psychological and social needs at post-SCI (e.g., negative view of themselves, depressed mood, emotional reaction, social isolation, and strains in relationships) during the early stage of rehabilitation that was occurring at the in-patient rehabilitation units in this study.

Coping referred to patients' thoughts and actions used to manage stressors and its related consequences, either in an emotion-focused or problem-focused way, in relation to SCI (Folkman et al., 1986). The coping ability was measured by Brief Coping Orientations to Problems Experienced Inventory in this study.

Self-efficacy referred to "an individual's perception of his/her confidence or competence in mobilising the motivational efforts, cognitive resources, and courses of actions to successfully execute specific task(s) within a given context", which would be the SCI related life situations in early rehabilitation (Bandura, 1977). Self-efficacy was measured by the Moorong Self-Efficacy Scale in this study.

Mood status referred to patients' emotional reactions to the stressful situations/events caused by the injury, and which could be influenced by stressful and traumatic experiences and their coping effectiveness during the psychological adjustment to the injury (Folkman et al., 1986; Galvin & Godfrey, 2001). This was assessed by the Hospital Anxiety and Depression Scale in the study.

Social support was regarded as the coping resources that patients with SCI received to guard against the health consequences of stressors (e.g., financial support, housing, information support, caregiving, accessibility of the public facilities, emotional support, etc.) (Cobb, 1976; Muller et al., 2012). It was measured by the Six-item Social Support Questionnaire.

Life satisfaction would represent participants' self-perception or evaluation of the illness impacts on his/her daily living, social relationship, self-care, and functioning. This satisfaction was measured by the Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form.

Inpatient rehabilitation referred to the stage of treatment in which patients would receive different physical and psychosocial care or training at post-SCI to improve functioning and reduce impairments caused by their disabling conditions. The goal of inpatient rehabilitation is to return people with SCI to the community.

4.3 Study setting

This study was conducted in two rehabilitation hospitals in the city area of Xi'an, China. The two hospitals were governed by the similar clinical standards and policies of rehabilitation care by the Medical and Health Authority of Shaanxi Province (Fang et al., 2013). These two hospitals received patients with SCI from the whole Shaanxi province, China. Most of the patients with SCI were transferred to these two hospitals after acute medical treatment (e.g., surgery), and received inpatient rehabilitation treatment there (e.g., physical therapy, occupational therapy and any training of mobility and use of assistive devices). The hospitals included not only patients with SCI in the initial rehabilitation stage but also those who were re-admitted due to medical complications. Patients suffering from SCI who are sustaining the illness over the first two years of onset often occupy 50-60% of this patient population in the rehabilitation wards, as indicated in the past 2-3 years' admission records of the two hospitals under study. The two rehabilitation hospitals did not have beds for individuals with SCI who were ventilator-dependent, and all patients with SCI in these two hospitals received a standard rehabilitation care upon admission.

Although the disability movement and disabled persons' self-help organisations are emerging in China in recent years (Zhang, 2017), patients still face great challenges after they are discharged into the community. While disabled people are entitled to specific support from the government, and many people with SCI can receive financial compensation for their injury, the infrastructure and community support systems (e.g., public transportation or accessibility, employment, community nursing, education, and housing) are less developed in China compared with Western countries. Due to the less supportive environment and policies for disabled people in China, the Coping-oriented Supportive Programme (COSP) designed for patients with SCI could be particularly important and perceived to have long-term benefits for these patients, who would be discharged from a protective environment of the rehabilitation hospital, to meet diverse challenging situations in the community of China. Usually, patients would stay for 3 to 6 months' inpatient rehabilitation that depends on their individual health condition and other personal issues (e.g., financial problem and any need for transferring to another hospital for acute medical care). Each hospital consists of two SCI rehabilitation wards, with similarly 30-40 beds in each ward. Therefore, there could be approximately 100-

160 patients with SCI in these two rehabilitation hospitals at one point, where those patients who met the study criteria (described at below Section 4.4) were approached and asked consent to be recruited into this study.

Each hospital contains one pair of intervention and comparison (control) groups (i.e., either intervention or comparison group in one ward) to be drawn out randomly, and stratified random sampling in terms of two different types of SCI (i.e., tetraplegia and paraplegia) and gender was performed from these eligible patients in each ward. As explained previously in Section 4.2, the main purpose of the ward selection (i.e., randomly selecting one to be intervention group and another to be comparison group in each hospital) from the two hospitals was to minimise intervention contamination. In order to balance the attention and social effects by the intervention providers or group context, the comparison group was also provided with brief education group sessions by a rehabilitation nurse (details of the intervention in the comparison group was provided in Section 4.5.2).

4.4 Study sample

4.4.1 Sample selection

There were two study groups in this quasi-experimental study. Participants in the intervention group received the COSP; whereas, those in the comparison group received basic didactic education in groups about the illness and injury-related problems and brief information about the knowledge of its medical treatment and rehabilitation services (see Section 4.5). For the two SCI wards in each study hospital, they were chosen in pairs (either Ward A-intervention group and Ward B-control group or A-control group and B-intervention group in each hospital) by drawing one labelled card (1-intervention or 2-comparison) in an opaque envelope by a rehabilitation nurse who would not involve in the interventions and outcome assessments. The results of ward allocation to the two study groups were also concealed to the outcome assessors and ward staff throughout the data collection period.

In the initial recruitment, a physician in each SCI ward was invited to assess the patients and recommend the patients who are medically stable, without having severe depression and anxiety (as indicated by HADS) and cognitive impairment (as indicated by the MMSE score >21; (Wang et al., 2017)) to participate in this study. Those medically stable patients who could stay in the wheelchair for more than two hours were proceeded to the second stage of screening for eligibility by the researcher. As this proposed study focused on early intervention for people with SCI, those patients within 2 years' onset of SCI had undergone the acute treatment in hospital before the current inpatient rehabilitation admission were targeted. An invitation letter and information sheet were provided to individual patients (and/or their family member or guardian if unable to give written consent) in person to ask for their consent for study participation.

The inclusion criteria of the sample include patients with SCI who were:

- Planned to stay at the hospital for inpatient rehabilitation for at least three months;

- Traumatic injury or non-traumatic injury diagnosed by the physician, and within 2 years onset of the injury;
- Aged 18-64 years adults, able to understand and speak Mandarin;
- Able to understand the content as well as follow the instructions as required by the COSP intervention;
- Voluntarily participation with the capacity to provide written or verbal consent;
- Not cognitive deficit because of brain injury.

Whereas, the exclusion criteria for patients are those who were:

- Cognitively impaired (i.e., Mini-Mental State Examination test score < 23) (Folstein, et al., 2001);
- Current having mental illness (e.g., "diagnosed with schizophrenia, anxiety disorder, or mood disorders"), which might interfere with the learning of the COSP intervention;
- Suffering from severe pain (mainly in the daytime; NRS>7) consistently in the previous month (Raichle, Osborne, Jensen, & Cardenas, 2006), frequent or serious somatic complaints, complete social withdrawal or non-response to questions or interactions (as shown in physician's recent assessment record).
- High risk of self-harm (i.e., having a plan to hurt themselves and having suicidal intention indicated recently);
- Currently participating in other psychosocial intervention(s) (e.g., psycho-education, social skills training, CBT, structured counselling programme, or other psychotherapies), and/or currently involved in any clinical trial.
- Presenting with symptoms of severe depression and/or anxiety (Hospital Anxiety and Depression Scale- Depression>9 and/or Anxiety>9).

4.4.2 Sample size estimation

As the COSP used in this study was modified from Kennedy (2003)'s Coping Effectiveness Training (CET) intervention, the sample size calculation could be based on two similar studies (Kennedy, Duff, Evans, & Beedie, 2003; King & Kennedy, 1999) that investigated the effects of CET for people with SCI. The results of the proposed primary outcomes (coping ability and self-efficacy) for this PhD studies were taken into consideration. There were no statistically significant effects on participants' coping ability found in Kennedy (2003)'s study, and the self-efficacy was indicated with an average effect size (Cohen's d) of 0.68 at post-test, indicating a moderate-large effect (Thalheimer & Cook, 2002). As the methodological nature in using the historical controls in Kennedy et al (2003)'s study, the effect size might not be reliable, or somewhat inflated, and thus not be useful and valid in calculating the sample size for this quasi-experimental study. In addition, the repeated measures design (or ANOVA test for >one post-tests) should also be considered for sample estimation.

It is usually more prudent to be conservative in effect size estimates so that Cohen (1992)'s conventional effect size in a medium level (f=0.25) for behavioural or psychosocial interventions was used for the sample size estimation (Polit & Beck, 2008). Using the level of significance at 0.05 and study power of 80%, the estimated sample size calculated by using G*Power was 41 for each study group by using repeated-measures ANOVA test. Taking into account approximately 20% drop-outs rate for different psycho-education interventions focused on coping with stress

(Duchnick, Letsch, & Curtiss, 2009; Van Daele, Hermans, Van Audenhove, & Van den Bergh, 2012), the sample size was calculated as 103 for the two study groups.

4.4.3 Recruitment procedure and sampling method

Due to very high risk of treatment contamination between groups in the same ward/setting (Keogh-Brown et al., 2007), the two wards in each of the two SCI rehabilitation hospitals were allocated to either the intervention or comparison group by a rehabilitation nurse (not otherwise involved in the study) by drawing one labelled card in an opaque envelope. The result of ward allocation to study groups was concealed to the outcome assessors and ward staff over the study period.

Study participants were recruited over a 6-month period from August 2016 to January 2017. The two hospitals for our sample selection are under a similar policy, characteristics, staff manpower, and nature. A physician on each SCI ward was invited to assess and recommend any of the inpatients staying at the wards that were medically stable and were eligible to participate in the study. Informed written consents were then sought from the eligible participants. There were 50 patients for the COSP and 49 patients for the comparison (brief education) group recruited to be the participants in this study. Prior to informing about their group allocation, baseline measurements were completed by those patients volunteered to participate.

Stratified random sampling was adopted. After the first level of selection of study setting (i.e., one ward to be intervention setting and another ward for being the comparison group setting in each hospital), the first stratum for sample selection was the injury type (i.e., tetraplegia and paraplegia) due to their close relationships with the study outcomes (e.g., self-efficacy and coping effectiveness) identified in previous studies (McMillen & Cook, 2003). Gender was the second stratum for the sample selection due to the more effective coping in female people with SCI (van Leeuwen, Hoekstra, van Koppenhagen, de Groot, & Post, 2012a). After an initial assessment of the eligibility of patients with SCI, the total number of patients with tetraplegia and paraplegia to be recruited from each ward was based on the ratio of the two injury types and gender.

It was estimated that in the study settings of this study, the average number of patients with paraplegia would be three times higher than those with tetraplegia, and thus a ratio of 3:1 was adopted for the sample selection. There were 37 participants with paraplegia and 13 participants with tetraplegia recruited for the COSP, while 36 participants with paraplegia and 13 participants with tetraplegia were recruited for the comparison group. Gender was also considered during the participants' recruitment process and the majority of the patients were male (the estimated ratio of male and female is 7:1) during the participant's recruitment period. For the 50 participants in the COSP and 49 participants in the comparison group, there were 43 and 44 male participants recruited, respectively. The stratified random sampling for the two study groups was performed by a rehabilitation nurse independent from this study, using the number generated by the online-randomiser (www.Randomizer.org). After the sample selection for the two study groups, the two trained outcome assessors who were concealed to the intervention and group allocation administered the baseline measurements for the selected participants in the SCI wards.

4.5 Interventions

4.5.1 The intervention group

Coping-oriented supportive programme

The COSP is a manualised psychosocial intervention programme for people with SCI undergoing inpatient rehabilitation. The programme consists of eight weekly, 1- to 1.5-hour sessions, and consisted of four phases: (1) orientation and encouragement; (2) cognitive appraisal; (3) coping; and (4) social support and future plan. Details of the 4-phase programme (together with modifications made based on the comments generated from content validation) presented in Chapter 3. Guided by the main theoretical underpinning of COSP, it aimed to facilitate patients with SCI undergoing rehabilitation to prepare/learn and practice effective coping strategies and skills learned in dealing with life challenges during the inpatient rehabilitation stage as well as the daily life after community reintegration. Participants' self-efficacy or sense of mastery in dealing with difficulties or problems caused by SCI would be potentially enhanced by the positive reinforcement of the adaptive coping achievements. The psychosocial approaches used in the COSP were discussed in Chapter 3.

The content of the COSP was modified according to specific Chinese cultural issues (detailed description in *Chapter 3- Coping-oriented supportive programme*). First, Chinese people could be quite conservative and found more difficult to openly express their feelings than Western people (Chan, Lee, & Lieh-Mak, 2000; Lin, 2002). Second, Chinese people might have difficulties in radical confrontation, assertive training, and direct/open discussion about sensitive issues such as family relationships and sexual health (Lin, 2002). Third, Chinese people tended to follow rules and boundaries that were defined by the therapist during the psychosocial intervention (Tseng, 1999) and they preferred to maintain harmony and "face-saving" during social interactions (Lin, 2002). Confucianism underpins the social dynamics of Chinese people, often emphasising people's capability and responsibilities of contributions to society; and this might influence the ways that Chinese people perceive their life satisfaction or quality of life at post-SCI (Bond, 2010; Hampton, 2000). Last, Chinese people are less experienced in using humour as a coping strategy for conflict, whereas they would rather use suppression in dealing with some unacceptable circumstances (Tseng, 1995). The stressful situations particularly related to Chinese policies or social contexts (e.g., limited public transportation or acceptability, public attitudes to disabilities) that might be encountered by participants after their inpatient rehabilitation were discussed in the group sessions.

4.5.2 The comparison group

Usual inpatient rehabilitation with didactic education group sessions

Participants in both the COSP and comparison group were provided with the routine inpatient rehabilitation care (mainly prescribed treatment, physiotherapy, other physical care, and occupational skills training as needed). In addition, the comparison group was provided with brief education group sessions (structured by the rehabilitation nurses and researchers), which consisted of eight 1- to 1.5-hour sessions with professional contacts similar to the COSP group, to try and balance the social interaction and attention effects during group sessions between the two study groups. A third comparison group (treatment as usual only) was not provided as the current two study group can serve the purpose of examining the effects of the COSP intervention for people with SCI during inpatient rehabilitation. The group education sessions were conducted by a trained rehabilitation nurse in a communal room on the SCI ward after the patients' dinner time. The didactic education provided by the rehabilitation nurse focused on SCI knowledge and personal care issues that are usually shared as part of routine practice. This included the basic health education, self-care and information of SCI, personal care (e.g., nutritional needs, skin care, bowel and bladder training) and its available treatment and rehabilitation services.

Most items of this usual care provided by the wards were also received by the intervention group. The duration and length of the group sessions (i.e., 8 weekly, 1.5-hour sessions) for the comparison group were very similar to those for the COSP but provided in a didactic and conventional education approach. Intervention sessions of 3-5 sub-groups of the comparison group were audiotaped and reviewed by the researcher to make sure it is purely didactic approach without any other psychotherapeutic elements. There were no participants in the comparison group who were receiving other types of psychosocial interventions according to the assessments from the data collectors.

4.6 Instruments for outcome measurements

Outcomes were assessed for the two study groups at baseline assessment, immediately after the intervention, and 1- and 3- month follow-up. A set of questionnaires were used, including a socio-demographic and clinical characteristics sheet and five self-reported outcome measures (i.e., coping strategies, self-efficacy, mood, life satisfaction, and pain). Each participant spent about 30 minutes to fill in the questionnaires. The questionnaires used for this study is presented in Appendix 4.

The primary outcomes of the study were participants' coping strategies and self-efficacy in managing stressors concerning SCI. Selecting coping strategies and self-efficacy as the primary outcomes were due to the theoretical underpinnings of the coping theory informing the content/objectives of the COSP established and tested in this study. The main concept guiding the design of the intervention content was coping, and participants' self-efficacy could positively be reinforced by using more adaptive coping strategies, and less maladaptive coping strategies. This notion was also discussed in the section about the theoretical underpinnings of the COSP in Chapter 3.

4.6.1 Primary outcomes

Brief Coping Orientations to Problems Experienced Inventory (Brief COPE).

Participants' coping strategies were assessed by the Brief-COPE Scale (Carver, 1997), consisting of 28 items in which 14 two-item domains measure 14 conceptually distinct aspects of coping strategies. Items rated on a 4-point Likert scale, ranging from 1- "I have not been doing this at all" to 4 – "I have been doing this a lot". The Brief COPE was derived from the COPE inventory (Carver, Scheier, & Weintraub, 1989), indicating that the domains possess satisfactory internal consistency (Cronbach's alphas=0.50-0.90) and criterion-rated validity. The Chinese version has been translated by (Wang et al., 2015) with even higher internal consistency (Cronbach's alphas= 0.69-0.91) and two-factor solutions. The two factors emerged are adaptive coping (i.e., involving 8 domains – "active coping, planning, use of emotional support, use of instrument support, positive reframing, acceptance, religion, and humour") that explained 34% of the total variance, and maladaptive coping (i.e., involving the remaining 6 domains – "venting, denial, substance use, behavioural disengagement, self-distraction, and self-blame") that explained additional 14% of the total variance (Bellizzi & Blank, 2006). The Cronbach's alpha for adaptive and maladaptive coping is 0.81 and 0.57, respectively (Meyer, 2001). In this study, the two subscales (adaptive coping and maladaptive coping) were employed for outcome analysis, which was in line with the intervention objectives and components aiming to facilitate patients' adaptive coping strategies at post-SCI.

Moorong Self-Efficacy Scale (MSES). Participants' self-efficacy was assessed by the 16-item self-reporting Moorong Self-Efficacy Scale (MSES), which assesses respondent's confidence or belief in their ability to complete a range of daily tasks. The items were rated on a 7-point Likert scale from 1, ''very uncertain'' to 7, ''very certain"; they were summed up to a total score (range from16 to 112), with a higher total score indicating a higher level of self-efficacy (Middleton, Tate, & Geraghty, 2003). The Chinese version of the MSES has demonstrated very good internal consistency

(Cronbach's alpha=0.93) in Taiwan Chinese with SCI (Chen, Lai, & Wu, 2011). The Chinese and original English versions indicated good content validity in Chen et al (2011)'s study and Middleton, Tate, and Geraghty's (2003) study, respectively.

4.6.2 Secondary outcomes

Hospital Anxiety and Depression Scale (HADS). Participants' mood status was assessed by the HADS. It is a 14-item self-report inventory that assesses the severity of symptoms of anxiety (7 items) and depression (7 items). Participants were asked to rate each item on a 4-point scale from 0-''not at all'' to 3-''very often indeed". Scores for each subscale were summed up, with higher scores indicating the higher severity of symptomatology associated with anxiety and depression. This scale has been widely used in populations with a physical disability, including SCI population, with very satisfactory internal consistency (Cronbach's alpha 0.93 for HADS-A and 0.90 for HADS-D) and promising content validity (Woolrich, Kennedy, & Tasiemski, 2006). The Chinese version of HADS has been translated by Leung, Ho, Kan, Hung, and Chen (1993) and indicated good agreement with the original English version, and the Cronbach's alpha for the anxiety and depression subscales was calculated and found to be 0.81 and 0.74, respectively. A total of 846 inpatients were assessed using the Chinese version HADS, indicating good internal consistency with Cronbach's alpha of 0.76 for anxiety and of 0.78 for depression (Zheng, Wang, & LI, 2003). The cut-off points of 9 were adopted for measuring morbid/clinical depression and anxiety of Chinese people with SCI in this study, as suggested by (Leung et al., 1993) and (Zheng et al., 2003).

Numerical Rating Scale (NRS) for pain level. Participants were asked whether they have any pain problems with this question "Have you in the past three months experience any pain (other than occasional headaches or menstrual cramps)". Respondents who answered "yes" was also asked to rate the 0-10 numerical rating scale (NRS) from 0- "no pain" to 10- "pain as bad as could be". This pain scale has been used in patients with SCI and demonstrated good reliability with Cronbach's alpha of 0.95 (Hawker, Mian, Kendzerska, & French, 2011) and good validity in measuring pain intensity (Raichle et al., 2006). The score for pain assessed by NRS can be categorised as mild pain (1 to 4), moderate pain (5 to 6), and severe pain (7 to 10) (Raichle et al., 2006).

Six-item Social Support Questionnaire (SSQ6). Participants social support was assessed by the SSQ6 developed by (Sarason, Sarason, Shearin, & Pierce, 1987), which was modified from the original 27-item Social Support Questionnaire (Sarason, Levine, Basham, & Sarason, 1983). Participants were asked to rate on a 6-point Likert scale, ranging from 1- "very dissatisfied" to 6- "very satisfied". The SSQ6 was reported to have good internal consistency (Cronbach's alpha=0.90) for number (of supporting persons) score and 0.93 for satisfaction score (Sarason et al 1987). The Chinese version translated by Chang (1999) also reported good internal consistency (Cronbach's alpha=0.94), and an intra-class correlation coefficient of 0.88, indicating a high correlation between both English and Chinese version in stroke patients (Chang, 1999).

Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form (Q-LES-Q-SF). Participants' life satisfaction was assessed by the Q-LES-Q-SF. This scale contains 16 items rating on a 5-point Likert scale, from 0- "very poor" to 5- "very good", with a higher total score indicating a higher life satisfaction. The internal consistency and test-retest coefficients were very satisfactory with Cronbach's alpha of 0.9 and ICC of 0.93, respectively (Stevanovic, 2011). Its item-scale correlations range from 0.41-0.81, and levels of sensitivity and specificity for chronic diseases and disabilities are 80% and 100%, respectively (Stevanovic, 2011). The Chinese version Q-LES-Q-SF was translated by Lee et al. (2014) and indicated good internal consistency (Cronbach's alpha of 0.87) and content validity in Chinese people with different kinds of chronic illness (e.g., stroke and mental disorders) (Tang, Qiu, & Jian, 2010).

4.7 Pilot study methods

4.7.1 Objectives of the pilot study

The objectives of the pilot study were to: (1) validate the COSP with experts' consultation; (2) evaluate the feasibility of the study, and acceptability of the COSP intervention; (3) evaluate the preliminary effects of the COSP with a small-scale pilot comparison study;

4.7.2 Design of the pilot study

Phase one of this study was to validate the content of the COSP by inviting a panel of six professional experts to review the intervention manual. Six experts rated the appropriateness of each item in the manual from 1 - "inappropriate", 2 - "somewhat inappropriate" needing major revision, 3 – "somewhat appropriate" needing a minor revision to 4 – "very appropriate". Revisions were made to the COSP items (especially those rated as 1 or 2) according to the expert panel's comments and revisited by the panel up to their full agreement. Phase two was a preliminary evaluation of the COSP in two SCI wards of a specialist rehabilitation hospital using a controlled, two-arm, pre- and post-test design. The feasibility and acceptability of the COSP were also examined. The baseline data of this small-scale pilot study were also used for calculating the Cronbach's alpha of the instruments used in the study, in order to future ensure the internal consistency of the instruments used for our study.

4.7.3 Study participants and their recruitment

In phase one of the pilot study, six experts in the relevant field of SCI and related rehabilitation psychology (two clinical psychologists in SCI rehabilitation, one trauma care and resilience researcher, one cognitive therapist with the psychiatric nursing background, one psychological researcher and one occupational health specialist) were invited to review the intervention programme. The validation form for the COSP (Appendix 5) was filled. Refinement of the intervention manual was performed and implemented by the researcher. The experts' panel was invited to review and comment on the intervention manual (together with a patient pamphlet with key information of the COSP retrieved from the intervention manual). The patient pamphlet was then translated by the researcher into Mandarin Chinese and back-translated by an independent English translator. A third bilingual nursing researcher was invited to compare the original and back-translated version to evaluate their content and textual equivalence. Any discrepancy found on the back-translated version was modified and its related text in Chinese was also amended with agreement between the researchers and translator.

For phase two of the pilot study, participants were recruited using a convenience sampling method over a two-week period during March 2016. The study participants were recruited from two SCI wards in the same hospital with very similar policy, characteristics and nature. Due to very high risk of treatment contamination between groups in the same ward/setting (Keogh-Brown et al., 2007), the two wards were allocated to either the intervention group or the comparison group by a rehabilitation nurse (not otherwise involved in the study) by drawing one labelled card in an opaque envelope. The result of ward allocation to study groups was concealed by the outcome assessor and ward staff throughout the study period. A physician in each SCI ward was invited to assess and recommend current inpatients that were medically stable and were eligible to participate in the study. The eligible potential participants were approached on the ward by the researchers to seek their informed consent to take part. Twenty-two participants (11 from each ward) were finally recruited to participate in the pilot intervention. Once patients had volunteered to participate, they would complete the baseline measurement. Participants' feedback on the COSP was also collected by asking them several closed/open-ended questions (Appendix 6).

4.7.4 Data collection of the pilot study

The study was conducted between March and June 2016, which involved participant recruitment, baseline measurements, implementation of the COSP intervention and post-tests. The 8 sessions of the COSP intervention were delivered over a two-month period (April and May). Prior to the intervention, the participants' socio-demographic and clinical characteristics, together with the primary and secondary outcome measures were collected. Similar outcome measures of the main study were used for both groups.

Feasibility of recruitment, retention, and intervention adherence

The recruitment process, attrition rates, group attendance rates and completion of the outcome measurements were recorded throughout the study. Intervention fidelity was assessed using a fidelity checklist (after each session) by the group helper (a trained rehabilitation nurse) and a research assistant. This was assessed by comparing the scheduled content detailed in the intervention manual with the actual content (audio recorded sessions) that was delivered. The fidelity checklist was rated on the scale of 1-7 (1 indicating poor fidelity and 7 indicating high fidelity) in between the group sessions.

Acceptability of the interventions

Intervention acceptability was assessed post-intervention. The COSP participants were asked to rate on the appropriateness of the "group meeting time arrangement", "duration of each meeting", "performance of the group facilitator", and "venue of the group meeting" from 1- inappropriate, 2- somewhat inappropriate, 3-neutral, 4-

somewhat appropriate, to 5- very appropriate. We also asked three open-ended questions to obtain further feedback on the COSP: “What aspects of this intervention do you think are beneficial for you?”; “What aspects of this intervention do you think are unhelpful or should be improved?” and “What aspects of this intervention do you think are difficult for you to understand or adopt? Why?”

4.7.5 Data analysis of the pilot study

For phase one of the study, the content validity index (CVI) was used to quantify the content validity of the COSP. The CVI of 0.80 was considered acceptable, while a value of 0.90 represented a satisfactory content validity (Polit & Beck, 2008) For Phase two, data were analysed by using the IBM’s SPSS for Windows, version 21.0. The significance level of statistical tests was set at $p \leqslant 0.05$.

For phase two of the study, data were analysed by using the Statistical Product and Service Solutions for Windows, version 21.0. The significance level of statistical tests was set at $p \leqslant 0.05$. Outcome data analyses were performed on per-protocol basis that could reflect the true intervention effects unaffected by protocol (intervention) non-adherence (Sedgwick, 2015). Last Observation Carried Forward strategy (Overall, Tonidandel, & Starbuck, 2009) was adopted for handling the missing data of those questionnaires that were not fully reported. Participants who successfully completed the intervention (attended at least 5 of the scheduled 8 group sessions) were included in the analysis. Non-parametric tests were adopted to analyse the outcome measurements due to the small sample size used in this study. Mann-Whitney U test was used for between-group, pre-test and post-test comparisons, and Wilcoxon Signed-Ranks test was performed for within-group differences in each outcome at post-test. Participants' feedback and comments on the three open-ended questions regarding their perceived benefits, aspects needing improvement and the most challenging parts of the intervention were summarised.

4.8 Ethical considerations

Ethical approval for conducting the proposed study was obtained through the Human Subjects Research Ethics Sub-committee of The Hong Kong Polytechnic University (Appendix 7), and the two study hospitals. The researcher approached all eligible participants and provides information about the project to them. The participants were informed about the study purpose, procedure and measures; and their personal identity and data were protected by maintaining anonymity and confidentiality with limited access from research team only for use in this research.

The researcher assured the participants that their personal identity and all information collected and their tape records were safely kept and locked in a restricted cabinet/room with restricted access. Participants were informed of their rights to withdraw from the study at any time without any negative consequence or penalty for their treatment or care to be received. Importantly, patients with SCI to some extent stay in a dependent relationship with the health professionals in the rehabilitation wards and thus any possible coercion was considered a serious issue and be prevented. Participants were clearly informed that their participation in this proposed study was entirely voluntary, and sufficient time was offered for them to consider their consent in joining this research if they prefer.

The contact information of the researchers was available for all the participants for any enquiries during and after the study. Eligible patients who were well informed about the study with the information sheet (Appendix 8), and verbal explanation by the researcher; those who were willing to participate in the study were asked to sign on a consent form (Appendix 9). If the patient was unable to sign the consent form due to the functional disability (impairment of the upper limb function, fatigue or other factors), his/her family member or guardian were asked to involve in agreeing and signing the consent form for the patient with the patient's prior verbal consent in study participation. If patients had no family member in China, the responsible rehabilitation nurse or physician signed the form as a witness person with the patients' verbal consent. If participants experience any strong emotional frustration, distress, suicidal ideas or severe physical unfit, they were referred to rehabilitation nurse and physician for further consultation and follow-up, as well as appropriate psychological care; and the group intervention, may be terminated, whenever necessary.

4.9 Data collection procedure for the main study

All research data of the main study were collected by two research assistants at four time points (i.e., baseline measurement at recruitment, and three post-tests at immediately, 1-month and 3-month after completion of the interventions). The research assistants received half-day training on the use of instruments and data collection procedure before the pilot study and were blinded to the group (intervention) allocation of the participants.

After the stratified sampling of eligible patients in each of the four SCI wards into the two study groups, participants in the two study groups who agreed to participate with written consent were asked to complete the study questionnaires, including demographic and clinical characteristics sheet and outcome measures at a quiet corner/room in the rehabilitation wards. They were then informed about their intervention assigned and undergo the respective interventions. During the two-month intervention period, the researcher led the 8 weekly group sessions. With the participants' consents, three group sessions of each of the intervention sub-groups (i.e., 4-5 participants in each sub-group) were randomly selected and their group sessions were audio-taped and reviewed by the researcher and one experienced clinical psychologist (who is a CBT therapist with rich experiences in cognitive and behavioural techniques covered in the COSP intervention) between the group sessions to examine the group progress, and the intervention fidelity. Outcome measurements were assessed again immediately after completion of the interventions, and at 1- and 3-month follow-up.

4.10 Data analysis of the main study

4.10.1 Data entry and cleansing

The dataset of the study was coded, summarised and analysed using IBM SPSS for Windows, version 21. Two research assistants who were responsible for the data entry were blind to the group assignment. Data re-checking was performed for every five participants in order to ensure the accuracy of the data entries. Corrections were made to the data set for any discrepancy (less than 1%) found during this process. Descriptive statistics were further performed to examine the raw data by the researcher. The maximum and minimum score with frequency counts were checked for the categorical data, while mean and standard deviations were checked for continuous data (Abu-Bader, 2010). In addition, z-score statistics were performed to identify outliers, and rechecking and corrections were made for those scores that were more than 3.00 and less than -3.00 (Mertler & Reinhart, 2016). There was in total less than 1% abnormal values and incorrect entries identified with manual checking, and corrections were made subsequently for them.

4.10.2 Management of missing data

The whole dataset included participants' demographic information, disease-related information at baseline assessments, and primary outcomes (coping and self-efficacy) and secondary outcomes (mood, social support, life satisfaction and pain) collected at pre-test (baseline), post-test (immediately after intervention) and 1- and 3-month follow up. A special code (i.e., 999) was used for entering the missing data in the database. The missing values for categorical data were identified and checked by performing frequency counts, and the missing values for continuous data were identified by observing the minimum and maximum scores for each questionnaire item. It is stated that if only a few data points (5% or less) are missing at random, the problem might be less serious and the ways of handling missing values would probably yield similar results (Tabachnick, Fidell, & Osterlind, 2001). The description of missing data and their analysis is presented in Chapter 6 - Results before they were preceded by the statistical analysis.

4.10.3 Statistical methods for data analysis

COSP effectiveness in comparison with didactic education group

Descriptive statistics were conducted not only to ensure the accuracy of the data entries by examining means and range of the data, generating graphic summaries but also to summarise and describe demographic and clinical characteristics and baseline scores of the outcome measures of the sample in the two study groups. After data screening and checking, comparisons of socio-demographic characteristics and baseline outcome scores between the two study groups were conducted to identify any differences in these characteristics and outcome scores between groups at recruitment. Independent sample T-test (for continuous variables with normal distribution), Mann-Whitney U test (for ordinal variable), and/or Chi-square test (for categorical variables) were used for the between-group comparison to check the homogeneity of the study groups at baseline (Portney & Watkins, 2000). If any differences found in the outcomes of the baseline factors, these would be considered to be inserted as co-variants during the statistical analysis stage. Baseline comparison was also performed between participants compliant with the study procedure and intervention programmes and those non-compliant by using independent sample T-test (or using Chi-square test for frequencies).

The effectiveness of the COSP was evaluated by comparing the changes over time in the outcome measures, including self-efficacy, coping ability, mood, life satisfaction, pain, social support and life satisfaction between the COSP and the comparison group over the 3-month follow-up (i.e., baseline, immediately after the intervention, 1- and 3-month follow-up). Final data analysis was based on both Per-Protocol (PP) analyses and Intention-To-Treat (ITT) analyses. The PP analysis of the final data has the idea that it might seem prudent to just eliminate any subjects who did not receive or complete their assigned treatment and include only those subjects who sufficiently adhered with the trial's protocol. Generally, the PP approach tends to bias results in favour of a treatment effect, as those who succeed at treatment are most likely to stick with it (Hollis & Campbell, 1999; Newell, 1992).

Therefore, most researchers doing RCT chose to use a more pragmatic or realistic approach, that is, the ITT. The principle of ITT is that data are analysed according to the "original random assignments" (Portney & Watkins, 2000). ITT can guard against the potential for attrition bias if dropouts are related to "outcomes or group assignment and preserves the original balance of random assignment" (Portney & Watkins, 2000). Although the ITT analyses may make us harder to find significant differences in study outcomes, the results from ITT could reveal the 'real' effects of the intervention for all the participants in this study. Therefore, both the PP and ITT analyses were performed to see any differences between two approaches to analyses on the intervention effects in terms of the participants' treatment adherence and/or study attrition.

Theoretically, the outcome variables measured in this study (i.e., maladaptive coping, adaptive coping, self-efficacy, anxiety, depression, social support, and quality of life were likely to be inter-correlated (i.e. its detailed explanation in Chapter 2 'Literature review'). The statistical plan of comparing the effects between the intervention and comparison group on these above-mentioned outcomes was either be a multivariate analysis of covariance (MANCOVA) if any of the outcome variables was/were moderately correlated or a repeated-measures analysis of covariance. The correlations of these outcomes were identified in order to decide whether multivariate analysis of covariance (MANCOVA) was preferred. Generally, MANCOVA is more powerful than ANCOVA, allowing the researcher to take into consideration of the moderate inter-relationships between the outcome measures during repeated-measures analysis (Tabachnick et al., 2001). However, if one or more of the assumptions for using MANCOVA are violated, ANCOVA test (should be repeated-measures ANCOVA test) for each of the outcome measures would be performed.

In order to conduct a MANCOVA, the data should fulfil the requirement that all or most of the outcome variables that were only minimally or moderately correlated (i.e., r of 0.20-0.50) (Munro, 2005). The statistical assumptions of using MANCOVA included limited outliers of the data (MANOVA is sensitive to outliers), linearity of dependent variable (i.e., it will decrease the power of analysis if the variables are independent of each other), multivariate normality (i.e., "ensuring that the dependent variables have a multivariate normal distribution with the same variance covariance matrix in each group"), homogeneity of the variance-covariance matrix (using the

Box's M test, p >0.01) and homogeneity of variance (using Levene's test of Error Variances, p>0.05) among the independent groups for each dependent variable (Munro, 2005) (p.255). Otherwise, if one or more of these assumptions were violated, ANCOVA test for each of the outcome measures would be performed.

Planned contrasts test (e.g., Helmert's contrasts codes) was also required to determine any of mean values at each time of measurement (immediately, 1-month and/or 3-month post-intervention) were different between groups, if significant result(s) was/were found on the study outcome(s) in repeated-measures ANOVA or ANCOVA test (Munro, 2005). Comparison of attrition and non-compliance rates were performed by performing t-test (or using Chi-square test for frequencies) between the group received the COSP and those in the comparison group received the brief education. Subgroups analyses of differences on individual significant outcome variables in terms of gender and injury type were also conducted as indicated for those significant outcomes.

Clinical significant changes in the study outcomes of the COSP intervention

As only the statistical significance was not enough to detect if the intervention (i.e., COSP) effects were clinically significant, the statistical size of an intervention effect is relatively independent of its clinical significance. In addition to the statistical analysis of the outcome measurements in determining the effectiveness of the COSP intervention, the clinical significant changes of the study outcomes were also investigated. The clinical significant changes were considered as the bridge in assisting the translation of research findings into clinical practice (Evans, Margison, & Barkham, 1998). The (Jacobson, Roberts, Berns, & McGlinchey, 1999) methods for defining and determining the clinical significance of intervention effects (especially in psychosocial and behavioural interventions) was adopted.

As this study got the specific focus on the population with SCI, and several outcome measurements (e.g., self-efficacy) adopted specific measurement tools for people with SCI, together with the consideration that the norms of psychosocial measurements were not adequately reported in the previous literature. The study adopted the method of assessing the changes (i.e., clinically significant changes, CSC) in outcome scores by evaluating whether the first post-test and other two follow-up assessment scores could extend to at least two standard deviations of the pre-test mean score of the outcome measurements (Jacobson & Truax, 1991). In addition, the second criterion for clinically significant change proposed by (Jacobson et al., 1999) was the reliable change index (RCI) that ensured the degree of the change to be of sufficient magnitude to exceed the margin of a measurement error. The RCI ("dividing the magnitude of change during the course of therapy by the standard error of the difference score", p. 4, Jacobson et al., 1999), together with consideration of the calculated CSC, were calculated to determine the clinical significant changes on the study outcomes (Jacobson & Truax, 1991). The patients' psychosocial outcomes would be considered as having clinical significance changes if the RCI value exceeded 1.96, which indicated the possibility of the clinical significant changes likely (caused by chance) to be less than 0.05. The previous literature regarding clinically significant changes on some of the outcomes were also reviewed and compared/discussed with our study findings.

4.11 Summary of the methods chapter

In summary, this was a quasi-experimental study with repeated-measures, two study groups (COSP and brief education comparison group) design. Participants were inpatients with SCI in two rehabilitation hospitals (i.e., two SCI wards in each hospital). Two wards were randomly selected for recruiting participants of the COSP, and the participants in another two wards were served as the comparison group. The sample size for the main study was calculated as 50 for each study group (use a medium effect size f=0.25, a power of 80% and a significant level of 0.05). The COSP group received 8 weekly group sessions, and the comparison group also received similar eight education group sessions.

The primary outcomes were participants' coping ability (maladaptive coping and adaptive coping), and self-efficacy. The secondary outcomes included participants' mood status (anxiety and depression), social support (amount of social support and satisfaction of social support), and pain, as well as life satisfaction. Outcomes were measured at baseline and immediately, one- and three-month after the interventions. Repeated-measures of ANCOVA were adopted for analysing the effects of the COSP on the primary outcomes and majority of the secondary outcomes. A few secondary outcomes that were in ordinal level of measurement were analysed using non-parametric test (i.e., Mann-Whitney U Test). (Jacobson et al., 1999)'s criteria for clinically significant changes were adopted. Missing data were checked and managed carefully before performing the final data analysis. The data analyses focused on the effects of the coping-oriented supportive programme (COSP) on several psychosocial outcomes of the participants with SCI during inpatient rehabilitation using both ITT and PP approaches. Additional sub-group analyses were also performed on interested factors (i.e., gender and injury type).

CHAPTER 5 THE PILOT STUDY

5.1 Introduction

This chapter presents the pilot testing of the COSP before its implementation in the main study. Methods of the pilot study were outlined in Chapter 4 (Section 4.7). The objectives of the pilot study were to validate the COSP with experts' consultation; evaluate the feasibility of the study as well as the acceptability of the COSP intervention, and test the preliminary effects of the COSP with a small scare pilot comparison group. The results of the pilot study are provided in Section 5.2, which included two phases. Phase one was the content validation of the COSP intervention. Content validity index (CVI) was adopted to quantify the content validity of the COSP intervention. Phase two was the preliminary test of the COSP effects using a small convenience sample of patients with SCI. Twenty-two patients (11 for each study group, i.e., COSP group and comparison group) were finally recruited to participate in the preliminary effects test. Participants' feedback on the COSP was also collected by asking them several closed/open-ended questions. Section 5.3 discussed the findings of the pilot study. The implications of the pilot study to the main study are presented in Section 5.4 and finally, a summary is presented in Section 5.5.

5.2 Results of the pilot study

5.2.1 Content validation of the COSP

Six experts in the relevant field of SCI and related rehabilitation psychology (two clinical psychologists in SCI rehabilitation, one trauma care and resilience researcher, one cognitive therapist with the psychiatric nursing background, one psychological researcher and one occupational health specialist) were invited to review the intervention programme. An evaluation form consisting of all 20 items of the COSP intervention was sent to the expert panel members. The content validity index (CVI) was used to quantify the content validity of the COSP. The CVI of 0.80 was considered acceptable, while a value of 0.90 represented a satisfactory content validity (Polit & Beck, 2006). The average CVI of the COSP manual (20 individual items in total) was 0.97 (ranged 0.50-1.00), indicating satisfactory content validity (Polit & Beck, 2008). One item has a CVI of 0.50, two items have a CVI of 0.83, and the others have a CVI of 1.00.

The item “review the stress and coping theory” (originally rated as 0.5) was revised as “review the coping skills provided in the previous sessions”, and further modifications were made based on the expert panel’s comments on the other items. Specifically, items that started with “explain” were changed to “explore/enquire” as the intervention provider would explore each participant’s cognitive and emotional reactions towards SCI rather than giving explanations directly. The length of the DVD playing was suggested to be reduced to around half an hour (rather than one hour) with only the most important information delivered. For the problem-solving session, the intervention provider was encouraged to use more of the participants’ own examples to illustrate and facilitate the skills. The intervention provider was suggested to invite the family members to join the last group session with both the families and the patients’ agreement. Revisions were made on the COSP items (especially those rated as 1 or 2) according to the expert panel's comments and revisited by the panel up to their full agreement.

5.2.2 Preliminary evaluation of the effectiveness of the COSP intervention

Due to the clinical situation at the time of recruiting the participants for the pilot study, there were not any female patients who were eligible to participate in the recruitment period. Therefore, all participants in this pilot study were male only. Flowchart of the study procedure of Phase two is presented in Figure 5.1, according to the latest Consolidated Standards of Reporting Trials (Schulz, Altman, & Moher, 2010). For the 11 participants allocated in each of the two study groups, 9 (82%) of them in the COSP completed more than 5 sessions of the intervention; and all the 22 participants completed the post-test. The socio-demographic and injury-related data of the 22 participants at baseline are presented in Table 5.1, indicating no significant differences between the two groups.

Figure 5.1 Flowchart of the study procedure (adapted from (Li et al., 2017b))

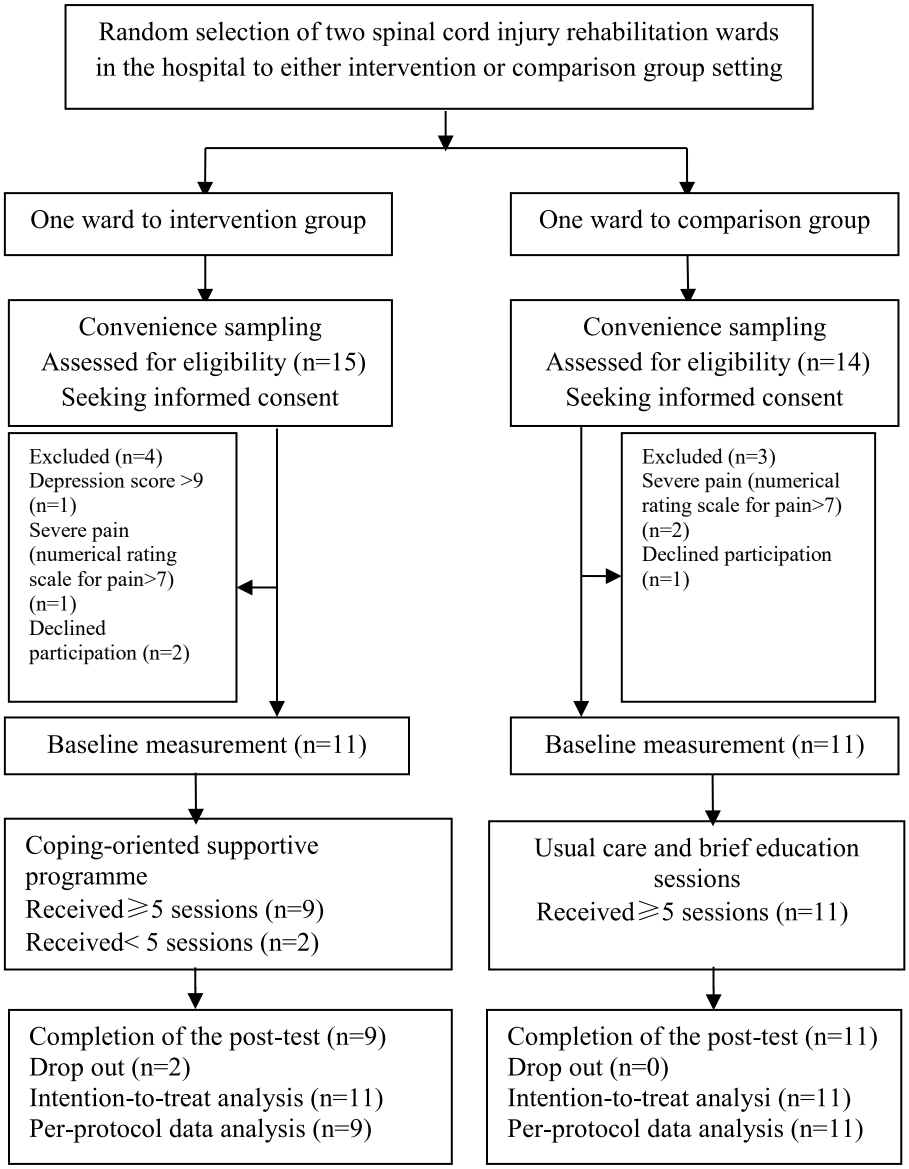


Table 5.1 Socio-demographic and disease information of participants in both intervention and comparison groups at baseline (N=19) (adapted from Li et al 2017b)

Characteristics	Intervention group (n=9)	Comparison group (n=11)
Age	41.67 (8.11)	43 (15.7)
Marital status		
Single	3 (33.3)	3 (27.3)
Married/De facto relationship	6 (66.7)	8 (72.7)
Separate/Divorced/Widow/Others	0	0
Educational level		
Primary school of below	5 (55.6)	2 (18.2)
Secondary	2 (22.2)	5 (45.5)
Tertiary or vocational training	2 (18.2)	4 (36.4)
University or above	0	0
Employment before injury		
Full time	9 (100)	8 (72.7)
Part-time	0	1 (9.1)
Retire	0	2 (18.2)
Student, housekeeping and unemployment	0	0
Religion		
Buddhism	0	1 (9.1)
Taoism	0	0
Christian and Catholic	0	0
Others	1 (11.1)	3 (27.3)
None	8 (88.9)	7 (63.6)
Average family income		
Below 3000 RMB	1 (11.1)	2 (18.2)
3001-6000 RMB	5 (55.6)	4 (36.4)
6001-9000 RMB	3 (33.3)	5 (45.5)
9001-12000 RMB	0	0
More than 12000 RMB	0	0
How do you consider your financial status at present?		
More than enough	0	0
Enough for daily expenses	1 (9.1)	0
Barely enough for daily expenses	4 (36.4)	6 (54.5)
Not enough for daily expenses	4 (54.5)	4 (36.4)
Very insufficient	0	1 (9.1)
Where do you receive financial support for current medical care?		
Insurance from the government or others	3 (33.3)	6 (54.5)
No insurance	6 (66.7)	5 (45.5)
Have you provided the main family income before the injury?		
Yes	8 (88.9)	9 (81.8)
No	1 (11.1)	2 (18.2)

Table 5.1 (Con't)

Characteristics	**Intervention group (n=9)**	**Comparison group (n=11)**
Who is the main caregiver for you?		
Spouse	3 (33.3)	2 (18.2)
Children	2 (22.2)	4 (36.4)
Maid	2 (22.2)	1 (9.1)
Friend or neighbours	1 (11.1)	2 (18.2)
Siblings	0	0
Parent	0	1 (9.1)
Others	1 (11.1)	1 (9.1)
Cause of injury		
Traumatic	9 (100)	10 (90.9)
Non-traumatic	0	1 (9.1)
Injury type		
Tetraplegia	4 (44.4)	4 (36.4)
Paraplegia	5 (55.6)	7 (63.6)
Completeness of the injury		
Complete injury	5 (55.6)	5 (45.5)
Incomplete injury	4 (44.4)	6 (54.5)
Time since injury (months)	8.1 (4.1)	8.2 (4.1)
Length of rehabilitation stay (months)	3.3 (1.7)	4.9 (3.0)
Current medication (psychotropic or painkiller)		
Psychotropic	0	0
Painkiller or analgesic	2(22.2)	5 (45.5)
None	7 (77.8)	6 (54.5)

Notes: Values are mean (Standard Deviation) for continuous data, and number (percent) for categorical data

Internal consistency of the instruments used for the outcome measurements

The value of Cronbach's alpha was calculated based on the pilot study baseline data, in order to confirm the internal consistency of the instruments used in the pilot and main study. Acceptable or good internal validity was found for both primary outcomes, and secondary outcomes (Cronbach's alpha: 0.873 for adaptive coping and 0.890 for maladaptive coping; 0.967 for self-efficacy; 0.731 for depression and 0.744 for anxiety; 0.745 for life satisfaction; and 0.923 for the amount of social support and 0.779 for the satisfaction of social support). These instruments for study outcomes could be reliable to be used in the main study.

Feasibility of recruitment, retention, and intervention adherence

Of the 25 people found to be eligible to take part, three refused to participate, and thus the recruitment or acceptance rate for study participation was 88%. As no participant dropped out from the study, its retention rate was 100%. A total of 9 (82%) of the 11 participants in the intervention group completed five or more sessions (average seven sessions) of the COSP intervention, while all the participants in the comparison group completed five or more sessions of the group education. Only 3 (14%) of the 22 participants did not fully report or complete the post-assessment questionnaires and did not complete one or two scales. Those missing cases were used their last observation carried forward to the post-tests if they were included in the data analysis. Average fidelity ratings were between 5.6 to 7 for all the group sessions, which is satisfactory as suggested by Dumas et al. (Dumas et al., 2001).

Acceptability of the intervention

As for acceptability of the COSP, most participants indicated that the "time arrangement for group meeting" and the "duration of each meeting" were very appropriate, but one suggested meeting more frequently than on a weekly basis (to have more group meetings and communications). All the participants scored the "performance of the group facilitator" and "venue of the group meeting" as appropriate or very appropriate. The majority of participants thought the COSP was beneficial to them, and the most beneficial aspect was the encouragement and support from peers, which further enhanced their motivation to engage in physical rehabilitation. Most of the participants perceived that it was a good chance to communicate their 'true' feelings and thoughts in the group. They also mentioned that they gained confidence in managing different stressful situations by using more adaptive coping strategies.

One participant expressed that: "*I learnt from other group members about their attitude to do the exercises, and would like to engage in the physical rehabilitation instead of lying on the bed all the day*." Another participant also said: "*I was thinking to stop smoking too much as I did not see other group members smoke after being injured, and smoking might do harm to my body especially I am now not in a good health condition*."

For the improvement of the intervention, three participants suggested placing more emphasis on their own lived examples to facilitate learning of effective problem-solving and coping strategies, as their own examples were thought to be more relevant and better understood. Moreover, 4 of the 11 COSP participants expressed difficulties in understanding the theories covered in the group, and they suggested reducing the didactic education about theoretical concepts of the illness and ways of coping.

Preliminary evaluation of the effectiveness of the COSP

Both intention to treat and per protocol analysis were used for the data analysis of the pilot evaluation, and these two methods revealed very similar results on the study outcomes. Since two participants in the COSP were determined to not have received an adequate "dose" of the intervention (i.e. they attended less than five group sessions), we included nine participants of the COSP group in the final per protocol analysis. Due to the small sample size adopted in this pilot test, outcome data analyses were performed on a per-protocol basis that could reflect the true intervention effects unaffected by protocol (intervention) non-adherence (Sedgwick, 2015). Whereas, all 11 participants in the comparison group who completed both the intervention and post-test were included in the data analysis. There was a statistically significant effect of the COSP on self-efficacy, indicating greater self-efficacy (measured by Moorong Self-efficacy Scale; Z= -1.978, p=0.048, Cohen's d=1.06). The per-protocol analysis (Table 5.2) also revealed statistically significant effects of the COSP on the participants' life enjoyment and satisfaction (Z=-2.801, p=0.005, Cohen's d=1.39), and satisfaction of social support (Z=-2.298, p=0.022, Cohen's d=1.22). In addition, the within-group comparisons of the study outcomes indicated that there were statistically significant improvements in self-efficacy (W=-2.668, p=0.008), depression (W=-2.714, p=0.007), and satisfaction with medication use (W=-2.000, p=0.046) in the COSP, but not in the comparison group.

Table 5.2 Data analysis for study outcomes between the intervention group (n=9) and comparison group (n=11) (Intergroup and Intragroup)

Variable	**Time**	**Mean (Standard Deviation) Intervention group (n=9) Wilcoxon signed-rank test for within group comparison (w, p-value)**	**Mean (Standard Deviation) Comparison group (n=11) Wilcoxon signed-rank test for within group comparison (w, p-value)**	**Difference (95% CI, lower bound-upper bound)**	**Mann-Whitney test for between-group comparison (Z, *p*-value)**
Brief COPE Adaptive coping	Pre	38.33 (7.11)	42.27 (5.35)	0.331 - 0.349	(-0.920, 0.321)
	Post	40.89 (6.11)	44.73 (7.47)	0.413 - 0.432	(-0.839, 0.402)
		(-1.735, 0.083)	(-1.842, 0.065)		
Brief COPE Maladaptive coping	Pre	30.89 (8.79)	28.09 (4.25)	0.351 - 0.370	(-0.956, 0.339)
	Post	28.33 (7.19)	29.18 (4.51)	0.711 - 0.729	(-0.383, 0.702)
		(-0.689, 0.491)	(-1.296, 0.195)		
MSES	Pre	62.22 (15.35)	66.00 (16.27)	0.577- 0.596	(-0.570, 0.569)
	Post	84.89 (15.02)	67.73 (17.2)	0.041 -0.049	(-1.978, 0.048*)
		(-2.668, 0.008*)	(-1.430, 0.153)		
HADS-D	Pre	4.78 (1.99)	5.55 (2.42)	0.374 – 0.393	(-0.884, 0.377)
	Post	3.78 (1.64)	4.91 (1.58)	0.164 – 0.178	(-1.404, 1.160)
		(-2.714, 0.007*)	(-1.327, 0.185)		
HADS-A	Pre	5.00 (2.00)	4.18 (1.83)	0.356 – 0.374	(-0.971, 0.332)
	Post	4.22 (2.11)	3.64 (1.75)	0.556 – 0.578	(-0.619, 0.536)
		(-1.732, 0.083)	(-1.732, 0.083)		
Q-LES-Q-SF	Pre	53.44 (5.20)	51.73 (6.86)	0.588 – 0.607	(-0.575, 0.565)
	Post	64.44 (5.43)	57.27 (4.92)	0.003 – 0.005	(-2.801, 0.005*)
		(-2.521, 0.012*)	(-2.854, 0.004*)		
SSQ6 Amount of support	Pre	3.26 (1.07)	2.51 (0.57)	0.053-0.062	(-1.874, 0.061)
	Post	3.19 (0.70)	2.84 (0.54)	0.226-0.242	(-1.243, 0.214)
		(-0.552, 0.581)	(-2.536, 0.011*)		
SSQ6 Satisfaction of support	Pre	5.31 (0.50)	5.18 (0.46)	0.293-0.311	(-1.110, 0.267)
	Post	5.63 (0.48)	5.00 (0.55)	0.017-0.023	(-2.298, 0.022*)
		(-1.200, 0.230)	(-0.719, 0.472)		

Notes: Brief COPE = Brief Coping with Problems Experienced Inventory; **MSES** = Moorong Self-Efficacy Scale; **HADS** = Hospital Anxiety and Depression Scale (A-Anxiety; D-Depression); **Q-LES-Q-SF** = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; **SSQ6**= Six item Social Support Questionnaire; Mann-Whitney test was used for between-group comparisons (Z, P-value), and the Wilcoxon Signed Ranks Test was used for within-group comparisons (W, P value) of pre- and post- assessment results. *P-value statistically significant at α≤0.05

5.3 Discussion on the pilot study results

5.3.1 Content validation of the COSP

One aim of this pilot study was to validate the COSP with experts' consultation. Results demonstrated that the intervention programme was viewed as having satisfactory content validity and as being culturally appropriate. The modifications made were generally related to not just the contents, but also suggestions about how to better facilitate participant involvement and exploration through the use of different questions and techniques, aiming to elicit their cognitive and emotional reactions. Furthermore, the degree to which the COSP could be a good representation of the theoretical underpinnings (i.e., stress and coping model) was enhanced during this validity process, which also helped strengthen the construct validity of this pilot study, as well as the subsequent larger-scale main study.

5.3.2 Preliminary evaluation of the effectiveness of the COSP

Effectiveness of the COSP

Findings from this study suggested that the COSP is a feasible and acceptable psychosocial care programme for Chinese people with SCI during inpatient rehabilitation. We found high levels of intervention attendance and outcome completion rates. The study also provided preliminary evidence of the effectiveness of the COSP for people with SCI during inpatient rehabilitation. The evaluation revealed that the COSP showed statistically significant effects on one of the primary outcomes, participant's self-efficacy, and a few secondary outcomes immediately following the intervention. The effect size estimate for self-efficacy (primary outcome) was 1.06

(Cohen's d), indicating a large magnitude of the difference (Cohen, 1992). This value is larger than that in Chen et al.'s (2015) (Chen et al., 2015) study (Cohen's d= 0.37 for self-efficacy) which evaluated the effects of a video-based psycho-education programme in SCI population in Taiwan, indicating a more beneficial intervention in our study. However, with no significant improvement in coping ability (another primary outcome), the findings of this study might not fully support the theoretical underpinning on stress appraisal, self-efficacy and coping effectiveness. It was stated in (Bandura, 1977)'s theory that the improved self-efficacy could be attributed to strong behavioural reinforcements through more frequent or better use of adaptive coping strategies and at the same time, adopting less maladaptive coping strategies. In addition, self-efficacy can play a crucial role in determining whether coping behaviours are initiated or sustained when they face stressful situations or life challenges (Chen et al., 2015; Kim & Cho, 2017).

Therefore, we hypothesized that the significantly positive results on self-efficacy might be due to participants' experience of learning from the successful model of the video-programme, which is congruent with Chen *et al.*'s (2015) study, and peer support or encouragement from the group members, as indicated by the participants' feedback on the COSP. The COSP participants'' feedback highlights that the encouragement or experience sharing gained from their peers (co-patients with SCI) helped them increase confidence and engage more effectively with the current physical rehabilitation programme in the service. This peer contact could have reinforced the important role of participants' coping ability and enhanced their self-efficacy in the adjustment process. However, the non-significant effects for coping ability might be due to the small sample size, and limitations on the study design (non-randomisation), small sample and/or data analysis (non-covariance analysis) methods used in this pilot test.

In addition, the non-significant effect on coping was consistent with King and Kennedy's (1999) findings, suggesting that marked improvement in coping ability would not be realised immediately after the intervention due to the protective environment and limited chances to use/practise their learned coping skills in the hospital. Therefore, it would be more realistic to assess the participants' changes in coping with a longer period of stressful and difficult life situations in the community or their home, after their discharge from the hospital. Cultural or sociological issues (e.g., conservative to express feelings) might also influence the intervention effects on coping; but however, there were not any in-depth qualitative interviews with the participants to understand or confirm how Chinese cultural issues could have influenced the intervention effects. Therefore, future research should consider exploring the influence of cultural and personal factors on the effectiveness of the COSP in using exploratory qualitative design.

The positive associations between greater self-efficacy and better psychological adjustment to SCI, mental health, and quality of life (Middleton et al., 2007; Peter et al., 2012) might explain the fact that there were statistically significant effects of the COSP on the participants' life enjoyment and satisfaction (secondary outcome). The pilot study also showed that the significant positive results on social support (one secondary outcome) could be seen as its moderating effect as a kind of coping resource to positively affect these patients' psychological adjustment (Muller et al., 2012). From which, the positive adjustment might also contribute to the greater improvement of patients' life enjoyment and satisfaction as shown in the results of this pilot study. Therefore, health professionals are encouraged to adopt different ways of coping and supportive strategies to enhance these patients' self-efficacy as it can be the antecedent for achieving positive effects of patients' stress management and thus psychosocial health in long-term.

Limitations of the pilot study

Two major limitations of this pilot study included: its small-sized convenience sample and the participants were also not randomly selected/allocated to study groups. Practical issues did not allow a 'true' random allocation of participants into the two study groups due to the large probability of intervention contamination effects within each of the wards under study where the patients spend a long period of time in close proximity to each other (Keogh-Brown et al., 2007). In addition, the sample only involved male participants, as there were no eligible female participants available during the study period, which limited the generalisation of the findings. The pre- and post-test design or outcome analysis was unable to detect a longer-term effect of the intervention. Therefore, there was no conclusion made for the effect of the COSP in improving the participants' coping ability and behaviour changes in longer-term follow-up. Future trials are recommended to conduct a longer-term assessment of the intervention effects with a larger sample size under a multi-site cluster randomisation method.

It could be argued that suboptimal levels of skills of the intervention provider (researcher) might contribute to the non-significant results on coping effectiveness. However, the COSP is a theory-based intervention, with a detailed manual for group facilitator and a pamphlet for the participants, which may standardise the intervention procedure. The researcher was also supervised and guided by a clinical psychologist throughout the intervention. The PP analysis approach also tended to bias results in favour of the intended treatment effects, as those who succeed in treatment are most likely to stick with treatment received (Hollis & Campbell, 1999). Importantly, the small sample size could not meet the assumptions or criteria for covariant analysis, which might also lower the validity of the findings.

5.4 Implications of the pilot study to the main study

Despite having some methodological limitations of the pilot evaluation as above described, this pilot study may contribute to the preliminary positive effects of one psychosocial intervention (i.e., the COSP) for people with SCI, which are not well studied or tested globally, especially in Chinese context. The findings supported the validity and potential benefits of the COSP in SCI during inpatient rehabilitation, and thus support the future implantation of the main study. Also, the COSP was a newly developed programme particularly designed for Chinese people with SCI sustaining mild to moderate psychological distress, making it difficult to directly compare the current findings of other similar studies involving those patients with severe or clinically diagnosed psychological health problems at post-SCI.

Several improvements can be suggested for the main study based on this preliminary test. First, referring to the programme format, it would be better to have short recess or breaks every 30 minutes in each individual session in order to facilitate better knowledge gains and engagement in the whole session. Second, flexibility or priority according to group preference should be allowed if any of the group participants are interested in certain topics, even though the topics of each session has been listed in the standardised manual. Third, the sessions can be scheduled and held thrice every two weeks so that the participants could have enough time to reflect or practice what they learned in the session(s). Fourth, the sample size for the main study remained the same with the results calculated in Chapter 4 (i.e., 50 for each of the study groups) due to the fact that the pilot study primarily aimed to evaluate the validity of the COSP intervention as well as its feasibility and acceptability, with weak findings on the COSP effectiveness. Last, participants in the COSP should be encouraged to discuss their learning with their caregivers and/or family members regularly, as the caregivers' cooperation, support and help are needed for their ill relatives to be supported for attending the intervention sessions and completing the homework tasks.

5.5 Summary of the pilot study

The study findings suggested that COSP could be a feasible and acceptable psychosocial care programme for Chinese people with SCI during an inpatient rehabilitation. Preliminary effectiveness testing indicated that the refined COSP was a promising Chinese culturally sensitive psychosocial care programme to enhance the patients' psychosocial health and well-being during inpatient SCI rehabilitation. The COSP and study procedure could be further refined or modified according to the pilot study results. A larger sample size of patients with SCI is needed to test the effectiveness of the COSP robustly before it can be integrated into conventional SCI rehabilitation services and practices.

CHAPTER 6 RESULTS

6.1 Introduction

This chapter reports the results of this quasi-experimental study on the effectiveness of a psychosocial care programme entitled coping-oriented supportive programme (COSP) for people with SCI during their inpatient rehabilitation. The chapter consists of six main parts. First, the details of participant recruitment and attrition are presented in Section 6.2. Second, Section 6.3 describes the comparisons of the participants' socio-demographic information and clinical characteristics, as well as baseline outcome scores. The effects of the COSP on both the primary outcomes (coping ability and self-efficacy) and secondary outcomes (mood status, life satisfaction, social support and pain) over a 3-month follow-up (i.e., at baseline and at immediately, one month and 3 months' post-intervention) in comparison with the comparison group, are presented in Section 6.5. Finally, the results of this study are summarised in Section 6.6.

6.2 Recruitment and dropouts of the study participants

A total of 99 participants (50 for the intervention group, and 49 for comparison group) with SCI were recruited between August 2017 and January 2018, and the flowchart of the study procedure is presented in Figure 6.1, as recommended by the latest CONSORT statement (Schulz et al., 2010). As indicated in the methods chapter (Chapter 4), two SCI wards in each hospital were chosen in pairs (e.g., Ward A for the COSP and Ward B for the comparison group) by drawing labelled cards in an opaque envelope delivered by a rehabilitation nurse in each SCI ward.

During the 6-month recruitment period (August 2017 to January 2018), the medical records of the 118 patients in the two wards were screened for eligibility by the researcher and ward physician. Thirty individuals were excluded due to the following reasons: clinically depressed and/or anxiety state [HADS-D >9 and/or HADS-A >9 (n=5)]; suffering from severe pain (NRS >7; n=6); duration of injury >2 years (n=10); being medically unstable or physically unable to attend the group sessions (n=8); and/or aged >65 years (n=1). Therefore, the 88 eligible patients with SCI in the two wards for the COSP were approached to participate in the study, and six patients (6.8%) refused to take part (due to time inconvenience or lack of motivation for the psychosocial interventions). Then, 50 out of the 82 eligible patients were randomly selected by a rehabilitation nurse using the random numbers generated from the online-randomiser (www.randomiser.org) in a ratio of 3 paraplegias to 1 tetraplegia (as shown in the methods chapter). For the comparison group, 73 eligible potential participants in the two wards were approached to participate in the study, and four of them (5.5%) refused to participate in the process. Fifty participants of the 69 participants were then selected for the comparison group using the similar procedure of recruitment to the COSP group. There was one participant in the comparison group who withdrew from the study before pre-test due to time inconvenience or conflict for participation with other medical treatments. There were also no reported or observed adverse effects (e.g., mortality, severe mental illness or other medical complications) caused by the interventions over the intervention period.

Forty-three of 50 participants (86%) in the COSP completed all three post-intervention outcome assessments. Seven of them (14%) dropped out due to their time inconvenience to attend the sessions, or they were lost to contact after discharged from the hospital. For the comparison group, forty-one of the 49 participants (84%) completed all three post-tests. Eight of them (16%) dropped out due to their time inconvenience to attend the sessions, or they were lost to contact after hospital discharge. There were no reported adverse effects or mortality in the two study groups during the follow-up period.

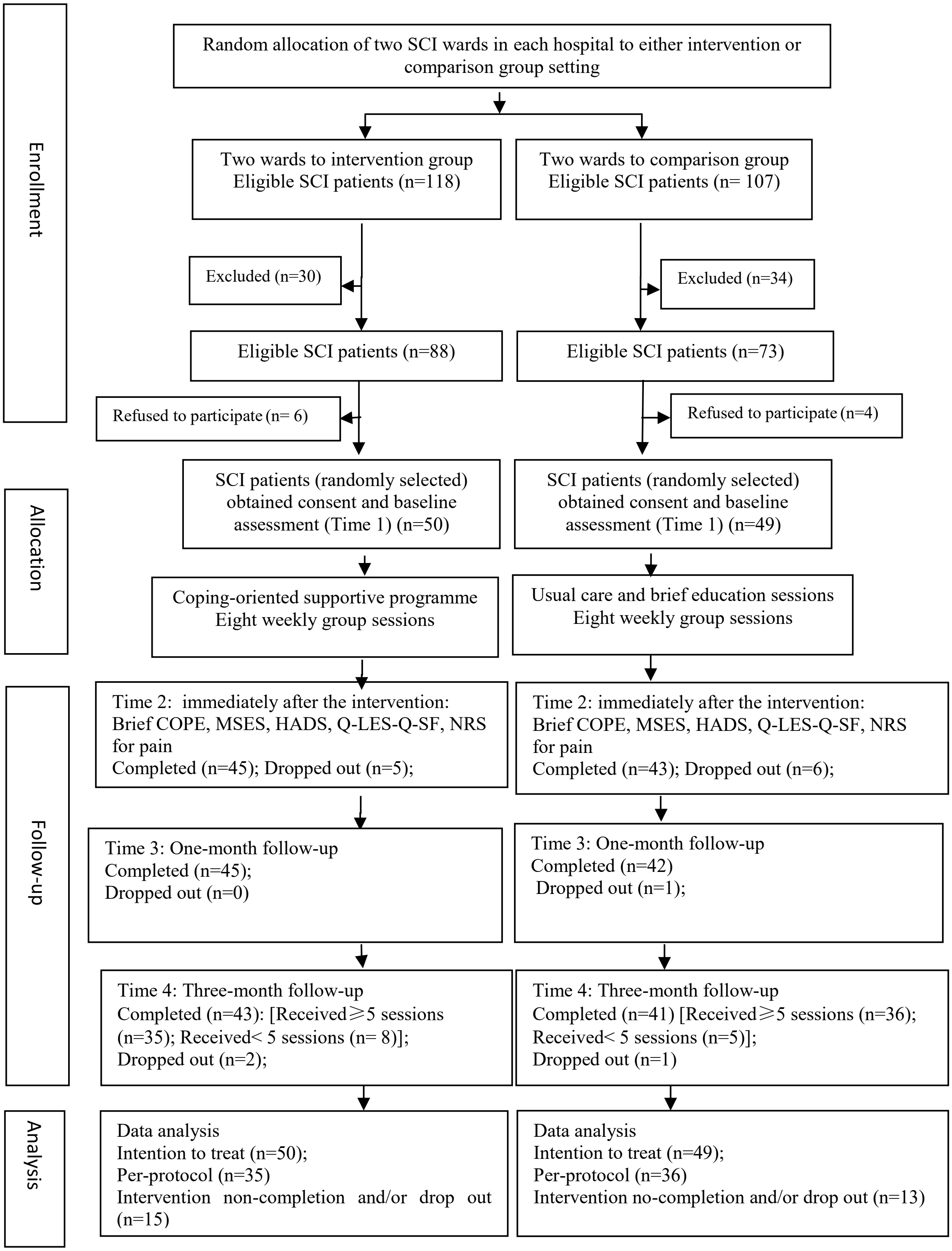
Around 15% attrition rate (15 out of 99 participants) among the participants was noticed. There were also no significant differences in participants' attrition rates (χ^2= 0.104, p= 0.747) between the two groups. Both intention-to-treat and per-protocol analyses were thus used for outcome analysis, in order to examine whether the drop-outs have any influence on the study results.

6.3 Intervention completion and fidelity

During the study period, nine participants (18%) attended less than five of the eight group sessions of the COSP, and seven (14%) attended less than five educational group sessions in the comparison group. There were no statistically significant differences on the participants' intervention attendance rates (χ^2= 0.21, p= 0.50) or completion rates (attended <5 and ≥5 group sessions; χ^2= 0.25, p= 0.62) between the two groups.

For the intervention fidelity, the fidelity checklist (Appendix 3) modified from Kennedy's (2013) Coping Effectiveness Training programme was adopted for rating on individual items of the topics covered in the COSP. The fidelity checklist (20 items) was scored on a scale of 1-7 (i.e., from '1' means poor fidelity to '7' means high fidelity) for each of COSP sub-groups (4-5 participants in each subgroup). With the participants' consent, three COSP sub-groups were randomly selected to be audio-taped and scored on the items. These selected subgroups' audiotaped record was scored on the 21 checklist items by the group helper and the research assistant. The fidelity scores for each of the three subgroups were 120, 125 and 128, accordingly. According to Dumas et al. (2011)'s criteria, the fidelity rating of these three subgroups was calculated as 82% (120/147), 85% (125/147), and 87% (128/147). Those ratings were deemed as satisfactory (> 80%) as suggested by (Dumas et al., 2001). For the single items that were rated less than 5 out of 7 points of rating, the intervention provider (researcher) had discussed with the assessors and reflected for any room for improvements of the intervention delivery. Immediately after the fidelity checking on one group session, the COSP delivery was reviewed and slightly refined for the later sessions or subgroups in order to enhance the intervention fidelity (i.e., ensuring high quality, consistency and adherence to the intervention manual).

Figure 6.1 Flowchart of the study procedure



6.4 Missing data management

Data cleansing was performed, and missing data were considered and managed before proceeding to statistical analysis using the method described in Chapter 4. Regarding the demographic information and clinical characteristics, there were only 0.2% missing values identified. These missing values were imputed by either the mean (for continuous data) or median (for categorical data) of those corresponding variables. Missing data for the baseline (pre-test) and follow-up (post-test, 1- and 3-month follow-ups) measurements of the outcome variables were assessed separately. With regard to the baseline measurement, there were less than 0.3% and 0.2% missing values for the primary and secondary outcomes, respectively. These missing values were also imputed by the mean score of the remaining complete items in that specific subscale of each participant (Schlomer, Bauman, & Card, 2010; Streiner & Geddes, 2001).

Regarding the missing values for the follow-up assessments of the outcome measures, two types of missing data occurred; first, when participants dropped out of the study without completing any follow-up measurement; second, when participants failed to complete one or more items of the questionnaire. For the first type of missing data, there were seven participants in the intervention group who were lost to follow over the 3-month follow-up period. For the comparison group, there were 8 participants who were lost to follow-up at three months. The missing values for these follow-up assessments were handled by the Last Observation Carried Forward (LOCF) strategy, which means that the participants' last data point before missing data was brought forward to the next and all the other follow-ups (Streiner & Geddes, 2001). This approach has been commonly used in clinical trials, and its advantage is to minimise the number of participants who are eliminated from the analysis. However, the LOCF strategy does not take into account that some dropouts might have changed (improved or deteriorated) significantly had they continued (Streiner & Geddes, 2001). This approach was used to ensure sufficient data for analysing the intervention with relatively longer-term effect expected by using LOCF strategy even the participants could not be contacted in the follow-up assessment (Lachin, 2000). For the second type of missing data (missing one or more items in the questionnaire), there were only a few missing data identified for the outcome measures (less than 0.2% for primary outcomes, and less than 0.5% for the secondary outcomes). These missing values were then imputed by the mean score of the remaining items in that specific sub-scale within the measurement for each participant.

6.5 Baseline comparisons

6.5.1 Socio-demographic and clinical characteristics of participants at baseline

Before testing the effectiveness of the planned intervention, a comparison of the participants' demographic and clinical characteristics and all of the outcome variables (presented in the next section) were conducted at baseline to determine the homogeneity of the study groups, and thus identify the covariates to the study outcomes (Polit & Beck, 2008).

The socio-demographic and clinical characteristics of all participants are presented in Table 6.1. A majority of the participants were male (n= 87, 88%). Their mean age was

41 years (SD=11.3), and over half (n=58, 60%) of them were married. Two-thirds (n=60) of the participants had the tertiary education or vocational training. Half of them (n=49, 50%) had an average household (monthly) income of 6,001-9,000 RMB (US$ 906-1358; US$1= RMB6.6); and more than half (n=62, 63%) considered their financial status to be "Barely enough for daily household expenses." Majority of them (n= 86, 87%) indicated that they had offered/contributed to the main family income before injury; and nearly 80% (n=77) indicated that they received financial support for their medical care. Spouses or parents were the main caregivers for two-thirds (n=64, 65%) of the participants.

Nearly all participants (n= 93, 94%) had a traumatic SCI; 74% (n= 73) were paraplegia, and the remaining ones were tetraplegia. Half of them (n= 50, 51%) had a complete SCI, and the average duration of SCI was 7.8 months (SD= 4.3). Whereas, the average duration of rehabilitation stay was 3.1 months (SD= 1.8). There was no statistically significant difference found in the participants' functional independence (measured by FIM) between groups. One-third of the participants (n= 31, 31%) were taking analgesic medication during the study period (according to their medical records). Only two participants (2%) had a history of traumatic brain injury, however, these injuries were not considered likely to be a barrier to receiving psychological interventions.

There were statistically significant differences in marital status (χ^2= 16.327, $p<0.01$) and participants' time since injury ($t= -2.011$, $p< 0.05$) between two study groups (with the comparison group had a longer duration of injury than the COSP). There was also a statistically significant difference in medication use (χ^2= 10.131, $p<0.01$) between groups (with the COSP participants taking more analgesic medication than the comparison group). Based on these results, the marital status, duration of SCI and medication use were used as co-variants in the analyses of treatment effects. Baseline comparison was performed between participants who were compliant to the study protocol (including those completed five or more intervention sessions, and all the follow-up assessments), and those who dropped out during the intervention period or follow-ups, by using independent sample t-test (or using χ^2 test for frequencies). Statistically, the significant difference was only found on the injury type (χ^2= 5.55, p= 0.024), with an attrition rate of tetraplegia (12/28= 43%) indicating higher than that of the paraplegia (16/73= 22%).

The participants in this study were recruited from two rehabilitation hospitals. As stated in the methods (Chapter 4), there were similar numbers of patients in these two hospitals. Thus, almost equal numbers of patients were recruited from these two hospitals, consisting of 50 patients from the COSP and 49 patients for the comparison group. Baseline comparisons on socio-demographic and clinical characteristics of the participants between the two hospitals were also performed. The results indicated no statistically significant differences in these characteristics between the two hospitals (all p values >0.05).

The values of the Cronbach's alpha were calculated based on the main study baseline data, in order to further examine/ensure the internal consistency of the instruments used. Acceptable or good internal validity was found for both the primary outcomes (Cronbach's alpha: 0.862

for adaptive coping; 0.901 for maladaptive coping), and secondary outcomes (Cronbach's alpha: 0,782 for anxiety, 0.796 for depression, 0.920 for amount of social support, 0.813 for satisfaction of social support and 0.820 for life satisfaction).

Table 6.1 Socio-demographic and clinical characteristics of participants at baseline (N=99)

Characteristics	COSP (n=50)	Comparison group (n=49)	t, χ2 or Fisher	p-value
Age (m*ean, SD*)	39.0 (11.7)	43.0 (10.7)	t = -1.78	0.079
Gender			**χ2** = 0.34	0.760
Male	43 (86)	44 (89.8)		
Female	7 (14)	5 (10.2)		
Marital status			t =16.82	***0.001****
Single	15 (30)	5 (10.2)		
Married/De facto relationship	32 (64)	26 (53.1)		
Separate/Divorced/Widow	3 (6)	18 (36.7)		
Educational level			4.78^{a}	0.188
Primary school of below	4 (8)	3 (6.1)		
Secondary	13 (26)	5 (10.2)		
Tertiary or vocational training	26 (52)	34 (69.4)		
University or above	7 (14)	7 (14.3)		
Employment before injury			3.17^{a}	0.197
Full time	40 (80)	40 (81.6)		
Part-time	5 (10)	1 (2)		
Others (e.g., retired and unemployed)	5 (10)	8 (16.4)		
Religion			2.48^{a}	0.240
Buddhism	4 (8)	6 (12.2)		
Taoism/Christian/Catholic/Others	1 (2)	4 (8.2)		
None	45 (90)	39 (79.6)		
Average family income at present			1.07^{a}	0.792
Below 3000 RMB	3 (6)	4 (8.2)		
3001-6000 RMB	18 (36)	20 (40.8)		
6001-9000 RMB	27 (54)	22 (44.9)		
>9000 RMB	2 (4)	3 (6.1)		
Financial status at present			2.83^{a}	0.432
More than enough	3 (6)	4 (8.2)		
Barely enough for daily expenses	31 (62)	31 (63.3)		
Not enough for daily expenses	15 (30)	10 (20.4)		
Very insufficient	1 (2)	4 (8.2)		
Family breadwinner before SCI			**χ2** =0.07	1.000
Yes	43 (86)	43 (87.8)		
No	7 (14)	6 (12.2)		
Financial support for medical care			**χ2** =2.26	0.133
Yes	42 (84)	35 (71.4)		
No	8 (16)	14 (28.6)		

Table 6.1 cont'd

Characteristics	**COSP (n=50)**	**Comparison group (n=49)**	**t, χ2 or Fisher**	**p-value**
Main caregiver			3.89[a]	0.425
Spouse	24 (48)	24 (49)		
Children	4 (8)	5 (10.2)		
Maid	8 (16)	5 (10.2)		
Siblings/Friend/Neighbours	3 (6)	8 (16.3)		
Parent	11 (22)	7 (14.3)		
Cause of injury			2.93[a]	0.112
Traumatic	49 (98)	44 (89.8)		
Non-traumatic	1 (2)	5 (10.2)		
Injury Type			**χ2** =0.004	1.000
Tetraplegia	13 (26)	13 (26.5)		
Paraplegia	37 (74)	36 (73.5)		
Completeness of the injury			**χ2** = 0.25	0.689
Complete injury	24 (48)	26 (53.1)		
Incomplete injury	26 (52)	23 (46.9)		
Time since injury (months) (*mean, SD*)	6.9, 4.2	8.6, 4.2	t = -2.01	***0.047****
Length of rehabilitation stay (months) (*mean, SD*)	2.8, 1.7	3.4, 1.9	t = -1.80	0.075
FIM (m*ean, SD*)	79.8, 16.7	82.8, 15.2	t = -0.952	0.344
Medication use			**χ2** =10.13	***0.002****
Psychotropic/Analgesic	23 (46)	8 (16.3)		
None	27 (54)	41 (83.7)		
History of traumatic Brain injury			2.00[a]	0.459
Yes	2 (4)	0 (0)		
No	48 (96)	49 (100)		

Notes:
COSP= Coping-oriented supportive programme
Comparison group = Usual inpatient rehabilitation with didactic education group sessions
SCI=Spinal Cord Injury
FIM=Functional Independence Measurement;
[a] Fisher's exact test value (if the lowest frequency of any categorical variable in any cell less than 5)
[b] US$1= RMB6.6
p<0.05, **p<0.01, ***p<0.001

6.5.2 Outcome measures scores at baseline

Mean scores of the study outcomes at baseline were also compared between groups (see details in Table 6.2). There were statistically significant differences found on the Brief COPE- adaptive coping (t= -2.049, p= 0.043), and pain (t= -3.147, p= 0.002).

The baseline differences in those these two outcome measurements between the two study groups were also adjusted during the subsequent analysis on the effects of the COSP.

Table 6.2 Comparison of outcome measurements scores at baseline (N=99)

Variables	**COSP (N=50)**	**Comparison group (N=49)**		
	Mean (SD)	**Mean (SD)**	**t**	**p**
Primary outcomes				
Brief COPE				
Maladaptive coping	36.0 (9.3)	34.9 (8.7)	0.599	0.550
Brief COPE				
Adaptive Coping	28.3 (9.0)	32.1 (9.3)	-2.049	***0.043****
MSES	50.3 (12.1)	53.6 (17.7)	-1.086	0.281
Secondary outcomes				
HADS-A	5.7 (1.4)	5.6 (1.3)	0.469	0.640
HADS-D	6.0 (1.4)	5.9 (1.4)	0.001	0.999
SSQ6				
Amount of support	3.4 (1.0)	3.5 (1.0)	-0.716	0.476
SSQ6				
Satisfaction of support	5.2 (0.7)	5.4 (0.5)	-1.620	0.109
Q-LES-Q-SF, Item 1-14	43.0 (10.5)	45.2 (17.2)	-0.776	0.440
	Median, Range, 75% Percentile	**Median, Range, 75% Percentile**	**z**	**p**
Q-LES-Q-SF, Item 15	3,2-3, 3	3,2-3, 3	-0.014	0.989
Q-LES-Q-SF, Item 16	3,2-4, 3	3,2-4, 3	-0.722	0.471
NRS	5,2-7, 6	4,2-6, 5	-3.147	***0.002*****

Notes:COSP= Coping-oriented supportive programme; **Comparison group** = Usual inpatient rehabilitation with didactic education group sessions;
Brief COPE = Brief Coping to Problems Experienced Inventory; **MSES** = Moorong Self-Efficacy Scale; **HADS-A** = Hospital Anxiety and Depression Scale-Anxiety (**A**-Anxiety; **D**-Depression); **SSQ6=** Six item Social Support Questionnaire; **Q-LES-Q-SF** = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; **NRS** = Numerical Rating Scale (Pain); ***p<0.05, **p<0.01, ***p<0.001***

6.6 Effectiveness of the COSP over a 3-month follow-up

The effectiveness of the COSP was evaluated by comparing the changes in the mean scores of the outcome measures between the COSP and the comparison group over 3-month follow-ups (immediately after the intervention and 1- and 3-month follow-up). The study primary outcomes included self-efficacy and coping ability (maladaptive coping and adaptive coping). The secondary outcomes were mood (anxiety and depression), social support, life satisfaction (item1-14), overall life satisfaction (item 15), and satisfaction with medication (item 16), and pain. The MANCOVA test was used for outcome analysis in this study as most of the assumptions for using MANCOVA were not violated (see Section 6.6.1 below). Both intention to treat and per protocol analysis performed are shown below.

6.6.1 Testing the statistical assumptions of MANCOVA test

Our data were tested for examining the eligibility or appropriateness for the use of MANOVA test, and the results for testing the statistical assumptions of MANOVA test were described as follows. All the continuous outcome variables checked were normally distributed, and there were only a few outliners identified according to the Mahalanobis distance. The scatter plots generated by the outcome variables did not show any evidence of non-linearity. Therefore, the assumption of linearity was satisfied. The Box’s test showed that data did not violate the assumption of homogeneity of variance-covariance matrices ($p>0.01$). The Levene’s test showed that most of the outcomes did not violate the assumption of equality of variance, except for two variables (i.e., self-efficacy and life satisfaction item 1-14) whose p-value was less than

0.05. Pearson’s product-moment coefficient test was used to test correlations between all the continuous outcome variables, and the results were presented in Table 6.3. As suggested by (Pallant, 2010), correlations up around 0.8-0.9 could be the reason for concern (i.e., MANCOVA not recommended). Since there was only few violation of the statistical assumptions as shown in Table 6.3, the MANCOVA test was finally adopted. Repeated-measures univariate analysis of covariance was also performed for social support (i.e., amount of social support and satisfaction of social support), as these two variables were not correlated with other outcomes.

Table 6.3 Correlation between outcome measures at baseline using Pearson's product-moment test (N=99)

Variables	**Brief COPE** Maladaptive coping	**Brief COPE** Adaptive coping	**MSES**	**HADS-A**	**HADS-D**	**SSQ6** Amount of social support	**SSQ6** Satisfaction of social support	**Q-LES-Q-SF, Item 1-14**
Brief COPE Maladaptive coping	1.00	-0.80***	-0.75***	0.52***	0.61***	0.13	-0.12	-0.68***
Brief COPE Adaptive coping		1.00	0.79***	-0.49***	-0.55***	-0.13	0.18	0.70***
MSES			1.00	-0.53***	-0.57***	-0.08	0.12	0.79***
HADS-A				1.00	0.42***	0.12	-0.06	-0.35***
HADS-D					1.00	0.16	0.04	-0.52***
SSQ6 Amount of social support						1.00	0.02	-0.07
SSQ6 Satisfaction of social support							1.00	0.18
Q-LES-Q-SF, Item 1-14								1.00

Notes: Brief COPE = Brief Coping to Problems Experienced Inventory; **MSES** = Moorong Self-Efficacy Scale; **HADS** = Hospital Anxiety and Depression Scale (**A**-Anxiety; **D**-Depression); **Q-LES-Q-SF** = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; **SSQ6**= Six item Social Support Questionnaire; Pearson correlation coefficient r; ***$p<0.05$, **$p<0.015$, ***$p<0.0001$***

6.6.2 Results of intention to treat analysis

As discussed in the last section, a mix-model 2x4 group by the time of MANCOVA was performed to investigate the COSP effects on six dependent variables (i.e., maladaptive coping, adaptive coping, self-efficacy, anxiety, depression and life satisfaction). With the participants' marital status, time since injury, and medication intake as covariates, the MANCOVA results indicated a statistically combined significant group by time interaction effects on those tested outcomes (Wilks' Lambda= 0.31, F (6, 91) = 3.46, p<0.001, Partial η2 =0.44, indicating a large effect). The results of univariate analyses on individual outcomes in terms of group*time interaction, group, and time effects are presented in Table 6.4.

For the group-by-time interaction effects, the COSP indicated statistically significant effects on participants' maladaptive coping, adaptive coping, self-efficacy, depression, anxiety, and life satisfaction item 1-14 (all p values <0.001), when compared with the comparison group (eta squared= 0.09 to 0.36, indicating moderate to large effects).

For the between-group effects, the COSP indicated statistically significant improvements in the participants' adaptive coping, self-efficacy, anxiety, depression, and life satisfaction (all p-values<0.001), when compared with the comparison group (eta squared=0.13 to 0.30). However, there were no statistically significant effects found on people's maladaptive coping.

Table 6.4 Intention to treat analysis for study outcomes (MANCOVA) (n=99)

Variables	Mean (SD)		Group effect		Time effect		Interaction effect	
	COSP (N=50)	Comparison group (n=49)	F (3, 96) p-value	Partial η^2	Greenhouse-Geisser, p-value	Partial η^2	Greenhouse-Geisser, p-value	Partial η^2
Brief COPE Maladaptive coping			1.82 $p=0.17$	0.037	454.02 $p<0.001$***	0.21	304.76 $p<0.001$***	0.15
Time 1	35.9(9.3)	34.9 (8.7)						
Time 2	30.0 (8.7)	32.2 (8.9)						
Time 3	29.0 (8.0)	32.2 (8.4)						
Time 4	28.8 (8.1)	33.4 (8.1)						
Brief COPE Adaptive coping			20.03 $p<0.001$***	0.30	5402.49 $p<0.001$***	0.38	4434.04 $p<0.001$***	0.34
Time 1	28.3 (9.0)	32.1 (9.3)						
Time 2	51.9 (8.8)	36.6 (9.7)						
Time 3	53.2 (7.5)	36.8 (9.8)						
Time 4	50.0 (7.7)	34.1 (9.1)						
MSES			15.18 $p<0.001$***	0.24	9697.64 $p<0.001$***	0.36	9496.103 $p<0.001$***	0.36
Time 1	50.3(12.1)	53.6 (17.7)						
Time 2	81.1(14.7)	60.8 (18.7)						
Time 3	83.6(13.5)	59.8 (18.0)						
Time 4	82.4(15.0)	55.8 (15.0)						
HADS-A			19.35 $p<0.001$***	0.29	62.67 $p<0.001$***	0.19	52.69 $p<0.001$***	0.17
Time 1	5.7 (1.4)	5.6 (1.3)						
Time 2	3.4 (1.2)	4.7 (1.1)						
Time 3	3.0 (0.9)	5.3 (1.2)						
Time 4	3.7 (1.0)	5.1 (1.0)						

Table 6.4 Con't

HADS-D			8.59	0.15	73.97	0.20	30.17	0.09
			*$p<0.001$******		*$p<0.001$******		*$p<0.001$******	
Time 1	6.0 (1.4)	6.0 (1.4)						
Time 2	3.8 (1.6)	5.1 (1.9)						
Time 3	3.4 (1.1)	4.9 (1.3)						
Time 4	3.7 (1.0)	5.1 (1.2)						
Q-LES-Q-SF, Item 1-14			7.37	0.13	8136.34	0.44	4506.87	0.31
			*$p<0.001$******		*$p<0.001$******		*$p<0.001$******	
Time 1	43.0(10.5)	45.2(17.2)						
Time 2	63.8(14.4)	52.4(17.6)						
Time 3	67.1(12.1)	52.3(17.1)						
Time 4	68.4(11.7)	47.7(15.6)						

Notes: COSP= Coping-oriented supportive programme; **Comparison group** = Usual inpatient rehabilitation with didactic education group sessions;
Time 1= Baseline**; Time 2=** immediately after the intervention; **Time 3=** One -month follow-up; **Time 4=** Three-month follow-up;
Brief COPE = Brief Coping to Problems Experienced Inventory; **MSES** = Moorong Self-Efficacy Scale; **HADS** = Hospital Anxiety and Depression Scale (A-Anxiety; D-Depression); **Q-LES-Q-SF** = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form;
***$p<0.05$*, **$p<0.01$; ***$p<0.001$**
η2 = Eta Square (Effect size; Small, 0.01<η2 < 0.06; Moderate 0.06<η2< 0.14; Large: 0.14<η2);
Co-variants adjusted: Baseline differences, marital status, time since injury, and medication use.

Regarding the time effects, there were statistically significant changes in the maladaptive coping, adaptive coping, self-efficacy, anxiety, depression, and life satisfaction for all the outcomes (all p values <0.001), across the three post-test periods (i.e., immediately after the intervention, one- and three-month follow-up). The effect sizes of these changes over time were moderate to large (eta squared= 0.19 to 0.44).

As stated in Section 6.5.1, univariate analysis of covariance was performed for social support (i.e., amount of social support and satisfaction of social support) as these two variables were not significantly correlated with other outcomes. The univariate analysis results for these two variables are presented in Table 6.5.

For the group-by-time interaction effects, the COSP indicated statistically significant effects on participants' satisfaction of social support (p<0.001), when compared with the comparison group (eta squared= 0.26, indicating large effects). However, there were no significant effects found for the amount of social support between two study groups. For the between-group effects, the COSP indicated statistically significant improvements in the participants' satisfaction of social support (p<0.001), when compared with the comparison group (eta squared= 0.325, indicating large effect). However, there were no statistically significant effects found on people's maladaptive coping, and amount of social support. Regarding the time effects, no statistically significant changes were found in both the amount of social support and satisfaction of social support.

Table 6.5 Intention to treat analysis for social support using repeated measures ANCOVA (N=99)

	Mean (SD)		**Group effect**		**Time effect**		**Interaction effect**	
Variables	**COSP (N=50)**	**Comparison group (n=49)**	**F (3, 96) p-value**	**Partial η^2**	**Wilks' Lambda, p-value**	**Partial η^2**	**Wilks' Lambda, p-value**	**Partial η^2**
SSQ6 **Amount of support**			0.160 p=0.853	0.003	0.95 p=0.187	0.049	0.94 p=0.470	0.029
Time 1	3.4 (1.0)	3.5 (1.0)						
Time 2	3.6 (0.9)	3.6 (0.7)						
Time 3	3.7 (0.8)	3.8 (0.8)						
Time 4	3.6 (0.9)	3.6 (0.8)						
SSQ6 **Satisfaction of social support**			23.12 ***p<0.001****	0.325	0.89 p= 0.013	0.107	0.55 ***p<0.001****	0.262
Time 1	5.2 (0.7)	5.4 (0.5)						
Time 2	5.4 (0.5)	4.6 (0.6)						
Time 3	5.5 (0.5)	4.2 (0.8)						
Time 4	5.7 (0.4)	3.9 (0.9)						

Notes:
COSP= Coping-oriented supportive programme;
Comparison group = Usual inpatient rehabilitation with didactic education group sessions;
Time 1= Baseline**; Time 2=** Immediately after the intervention; **Time 3=** One -month follow-up; **Time 4=** Three-month follow-up;
SSQ6= Six item Social Support Questionnaire;
p<0.05, **p<0.01; ***p<0.001
η2 = Eta Square (Effect size; Small, 0.01<η2 < 0.06; Moderate 0.06<η2< 0.14; Large: 0.14<η2);
Co-variants adjusted: Baseline differences, marital status, time since injury, and medication use.

Participants' satisfaction with medication (item 15 of Q-LES-Q-SF), overall life satisfaction (item 16 of Q-LES-Q-SF), and pain were at the ordinal level of measurements and thus analysed by using non-parametric test (i.e., Mann-Whitney U test). Results of the analysis of study outcomes using Mann-Whitney U tests are presented in Table 6.6. There was a statistically significant difference (p= 0.027) on satisfaction with medication (item 15 of Q-LES-Q-SF) at Time 2 (with the comparison group better than the COSP intervention); however, there was no sustainable statistically significant effect found for the subsequent two assessment times (Time 3 and Time 4). There was a statistically significant difference found on participants' overall life satisfaction (item 16 of Q-LES-Q-SF) at Time 3 (p= 0.001) and Time 4 (p= 0.002) between two study groups (with the COSP much better than the comparison group). For the pain level (measured by NRS), statistically significant differences were found at Time 3 (the COSP group significantly lower than the comparison group) and Time 4 (the COSP group significantly lower than the comparison group).

Table 6.6 Intention to treat analysis for study outcomes using Mann-Whitney U tests (N=99)

Variables	**COSP (N=50)**		**Comparison group (N=49)**			
	75% Percentile	**Median Range**	**75% Percentile**	**Median Range**	**z**	**p**
Secondary outcomes						
Q-LES-Q-SF, Item 15						
Time 2	4	3, 2-4	4	4, 3, 2-4	-2.22	**0.027***
Time 3	4	3, 3-4	4	4, 3, 2-4	-1.04	0.300
Time 4	4	4, 3-5	4	4, 3, 2-5	-1.53	0.125
Q-LES-Q-SF, Item 16						
Time 2	4	3.5, 3-4	4	4, 3, 2-4	-1.93	0.054
Time 3	4	4, 3-5	4	4, 3, 2-5	-3.48	**0.001****
Time 4	4	3, 2-5	3	3.5, 3, 2-5	-3.09	**0.002***
NRS						
Time 2	4	3, 1-7	5	5, 3, 1-7	-1.09	0.137
Time 3	3	3, 1-5	5	5, 3, 1-7	-2.25	**0.025***
Time 4	3	3, 1-4	4	4, 3, 1-7	-3.09	**0.002***

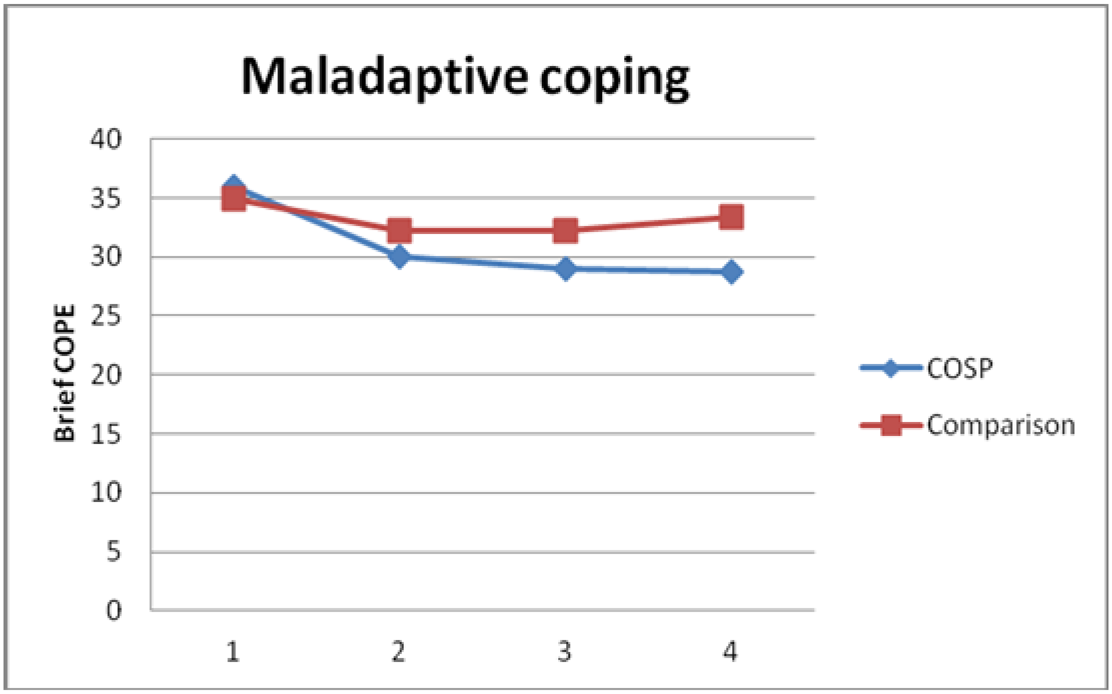
Notes:
COSP= Coping-oriented supportive programme;
Comparison group = Usual inpatient rehabilitation with didactic education group sessions;
Q-LES-Q-SF = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; **NRS** = Numerical Rating Scale (Pain);
Time 2= Immediately after the intervention; **Time 3**= One -month follow-up; **Time 4**= Three-month follow-up;
p<0.05, **p<0.01, ***p<0.001;

The profile plots of the maladaptive coping, adaptive coping, self-efficacy, anxiety, depression, and life satisfaction item 1-14 are presented in Figure 6.2. The figures showed a marked increase of the adaptive coping and self-efficacy at Time 2 in the COSP group, and only a slight increase of these two outcome variables was noticed in the comparison group. The adaptive coping and self-efficacy remained at the similar level among three post-tests (Times 2, 3 and 4). There was also a slight decrease of the maladaptive coping at Time 2 in both study groups, and maladaptive coping at the subsequent Time 3 and Time 4 remained at the similar level with Time 2.

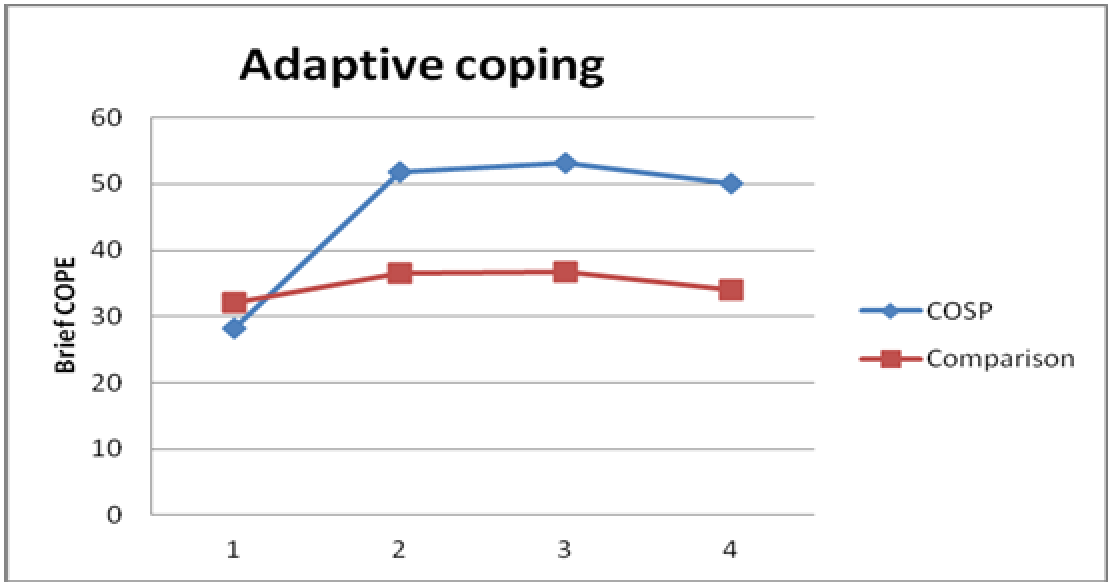
There are marked reductions of anxiety and depression at Time 2 for both study groups. The COSP showed a slight increase in anxiety and depression from Time 3 to Time 4, and the comparison group remained at similar levels of anxiety and depression across three post-tests (Times 2, 3 and 4). The amount of social support did not show many changes across three post-tests for both study groups. The comparison group showed a gradual decrease of the satisfaction of social support across three post-tests, but the COSP showed similar level for the satisfaction of social support across three post-tests (Times 2, 3 and 4). There is also a marked increase of life satisfaction item 1-14 at Time 2 for two study groups, and not much fluctuation was noticed for the subsequent changes in life satisfaction item 1-14 for both groups.

Figure 6.2 Profile plots of the maladaptive coping, adaptive coping, self-efficacy, anxiety, depression, amount of social support, the satisfaction of social support, and life satisfaction item 1-14.

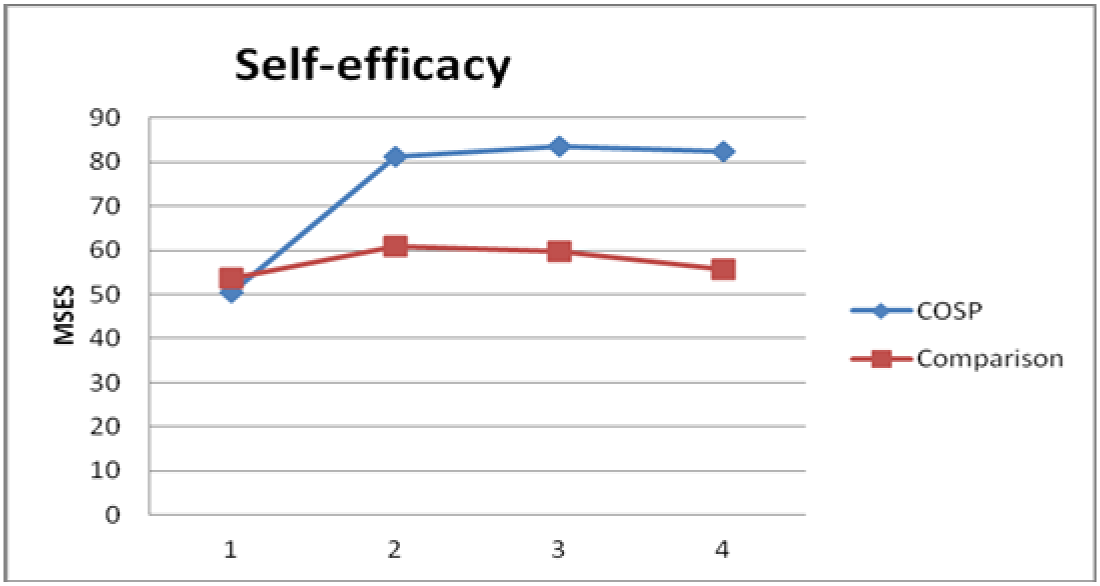
(1) Profile of Brief COPE- Maladaptive coping



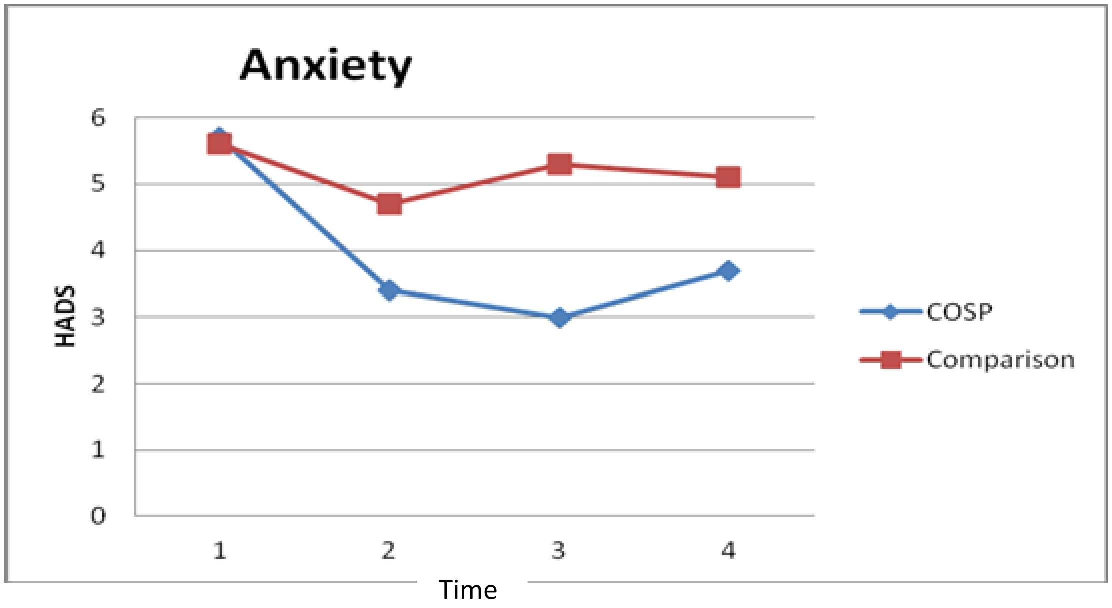
(2) Profile of Brief COPE- Adaptive coping



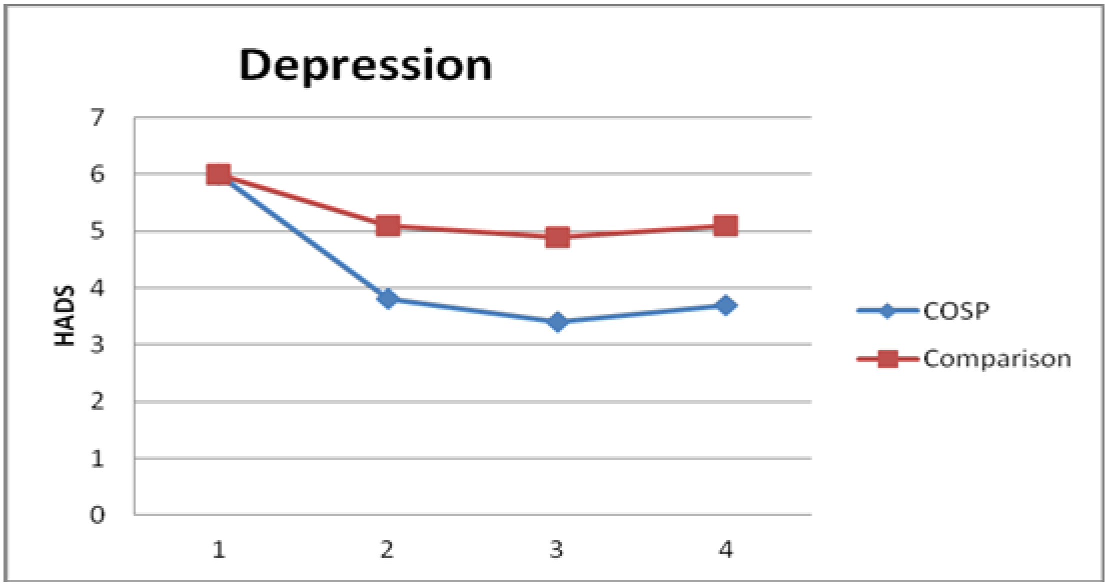
(3) Profile of MSES



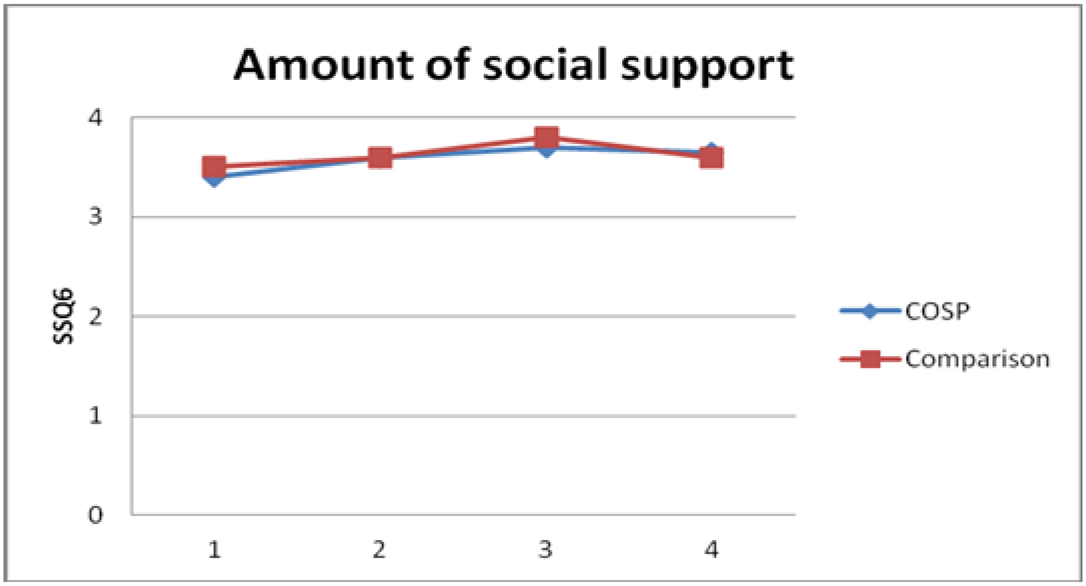
(4) Profile of HADS-Anxiety



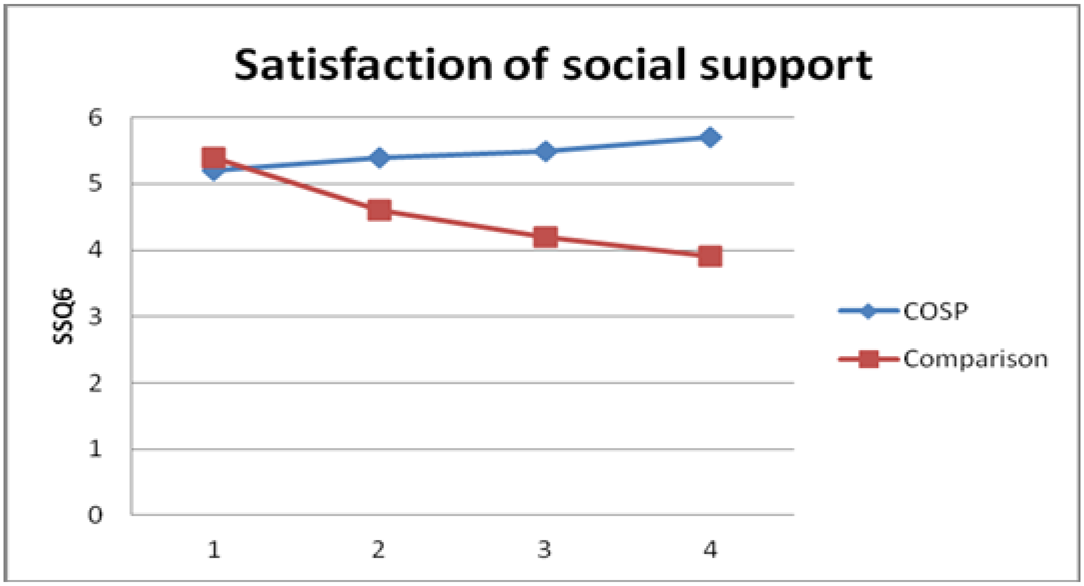
(5) Profile of HADS-Depression



(6) Profile of SSQ6-Amount of social support



(7) Profile of SSQ6-Satisfaction of social support



(8) Profile of Q-LES-Q-SF, Item 1-14

Note: Time 1- Pre-test, Time 2-Postest, Time 3- one-month follow-up, Time 4- three-month follow-up

6.6.3 Results of per protocol analysis

There was a relative moderate attrition rate noticed in both the COSP and comparison group (14% and 16%, respectively); and 9 and 7 participants attended less than five intervention sessions for the COSP and comparison group. Therefore, per protocol analysis was performed. The per protocol (PP) analysis involved those participants who complied with the trial or intervention protocol, and the compliance refers to completing the assigned interventions and being evaluated according to their completion of the study or its protocol (Portney & Watkins, 2000).

Based on the per protocol analysis principles, there were 71 participants included in the data analysis (35 for the intervention group, and 36 for the comparison group). The same procedure as the intention to treat analysis was performed for the per protocol analysis. Baseline comparison of socio-demographic and clinical characteristics indicated statistically significant differences in participants' marital status (χ^2= 19.31, $p<0.01$) and medication (χ^2= 4.78, $p<0.05$) used between two study groups. Results on the baseline comparison of the study outcomes were also considered during data analysis on the COSP effects. Confounding factors identified through baseline comparison were inserted as co-variants when performing the univariate analysis. Data were normally distributed and MANCOVA test was adopted for the PP analyses, as those data did not seriously violate the requirements of the MANCOVA analysis.

Very similar results of the COSP effects on the primary and secondary outcomes were found between the ITT and PP analysis. Same as ITT analysis, the MANCOVA test was performed to investigate the COSP effects on six outcome variables. With the participants' marital status and medication intake as co-variants, the MANCOVA results indicated a statistically combined significant group by time interaction effects on those tested outcomes (Wilks' Lambda= 0.30, F (2, 68) = 2.35, $p<0.001$, Partial η2 =0.45). Then univariate analyses results on each individual outcome are presented in Table 6.7.

For the group-by-time interaction effects, the COSP indicated statistically significant effects on participants' maladaptive coping, adaptive coping, self-efficacy, depression, anxiety, and life satisfaction item 1-14 (all p values <0.001), when compared with the comparison group (eta squared= 0.07 to 0.39, indicating moderate to large effects). For the between-group effects, the COSP indicated statistically significant improvements in the participants' adaptive coping, self-efficacy, anxiety, depression, and life satisfaction (all p-values<0.001), when compared with the comparison group (eta squared=0.21 to 0.47). However, there were no statistically significant effects found on people's maladaptive coping. Regarding the time effects, there were statistically significant changes in the maladaptive coping, adaptive coping, self-efficacy, anxiety, depression, and life satisfaction (all p values< 0.001), across the three post-test periods (i.e., immediately after the intervention, one- and three-month follow-up). The effect sizes of these changes over time were moderate to large (eta squared= 0.18 to 0.3).

Table 6.7 Per-protocol analysis for study outcomes (MANCOVA) (N=71)

	Mean (SD)		**Group effects**		**Time effects**		**Interaction effect**	
Variables	**COSP (N=35)**	**Comparison group (n=36)**	**F (2, 68) p-value**	**Partial η^2**	**Greenhouse-Geisser, p-value**	**Partial η^2**	**Greenhouse-Geiser, p-value**	**Partial η^2**
Brief COPE Maladaptive coping			4.089 $p= 0.021$	0.11	403.83 $p<0.001$***	0.25	252.29 $p<0.001$***	0.17
Time 1	34.9 (9.5)	35.3 (8.9)						
Time 2	28.7 (8.8)	32.6 (8.9)						
Time 3	27.8 (7.9)	32.7 (8.0)						
Time 4	27.5 (8.2)	34.2 (7.8)						
Brief COPE Adaptive coping			30.334 $p<0.001$***	0.47	3167.98 $p<0.001$***	0.35	3108.90 $p<0.001$***	0.34
Time 1	29.7 (9.2)	32.1 (9.7)						
Time 2	54.0 (5.9)	36.9 (10.0)						
Time 3	54.8 (4.9)	37.1 (10.1)						
Time 4	51.5 (4.4)	34.4 (9.5)						
MSES			20.870 $p<0.001$***	0.38	7800.01 $p<0.001$***	0.39	7704.36 $p<0.001$***	0.39
Time 1	51.2 (12.7)	53.0 (17.7)						
Time 2	84.3 (13.5)	60.9 (18.9)						
Time 3	86.5 (13.0)	60.6 (18.6)						
Time 4	86.2 (14.8)	55.9 (14.4)						
HADS-A			22.424 $p<0.001$***	0.39	44.77 $p<0.001$***	0.18	40.932 $p<0.001$***	0.16
Time 1	5.7 (1.5)	5.6 (1.4)						
Time 2	3.2 (1.2)	4.7 (1.2)						
Time 3	2.9 (0.9)	5.4 (1.3)						
Time 4	3.5 (1.0)	5.2 (1.0)						

Table 6.7 Con't

	Mean (SD)		**Group effects**		**Time effects**		**Interaction effect**	
Variables	**COSP (N=35)**	**Comparison group (n=36)**	**F (2, 68) p-value**	**Partial** η^2	**Greenhouse-Geisser, p-value**	**Partial** η^2	**Greenhouse-Geiser, p-value**	**Partial** η^2
HADS-D			11.643 ***p<0.001****	0.26	46.72 ***p<0.001****	0.18	0.717 ***p=0.026****	0.07
Time 1	5.8 (1.3)	6.1 (1.4)						
Time 2	3.5 (1.5)	5.3 (2.0)						
Time 3	3.2 (1.0)	4.9 (1.3)						
Time 4	3.7 (0.8)	5.0 (1.2)						
Q-LES-Q-SF, Item 1-14			8.909 ***p<0.001****	0.21	4863.33 ***p<0.001****	0.38	3446.50 ***p<0.001****	0.30
Time 1	43.1 (11.0)	44.7 (17.1)						
Time 2	64.6 (13.2)	52.3 (17.7)						
Time 3	67.5 (10.7)	52.0 (16.7)						
Time 4	69.4 (10.2)	46.6 (15.3)						

Notes: COSP= Coping-oriented supportive programme;
Comparison group = Usual inpatient rehabilitation with didactic education group sessions;
Time 1= Baseline**; Time 2=** Immediately after the intervention; **Time 3=** One -month follow-up; **Time 4=** Three-month follow-up;
Brief COPE = Brief Coping to Problems Experienced Inventory; **MSES =** Moorong Self-Efficacy Scale; **HADS =** Hospital Anxiety and Depression Scale (A-Anxiety; D-Depression); **Q-LES-Q-SF =** Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form;
***p<0.05, **p<0.01, ***p<0.001;**
η2 = Eta Square (Effect size; Small, 0.01<η2 < 0.06; Moderate 0.06<η2< 0.14; Large: 0.14<η2);
Co-variants adjusted: Baseline differences, marital status, time since injury and medication use.

As stated in Section 6.5.1, individual univariate analysis of co-variance tests were performed for social support (i.e., amount of social support and satisfaction of social support). The univariate analysis results for these two variables are presented in Table 6.8. For the group-by-time interaction effects, the COSP indicated statistically significant effects on participants' satisfaction of social support ($p<0.001$), when compared with the comparison group (eta squared= 0.40, indicating large effects). However, there were no significant effects found for the amount of social support between two study groups. For the between-group effects, the COSP indicated statistically significant improvements in the participants' satisfaction of social support ($p<0.001$), when compared with the comparison group (eta squared= 0.37, indicating large effect). However, there were no statistically significant effects found on people's maladaptive coping, and amount of social support. Regarding the time effects, no statistically significant changes were found in both the amount of social support and satisfaction of social support.

Table 6.8 Per-protocol analysis for social support using repeated measures ANCOVA (N=71)

	Mean (SD)		**Group effects**		**Time effects**		**Interaction effect**	
Variables	**COSP (N=35)**	**Comparison group (n=36)**	**F (2, 68) p-value**	**Partial** η^2	**Wilks' Lambda, p-value**	**Partial** η^2	**Wilks' Lambda, p-value**	**Partial** η^2
SSQ6 Amount of support			0.255 $p=0.776$	0.01	0.962 $p= 0.463$	0.04	0.910 $p= 0.391$	0.05
Time 1	3.2 (0.9)	3.4 (0.9)						
Time 2	3.5 (0.9)	3.5 (0.7)						
Time 3	3.5 (0.8)	3.7 (0.9)						
Time 4	3.5 (0.8)	3.5 (0.7)						
SSQ6 Satisfaction of social support			**19.802** ***p<0.001****	**0.37**	0.865 $p= 0.022$	0.135	0.362 ***p<0.001****	0.40
Time 1	5.2 (0.7)	5.5 (0.5)						
Time 2	5.4 (0.5)	4.6 (0.7)						
Time 3	5.5 (0.5)	4.3 (0.8)						
Time 4	5.7 (0.5)	3.9 (0.9)						

Notes: COSP= Coping-oriented supportive programme;
Comparison group = Usual inpatient rehabilitation with didactic education group sessions;
Time 1= Baseline**; Time 2=** Immediately after the intervention; **Time 3=** One -month follow-up; **Time 4=** Three-month follow-up;
SSQ6= Six item Social Support Questionnaire;
***p<0.05, **p<0.01; ***p<0.001**
η2 = Eta Square (Effect size; Small, 0.01<η2 < 0.06; Moderate 0.06<η2< 0.14; Large: 0.14<η2);
Co-variants adjusted: Baseline differences, marital status, time since injury and medication use.

Participants' satisfaction with medication (item 15 of Q-LES-Q-SF), overall life satisfaction (item 16 of Q-LES-Q-SF), and pain were at the ordinal level of measurements and thus analysed by using non-parametric test (i.e., Mann-Whitney U test). Results of the analysis of study outcomes using Mann-Whitney U tests are presented in Table 6.9. There was a statistically significant difference (p=0.001) showed on satisfaction with medication (item 15 of Q-LES-Q-SF) at Time 2; however, there was no sustainable statistically significant effect found for the subsequent two times assessment (Time 3 and Time 4). There was a statistically significant difference found on participants' overall life satisfaction (item 16 of Q-LES-Q-SF) at Time 3 (p= 0.018) and Time 4 (p= 0.013) between two study groups (with the COSP better than the comparison group). For the pain level (measured by NRS), statistically significant differences were found at Time 3 (the COSP group lower than the comparison group) (p= 0.003) and Time 4 (the COSP group lower than the comparison group) (p= 0.001).

Table 6.9 Per-protocol analysis for study outcomes using Mann-Whitney U tests (N=71)

Variables	**COSP (N=35)**		**Comparison group (N=36)**			
	75% Percentile	**Median, Range**	**75% Percentile**	**Median, Range**	**z**	**p**
Secondary outcome						
Q-LES-Q-SF, Item 15						
Time 2	4	3, 3-4	3	3, 2-4	-3.379	0.001***
Time 3	4	4, 3-4	4	3, 2-4	-2.063	0.048
Time 4	4	4, 3-5	4	3, 2-5	-1.490	0.133
Q-LES-Q-SF, Item 16						
Time 2	4	4, 3-4	4	4, 3-4	-2.160	0.034
Time 3	4	4, 3-5	4	4, 3-5	-2.343	0.018*
Time 4	4	4, 2-5	4	4, 2-5	-2.473	0.013*
NRS						
Time 2	3	3, 1-6	3	3, 1-6	-2.286	0.022
Time 3	3	3, 1-5	3	3, 1-5	-2.908	0.003**
Time 4	3	2, 1-4	3	2, 1-4	-3.573	0.001***

Notes: COSP= Coping-oriented supportive programme;
Comparison group = Usual inpatient rehabilitation with didactic education group sessions;
Q-LES-Q-SF = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; **NRS** = Numerical Rating Scale (Pain);
Time 2= Immediately after the intervention; **Time 3**= One -month follow-up; **Time 4**= Three-month follow-up;
*p<0.05, **p<0.01, ***p<0.001;

6.6.4 Helmert contrasts tests for significant outcome variables

For those outcome variables (i.e., maladaptive coping, adaptive coping, self-efficacy, anxiety, depression, the satisfaction of social support, and life satisfaction) with statistically significant group-by-time interaction effects, Helmert contrasts tests were used to pinpoint at which time point(s) each of these outcomes significantly changes occurred over time.

As consistent results of the COSP effects on the primary and secondary outcomes were found between the ITT and PP analysis, the Helmert's contrast tests in identifying the intervention effectiveness at each specific time (Tabachnick et al., 2001) were performed on the outcomes showing significant differences in the ITT analyses only. Overall, the COSP reported relatively more significant improvements in these psychosocial outcomes than the comparison group. The results (summarised in Table 6.10) included the mean difference of outcome variables between two groups, standard error, F-value (including p value) and 95% confidential intervals.

The results indicated that there were statistically significant between-group differences across three post-tests (Times 2, 3 and 4) for maladaptive coping, anxiety, the satisfaction of social support, and life satisfaction (all p-values < 0.05). However, there were statistically significant differences on adaptive coping ($p= 0.001$) and depression ($p= 0.001$) (p-values less than 0.05) at Time 2 only. For participants' self-efficacy, there were statistically significant differences found at Time 2 ($p= 0.001$) and Time 3 ($p= 0.02$). The results showed that the effects of the COSP were significant and comprehensive immediately after the intervention (Time 2) but no further marked improvements in longer follow-up (1-3 months).

Table 6.10 Helmert Contrast test on outcome variables with significant difference between groups

Variables	**Time 2**				**Time 3**				**Time 4**			
	MD	**SE**	**F (2,96) p-value**	**95% CI**	**MD**	**SE**	**F (2,96) p-value**	**95% CI**	**MD**	**SE**	**F (2,96) p-value**	**95% CI**
Brief COPE Maladaptive Coping	-2.28	1.77	10.29 $p<0.001$***	-5.79 to 1.22	-3.14	1.64	4.58 $p=0.013$*	-6.41 to 0.12	-4.6	1.63	4.43 $p=0.014$*	-7.83 to -1.35
Brief COPE Adaptive Coping	15.3	1.86	33.0 $p<0.001$***	11.6 to 19.0	16.3	1.75	2.17 p=0.119	12.9 to 19.8	15.8	1.69	0.8 p=0.688	12.5 to 19.2
MSES	20.3	3.37	39.5 $p<0.001$***	13.6 to 20.0	23.8	3.20	4.09 $p=0.020$*	17.4 to 30.1	26.6	3.01	1.27 p=0.290	20.6 to 32.6
HADS-A	-1.29	0.24	12.8 $p<0.001$***	-1.76 to -0.82	-2.33	0.22	3.32 $p=0.041$*	-2.77 to -1.89	-1.41	0.20	9.48 $p<0.001$***	-1.80 to -1.00
HADS-D	-1.36	0.35	9.99 $p<0.001$***	-2.06 to -0.67	-1.50	0.24	1.66 p=0.20	-1.97 to -1.02	-1.32	0.22	0.53 p=0.591	-1.76 to -0.89
SSQ6 Satisfaction of social support	-0.21	0.13	34.9 $p<0.001$***	0.63 to 1.09	1.26	0.14	10.28 $p<0.001$***	0.98 to 1.53	1.80	0.14	6.35 $p= 0.003$**	1.53 to 2.07
Q-LES-Q-SF Item 1-14	11.4	3.23	29.5 $p<0.001$***	4.97 to 17.8	14.8	2.97	8.07 $p<0.001$***	8.9 to 20.7	20.7	2.76	10.9 $p<0.001$***	15.2 to 26.2

Notes: MD: Mean Difference; **SE:** Standard error; **95% CI**: 95% confidence level for MD
Brief COPE = Brief Coping to Problems Experienced Inventory; **MSES** = Moorong Self-Efficacy Scale;
HADS = Hospital Anxiety and Depression Scale (**A**-Anxiety; **D**-Depression); **Q-LES-Q-SF** = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; **SSQ6=**Six item Social Support Questionnaire; **NRS** = Numerical Rating Scale (Pain);
Time 2= Immediately after intervention; **Time 3**= One-month after intervention; **Time 4**= Three-month after intervention
*$p<0.05$, **$p<0.01$, ***$p<0.001$; Co-variants adjusted: baseline differences, marital status, time since injury, and medication use.

6.6.5 Clinical significant changes on outcomes of the COSP group

Clinical significant changes were examined on those outcomes (i.e., maladaptive coping, adaptive coping, self-efficacy, anxiety, depression, and life satisfaction) that showed statistically significant changes (time effects) within the COSP group over the 3-month follow up. The Jacobson (1999)'s criteria for the changes that exceed two standard deviations above the mean score at baseline was adopted (as described in the methods chapter), together with the evaluation of the Reliable Change Index (RCI) score (whether RCI >1.96) for such changes. The results of the clinical significant changes (CSC) and the RCI are presented in Table 6.11.

Table 6.11 Clinical significance changes in the maladaptive coping, adaptive coping, self-efficacy, anxiety, depression and life satisfaction for the COSP group (N=50)

	T2 (M)-T1(M)[a]	**T3 (M)-T1(M)**	**T4 (M)-T1(M)**	**CSC**
Brief COPE Maladaptive coping	5.9 RCI[b]=1.4	6.9 RCI=1.8	7.2 RCI=1.8	18.5
Brief COPE Adaptive coping	23.6 RCI=4.1*	24.9 RCI=4.3*	21.7 RCI=3.7*	18
MSES	30.8 RCI=4*	33.3 RCI=4.3*	32.2 RCI=4.1*	24.2
HADS-A	2.3 RCI=1.5	2.7 RCI=1.4	2 RCI=1.2	2.8
HADS-D	2.2 RCI=1.4	2.6 RCI=1.8	2.3 RCI=1.2	2.8
Q-LES-Q-SF, Item 1-14	20.8 RCI=3.1*	24.1 RCI=3.5*	25.4 RCI=3.8*	21

Notes:
COSP= Coping-oriented supportive programme;
Time 1= Baseline**; Time 2**= Immediately after the intervention; **Time 3**= One -month follow-up; **Time 4**= Three-month follow-up;
CSC: Clinical significant changes= 2*standard deviation of the outcome measure at baseline
Brief COPE = Brief Coping to Problems Experienced Inventory; **MSES** = Moorong Self-Efficacy Scale; **HADS** = Hospital Anxiety and Depression Scale (A-Anxiety; D-Depression); **Q-LES-Q-SF** = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form;
[a] The mean difference between the post-test and baseline
[b] **RCI:** Reliable Change Index that shows the mean difference between two measurement times was clinically significant if it >1.96*

According to the results presented in Table 6.11, for the COSP group, clinical significant changes were demonstrated on participants adaptive coping at Time 2 (mean difference= 23.6, RCI >1.96), Time 3 (mean difference= 24.9. RCI >1.96), and Time 4 (mean difference= 21.7, RCI >1.96); Self-efficacy at Time 2 (mean difference= 30.8, RCI >1.96), Time 3 (mean difference= 33.3, RCI >1.96) and Time 4 (mean difference= 32.2, RCI >1.96); life satisfaction at Time 3 (mean difference= 24.1, RCI >1.96), and Time 4 (mean difference= 25.4, RCI >3.8). However, there were no clinically significant changes in the participants' maladaptive coping, anxiety, and depression within the COSP group.

6.6.6 Comparison of COSP effects regarding gender and injury type

As informed by the literature review, gender and injury type (as discussed in the literature review, Chapter 2 and methods, Chapter 4) are the two important factors that could influence participants' coping strategies and psychosocial adaptation to SCI. Therefore, treatment effects between the COSP subgroups regarding gender and injury type were examined using Mann-Whitney U test.

The results of the subgroup analysis are summarised in Table 6.12. In which, only the results on maladaptive coping indicated much differences (statistically significant differences showed at Times 2, 3 and 4, all p-values < 0.05) between male and female participants, with female participants' maladaptive coping score higher than the male participants. For the other outcomes, there were no much differences (only has one-time point statistically significant difference) showed between different gender groups.

As indicated in Table 6.12, mean differences on adaptive coping (Times 1, 2 and 3), self-efficacy (Times 1, 2, 3 and 4), anxiety (Times 1 and 2), depression (Times 1, 2 and 3) and life satisfaction showed statistically significant differences between tetraplegia and paraplegia. The paraplegia sub-group in the COSP indicated higher adaptive coping ability, self-efficacy, and life satisfaction, and lower depression and anxiety than the tetraplegia.

Table 6.12 Comparison of intervention effects in COSP regarding gender and injury type

Variables	Gender				Injury Type			
	Male(n=43) Mean (SD)	**Female(n=7) Mean (SD)**	**z**	**p**	**Tetraplegia (n=13) Mean (SD)**	**Paraplegia (n=37) Mean (SD)**	**z**	**p**
Brief COPE Maladaptive coping								
Time 1	34.88 (9.55)	42.60 (2.51)	-1.78	0.074	41.69(6.99)	31.95(9.21)	-2.88	0.004**
Time 2	28.78 (8.70)	37.14 (3.81)	-2.30	0.019*	35.38(6.94)	28.03(8.48)	-2.58	0.010*
Time 3	27.98 (7.91)	35.57 (4.35)	-2.37	0.018*	34.15(5.51)	27.24(7.94)	-2.77	0.010*
Time 4	27.88(34.71)	34.71(5.02)	-2.16	0.031*	34.46(5.03)	26.86(8.10)	-3.01	0.003**
Brief COPE Adaptive coping								
Time 1	29.12 (9.47)	23.29 (1.89)	-1.16	0.247	22.69 (7.17)	30.27 (8.86)	-3.17	0.002**
Time 2	51.53 (9.38)	54.29 (3.40)	-0.27	0.789	47.46 (6.57)	53.49 (9.05)	-3.08	0.002**
Time 3	52.91 (7.89)	54.71 (3.86)	-0.32	0.746	50.38 (4.75)	54.14 (8.02)	-2.87	0.004**
Time 4	49.28 (8.03)	54.29 (2.63)	-1.97	0.049*	48.46 (4.56)	50.51 (8.51)	-1.81	0.070
MSES								
Time 1	51.77(12.12)	41.00 (6.81)	-2.51	0.012*	40.38 (8.07)	53.73 (11.37)	-3.55	<0.001***
Time 2	81.42(15.29)	79.00 (10.61)	-0.81	0.417	68.54 (13.57)	85.49 (12.43)	-3.94	<0.001***
Time 3	83.79(14.11)	82.57 (9.78)	-0.34	0.736	71.08 (12.97)	88.03 (10.75)	-4.22	<0.001***
Time 4	83.07(15.47)	78.14 (12.06)	-0.99	0.320	67.69 (13.71)	87.54 (11.81)	-4.11	<0.001***
HADS-A								
Time 1	5.51 (1.37)	6.86 (1.07)	-2.40	0.017*	6.38 (1.26)	5.46 (1.39)	-2.02	0.043*
Time 2	3.37 (1.20)	3.43 (1.51)	-0.04	0.965	4.00 (1.16)	3.16 (1.19)	-2.16	0.031*
Time 3	2.95 (0.90)	3.00 (0.82)	-0.28	0.777	3.15 (0.90)	2.89 (0.88)	-0.98	0.328
Time 4	3.58 (0.98)	4.14 (0.90)	-1.54	0.123	4.00 (0.91)	3.54 (0.99)	-1.64	0.102

Table 6.12 Con't

Variables	**Gender**				**Injury Type**			
	Male(n=43) Mean (SD)	**Female(n=7) Mean (SD)**	**z**	**p**	**Tetraplegia (n=13) Mean (SD)**	**Paraplegia (n=37) Mean (SD)**	**z**	**p**
HADS-D								
Time 1	5.81 (1.33)	7.00 (1.41)	-1.95	0.051	6.85 (1.35)	5.68 (1.29)	-2.66	___0.008**___
Time 2	3.79 (1.52)	3.57 (1.81)	-0.31	0.753	4.62 (1.45)	3.46 (1.48)	-2.34	___0.019*___
Time 3	3.49 (1.08)	3.00 (1.00)	-1.19	0.234	4.00 (1.08)	3.22 (1.00)	-2.08	___0.038*___
Time 4	3.84 (0.99)	3.14 (0.90)	-1.59	0.112	3.62 (1.12)	3.78 (0.98)	-0.32	0.747
SSQ6								
Satisfaction of social support								
Time 1	5.19 (0.72)	5.36 (0.48)	-0.40	0.687	5.31 (0.88)	5.17 (0.61)	-0.98	0.327
Time 2	5.41 (0.51)	5.57 (0.35)	-0.72	0.472	5.58 (0.40)	5.38 (0.52)	-1.14	0.256
Time 3	5.44 (0.55)	5.79 (0.39)	-1.61	0.109	5.58 (0.64)	5.46 (0.51)	-1.02	0.306
Time 4	5.62 (0.46)	6.00 (0.00)	-2.08	___0.037*___	5.77 (0.44)	5.65 (0.45)	-0.94	0.347
Q-LES-Q-SF, Item 1-14								
Time 1	43.69(10.77)	38.52 (8.24)	-0.88	0.380	39.01 (7.06)	44.35 (11.26)	-1.51	0.131
Time 2	64.04(15.13)	61.99 (9.82)	-0.77	0.440	55.49 (11.51)	66.65 (14.36)	-2.59	___0.010*___
Time 3	67.57(12.35)	64.29 (11.20)	-0.94	0.347	58.65 (10.43)	70.08 (11.38)	-2.95	___0.003**___
Time 4	69.06(11.28)	64.30 (14.17)	-1.01	0.312	59.89 (9.80)	71.38 (10.88)	-3.10	___0.002**___

Notes:
Brief COPE = Brief Coping to Problems Experienced Inventory; **MSES** = Moorong Self-Efficacy Scale;
HADS = Hospital Anxiety and Depression Scale (**A**-Anxiety; **D**-Depression); **Q-LES-Q-SF** = Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; **SSQ6**=Six item Social Support Questionnaire;
Time 1= Baseline**;** **Time 2**= Immediately after intervention; **Time 3**= One-month after intervention; **Time 4**=Three-month after intervention. ___*p<0.05, **p<0.01, ***p<0.001___

6.7 Summary of the results

The four SCI wards (two wards in each study hospital) were assigned as the COSP (two SCI wards) group and the comparison group (two SCI wards). A total of 99 patients with SCI were randomly selected from 161 eligible patients to participate in the study, in which 50 patients were in the didactic education group. Overall, the completion of the COSP intervention was high with only 16 participants attending less than five group sessions. A total of 15 participants (i.e., 7 in the COSP and 8 in the comparison group) were lost to follow-up after three months. There were 99 participants included in the ITT analysis and 71 participants (include those complete 5 or more intervention sessions, and all three times follow-up assessments) included in the PP analysis.

There was a statistically significant overall improvement in the majority of the psychosocial outcomes for participants in the COSP. Consistent with our study hypothesis, the MANCOVA tests (using the participants' marital status, time since injury, and medication intake as the co-variants) indicated statistically significant effects on the primary outcomes (coping ability and self-efficacy), as well as the other secondary outcomes including mood status (anxiety and depression), satisfaction of social support and life satisfaction between two study groups over a 3-month follow-up period (with moderate to large effect sizes; Partial eta-squared ranged from 0.09 to 0.36). However, there was no statistically significant difference found in the amount of social support between the two study groups. The Mann-Whitney U tests indicated statistically significant effects of the COSP on overall life satisfaction (item 16 of the Q-LES-Q-SF) and pain (NRS score) at Times 2 and

3. Very similar results of outcome measures (treatment effects) were found between the ITT analysis and PP analysis.

Results of Helmert's contrasts tests for those variables with a significant difference between groups using MANCOVA indicated that the main intervention effects on participants' maladaptive coping, anxiety, the satisfaction of social support, and life satisfaction of COSP were achieved at immediately after the intervention, 1- and 3-month follow-up. For the main intervention effects on participants' self-efficacy, there were statistically significant effects achieved only immediately after the intervention and 1-month follow-up. However, for participants' adaptive coping and depression, statistically significant effects were only achieved immediately after the intervention. For the COSP intervention, clinically significant changes were found in participants' adaptive coping, self-efficacy at Times 2, 3 and 4; and life satisfaction at Times 3 and Time 4. In addition, female participants indicated statistically higher scores on maladaptive coping in the three post-tests over 3 months' follow-up. There were statistically significant differences found on most of the study outcomes (i.e. maladaptive coping, adaptive coping, anxiety, depression and life satisfaction) between the two injury types; and the participants with paraplegia indicated more adaptive psychosocial outcomes than those with tetraplegia. All of the above results on the effects of the COSP on those patient outcome variables, and the subsequent sub-group analyses on gender and injury types in the COSP are discussed in the next chapter.

CHAPTER 7 DISCUSSION

7.1 Introduction

This chapter discusses the effectiveness of the COSP intervention (Section 7.2), including its effects on the primary outcomes and secondary outcomes of the study, and any sustainable improvements of the study outcomes. Clinically significant changes in the outcomes of the COSP group and intervention effects within the COSP group in terms of gender and injury sub-groups are also discussed simultaneously, followed by a discussion on the intervention completion and study attrition. The links between theoretical underpinnings and study findings are discussed in Section 7.3. Finally, strengths and limitations of the study are delineated in Sections 7.4 and 7.5, respectively.

7.2 Overview and individual aspects of the effectiveness of the COSP

A holistic view of disability-related rehabilitation for people with SCI was initiated in the 1980s (Fuhrer, 1987), and it emphasised the importance of delivering both physical and psychosocial care in the rehabilitation process of disabled patients. As stated in Chapter 2, early research and most of the current rehabilitation services have been emphasising biomedical approaches to SCI rehabilitation (focusing on medical complications, physical functioning and training such as by active exercise programmes), demonstrating satisfactory improvements in physical functioning, certain level of self-care and general health condition (Harvey, Lin, Glinsky, & De Wolf, 2009; Hicks et al., 2011). As shown in our literature review in Chapter 2, only a few studies on the psychosocial interventions for people with SCI during inpatient rehabilitation were conducted in Western countries, and only one experimental study evaluating a psycho-education intervention was found in Asia. This PhD study can fill in this knowledge/research gap in psychosocial rehabilitation in SCI. This PhD study provides evidence of the effectiveness of a culturally sensitive (adopting characteristics or issues in Chinese culture) psychosocial care programme entitled "coping-oriented supportive programme (COSP)" for people with SCI during their inpatient rehabilitation stage when compared with a didactic brief education group over a 3-month follow-up. The COSP was a group-based psychosocial intervention programme with eight weekly 1.5-hour sessions, which focused on training and facilitating patients to improve their coping ability and self-efficacy in managing their life problems and difficulties caused by SCI. The COSP demonstrated significantly positive improvements in people's coping ability, self-efficacy, mood state, the satisfaction of social support, and life satisfaction.

The stress and coping theory described in the literature review has also shed light to the main purpose of this research on facilitating people with adaptive coping skills to deal with different challenges and stressors caused by or in relation to SCI. The COSP based on the concepts of stress and coping theory was found effective in enhancing people's coping ability and self-efficacy at post-SCI as well as the other important psychosocial outcomes. In addition, most of the interventional studies regarding psychosocial care for people undergoing inpatient SCI rehabilitation tend to be specialised programmes targeting on specific subgroups of the SCI population such as those with chronic pain, depression and/or pressure ulcer, which could only account for 10-20% of the SCI population (Craig & Perry, 2008). The COSP intervention evaluated in our study is a "front-line" psychosocial care programme designed for those people who are in the early stage of rehabilitation presenting with adjustment and emotional problems and anticipating the difficulties encountered in future home leaving after hospital discharge. Our study also filled the research gaps of lacking interventional studies with its focus in psychosocial care for people with SCI in Asian (e.g., Chinese context). Consistent with our study hypothesis, the study findings indicated statistically significant effects on the primary outcomes (coping ability and self-efficacy), as well as the other secondary outcomes including mood status (anxiety and depression), satisfaction of social support and life satisfaction between two study groups over a 3-month follow-up period (with moderate to large effect sizes; Partial eta-squared ranged from 0.09 to 0.36). However, there was no statistically significant difference found in the amount of social support between the two study groups.

7.2.1 Effectiveness of the COSP on primary outcomes

The results of this study (Section 6.6) indicated that there were statistically significant improvements on people's coping ability and self-efficacy for the COSP participants, in comparison with the didactic education group over the 3-month follow-up. The COSP has achieved large group*time effects on those primary psychosocial outcomes (partial eta squared= 0.15 for maladaptive coping, 0.34 for adaptive coping and 0.36 for self-efficacy) (Cohen, 1992) over the follow-up evaluation stage, when compared with the didactic education group during the inpatient rehabilitation setting. The results generated from the MANCOVA test followed by Helmert contrast tests supported the research hypothesis (Chapter 1) that the COSP participants could indicate significantly greater improvements in maladaptive coping at immediately post-intervention, 1- and 3-month follow-ups.

The results also supported partially the hypotheses that the COSP could demonstrate significantly more adaptive coping at immediately post-intervention, and higher self-efficacy at both immediately and 1-month post-intervention, when compared with the comparison (brief education) group. However, the COSP participants' adaptive coping at 1- and 3-month follow-up, and self-efficacy at 3-month follow-up were found slightly improved only.

Intervention effects on coping

The COSP has shown statistically significant effects on people's coping ability, including both maladaptive coping and adaptive coping. It is also noteworthy that the main components of the COSP focused on improving participants' coping abilities for various stressful events/situations at post-SCI during their earlier rehabilitation stage. The stress and coping model is widely used to illustrate people's psychological adjustment process to SCI (Folkman et al., 1986). Coping as the core concept of the theory was the most important target of the COSP intervention (Martz & Livneh, 2007). The COSP intervention provided the participants with various coping strategies, mainly including problem-solving, emotional coping and ways of challenging negative thoughts, as well as distinguishing between maladaptive and adaptive coping strategies and attributing changes from maladaptive to adaptive coping.

Research evidence supporting the positive effects on coping ability or coping-related beliefs from psychosocial interventions for people with SCI were reported in several previous studies (Dorstyn et al., 2012; Perry et al., 2010) conducted in the community. Dorstyn et al. (2010)'s study that evaluated a cognitive behavioural based intervention for people with SCI and co-morbid depression. There were also improved coping strategies (medium effect size) reported in (Perry et al., 2010)'s study that tested the effects of the pain management programme (mainly cognitive behavioural approaches). Psychosocial interventions were also found to be effective in enhancing the coping ability for people with other kinds of acquired physical disabilities (i.e., stroke, limb amputation or multiple sclerosis) (Dorstyn, Mathias, & Denson, 2011). Psychosocial care programmes (problem-solving based intervention) are found to be effective in improving stroke survivors' coping abilities, mental health and social functioning (Grant, Elliott, Weaver, Bartolucci, & Giger, 2002). Coping skills training and coping-based interventions were also found to be effective in supporting people's psychological adjustment to multiple sclerosis (McCabe, McKern, & McDonald, 2004), as well as improving those participants' quality of life (Schwartz, 1999).

The psychosocial care programmes of the above-mentioned studies having positive effects on participants' coping ability (either in spinal cord injury population or people with other kinds of physical disabilities) have its common characteristics in adopting one or some cognitive (and/or behavioural) techniques (e.g., problem-solving, negative thoughts challenging, relaxation, some simple mindfulness exercise, pleasant activity scheduling, social skills training such as communications skills training). This is in line with the COSP intervention used in our study as coping was the main target of the intervention programme (four of the 8 sessions in the COSP targeted on the coping skills facilitation and discussion). Participants of COSP intervention and other interventions (pain management programme, social supportive group and cognitive behaviour interventions) mentioned above were facilitated various strategies in managing the stressful situations (events) they encountered. The positive findings on coping found from intervention studies for people with SCI or other kinds of physical disabilities can further confirm/certify the effectiveness of the individual components (i.e., problem-solving, challenging negative thoughts, emotion-based coping) of the COSP intervention in enhancing people's coping abilities in our study.

Large effect sizes were indicated on both the maladaptive coping and adaptive coping abilities of our study participants. Our study has its focus on enhancing people's coping abilities, and the intervention adopted was a coping-oriented supportive programme with the core elements/components of the intervention package on coping. However, previous studies that adopted coping effectiveness training, as their intervention approach did not show statistically significant effects on participants coping abilities (Duchnick et al., 2009; Kennedy et al., 2003; King & Kennedy, 1999). This is because our study adopted a parallel comparison group design (comparing the COSP intervention with didactic education group), which improved the methodological design as well as the validity of the study findings of (Kennedy et al., 2003; King & Kennedy, 1999)'s studies that used a historical control group (which does not permit concurrent comparison under the same context). In addition, the positive effects showed in our study might be due to the study settings (i.e., rehabilitation wards for people with SCI) that are under the open visiting policy. This means participants of our study have much freedom to access the outside environment during their stay in the unit. Due to the inadequate development of the community health system in Mainland China, patients with SCI would often stay in the inpatient rehabilitation wards for half a year to an average one year. In this relatively long hospital stay, patients, therefore, have more chance to develop better adaptive coping skills. However, the participant still adopted less maladaptive coping strategies (such as substance misuse or avoid using health service) before both the COSP implementation and the follow-up assessment periods. Therefore, the COSP effectiveness on the changes in participants' maladaptive coping was not significantly indicated. Also, it is worth to note that the main study had overcome the major limitation of our pilot study that adopted a small sample size resulting in a lack of statistical power (Li, Bressington, & Chien, 2017).

In terms of the clinically significant changes (improvements) of participants' adaptive coping and maladaptive coping in the COSP intervention group, only people's adaptive coping improved immediately after the intervention and during its follow-ups. The clinical significant changes of people's adaptive coping in the COSP improved on the previous negative findings of (Kennedy et al., 2003; King & Kennedy, 1999)'s studies on the coping outcomes of the intervention group. Our study findings in terms of clinically significant changes in people's adaptive coping improved the study finding of the above-mentioned studies. This might imply that we adopted a more rigorous design for the COSP evaluation, and the relatively longer hospitalisation stay of the participants in our study might contribute to the findings. Due to the under-development of the health service systems in the community settings of Mainland China (Sun et al., 2015), patients stayed in the inpatient rehabilitation setting for a relatively longer period compared with other Western countries. This relatively longer inpatient stay might have contributed to the large changes on their adaptive coping strategies (the participants of our study sustained a relatively long time since injury that the previously reviewed interventional studies presented in Chapter 2). Researchers and health professionals need to pay more efforts on identifying effective ways in reducing people's maladaptive coping strategies/styles at post-SCI, as well as effective ways to assess people's maladaptive coping behaviours (e.g., field observation or interviews). As suggested by (Kennedy et al., 2003), the relatively protective environment might also hinder the large clinically significant changes on people's maladaptive coping, which, we expect, to be improved to a higher degree after participants' community reintegration.

Intervention effects on self-efficacy

The COSP also indicated statistically significant effects on participants' self-efficacy (as another primary outcome of this study) in dealing with different stressful life situations encountered after SCI. Self-efficacy serves an important role in enhancing or managing people's psychological adjustments to SCI. It is suggested that self-efficacy is one of the essential positive factors in managing or relieving from the psychosocial impacts of SCI, with which people would have improved motivation and confidence in thriving their future (Middleton & Craig, 2008). The environment of inpatient rehabilitation is quite different from the community, and people with SCI would face different kinds of stressful situations in different social contexts. A higher level of self-efficacy in life-situation management could contribute and ensure a higher substantive engagement in adaptive coping when people are faced with stressful situations (Galvin & Godfrey, 2001). The high self-efficacy determines whether coping behaviour would be initiated, how much energy and efforts would be spent, and its sustaining time when they face various stressful situations or life difficulties (Bandura, 1977), and thus make a crucial contribution to the successful adaptation to SCI (Kim & Cho, 2017). The coping and self-efficacy play pivotal roles during dynamic process of people’s psychological adjustment, in addition to the significant contributions from participants’ coping ability to their improved self-efficacy, other important factors (e.g., social support) are also required, which would be discussed later in this section.

Theoretically, improved self-efficacy can be attributed to strong behavioural reinforcements through more frequent use of adaptive coping strategies and less use of maladaptive coping strategies (Marks & Allegrante, 2005). That is to say, improved self-efficacy is the product of effective coping behaviours, and conversely, this serves as the antecedent for subsequent effective coping behaviour in the long-term run. The mechanisms can be illustrated by (Bandura, 1977)’s self-efficacy theories. That is to say, learning from consequences following certain types of behaviour or performance is conceived as a cognitive process, form which people’s self-efficacy to a specific task or situation will be altered by behaviour reinforcement to gain beneficial consequences and avoid negative consequences. This illustration is in line with the claim that participants’ self-efficacy and coping are inter-related and interactive with each other within the dynamic stress and coping model (Folkman et al., 1986). Participants’ perceived self-efficacy or self-mastery in dealing with the stressful situations caused by SCI can be improved by benefits gained from the therapeutic components of the COSP intervention in the changes/improvements of cognitive appraisal of the injury and experiencing effective coping strategies (Arbour-Nicitopoulos, Ginis, & Latimer, 2009; Chen et al., 2015).

There are other previous studies of psychosocial interventions for people with SCI adopting coping as the main concept for their intervention programmes. The findings of those studies indicated statistically significant effects on the cognitive-oriented concepts/outcomes including people's perception of control (Cohen's d=0.55) (Craig et al., 1997), sense of coherence (Cohen's d = 0.40) (Norrbrink Budh et al., 2006), and self-perception (Cohen's d= 0.83) (Chen et al., 2015). As suggested by (Peter et al., 2012), self-efficacy was found to have positive correlations with those concepts/variables mentioned above. These cognitive-oriented concepts were also under the same category of "appraisal" driven by the stress and coping theory (Folkman et al., 1986; Galvin & Godfrey, 2001), which further consolidated the effects of the COSP on improving people's self-efficacy in managing SCI and its related disabilities.

The moderate correlation between coping and self-efficacy in our study were also confirmed by analysing the baseline data (r=0.75 and 0.79 for maladaptive coping and adaptive coping respectively, p<0.01). Apart from coping skills training and sharing, we adopted and provided a DVD training material to facilitate learning from other people with SCI. The DVD programme concerns on the sharing from those role models about how they could successfully cope and adjust to various difficult life situations concerning SCI. The education and discussions about the usefulness of self-efficacy in illness management during the last COSP group session were also covered (Bandura, 1977; Chen et al., 2015). Participants' feedback on the COSP also emphasised the positive effects gained from peers' support and encouragement during the groups. This peer support and encouragement might also contribute to the improvement of participants' self-efficacy. The contributions from participants' improved social support to their self-efficacy and the other outcomes are discussed more in the "social support" section of the outcomes discussions. Furthermore, coping-based interventions (i.e., coping effectiveness training) were found to significantly improve self-efficacy and positive states of mind for people living with HIV (Chesney, Chambers, Taylor, Johnson, & Folkman, 2003), stroke (Ch'Ng, French, & Mclean, 2008) or other types of physical disabilities (Marks & Allegrante, 2005; Villanueva, Fitch, Quadir, Raju Sagiraju, & Alamgir, 2017). The sense of control for people with chronic heart failure was also found to be the positive outcome of the coping-based interventions (Nahlen Bose et al., 2016). The finding of this study on self-efficacy was not only consistent with the literature but also the results of the pilot study with a large effect on self-efficacy in those COSP participants at immediately post-intervention (Li et al., 2017).

The self-efficacy of the participants in the COSP also indicates clinically significant changes at immediately after the intervention, 1- and 3-month follow-ups (according to the results on the clinically significant change in Chapter 6). In our study, the scores on self-efficacy of participants in the COSP at the three follow-up times all exceeded the two standard deviations above the baseline mean score (Jacobson et al., 1999). However, the clinical significant changes were not found to be revealed in (Arbour-Nicitopoulos et al., 2009)'s findings on participants' self-efficacy beliefs in coping with illness management, as well as (Norrbrink Budh et al., 2006)'s study on the improvements in participants' sense of coherence. The self-efficacy scores at post-tests in the above-mentioned two studies indicated improvements (changes to better self-efficacy or sense of coherence) from the baseline measures; however, these changes did not exceed the two standard deviations from the baseline scores. The COSP has its particular clinically significant effects for the improvements of participants' self-efficacy might be due to not only the positive reinforcement from active coping and engagement in rehabilitation, but also due to the specific content (in the eight session of the COSP intervention) covered in the COSP intervention (eighth session of the programme). The concept "self-efficacy" was particularly addressed as an intervention topic in the last session of the COSP intervention, from which various self-efficacy beliefs were facilitated to the COSP participants. Participants of the COSP were also encouraged to practice those self-efficacy related beliefs in their daily lives, to further strengthen their confidence in dealing with various stressful situations caused by SCI. Self-efficacy is often used as a predictor of people's subsequent coping behaviours at post-SCI. It is also often used as study outcomes of clinical trials in evaluating interventions in improving individuals rehabilitation performance or functions at post-SCI (Arbour-Nicitopoulos et al., 2009; Hampton, 2000). Such clinically relevant changes in patients' self-efficacy can thus contribute to their engagement in SCI rehabilitation and more meaningful clinical outcomes.

These two important outcomes mentioned above (i.e., coping and self-efficacy) provided a sound foundation during people's psychological adjustment process to SCI. Coping strategies are the core components of the COSP interventions, and the study findings indicated positive improvements for people's coping strategies (both maladaptive coping and adaptive coping). Those positive reinforcements gained can lead to gradual improvements in participants' self-efficacy in managing various consequences caused by SCI. As illustrated in the stress and coping theory (Folkman et al., 1986), these two crucial factors determined people's psychological adjustment to SCI, and subsequent mental health, life satisfaction and other health outcomes that are mainly psychosocial related. Further elaboration of the link between study findings and the theoretical underpinnings of this study is presented in Section 7.3.

7.2.2 Effectiveness of the COSP on secondary outcomes

Participants' social support (including the amount of social support and satisfaction of social support), mood status (including anxiety and depression), life satisfaction, and pain were the secondary outcomes of this study. The findings showed statistically significant moderate to large effects on participants'' mood status (anxiety and depression), life satisfaction and satisfaction of social support over the 3-month follow-up. However, there were no statistically significant effects found on the amount of social support between groups over the follow-up. In addition, statistically significant reductions were found on pain levels at 1- and 3-month follow-ups in the COSP group, when compared to the education group. The MANCOVA (ANCOVA) and contrast test results supported the research hypotheses that the COSP participants had significantly greater improvements in anxiety, the satisfaction of social support and life satisfaction at immediately post-intervention, 1- and 3-month follow-ups; in depression at immediately post-intervention; and in pain at 1- and 3-month follow-ups. However, research hypotheses regarding the levels of depression at 1- and 3-month follow-up, social support at all post-tests, and pain at immediately post-intervention were not supported.

Intervention effects on mood status

Participants' mood status (including depression and anxiety) were measured by the Hospital Anxiety and Depression Scale, HADS (Leung, Ho, Kan, Hung, & Chen, 1993). The COSP aimed to support people's psychological adjustment with one of the study objectives in achieving better mental health at post-SCI, thus lowering the possibilities for suffering clinical depression or other mental disorders. People with SCI who are depressed or psychologically distressed may have a higher chance of having a long duration of hospitalization(s), chronic pain, poor physical and psychosocial functioning, and occurrence of pressure sores (Perkes et al., 2014). While the study participants with SCI in this study indicated mild to moderate levels of distress (that is, their mood status could unlikely to further reduce in a large extent), it is important to note that participants' mood status in the COSP group indicated statistically significant improvements, when compared with those in the didactic education group.

There were statistically significant reductions in depression and anxiety found in (Kennedy et al., 2003; King & Kennedy, 1999; Perry et al., 2010)'s studies during SCI inpatient rehabilitation using the coping-based or CBT-based intervention during, however, the study samples in those studies sustained somewhat more depressed and anxious mood than the general SCI population. Moderate effects were achieved in (Dorstyn et al., 2010)'s study using CBT-based intervention during SCI inpatient rehabilitation in improving participants' depression (Cohen's d= 0.38) and anxiety (Cohen’s d= 0.50) over the 3-months follow-up, and participants depression and anxiety level changed from moderate/severe levels to mild ones. Large effect sizes were achieved in (Kennedy et al., 2003)’s study in improving people’s depression (Cohen’s d= 0.96) and anxiety (Cohen’s d= 0.62) during SCI inpatient rehabilitation, and the intervention group participants’ levels of depression and anxiety improved from moderate/high levels to mild levels. The pain management programmes (using cognitive behavioural based approaches) in (Perry et al., 2010)’s study also indicated moderate effects in participants’ mood (Cohen’s d= 0.48), and anxiety (Cohen’s d= 0.58) during SCI inpatient rehabilitation, and participants’ depression and anxiety levels also changed from moderate/severe levels to mild ones.

However, other studies regarding psychosocial interventions for people with SCI have reported inconsistent results about improvements in depression. For example, no overall significant difference on mood status (i.e., depression and anxiety) was found in (Craig et al., 1997; Duchnick et al., 2009; Guest, Craig, Nicholson, et al., 2015)’s studies. The significant effects only achieved in those participants with relatively high levels of depression (Cohen’s d= 0.79) (Craig et al., 1997), resulting in a shift from severe to mild levels of depression. The above-mentioned intervention studies designed for people with high levels of psychological distress were mainly delivered by clinical psychologists, and their main purpose was to offer psychological treatment to those clients who already had mood problems. Nevertheless, the COSP intervention was designed for those people with mild to moderate levels of psychological distress during their earlier stages of SCI rehabilitation, thus aiming to prevent any negative changes or deterioration in their mental health or well-being. Our study findings indicated moderate treatment effects ($0.06 < \eta 2 < 0.14$) of the COSP on the participants' depression and anxiety levels; that is, most of the participants' depression and anxiety reduced from a moderate to a mild level, or a higher mild to a lower mild level. The findings of the main study on patients' mood status indicated much better results than those of the pilot study (which did not indicate any significant effects on anxiety and depression) (Li et al., 2017). As the pilot evaluation of the COSP intervention has its primary objective to evaluate the feasibility issues of the study, and certain kinds of limitations were noted on the intervention effects test.

Our positive findings on participants' mood status further confirmed the important function of the COSP concerning patients' mental health and well-being at post-SCI. Participants' improved coping abilities and self-efficacy are considered to be the contributing factors to improve their mood status (Elfström & Kreuter, 2006; Pollard & Kennedy, 2007). As suggested by Kennedy (2008) and Martz and Livneh (2007) in their coping-focused interventional studies, using more adaptive coping strategies and having higher confidence in overcoming the life difficulties/challenges at post-SCI could improve patients' engagement in handling events or situations arising from their SCI. Participants would thus handle the SCI-related difficulties in a problem-solving approach, rather than mainly dwelling on the negative thoughts and emotions such as anxiety and depressive mood. If the problems/stressors encountered were unchangeable, patients (or participants in the COSP) were also guided to use emotion-based coping strategies to get immediate relief from those negative feelings (Kennedy, 2008) and then spared more time to tackle the problems, or let it go whenever necessary.

Despite the statistically significant changes noted, the COSP participants' anxiety and depression did not improve to clinically significant levels (refer to the results in Chapter 6). This is perhaps understandable as the majority of the participants recruited in this study were not clinically depressed or suffering from a high degree of anxiety at recruitment (or in the early stage of rehabilitation). On average, the participants indicated low to moderate levels of depression and anxiety, which might cause a ceiling limit for the improvements in their mood status. The previous studies that reported statistically (and clinically) significant within-group improvements on depression or mood status involved participants with major depression or depressive disorder in (Dorstyn et al., 2012; Kahan et al., 2006; Kemp et al., 2004)'s study, and those with high levels of depression and anxiety (Craig et al., 1997). Nonetheless, participants of the COSP group did not show any deterioration of the mood status compared with the baseline assessment. Participants of the COSP group also experienced improvements from moderate to mild levels of depression, which indicates the clinical meaningfulness or relevance of these findings on patients' mood statuses at post-SCI. The COSP was specifically developed for patients with mild to moderate levels of psychological distress at post-SCI, with its aim in preventing worsening of their mental health (Kennedy, 2008). However, patients with SCI may have chances to develop more severe mental health or depressive problems in long-term, especially starting to re-integrate into the community (Bonanno et al., 2012). Therefore, a longer-term follow up (e.g., >1 year) and after their community reintegration is recommended for future research, in order to evaluate and understand the longer-term benefits of the COSP on mood status of people with SCI.

Intervention effects on social support

Social support (as discussed in chapter 2 and 3) as one kind of coping resources has its important role in buffering the psychological distress during patient's psychological adjustment process to SCI. Both the amount and types of social support (or the supporting persons/relationships) can positively influence their physical and mental health coping effectiveness, psychological adjustment and subjective well-being (Muller et al., 2012). Inadequate/poor social support may cause social isolation, and exacerbate people's feelings of psychological distress and adverse patients' mental health and well-being at post-SCI (Hampton, 2004; Muller et al., 2012). Social skills training, the concept of social support and ways of seeking social support were facilitated during the COSP delivery, mainly in the last two sessions of the study.

Apart from the supportive effects gained from the group environment of the intervention (Yalom & Leszcz, 2005), participants' feedback after the pilot study on the COSP indicated the encouragement and support from peers during the group intervention were also quite helpful (Li et al., 2017). The positive effects (partial eta-squared= 0.26, a large effect) on participants' satisfaction of social support in the main study is consistent with the findings of the pilot study (Li et al., 2017). During the COSP intervention delivery, social skills training (i.e., assertiveness training) as well as ways of seeking/maintaining social support are discussed. These contents might contribute to the significant positive effects on participants' satisfaction of social support. We did not find previous reviewed interventional studies measuring social support as their study outcomes, as social support (or social skills training) are not covered in the intervention content, or is only addressed in few dosages. However, the positive relationship between social support and physical health, as well as psychological health are demonstrated in some cross-sectional and cohort studies for people with SCI (Muller et al., 2012). The positive function of social support on people's improved coping ability, depression and psychosocial health were also revealed in other populations (i.e., HIV, arthritis) (Jia et al., 2004; Penninx et al., 1997).

The social support has been also associated with better physical functioning of older adults (Everard, Lach, Fisher, & Baum, 2000), and contributed to the self-efficacy and quality of life for people with multiple sclerosis (Motl, McAuley, Snook, & Gliottoni, 2009). Social support was evidenced to have significant effects for the above-mentioned psychosocial outcomes (e.g., mood, self-efficacy, health and functioning, as well as quality of life). This is because social support plays pivotal roles (acting as coping resources) during people's coping process (problem-based coping and emotion-based coping) (Galvin & Godfrey, 2001). The support can be information support (useful tips in managing SCI medications or public resources for supporting them), and support from families/relatives in providing caregiving. Emotional support can also be provided to people with SCI from their social support system (less social isolation and companionship), and thus contributed to more adaptive coping. Those social skills training (e.g. communication skills and assertiveness training) can help the participants manage inter-personal relationships and relieve stress from social constraints (Muller et al., 2012). The improved coping ability/process can thus contribute to better psychosocial adaptation, mood status, functions and quality of life (Barone & Waters, 2012; Elfström & Kreuter, 2006).

Although the participants perceived social support was measured, the scope of the social support measurement might be wider than the peer support occurred in the COSP group. The peer support in a therapeutic group was underpinned or demonstrated in previous studies on psychosocial group interventions, in which peer support can provide practical solutions/suggestions for the participants, as share common emotions/feelings, and thus contributed to their psychological and social functions (Merckaert et al., 2017; White & Freeman, 2000; Zanca et al., 2013). The peer support gained in the group intervention could further contribute to people's psychosocial functioning and status, as there is research evidence supporting the effectiveness of structured peer mentoring programme or peer-supported management programme in enhancing people's self-efficacy and self-management abilities in coping with the consequences caused by SCI (Jones & Gassaway, 2016; Ljungberg, Kroll, Libin, & Gordon, 2011). Participants' perceived social support could help enrich their coping resources, and thus facilitate better coping with stressors and improve their self-efficacy in living with SCI.

It is understandable that the COSP did not demonstrate statistically significant effects on participants' number of social supporters at post-intervention because patients still stayed in the inpatient rehabilitation unit, where was not an open community environment and thus patients' friends and relatives might not able to visit, support and assist him in daily living. Although they might leave the hospital for a short period (e.g., half a day), it could be difficult for the patients to interact with and relate to the outsiders and expand their social support and its network. Nonetheless, social support is a multi-dimensional concept that can be influenced by other external factors (such as patients' family system and relationships, social network and integration system, and the distance or time convenience for relatives visiting the patient). It would be useful to conduct in-depth qualitative interviews to have more understanding of their perceived social support, how to integrate into the community, awareness of their personal and available community supportive resources, and any plan for social engagement and integration.

Intervention effects on life satisfaction

The life satisfaction measurement is essentially participants' subjective assessment of their current life status as a whole. The significant positive effects on life satisfaction were revealed by the total score on items 1-14 of the Q-LES-Q-SF scale, and a single Item 16 - 'overall life satisfaction', at the one- and three-month follow-up. There was no statistically significant effect found on another single Item 15 - "Satisfaction with medication" at T3 and T4. Coping-based interventions were hypothesized to have positive effects on people's life satisfaction and quality of life.

Only one of the reviewed studies testing a psychosocial care programme for people with SCI was found to adopt life satisfaction as a study outcome (Norrbrink Budh et al., 2006) and the positive findings on life satisfaction in our study are consistent with their findings. Theoretically, the improvements in these outcomes were largely attributed to the participants' coping ability and self-efficacy that are the primary outcomes of this study (Kennedy et al., 2010). The improvements in people's perceived satisfaction of social support and mood may also have contributed towards enhanced life satisfaction (Peter et al., 2014; Post et al., 1999). The enhanced life satisfaction can also lower individuals' future psychological distress, depression and well-being at post-SCI (Charlifue & Gerhart, 2004).

Life satisfaction is regarded as the subjective assessment of people's quality of life and health status, and has strong positive relationships with their quality of life (Rivers et al., 2017). Perry et al. (2010)'s study using pain management programme with a focus on participants' cognitive and behavioural aspects also showed significantly mild to moderate improvements in people's quality of life in the intervention group compared with the usual care. The positive results on life satisfaction and quality of life from previous studies are broadly consistent with our findings (although the effect sizes resulting from the COSP intervention were larger). The statistically (and clinically) significant positive effects on participants' life satisfaction after their participation in the COSP can also improve their psychological status and confidence in facing diverse life situations and stressful factors after community reintegration. People's life satisfaction can also contribute positively with their social relationships and emotional well-being (Ruvalcaba-Romero, Fernández-Berrocal, Salazar-Estrada, & Gallegos-Guajardo, 2017), and thus to some extent, patients' life satisfaction post-SCI is a manifestation of their health status and psychological well-being (Gurcay et al., 2010). Moreover, life satisfaction can serve as one of the important clinical/health outcomes in evaluating psychosocial interventions (Dijkers, 2005; Frisch, 2014) as the life satisfaction covers the subjective assessment not only on their health status, but also the emotional health as well as social relationships.

The clinically significant changes in participants' life satisfaction at 1- and 3-month follow up can add more clinical values and meaningfulness of the COSP intervention. This is also in line with the previous studies in which the psychosocial interventions (coping or cognitive behavioural oriented) could demonstrate positive between-group effects or within-group improvements in patients' quality of life or subjective life satisfaction at post-SCI (Kahan et al., 2006; Kemp et al., 2004; Perry et al., 2010)'s studies. As those psychosocial interventions can improve people's psychological and social status, and further contribute to participants' physical wellness. Therefore, their life satisfaction can be improved as a result of the improvement in all of the participants' bio-psychosocial aspects (Barone & Waters, 2012; Galvin & Godfrey, 2001). Participants' improved life satisfaction as one of the positive results after attending the COSP can further contribute to more positive appraisal of their life situations, and thus lead more positive thinking, better coping as well as higher degrees of rehabilitation engagement in a long-term consideration (Dijkers, 2005).

Intervention effects on pain

Chronic Pain is one of the most important medical complications of SCI because it has a high prevalence rate of around 75% (Sezer et al., 2015). Chronic pains at-post SCI included both neuropathic and nociceptive types, and contribute to reduced quality of life (Hagen & Rekand, 2015). Chronic Pain has a very negative impact on people's daily life and is related to a decrease in participants' self-rated health, higher levels of depressive mood and psychological problems (Barrett et al., 2003). Chronic pain is bio-psychosocial in nature, as it is not only a physical symptom but also influenced by an individual's cognitive response to it (Middleton et al., 2014; Nicholson Perry et al., 2009; Widerström-Noga et al., 2007).

The findings showed statistically significant differences in pain levels between the two study groups at T3 and T4 (with pain lower in the COSP group). Patients' attitude and reaction to their pain might be changed after attending the COSP as they were encouraged to use more engaged coping strategies (i.e., problem-solving) rather than denial or avoidance of the problem, as well as emotional coping in relieving negative feelings or distress in relation to pain (Heutink et al., 2014; Wollaars et al., 2007). Besides, pain is also related to people's ways of thinking, and some catastrophic thinking would lead to participants' negative appraisal/feelings of their pain level. The pharmacological approaches are the mainstream for pain management at post-SCI, and non-pharmacological approaches may have additional effects on SCI chronic pains (Norrbrink Budh et al., 2006; Wollaars et al., 2007).

Findings of some previous studies using pain management programmes (mainly psychosocial-based, cognitive and behavioural oriented and or coping-based strategies) for people with SCI indicated positive effects in improving participants' pain intensity and unpleasantness (Norrbrink Budh et al., 2006), pain catastrophic thinking (Perry et al., 2010), pain-related disability (Heutink et al., 2014) and pain interference (Burns et al., 2009). These above dimensions of pain related outcomes further confirmed the bio-psychosocial nature of pain problems in the SCI population, and supported the positive effects of psychosocial care programme (such as COSP) in improving pain (assessed by NRS in our study). Research evidence supporting the effects of psychosocial approaches on participants' pain further confirms the clinical importance of such programmes. The findings are also in accordance with the bio-psychosocial notion of SCI rehabilitation, in that people's physical and psychosocial health is inter-related and inter-dependent. This implies that programmes such as the COSP may also have beneficial effects on other medical complications or functional levels of people with SCI. These outcomes could be measured in future research.

Apart from the clinical significant changes calculated on the continuous variables of the COSP group using (Jacobson et al., 1999)'s methods, the clinically significant changes on pain were also reviewed and compared with previous studies. Farrar, Young Jr, LaMoreaux, Werth, & Poole (2001)'s study suggested a reduction of "approximately two points or a reduction of approximately 30%" in the numerical rating scale of pain represented a clinically important difference on one's pain perception. Using this criterion, there was no clinically significant change in pain level of the COSP group (the 75% percentile of pain value remained the same from Time 2, Time 3 and Time 4 (i.e., three NRS values equal to 3). In addition, the medians remained the same from Time 2 (NRS= 3) to Time 3 (NRS= 3), and only reduced "1" point at Time 4 (NRS= 2). The reasons for these non-significant results in terms of clinical changes might be due to the fact that we did not recruit those patients with severe pain; the COSP was not designed to specifically focusing on pain problems. Nevertheless, the trend of pain reduction showed in the COSP intervention arm indicated the promising clinical value of using psychosocial approaches in pain management for people with SCI. We suggested future studies, when using psychosocial interventions, can specifically target on pain problems and having more intensive content in relation to pain issues addressed so that to see the potentially promising effects of such interventions.

7.2.3 Comparison of interventions effects in different sub-groups of the COSP

Comparison of interventions effects in different gender groups

Our study findings revealed more maladaptive coping in the female participants, which contradicts the results from psychosocial intervention studies conducted by (Chen et al., 2008; Unruh et al., 1999) that indicated higher life satisfaction, positive coping and better psychosocial adaptation for female participants than males. However, our results are similar to (Krause et al., 2004) exploratory study findings that reported higher scores on depressive symptoms and psychological distress, and greater problems in coping with females than males (with other factors controlled).

Gender differences that are congruent with the cultural context could be given special consideration in future SCI psychosocial care programmes. For instance, males are assumed to be the main source of family financial support in Mainland China (Cooke, 2007) and females are often more comfortable communicating their emotions than males (van Leeuwen et al., 2012). These Chinese social norms or characteristics of people in different gender groups might bring extra pressure to male at post-SCI. Therefore, the findings of this study about the gender difference on psychosocial outcomes need to be further confirmed and examined in future studies as research evidence in exploring the difference of gender differences in people's psychosocial well-being at post-SCI is still lacking. Qualitative interviews or assessments with more detailed/comprehensive information can be conducted/used to further explore the gender differences in future studies. More intensive training in communication (and social) skills can thus be considered for male participants. In addition, gender differences can be discussed in the intervention sessions, which might enhance participants' awareness of the possible influence of their gender on their psychosocial reactions/responses to SCI, and facilitated study participants' more adaptive thinking and behaviours in reaction to the gender differences. Some examples of stressors caused by participants' gender differences can be highlighted/discussed in the group.

Comparison of interventions effects in different injury sub-groups

The influence of people's injury level/severity on their psychological adjustment, mental health and psychosocial well-being is still debatable. As we discussed in Chapter 2, some researchers reported inconsistent results and somewhat controversial arguments on this relationship on this topic. It is suggested that the severity of SCI was not associated with patients' coping behaviour and cognitive appraisal with the disability in Kennedy et al (2003)'s study, and the level of impairment in SCI has not yet been found relating to these patients' mental health (van Leeuwen et al., 2012).

A cross-sectional study revealed that injury severity had no direct relationship with patients' mental health at post-injury, but these people's perceived loss of physical functioning is inversely associated with their psychological well-being (Deroon-Cassini, De St. Aubin, et al., 2009). A higher level of dispositional optimism and more positive trend of their mental health were reported in people with tetraplegia whose range of disability is usually wider than that in paraplegics (Rostowska & Kossak, 2011). No relationship between people's functionality and psychosocial adaptation outcomes after spinal cord injury was found in (Martz et al., 2005)'s study. McMillen & Cook (2003) study found that better motor condition and lower severity of injury were found to be associated with much stronger beliefs and perceived self-efficacy in managing people's disease and related problems caused by the injury.

As there are many controversies shown in previous studies and the findings of this study, the inter-relationships between severity of patients' function levels and their psychological adjustment and/or psychosocial adaptation to SCI need to be further examined in future research. Our study findings add some evidence supporting the negative relationships between people's injury severity and psychosocial well-being, that is, participants with paraplegia had more adaptive psychosocial outcomes than those with tetraplegia. These negative relationships were observed from the baseline comparison as well as the follow-up assessments. This finding suggests that people with tetraplegia may need longer and more intensive interventions than people with paraplegia. Although the relationship between people's injury level/severity of SCI and their psychological adjustment and/or adaptation is not consistently observed in all studies, future studies may consider having tailored coping-focused or psychosocial intervention to meet specific health needs of different types/severity of SCI sub-groups. Furthermore, how the injury level is related to automatic negative thoughts can be explored; and some suggestions can be made for practical strategies to deal with different functional abilities (for example, people with tetraplegia might need more physical support from others or more skills practice using advanced wheelchairs).

7.2.4 Intervention completion, fidelity and study attrition

Intervention completion

There are in total eight sessions for both the intervention group (the COSP intervention) and comparison group (the didactic education group). As described in Chapter 3, the participants who completed five or more sessions were considered to be the completers of the intervention. There were relatively high intervention completion rates in both the COSP (35/50=70%) and comparison (36/49= 73%) groups. When compared with Burns et al.'s (2013) study on a psychosocial intervention to manage pain in SCI that adopted similar methods in calculating the intervention completion rate, the completion rate in our study was similar to (Burns et al., 2013) study (completion rate= 71%). The completion rate of the COSP in this study was also similar to those studies (ranged 60-80%) (Duchnick et al., 2009; Guest, Craig, Nicholson Perry, et al., 2015; Kennedy et al., 2003).

The relatively high intervention completion rate in this study might be attributed to several possible reasons. First, the participants of our study were rehabilitation inpatients, which allow more convenience and available time (when compared with those participants in the community) for them to join the group sessions. Second, the intervention provider was a nurse researcher who received comprehensive training and supervision that could enhance the effectiveness and quality of the delivery of the COSP intervention. Third, the nurse researcher, together with physician and rehabilitation nurses in the SCI wards, actively encouraged the participants to join the group sessions every time before its commencement, and the physicians were also very cooperative in adjusting patients' medical treatment (or physical exercise) schedules to fit with the arrangement with our intervention sessions. In addition, much flexibility was provided for the participants in joining the group sessions, and those patients lying on the bed were included if they were willing to take part in the interventions with medically stable body condition. It is worth noting that some active patients in the SCI wards helped in encouraging their peers to take part in our study; meanwhile, they also provided practical information on arranging the group sessions during their common convenient time. Finally yet importantly, the COSP and the study procedures were refined and improved based on the results of the pilot study, for example, more participants' own examples were adopted to have a better illustration of the content of COSP in the group, which might have contributed to their adherence in attending the group sessions.

Intervention fidelity

Intervention fidelity means the degree to which the implementation of an intervention is faithful to its original plan (Polit & Beck, 2008); and a good fidelity requires the intervention to be delivered truly addressing the theory and objectives underlying the research (Dumas et al., 2001). The improvement of intervention fidelity can enhance both the trial's internal and external validity by reducing random and unintended variability in delivering the intervention. Generally, intervention fidelity covers five aspects, which are, proper **design** of the intervention, **training** of intervention provider to ensure their competency in delivering and managing the programme, the process of the programme **delivery** with strengthening intervention provider's adherence of the standardized protocol, participants' **receipt** of the intervention, as well as their **enactment** to those skills learnt in the intervention (Bellg et al., 2004; Hoffmann et al., 2014). The following explanations are the solutions used in this PhD study for ensuring the intervention fidelity.

Design of the intervention. The main aim of the COSP was to facilitate patients with adaptive coping skills to manage challenges and stressors concerning SCI. With the main content focusing on coping, this programme could reflect its theoretical foundations well as it was established mainly on the stress and coping model (as mentioned in the theoretical underpinnings section of this chapter). The eight group sessions of COSP were delivered in a small-group based format with group dynamic/process addressed, which could make sure that similar dose of intervention was provided to each participant. Meanwhile, group sessions for all participants were delivered by one trained nurse researcher only that can also help to ensure the similar dose of intervention received among participants. In addition, the possible challenges and difficulties that might occur during the group delivery had been discussed among the researchers and the expert in CBT therapist with solutions worked out before its actual implementation, which also helped the interventionist(s) (and researcher) enhance the appropriateness and efficiency in delivering the intervention in the wards under study.

Training of intervention provider. The COSP was delivered by a nurse researcher who is a registered nurse with experience in nursing care for patients with SCI in the rehabilitation hospital. It is suggested that health professionals should receive additional training in order to be adequately skilful in undertaking the recommended tasks and roles (Middleton et al., 2014). Before intervention implementation, the nurse researcher had received coursework in related theories and training in techniques of psychotherapeutic approaches (coping theories, social skills training and cognitive behaviour therapy), followed with group intervention by watching group psychotherapy videotapes, as well as supervised by an experienced clinical psychologist. In addition, the nurse researcher also rehearsed the intervention delivery with several experts in delivering group psychosocial interventions using role-play and peer-reviewed techniques, from which inspiring comments and feedback on the sessions were collected for further improvements of the nurse researchers' competency in delivering the COSP.

In the process of delivering the COSP, the intervention provider was having biweekly meetings with a clinical psychologist with expertise in cognitive psychology and therapy. During the meetings, the intervention provider consulted the questions and problems that emerged in the group sessions, as well as the difficult cases encountered. The intervention provider received comments and feedback on those questions/problems raised. The psychologist also gave guidance and supervision on those psycho-therapeutic skills adopted, and those intervention content outlined in the COSP, in order to further enhance the nurse researcher's competency in delivering the group sessions. In the meantime, researchers' emotional reactions were also explored due to stressful or upsetting feelings evoked by facilitating the therapeutic groups before the implementation of the new intervention sessions.

Delivery of the intervention. To ensure that the intended content of the COSP was provided to the participants, fidelity checking was performed for three subgroups of the COSP intervention arm by the group helper and the research assistant. The fidelity ratings were deemed as satisfactory as the values were above 80% of the total scores (Dumas et al., 2001). This fidelity check had provided the nurse researcher with information relevant to their performance and acted as the supportive or corrective feedback. As the fidelity checking made the nurse researcher be aware of the importance of intervention-protocol adherence, timely corrections could be taken by the nurse researcher to further improve the intervention delivery and maximize its fidelity.

Receipt of the intervention. Ensuring that the group sessions were received as intended is also an important aspect of intervention fidelity (Bellg et al., 2004; Stein, Sargent, & Rafaels, 2007). The receipt of the intervention concerns participants' understanding of the intervention content and their competency to practice those skills learnt during the intervention sessions. To make sure the participants have a good understanding of the COSP content, the intervention provider used a blackboard to draft the key ideas or draw some figures in assisting the intervention delivery. In addition, the nurse researcher tried to use participants' own examples to facilitate the group sessions to achieve their maximum understanding of the intervention content. Meanwhile, participants were asked about their feedback on the COSP by using several open-ended questions after the COSP. If some of the content were difficult to be captured/understood, the nurse researcher would use more illustrations and more demonstrations in using role-play or telling metaphors. Group dynamic (process) issues that emphasized the therapeutic nature of the COSP were also addressed in the intervention delivery as discussed in section 3.5 (Bieling et al., 2006). The nurse researcher also provided each participant opportunity to talk to the group, either by guided discovery or by direct questioning. In addition, the intervention provider also reviewed the previous session before the commencement of the new intervention session. More feedback on participants' practice of the learnt skills in their daily lives was given, in order to ensure the knowledge foundation of the new session delivery, as well as reinforce the appropriate understanding/practice of the previous sessions.

Enactment of the intervention skills. As the COSP is designed to facilitate patients various coping strategies in modifying their coping behaviours, the enactment of the intervention which means participants' performance of the intervention-related skills, behaviours, and cognitive strategies in relevant real-life situations at post-SCI (Bellg et al., 2004; Polit & Beck, 2008) should also be taken into consideration. Homework was assigned to the participants if some of the content delivered in the group sessions were deemed as necessary to have practice in their daily lives. Participants' completion of their homework was reviewed at the beginning of the next group session other verbally (if some of the group members were not able to take notes of their practice) or reading their notes taken on their practice of those skills learnt in the group sessions. In addition, participants were encouraged by the group facilitator to practice those learnt skills in dealing with stressful situations in their real life, together with help from their family members as well as caregivers.

Study attrition

Compared with previous literature (psychosocial intervention studies for people with SCI during inpatient rehabilitation in Chapter 2) having attrition rates from 0% to 42%, the attrition rate in the study was not so high (15% participants dropped out). The study attrition was mainly due to their time inconvenience to attend all intervention sessions, having been discharged from the hospitals, and/or loss to contact. These reasons for participants' attrition were consistent with previous studies evaluating psychosocial interventions for people with SCI during their inpatient rehabilitation (Chen et al., 2015; Duchnick et al., 2009; Guest, Craig, Nicholson Perry, et al., 2015). We consider this attrition rate of our study as acceptable due to the difficulties for people with SCI in adhering a structured multiple-session, group-based psychosocial intervention programme (especially those having serious medical complications or difficult family or life situations interfering with their interest or, desire in group participation), and high demands for time and efforts for learning and practices. Taking references from previous literature of psychosocial care for people with SCI (Craig, Hancock, Chang, & Dickson, 1998; Duchnick et al., 2009; Dyck et al., 2016; Guest, Craig, Nicholson Perry, et al., 2015), the reasons for participants' attrition were summarised. The reasons include peoples' attitude in avoiding psychological interventions (as patients usually concern too much on their physical health and are not aware of their psychological reactions to the injury). In addition, participants' lack of experience in estimating the difficulties in the community after their discharge and having various medical complications (special care needs) might interfere/hinder the intervention performance/attendance, as well as schedule conflicts with other rehabilitation programmes.

Nonetheless, we had considered the intervention completion rates and the study attrition rate during the data analysis process. Both the intention to treat (ITT) analysis and per protocol (PP) analysis were adopted (As described in Chapter 6, Section 6.2), and PP analysis included those participants who were completers of the interventions and the three times follow-up assessments. Study findings analysed by ITT and PP analysis were compared, and these two ways of analysis manifested very similar results. The very similar results showed thus indicated that the attrition or dropouts of the study did not have much influence on the study outcomes/findings, and therefore, can further ensure the validity of our study findings.

7.3 The link between theoretical underpinnings and study findings

To facilitate a better understanding of the study findings, it is important to align the study results with the theoretical underpinnings (as described in Chapter 3, Section 3.4.1) of the COSP intervention. This study has provided empirical evidence in supporting the positive effects of COSP on the improvements of people's psychological adjustment at post-SCI. Results on the outcome assessment at baseline indicated significantly moderate correlations between the majority of the study outcomes (i.e., maladaptive coping, adaptive coping, self-efficacy, anxiety, depression and life satisfaction). The finding of this study resulted in improvement in a variety of psychosocial health outcomes for people with SCI, which highlighted the importance and necessity of adopting coping-oriented interventions for inpatient SCI rehabilitation.

These significant correlations found between the outcome measurements consolidated the valid utilization of the stress and coping theory in illustrating people's psychological adjustment to SCI. The COSP addressed the most crucial/core concept of the stress and coping theory that is 'coping'. The whole intervention programme aimed to facilitate people with various coping strategies in dealing with the consequences/stressors caused by SCI. The COSP participants were also taught to distinguish between maladaptive coping and adaptive coping strategies, as well as recognise the importance of self-efficacy and how it applies to their rehabilitation and daily lives. The positive findings on self-efficacy also further support the notion that people's self-efficacy in dealing with various stressful life situations at post-SCI would be improved by benefits gained from the therapeutic components of the intervention in changes of cognitive appraisal of the injury and experiencing effective coping strategies (Kennedy & Ebrary, 2007).

According to the stress and coping theory, coping and self-efficacy are two important factors (and they are dynamically interdependent and interact with each other) in revealing/determining their successful adaptation to the impact of the stressful events. While the COSP was designed to address those two important factors, and the positive psychosocial adaptation outcomes (i.e., mental health and life satisfaction) resulting from the COSP further consolidate the effectiveness or appropriateness in adopting the stress and coping theory for the intervention design and study outcome formulation. Positive findings on people's coping ability and self-efficacy, as well as improvements in their psychosocial adaptation after their participation of the COSP programme can thus suggest a clear link between the theoretical underpinnings and outcomes study findings.

The improved satisfaction of social support reinforces the pivotal role of the social support that acted as important coping resources in supporting the adjustment process. Social support with its buffering effects on stress can support better psychosocial adaptation and psychosocial outcomes (Muller et al., 2012). Besides, the group-based format can serve as the context for participants for getting social support from peers, and thus facilitating better psychosocial adaptation.

7.4 Strengths of the study

This study is the first of very few to evaluate the effects of a psychosocial care programme in supporting the psychological adjustment for Chinese people with SCI during their inpatient rehabilitation. The COSP was found to be effective on the majority of the psychosocial outcomes over three months' follow-up, and the study has its strengths in the following aspects.

Design of the study

This study adopted a quasi-experimental design with two parallel study groups to evaluate the psychosocial care programme-COSP in the inpatient SCI rehabilitation setting. We also included multiple follow-up points (repeated measures, i.e., baseline, immediately after the intervention, 1- and 3-month follow-up) for the outcomes assessment. These repeated measurements on different time points and the use of Helmert contrast tests enabled the researchers to examine and understand the changes over time (Keselman, Algina, & Kowalchuk, 2001). The target population of this study covers the majority (70-80%) of the SCI population with mild to moderate levels of psychological distress. The COSP intervention was also standardised and underpinned by a strong theoretical basis, and the intervention manual/pamphlet was used to ensure the successful delivery of the COSP intervention. Comprehensive strategies were adopted to enhance the fidelity of the COSP delivery, and thus strengthen the internal validity of the study. Sound outcome measurements (e.g., Moorong self-efficacy scale specifically designed for people with SCI) were adopted for the COSP effects evaluations.

Sustainable improvements in the study outcomes

As mentioned above to be one of the strengths of this study design, Helmert contrast tests were used to examine the intervention effectiveness at each point of follow-up assessments. We anticipated the COSP intervention could have sustainable positive improvements (i.e., continuous statistically significant changes and/or the beneficial effects are maintained without deterioration) for people's psychosocial outcomes at post-SCI. The COSP has its focus in addressing people' psychosocial problems and thus has its long-term goal of improving people thoughts and behavioural reaction to those stressful events caused by the injury. Those behavioural changes can equip individuals sustaining SCI with better adaptation and coping with various stressful life situations/events in a long-term consideration.

As indicated in the figures on the changes of the study outcomes, the COSP intervention effects indicated continuous statistically significant improvements across three times follow-up assessment (i.e., immediately after the intervention, 1- and 3-month follow up) on most of the study outcomes (i.e., maladaptive coping, anxiety, the satisfaction of social support, and life satisfaction). The other continuous outcomes were rather staying at a stable level without deterioration. These sustainable effects achieved indicated more capability of the participants in facing diverse situations in the future, and contribute to their future appropriateness in using these learned coping skills.

Group-based psychosocial care programme adopted

The COSP intervention adopted a group-based format intervention and it provides opportunities for group members to share their experience in managing their injury, which can be supported by the evidence generated from the pilot study. The group-based format in our study has been shown to be a feasible approach/format to be used for psychosocial interventions for people with SCI (Craig et al., 1998; Zanca et al., 2013). As the SCI population were facing a common stressful situation of coping with consequences after SCI, this format has been an appropriate and useful modality for people with SCI in sharing the experience of coping and ways of effective management of their injury. Group participants would also feel a sense of connecting with others and emotional support from the peers in the group.

Nurse researcher as the COSP intervention provider

The COSP was consistently delivered by one nurse researcher all throughout the study period (including both pilot study and the main study), which helps to ensure the internal validity of the study (without much variations in delivering the COSP intervention from different intervention providers). However, this might also reduce the quality of the intervention delivery as the nurse researcher carried much workload in the whole study period. We suggest future studies in training rehabilitation nurses in each SCI ward to carry the role to be the intervention provider for the COSP. Rehabilitation nurses could expand their role in delivering psychosocial interventions for people with SCI in the rehabilitation wards, and they are suggested to be appropriate health professional in delivering the COSP intervention ("first-line" psychosocial care programme) as they are quite familiar with patients' condition and SCI knowledge (Angel et al., 2009).

Modifications of the COSP interventions as culturally sensitive

It is worthy to note that the target population of our study is Chinese people with SCI, and the nature of the COSP was focusing on people's psychosocial aspect. The COSP intervention facilitated various techniques in relation to people's thoughts and behaviours and ways of solving the problem as well as some personal beliefs about this injury and its related disabilities/consequences. These psychosocial issues in relation to the COSP content and its delivery were influenced by people's cultural values as well as particular social notions (Chu, Leino, Pflum, & Sue, 2016). With the essential need in considering the incorporation of cultural issues when delivering psychosocial interventions (Moodley et al., 2013), the content of the intervention programme was modified to be adapted to the Chinese culture. Chinese cultural issues (e.g., face-saving, harmony maintaining and Confucianism, and/or Chinese social norms) were also provided as didactic education content in the group sessions of COSP that might enhance people's awareness of being influenced by their cultural norms. The intervention provider (i.e., nurse researcher) of COSP is a Chinese person with the preparation of learning and training in addressing Chinese cultural issues during the process. She was also having a continuous discussion with her intervention supervisor regarding cultural issues (such as facing-saving, Confucianism) that emerged in the group sessions, and corresponding actions were taken to manage them well.

Addressing those Chinese culture issues might have contributed to the effectiveness of the COSP in improving people's psychosocial adaptation to the impact of SCI (Chan et al., 2006; Tseng, 1999). Those culture or sociological issues (or social norms) discussed in Chapter 3 might influence the intervention effects on people's thoughts and actions. However, as we did not perform in-depth qualitative interviews with participants, we could not be certain how Chinese cultural issues may have influenced the study outcomes; future study thus is suggested to explore the possible influence of Chinese cultural issues on the study findings and how Chinese culture influences intervention participants' thoughts and behaviour.

Sample equivalence between two study groups

As this study adopted a quasi-experimental design for which individual participant randomisation had not been achieved. This might pose threats to the intervention effects due to known and unknown confounding factors. The most salient two factors suggested in the literature (as presented in Chapter 2) were participants' injury severity (tetraplegia or paraplegia) and gender sub-groups (male and female participants). Those two factors acted as the strata and served the purposes of balancing two study groups in these two aspects. Possible confounding factors for the intervention effects (demographic factors as well as patients' clinical characteristics) were reviewed ahead of time during the literature review stage, assessed while collecting the baseline information, as well as controlled in the data analyses, which contributed to higher internal validity and rigour of the findings.

Study settings (inpatient SCI rehabilitation wards) under similar regulations

This study was conducted in two rehabilitation hospitals and each hospital has two SCI wards. As described in the methods chapter, these two hospitals were under similar regulations and medical policies. Thus, those SCI wards involved in our study had the similar medical environment and resided in the same social contexts. In addition, the baseline comparisons between these two hospitals did not differ from each other in both the COSP and comparison group, according to the results described in Chapter 6. The similar situations mentioned above mitigate the chances of the potential confounding factors caused by hospital/environmental variations.

No adverse events occurred during the intervention delivery

No adverse events (such as mortality or psychiatric disorders or other severe emotional outbursts) were reported during the COSP delivery, which is considered as an additional strength of this study. This does not support the view that possible adverse consequences might be caused by the group-based interventions. In chapter three, we listed several types of difficult situations in relation to the types of group participants. Those common types for challenging participants within a psychosocial group intervention were discussed and ways for handling those difficult situations were provided. Apart from the difficult situations caused by different group members' behaviour in the group, some other difficult situations can arise when running a group intervention. For instance, participants with SCI might have emergent health situations happen during the intervention delivery process (e.g., incontinence or sudden uncomfortable feeling), the group session was rescheduled if those situations happened. There is also a need to adjust all counterparts' time arrangement/schedule for a group session, which needs lots of preparation for the real intervention implementation (Yalom & Leszcz, 2005). Sometimes, group sessions might also cause hurtful feelings after participating in the interventions (Galinsky & Schopler, 1994; Roback, 2000). Nevertheless, we had plans of providing a referral to the psychiatric department in the rehabilitation hospitals for dealing with some severe emotional reactions, if resulted, from the COSP. It would be a benefit for future studies to incorporate qualitative interviews about participants' experiences (Creswell, Plano Clark, Gutmann, & Hanson, 2003) especially those negatives ones, after their attendance at the group sessions.

7.5 Limitations of the study

Most of the study limitations were due to the practical issues (e.g., clinical resources and reality, patients' perspective and PhD study requirements). With all those information taken into consideration, several important limitations of this study were identified with reference to the Cochrane Risk of Bias Tool (Higgins et al., 2011).

Full randomisation not performed

The major limitation of this study is its methodological nature of non-randomised sample (people with SCI) recruitment from the four rehabilitation wards. Although two SCI wards in each hospital were selected to be allocated into different study groups (intervention and comparison group), each individual with SCI was not randomly assigned/allocated to different study groups. This strategy was mainly adopted to reduce the risk of contamination of intervention effects across two study groups. The non-equivalent sample between groups might have produced potential confounding factors to the results of the COSP effects evaluation (Schulz et al., 2010). Without randomisation of people with SCI into different study groups performed, the study findings might be influenced by other unknown/uncontrollable confounding factors. Therefore, the conclusions generated from the findings of this quasi-experimental study are less compelling than the randomised controlled trial and thus need to be considered with caution. However, this quasi-experimental design was considered the most practical way for this PhD study. Thus, the positive intervention effects manifested can still provide evidence to further research and its direction about psychosocial care for people with SCI.

Limitation on the study sample obtained

Although our study participants were randomly selected from two rehabilitation hospitals in one area of China in that recruitment period, that selective sample might not be representative of all the SCI population throughout the whole year or a broader population in Mainland China. In addition, those participants selected were motivated and willing to join the interventions. Thus, our study findings might not be able to generalize to the populations that did not show their willingness to receive psychosocial interventions. Moreover, it is noteworthy that we only recruited patients who were physically stable to join the group sessions, which might limit the generalisability of the findings to patients not able to attend group interventions.

We suggest a future study should compare the socio-demographic and clinical characteristics of those participants and nonparticipants, to see whether that sample who joined our study could be representative of the whole SCI population in our study settings. However, on the other hand, the previous mentioned stratified sampling in ensuring the study participating to have paraplegia and tetraplegia, as well as both male and female participants can enhance the sample diversity in each hospital/ward. In addition, the study sample selected were those patients with mild to moderate levels of psychological distress, which represented the majority (70% to 80%) of the SCI population in the early rehabilitation stage (Post & van Leeuwen, 2012) that contributed to the sample representativeness or generalisation of the study/findings.

Longer-term follow-up not performed

A medium-term 3-month follow-up is one of the other limitations of this study due to time restriction for the PhD study. The possible follow-up to at least one year after completing the intervention would be needed to examine the long-term effects (especially after participants' reintegration in the community) of the COSP. Besides, some of the coping strategies that people with SCI learned in the COSP can be used after hospital discharge to enhance patients' reintegration into the community. It would be better to evaluate the outcome over a more extended period of follow-up (e.g., one to two years), together with other measures for community-based re-integration and adjustments after inpatient rehabilitation.

Self-report subjective measures adopted

The use of self-report subjective measures for the study outcomes might cause participants' misunderstanding of some items in the instrument and thus bias the study results. Therefore, future research is recommended to adopt some objective measures to have a more evidenced assessment of the study outcomes, and therefore increase the internal study validity. For example, some objective measures such as observations of participants' behaviours after attending the COSP as well as their interactions with people around them, hospital readmission rates (including deterioration of mental state, use of medications for pain/mood, medical complications).

A lack of qualitative exploratory study

As we adopted a quantitative approach for evaluating the psychosocial care programme (COSP) which is multifaceted and complex in nature, it is still not possible to reveal the mechanism or identify the active ingredients of the COSP. A qualitative exploratory or observational study, or mixed methods research design, can be used in the future study to explore the group process and perspectives of strengths and weaknesses of the COSP from the participants and the intervention providers as well as health professionals, in order to understand the working mechanisms of the intervention and thus its active elements. These elements or mechanisms can then be tested in future comparative or predictive research to identify the therapeutic effects of individual components of the COSP.

Open-label trial adopted

An open-label trial (unblinded study design) was adopted, as it was not feasible to truly blind the study participants or research team. Due to the nature of the psychosocial interventions, participants were not blind to the interventions they were receiving, which might cause subjective bias to their performance and rating on the outcome measurements (particularly as self-rated questionnaires were used). In addition, the SCI wards in each hospital were chosen to be in either the COSP intervention group or the comparison group (to avoid intervention contamination), and participants were selected (perform the baseline assessments) after the ward allocation which might cause subjective performance bias (and/or recruitment and selection bias) on their rating on the study outcomes as well. In addition, the intervention programme delivered by the rehabilitation nurses in the comparison group did not use a detailed formulated protocol (with general rules only), which might threaten the internal validity of the study. Nonetheless, study participants had no idea of which intervention programme (either the COSP or didactic education programme in the comparison group) was intended to be superior to the other.

Future studies can consider using a cluster randomised controlled trial design and should randomly allocate the study participants into different study groups before performing the baseline assessments.

Single items adopted for some of the outcomes

Single items were adopted/analysed for some of the study outcomes such as pain (NRS single item rated on pain level from 0-10) and life satisfaction item 15 and 16. The use of single items for the outcome measurements might cause some degrees of inaccuracy and non-continuous scores. Indeed, those single items were only used for the secondary outcomes, and the use of them also assist easier ways of getting responses from study participants as well as helped reduce the incompletion rate of those questionnaires, as well as missing data reduction. Non-parametric tests were adopted/matched for the statistical data analysis of those single items to examine the COSP effects and the changes/trends on the study outcomes.

This chapter discussed the COSP effectiveness, the link between the theoretical underpinnings and study findings, as well as study strengths and limitations. In the next chapter, study's contributions to new knowledge, study implications for policy, practice as well as research will be presented, followed by a conclusion of this whole thesis.

CHAPTER 8 IMPLICATIONS AND CONCLUSION

8.1 Introduction

This chapter describes the contribution of our study to the knowledge of implementing a psychosocial care programme for people with SCI during their inpatient rehabilitation stage (Section 8.2). The implications of the study findings for policy and practice, as well as for future research, are presented in section 8.3. The conclusion of the whole thesis is provided in Section 8.4.

8.2 Study contributions to knowledge

This PhD study was the first clinical trial to examine the effectiveness of a coping-oriented supportive programme for Chinese people with SCI during their inpatient rehabilitation stage. It pioneered a psychosocial care programme for people with SCI in Mainland, China. The findings of this study support the high potential of the integration of COSP intervention into the current rehabilitation routine, specifically in a Chinese context. The study has addressed several important research gaps (as described in Chapter 2 and discussed in Chapter 7) existing in the previous literature in the area of psychosocial care for people with SCI. The findings add to the knowledge on psychosocial care for people with SCI in five important aspects.

Research evidence in supporting the COSP effectiveness

This study adds evidence in the research area of psychosocial care in SCI rehabilitation, which is indeed limited globally and has a large paucity in the Chinese population. The study findings have indicated a statistically significant effect of the COSP on those important psychosocial outcomes of people with SCI over three month's follow-up. These findings further supported the effectiveness of using stress and coping model (Folkman et al., 1986) in revealing the process of people's psychological adjustment to SCI. The positive effects of COSP to those study outcomes show that the coping model can provide a well-structured framework for the development of the intervention protocol as well as the study outcomes.

Potential of the incorporation of the COSP into routine SCI rehabilitation

With confidence gained from the positive results of the COSP intervention on those psychosocial outcomes, we thus state that the incorporation of a psychosocial care programme into SCI rehabilitation routine care is highly possible. This claim/recommendation can be supported by the satisfactory acceptability of COSP to the study participants, the relatively low attrition rate of this study, participants' availability for attending the group session during the residential period in the hospital, as well as positive intervention effectiveness achieved on their psychosocial outcomes.

Chinese culturally sensitive psychosocial care programme for people with SCI

It is crucial to consider the cultural issues when delivering psychosocial intervention (Moodley et al., 2013). The COSP intervention was also modified to address Chinese culture issues (e.g., face-saving, maintaining harmony, Confucianism, etc.), in relation to people's ways of thinking and their coping behaviour at post-injury. The successful adaptation and implementation of COSP in our study also demonstrated the possibility, feasibility and effectiveness of delivering psychosocial interventions in a Chinese population. Those positive effects made by COSP on participants' psychosocial outcomes can reflect and demonstrate the importance and need for such modifications in addressing cultural issues for the whole study process. The nurse researcher herself is a native Chinese person that might help reduce the difficulties in understanding participants' thoughts and behaviour about cultural aspects. As main components and approaches/techniques used in COSP were adapted from Western countries (i.e., UK and Australia, and the content mainly adapted from the Coping Effectiveness Training Manual), we thus perceive the potential in adapting the coping effectiveness training intervention to people with SCI in other cultural contexts in the future.

Appropriateness in training rehabilitation nurse as the COSP provider

As indicated in the previous literature review of this thesis, health professionals working in the SCI wards (e.g., rehabilitation nurses) are considered appropriate in delivering the COSP during SCI routine rehabilitation. This can meet the clinical needs of lacking clinical psychologist or experts in psychological treatment in the rehabilitation wards/contexts globally. The COSP that was successfully facilitated by a nurse researcher in this study indicates the potential in training other health professionals in taking the role of psychosocial intervention provider, as well as performing relatively satisfaction psychosocial care for people with SCI during their inpatient rehabilitation stage. This successful COSP implementation by a nurse researcher with training in psychosocial intervention delivery can also strengthen nurses' role to be more holistic in SCI caring.

Consideration of the clinically significant changes in the study outcomes

In addition to the analysis of the statistically significant effects of the COSP, clinically significant changes were also considered and performed according to the criteria proposed by (Jacobson et al., 1999). This study fills this gap existed in the previous literature on psychosocial care for people with SCI, in terms of determining the clinical significant changes of the psychosocial outcomes measured. This could provide evidence for deciding the clinical relevance and importance of the COSP effects.

8.3 Implications

8.3.1 Implications for policy and practice

Findings of this study provide evidence for the effectiveness of a coping-oriented supportive programme for people with SCI during their inpatient rehabilitation stage. This research has its potential implications for improving policy in enhancing more emphasis/attention to psychosocial care of SCI rehabilitation. The comprehensive literature review and the COSP development and evaluation in our study strengthen the clinical needs for such a psychosocial programme for people with SCI during their inpatient rehabilitation stage. The psychosocial care programme can support people's psychosocial adjustment and improve their adaptation to the injury and its subsequent consequences, and improve the participants' rehabilitation outcomes and whole well-being. The major policy implication from this PhD study is that it provides empirical research evidence in supporting the potential integration of a psychosocial care programme into routine SCI rehabilitation. This statement was driven by the importance but the scarcity of such psychosocial interventions conducted for people with SCI during their inpatient rehabilitation stage. Meanwhile, the improved psychosocial conditions can also support better physical functioning and health condition as participants' enhanced self-efficacy can promote more engagement for people's physical rehabilitation, and better adaptation to the challenging situations during their inpatient rehabilitation as well as subsequent community reintegration.

Although the incorporation of the psychosocial care programmes into SCI routine rehabilitation is highly recommended, this incorporation still faces challenges and much consideration in future studies. The first potential difficulty that might hinder/inhibit the easy integration of this psychosocial care programme into routine SCI care is the complex nature of this intervention and its high demand on the training of the intervention provider. This protocol-based psychosocial care programme incorporated kinds of psycho-therapeutic techniques (i.e., cognitive modifications, behaviour intervention approach, and social skills training, etc.), which need intensive training from an experienced clinical psychologist (e.g., CBT practitioner). Before intervention implementation, the nurse researcher had received coursework training and supervision by an experienced clinical psychologist. Further ongoing training and supervision during the intervention delivery stage were also received by the nurse researcher.

As the COSP was only delivered/evaluated to two rehabilitation hospitals in China, a further generalisation of the COSP implementation in other rehabilitation settings in China can only be considered after its further testing in other provinces using a more robust research design (i.e. a multi-centre cluster randomised controlled trial). Another possible implication of this study to clinical practice is about a recommendation on choosing the appropriate health professionals in delivering the psychosocial care programmes during SCI rehabilitation. The successful experience in training nurse researcher to deliver the COSP intervention in our study indicate possibilities and high potential of facilitating psychosocial group intervention by rehabilitation nurses after receiving proper training and supervision. Chinese cultural issues/notions should be considered for the whole study process including intervention programme design and implementation. Proper arrangement of patients' schedule, as well as effective support from the physician, is also crucial factors to ensure a successful delivery of the COSP intervention in the clinical settings.

8.3.2 Implications for future research

This study provides promising research evidence of the effectiveness of the COSP in enhancing psychosocial outcomes for people with SCI during their inpatient rehabilitation. This study adopted a quasi-experimental design that is not as compelling as a randomised controlled trial, and this study might not be generalised to a large Chinese population in the different socio-cultural background and different regions of Mainland China. Therefore, future research trials are recommended to be conducted using a clustered randomised controlled design in multiple study settings.

We also suggest a qualitative exploratory study followed by quantitative assessment of the intervention effects. This qualitative exploratory study can facilitate understanding the working mechanisms of the COSP intervention, and participants' experience in attending the group intervention sessions. Those patients' narrative feedback can assist better interpretation and understanding of the study findings and potential directions for improving the study design as well as the intervention content.

Training rehabilitation nurses as the intervention providers are highly recommended in the future with allowed sufficient resources. This can further prove the appropriateness for rehabilitation nurses taking the role of psychosocial intervention providers. Findings from psychosocial interventions often adopted participants' self-reported outcome measurements due to its subjective nature. However, if future studies use some objective measurements such as stress hormone levels or behaviour observations, those study findings could be more empirical and certain.

The focus of the COSP intervention evaluated in this study was to facilitate participants' effective coping skills for their life-long use. As with current progress of medical development in SCI rehabilitation, the injured spinal cord is still incurable and the disabilities issues are unavoidable. Patients with SCI might meet various stressful situations in different life stages, and we hope these coping skills and behaviour changes can last for their long-term adoption. Long-term assessments (i.e., one or two years) for the COSP intervention effects are recommended for future research. Blinding of the study participants to specific study groups is also suggested for future studies. Some boosting sessions can be further considered to reinforce the intervention effects during the follow-up assessment stage if further improvements are expected for those outcomes staying in a stable level overtimes (Ducharme, Lachance, Lévesque, Zarit, & Kergoat, 2015; Kearney, 2017).

Participants' thoughts/beliefs on their situations/consequences at post-injury can be reviewed, and further suggestions on the ways of handling the problems/concerns occur can be discussed. As suggested by the guide to booster sessions of Beck's cognitive behavioural therapy (Beck, 2011), questions such as "what has gone well with you? What problems arose? How did you solve the problem? Was there a better way of handling them? How did you deal with your automatic thoughts/beliefs? How did the COSP help you in some situations and what's your plan for your future use of the COSP?" can be asked in order to provide further suggestions to the participants, and to maintain the intervention effects and participants' psychosocial well-being over time.

Coping as the main concept in guiding the intervention development and study outcomes assessments was also found to be one important factor in predicting people's resilience when facing those challenging issues and/or stressful situations caused by SCI (Bonanno et al., 2012; Kilic, Dorstyn, & Guiver, 2013). "Resilience" as an emerging concept in rehabilitation psychology has, in recent years, raised researchers and clinicians' interests in psychosocial rehabilitation of SCI (Driver et al., 2016; Guest, Craig, Nicholson Perry, et al., 2015; Kornhaber, Mclean, Betihavas, & Cleary, 2017). Thus, resilience-based psychosocial care programmes or interventions using resilience as the theoretical underlying or primary goals can be further explored as a promising research direction in this area. In addition, expectations from people with SCI during inpatient rehabilitation as well as suggestions/recommendations from caregivers can be further explored for the future development of psychosocial interventions and/or such psychosocial rehabilitation programmes.

8.4 Conclusion

Psychosocial care programmes that have equal importance with physical rehabilitation play a pivotal role in supporting people's psychological adjustment to SCI during inpatient rehabilitation. The COSP intervention evaluated in this study had an overall statistically significant moderate to large effect on the majority of the psychosocial outcomes for people with SCI during their inpatient rehabilitation stage. Study findings indicated statistically significant effects on participants' maladaptive coping, anxiety, satisfaction of social support and life satisfaction at immediately after the intervention, 1- and 3-month follow-up; adaptive coping and depression at immediately after the intervention; self-efficacy at immediately after the intervention and 1-month follow-up. Majority of the study outcomes (i.e., maladaptive coping, anxiety, satisfaction of social support, and life satisfaction) showed continuous statistically significant improvements across several follow-up time points. A few improvements in outcomes (i.e., adaptive coping, self-efficacy and depression) remained stable after the first post-test of the intervention. The clinically significant changes in participants' adaptive coping, self-efficacy, and life satisfaction highlight the practical relevance and clinical importance of the COSP intervention. Male participants and those with paraplegia were found to have better psychosocial adaptation outcomes, suggesting that future studies might consider tailoring the intervention for specific subgroups of people with SCI. The study findings support the effectiveness and validity of using stress and coping theory as the primary framework for guiding SCI intervention development as well as study outcomes formulation.

This study pioneers a structured psychosocial care programme for Chinese people with SCI and filled several methodological and practical research gaps existing in the previous literature. Primarily, the study has contributed to the new knowledge of adding research evidence on the effectiveness of the COSP in improving patients' psychological adjustment during inpatient SCI rehabilitation, particularly in a Chinese context. The significant positive effects of the COSP on enhancing people's self-efficacy, coping abilities, mood status and life satisfaction indicated the potential value of the integration of this psychosocial care programme into routine SCI inpatient rehabilitation. Future studies should train rehabilitation nurses to deliver the COSP during their day-to-day clinical practice and measure medium-long term (e.g., after people's community reintegration at post-SCI) patient outcomes using a multi-site cluster randomised controlled trial design.

Appendices

Appendix 1 COSP intervention outline

Introduction to the programme

This COSP programme is a psychosocial care intervention with eight group sessions. It aims at helping you manage the demands aroused from spinal cord injury (SCI). Over the coming eight weeks, you will be encouraged to recapture the stressful situations that you have experienced following the injury and then find ways to deal with these situations effectively and thus reduce their related-stress. One important component of stress management is to make a decision about where to focus one's effort. The goal of this COSP programme is to build your confidence and ability in coping with the current injury and subsequently managing your future life. *Content and tools used in this pamphlet are modified from Hsiao Yu Chen's DVD-based educational programme, Kennedy (2008)'s handbook of "Coping effectively with Spinal Cord Injury" and Craig (2012)'s handbook of "surviving and thriving with SCI" with their permissions.*

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Group session one: Introduction

Warm-up

- Introduce yourself to the rest of the group, for instance: your city and living place, age and marital status, whether or not you have children, previous employment, etc.
- You will meet once per week for eight weeks. All the information you talked will stay in the group. It will be most useful for you if you can come to every meeting.
- You are invited to talk about any reasons for participating in this programme, and your expectations about what you can achieve from it.
- Remember that you are the expert in managing your injury and life.

Spinal cord injury (SCI) and stressors related to SCI

- Tetraplegia and paraplegia
- Incomplete and complete injury
- Stressors related to SCI
- Function loss and physical changes due to the injury
- Medical complications: pain, depression, sexual impairment
- Requiring more time than before to complete tasks
- Irritation with self or with others
- Unmet role expectation and social relationships

What have you learnt from the DVD? Think about your goal and things you want to achieve from this programme.

Group session two: cognitive appraisal

What is stress?

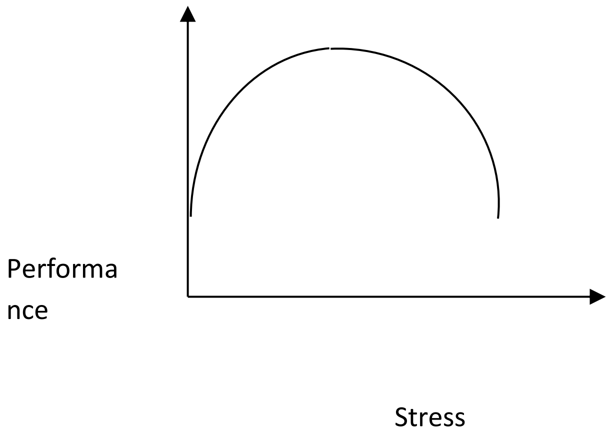


Figure 1 Performance/Stress graph

- Low mood
- Negative thinking
- Poor sleep
- Muscular tension
- General fatigue

"Because SCI is new to you, initially it can be very demanding. You will need to learn to cope with a variety of new situations. It is important to manage stress effectively, you may become overwhelmed and the stress will interfere with your ability to deal with certain situations. The particular situation will only get worse then, and you will experience even more stress."

Coping

Coping is the method of considering each life stressors and the ways that you help yourself deal with it. As you proceed with this programme, you will be given opportunities to strengthen your adaptive strategies in coping with stress concerning SCI.

Let's learn to break down or analyse a complex stressor

Example: Xiao Hua is a SCI patient and he sometimes needs assistance from the hospital staff, but often ignored by the staff.

Who is involved?	The staff on the ward.
What is the situation/context?	When I need some help with certain things, the staff claims they are too busy. They seem to make time for everyone else, however. I feel like they are ignoring me.
Where are these situations likely to occur?	On the ward mostly, when I need help with something.
When did they last occur?	This morning when I needed some help washing and at dinner time when I needed assistance.
When are they likely to occur again?	It is most likely to happen in the morning and at mealtimes.

Matching your coping strategy with each stressor (Adaptive coping)

What are the external aspects of this specific situation that can be changed?	The staff's behaviour My behaviour
What elements of the problem are amenable to change?	The staff could be more understanding I could change the way I ask for help I could change the way I react to not getting help

Is it possible to change or manage in a different way your behaviour or your actions or your behaviour towards who, what, where, and when?	I will be more assertive with staff when I need help I will also arrange a time for them to see me in the morning and at dinner

❖ **Problem-focused coping (changeable situation)**

-Problem-solving (Session three)

-Active coping (Session three)

-Making decisions (Session three)

-Rehearsing solutions (Session three)

-Developing social and communication skills (Session seven)

❖ **Emotional-focused coping (unchangeable situation)**

- Relaxation (session four)

-Change the way you think about the problem/situation (Session five)

-Re-evaluating the significance of an issue (Session five)

-Changing the meaning of something for yourself (Session five)

Homework:

My signs of stress

The exercise helps you look into your personal signs of stress.

What happened when you got stressed?

What did/do you notice when faced with stress?

How do you think and feel?

What would you do?

Any bodily changes or reactions do you notice?

Analysis of stressors, to see what can be changed or not

List the stressors related to your injury and place a checkmark in the appropriate column to indicate whether the stressor can or can't be changed.

Stressor	Changeable	Unchangeable

Group Session three: Problem-solving

Problem-solving is a logical step-by-step procedure for coming up with practical ways of solving problems. Problem-solving is used after you have appraised a situation and established which aspects of the problem are changeable.

Step 1: Identify the problem and goal to be achieved (Be specific and careful when doing this, include the situation or context of the problem. Describe the problem and its context, e.g., Where, How, Who, What?) (Session Two)

Step 2: Generate possible solutions (Include silly, unrealistic and realistic solutions, the more the better)

Step 3: Assess the advantages (Pros) and disadvantages (Cons) of each solution. (Begin to weigh up in your mind that is the best one from the alternative options)

Step 4: Select the best solution

Step 5: Develop a plan to carry out your preferred solution (How many steps, list out all the steps)

Step 6: Review your problem- solving down (Praise yourself if you were successful. Revise your plan if you need to—tell yourself you have tried your best and it is now improving and continue applying this technique)

An example of using problem-solving:

Issue: You are feeling depressed about your lack of mobility.

Goal: To gain better access to mobility resources.

Solutions: a) Reduce negative thinking about lack of mobility; b) Communicate your concerns to staff and family; c) Tell people off about the problem, d) Don't do anything as it is too hard.

Best solution for examining pros and cons can be: reject "c" and "d", choose "b" first and perhaps apply "a" later.

Plan: Think about whom to talk to first, share with friends in the unit about the problem, and then approach the best person to discuss the problem. Later, do the psychology program to learn how to reduce my negative thinking.

Review: Assess how the problem has been addressed. Are other strategies needed?

Homework

Problem-solving worksheet

1. Identify the problem, consequences of the problem and goal to be achieved.

2. Generate possible solutions

3. Assess the advantages (Pros) and disadvantages (Cons) of each solution

4. Select the best solution

5. Develop a plan to carry out your preferred solution

When developing your plans for a preferred solution, you need to consider:

- What may make this plan difficult to achieve,
- Who/what might help to achieve this plan,
- How I will know if I have achieved the plan, etc.

6. Review your problem-solving outcome

Remember: Praise yourself if you were successful; Revise your plan if you need to (tell yourself you have tried your best and it is now improving) and continue applying this technique.

Group Session four: Managing emotion

Guided imagery exercise:

Do the following exercises now:

Imagine a red rose for 5 seconds and hold the image.

Imagine a gold coin and hold for 5 seconds.

Imagine a cold bottle against your cheek on a hot day and hold for 5 seconds.

Imagine the national anthem being played and hold for 5 seconds.

Imagine a waving flag for 10 seconds. First, imagine the Chinese flag on a flagpole (5 secs). Now imagine it being blown by the wind (5 secs). Then, increase the force of the wind so it is being blown around strongly (5 secs). Further, imagine the wind moving trees nearby, and leaves blowing around (5 secs).

Favourite places visualization (do this over 10-15 mins taking 20-second breaks between instructions)

Go somewhere comfortable and close eyes and begin to relax.

Let your breath slowly inhale and exhale.

Continue to relax.

Focus on your slow breathing for the next 60 seconds.

Now, imagine a place you love to be in, a sandy, quiet, safe beach.

Perhaps you are lying down observing a wide blue sky with white clouds

Or a green meadow scene with flowers

Or sitting comfortably in front of warm fire on a cold day, or lying on your bed in your bedroom

Keep breathing slowly

Feeling at peace, keep relaxing

Now, what colours can you see (yellow sand, green grass and red/ blue flowers)?

What peaceful sounds can you hear (the gentle surf, children playing in the distance, birds singing somewhere close)?

Describe any scents you can detect (e.g. scents in your bedroom, the smell of salt air, meadow grassy smells)?

Keep visualizing your scene and let it develop in your mind

Stay there in the scene and enjoy it

Taking your time, just keep relaxing

Keep focusing on your slow breathing

Breathe in and out slowly

Now let your scene change (e.g. a cloud moving across the sky, log burning and crackling, birds flying).

Watch your scene as it changes, don't try to force it or think of anything in particular, and just allow whatever happens to happen.

Continue to imagine your scene and keep relaxing

Be aware of your slowed breathing

Enjoy this feeling and stay relaxed for the next 5 minutes, then slowly open your eyes and let the scene go. Continue to enjoy the feeling of calm you have experienced. Sit quietly for a little while longer and keep your breath rate slow and even before you begin to move around.

Homework: practice the above visualization exercise for about 10-15 minutes at least once a week.

Tips: you can practice this exercise progressively if any comfortable feelings occur or you'll find sometimes it is difficult to proceed.

A simple mindful exercise:

- Look around the room. Observe and note the different coloured things in the room. What is blue? What things are brown or wood colour, and what things are red, green or yellow? Repeat for as many colours in the room you can see.
- Observe any patterns in the room. Describe these to yourself.
- Adapt this for different shaped things in the room? Spend a minute on shapes you can see, describing them to yourself.
- Now use your sense of hearing. Count how many sounds you can hear. List them to yourself. Become aware of every tiny little sound.
- Concentrate on the floor. Is it tiled, carpeted, or wood? Are there any mats? Describe the floor to yourself.

- If you can touch some objects nearby you. Describe them to yourself in terms of their smoothness, roughness, softness, whether they are textured, and so on.
- If any unpleasant emotions (anger, anxiety) or unhelpful thoughts about the past or future (such as “I can’t do this anymore”; “There is no hope, I am useless”; “It is going to be awful”), don’t focus on them and entertain them. Give them a short label such as “that is a sad feeling” or “that is a painful memory”. Let them go by simply refocusing your mind on things around you.

Reflection:

How successful was this experience? Did you enjoy it? Did you think about your problems during this time? Did you focus on any painful or unhelpful memories or thoughts? If you did, what did you do to remove them from your mind?

Homework:

Do a mindful exercise for 10 minutes each day at thrice per week. This can be done anywhere, but the ideal place is somewhere pleasant where you won’t be disturbed. It can be in a garden around the hospital, or anywhere outside where you can distract yourself such as along a nearby street. As long as you are safe and you know you can feel at peace there.

Begin by saying to yourself “I am observing things around me ” Observe things such as any plants, trees, the ground below you, the road, the water, houses, road lights, leaves on the ground, birds, ants, wind in the trees, clouds in the sky, the sun on your skin, how hot or cold it is, the wind in your hair, waves on the water, and so on. Focus on these things throughout the time. Enjoy what you see.

While you are observing things around you, begin to also focus your attention to any sensations in your body. Pay attention to your arms and notice any changes as time goes by. Has your breathing changed while you have been observing?

Label any negative memories or thoughts, and then let them drift away. Don't become focused on them, by focusing your mind again on things around you.

After 15 minutes or so, say to yourself: "I am now stopping"

Try applying these mindfulness skills to other areas of your daily life. List these areas below:

Areas I can apply mindfulness to; also describe briefly how I can do this (frequency a week, where, how long, etc.):

1.

2.

3.

4.

Scheduling pleasant activities

Step 1: decide what, when, how, and with whom

Step 2: Set realistic goals

Step 3: Commit yourself to do it—and do it

This schedule provides a list of possible pleasant activities. Go through the list and tick any activity you would like to do more often. If you cannot perform some of these activities, that is OK, just pick another activity. There may be some pleasant activities that you would like to do which have not been listed. Feel free to add your own activities to the Schedule. Also, make sure that some of your activities are low cost and easy to perform (e.g. exercise, having a coffee in a cafe, listening to music, reading, talking with a friend). Some events should be chosen that are less frequent and longer-term, such as planning a holiday, or a weekend trip away. Make sure there is a good mix of the two. Please also indicate the frequency of each activity that you would like to commit (e.g. Short-term: once/twice per week. Long-term: once per month, once per year).

Pleasant Life Event Schedule (please take "√" after the activity you would like to perform and indicate the frequency)

Activity	**Frequency**
Going to a concert	
Planning trips or holidays	
Going shopping or window-shopping	
Painting, drawing or sculpting	
Reading novels, poems or plays	
Going to a bar, pub or club with friend or family	
Going for a scenic drive	
Singing	
Playing cards	
Watching comedies and funny movies	
Solving a puzzle or a crossword	
Having lunch with friends	
Playing with pets	
Learning a foreign language	
Having a picnic with family and friends	
Playing chess or other board games	

Buying and wearing new clothes

Sitting in the sun and relaxing

Playing computer games

Going to parties

Having a lively talk with friends

Listening to the radio or watching TV

Having friends/ family come to visit

Having a message

Writing letters or cards

Hearing and telling jokes

Going to see beautiful scenery

Playing sports such as tennis, basketball, table tennis, archery

Doing weight training

Doing woodwork or metalwork

Playing a musical instrument

Playing Darts

Writing in a diary

Knitting, crocheting etc

Going out to a restaurant or a cafe for breakfast, lunch or dinner

Going to a museum or exhibit

Talking on the telephone to friends or family

Going to the movies

Attending a family get together

Meditating and relaxing

Visiting friends

Reading the newspaper

Listening to music

Going for mindful ride in my chair

Helping others

Reading magazines

Going to the Library

Travelling with a group

Going horse riding

Painting

Others ……

… …

Homework

For the next week, from the activities you ticked above, you should select at least three enjoyable activities and then commit to them by deciding what day, when you would like to do this, and with whom you would like to do it. Keep a list so we can discuss this next time we meet.

Example:

Activity: coffee in a cafe Day: Monday Time: 10 am who with: by myself

Activity: Go to the movies Day: Friday Time: 7 pm who with: friend

Activity: Seeing family Day: Saturday Time: 1 pm who with: partner

Activity: Day: Time: Who with:

Activity: Day: Time: Who with:

Activity: Day: Time: Who with:

Group Session five: Changing Negative Thinking

Unhelpful thoughts can make you feel depressed, scared, and demoralized. This in turn affects your actions, which can further confirm the negative thoughts.

Example: Xiao Wei feels that no one wants to be friends with him since his injury

Thought: "*I don't speak to people with disabilities before the injury, why will people want to be friends with me now?*"

Feelings: Low confidence, worthlessness, depression, and anxiety in social situations

Action: Avoidance of social situation, which confirms the negative thought.

You are encouraged to share your any kinds of your thoughts, feelings and emotions related to the injury to the group. Remember, we are a group to encourage everyone to talk, and also you are not allowed to judge others' thoughts negatively.

Common thinking errors:

- ***Overgeneralization.*** *Taking one unfortunate situation and drawing sweeping, generalized conclusions from it.*

  Example: "My mother couldn't visit me today. She can't deal with seeing me in a wheelchair."

- ***Discounting the positive***. *Ignoring positive aspects and focusing only on the* *negative.*

Example: “My physical therapist says I am making progress, but I still can’t walk, so what does it matter?”

- ***Black-and-white thinking.*** *Thinking of things in absolute terms, like “always”, “every,” or “never”.*

  Example: “I will never be able to work again.”

- ***Catastrophizing.*** *Predicting the future negatively without considering other, more likely, outcomes.*

  Example: “I won’t be able to run my house or take care of my children. My husband/wife will leave me and my kids will resent me, and my life will fall apart.”

- ***Personalization.*** *Holding yourself personally responsible for an event that is not entirely under your control.*

  Example: “If I hadn’t gone shopping that day, I wouldn’t have gotten in the accident and I wouldn’t be in a wheelchair.”

- ***Jumping to a conclusion.*** *Assuming something negative where there is actually no evidence to support it. Two specific subtypes are also identified:*

  Mind reading---Assuming the intentions of others. Arbitrarily concluding that someone is reacting negatively to you.

  Example: “My partner went to bed early. He no longer finds me attractive because I am in a wheelchair.”

  Example: “My relatives do not want to see me in a wheelchair, I’m losing all my family members’ face”.

  Fortune telling----Predicting future events will turn out badly despite the lack of evidence to support this.

  Example: “My friends won’t invite me to their annual house party now that I am disabled.

- ***Emotional reasoning.*** *Assessing a situation solely in emotional terms.*

  Example: “My partners are desperate for me to walk again. I’m letting them down.”

- ***Should, musts, and ought.*** *Expecting that yourself or others should, must, or ought to be a certain way.*

Example: “My friend should understand what I’m going through.”

Changing negative thoughts

Next time when you feel blue (low mood), you can try to catch the thought that gone through your mind. And then use following ways to challenge your negative thoughts:

Step 1: Identifying any negative/unhelpful thoughts and writing these down

Step 2: Evaluating the evidence against these thoughts, beginning with what you think is your most severe negative thought.

Step 3: Developing helpful and realistic thoughts related to the thought

Example:

Catastrophic, excessive and unhelpful thinking	**Evidence against this type of thinking**	**Helpful and realistic thinking**
Example of excessive negative thinking: “I cannot put up with it anymore” “It is too difficult” “I am hopeless and useless now”	I have many resources such as intelligence, social support, time, and understanding my problems. I have been able to use my skills to deal with my problems in the past, so I will beat it in again	“I can cope with and adjust to my problems such as my pain” “If I use my skills and manage my health I will be OK”
Example of excessive positive thinking: “I don’t need any help. I can manage by myself” “I don’t need to be concerned about anything” “You	SCI is a severe injury that has resulted in a high level of dependence. Help from others can be very beneficial. I have learned lots of skills, but I don’t know everything.	“Accepting help from others is OK. Getting assistance from others will make me tougher and more resilient” “Life can be very

don't understand, it is my problem"	Everyone needs help from others at times, and I am no different.	tough at times, but I can cope"

Other negative thoughts:

- "I won't be able to run the house now. I can't do anything."
- "My partner won't be able to cope with me being a burden. He will leave me"
- "I used to be a professional athlete. I've never had another job. I'll never be able to work again."
- "No one will want to be with me now that I'm disabled."
- "I'll never be able to look after myself. What's the point in carrying on?"
- "My hands don't work, my legs don't work. Nothing works. I'm useless."
- "I can't look after my kids if I'm in a wheelchair."
- "With my level of injury, I'm always going to have to rely on other people, so what's the point of rehab? I may as well give up."
- "I'm not progressing fast enough with my rehab."
- "No one will find me attractive now."
- "I couldn't contribute anything to my family and the society. I'm useless."
- "I am not an eligible father (mother) or husband (wife)". I'm useless"

- “I am a heavy burden to my family, what’s the point in carrying on.”

Homework:

Use the following form to challenge your negative thoughts. Identify your thoughts in the first column and rate the intensity of your mood on a scale of 0-100. Use the remaining columns to list the evidence for and the evidence against the thoughts. Then, generate an alternative, rational thought and rerate your mood. See the first row for an example.

Thought	Mood and Mood Intensity Rating	Evidence For Thought	Evidence Against Thought	Alternative Thought	Mood and Mood Intensity Rating
My life is over now that I'm in a wheelchair	*Hopeless (95)*	*I am paralyzed and can't do anything that I enjoy. I always need someone to help me. I can't fend for myself.*	*Well, last weekend I did play catch with my kids at the park. I even went to the corner market on my own to pick up a few groceries*	*I may be paralyzed but that doesn't mean I can't participate in fun activities and live a full life*	*Hopeful (75)*

Group session six: Maladaptive/Adaptive Coping

Additional adaptive coping strategies (these strategies could help you cope with stress):

- Acceptance - accepting that you have had a spinal cord injury (SCI) and there would be some consequences or changes that it brings to your lifestyle.
- Positive reframing - looking at new ways of learning from the experience.
- Active thinking and planning - figuring out the best ways to deal with certain situations.
- Prioritizing - focusing on your limited resources on the issues that really matter to you at the moment.
- Confrontation - confronting stressful situations and using problem-solving.
- Social support - seeking and receiving support from others.
- Fatalism voluntarism – Do whatever is humanly possible, and leave the rest to what is fated by heaven.

Maladaptive coping (these are unhelpful coping strategies that are likely to increase your stress):

- Doing nothing about the problem;
- Avoiding thinking about your injury and what it means to you;
- Denying that you have an injury and not doing the things you need to do (e.g., physical therapy);
- Expressing extreme emotion (e.g., constantly talking about how bad you feel); and

- Thinking about using drugs or alcohol;

You are encouraged to think about the unhelpful coping strategies you use before for some particular situations, and please consider more alternatives.

Homework

- Think about the coping strategies they generally use and consider whether they are adaptive or maladaptive.
- Think of one adaptive strategy that they can continue using and one maladaptive strategy that they can discontinue.
- Continue practising relaxation training and engaging in pleasurable activities.

Group session seven: social skills training

Effective communication is really important!

Pay attention to your “tone, facial expression, head shaking and nodding, eye contact, gestures, posture, body contact and touch, appearance, proximity, and sitting orientation”

You need to remember that being assertive is to maintain a “harmonious relationship” in long-term benefits. Learn to be assertive in your life.

Being assertive

Assertiveness involves

- Developing the ability to express thoughts and feelings honestly
- Being open to taking risks
- Showing respect
- Being sensitive to others
- Being responsible for one’s own behaviour

Your assertiveness rights:

- Be independent
- Change your mind
- Say you don’t know

  - Say you don’t understand
  - Say you don’t care
  - Make mistakes
  - Express anger
  - Have an opinion that is different from others

Other two types of inappropriately common behaviours when facing stressors

  - Being passive: holding back your feelings and thoughts and doing what the other person wants (protecting their rights) at the expense of your rights.
  - Being aggressive: getting what you want by being angry, deceptive or hostile, protecting your rights at the expense of the other person’s rights.

Examples:

Your mother and her friend come to visit you. Rather than asking you, the woman says to your mother: "Do you think he wants a drink?" How would you respond?

- PASSIVE: Allow your mother to answer for you.
- AGGRESSIVE: "You've got a nerve asking my mother instead of me. I can speak for myself you know."
- ASSERTIVE: "I appreciate you asking, but I can answer myself thank you. I would like it if you asked me next time."

Your caregiver keeps doing things for you when you are capable of doing them yourself. What do you do?

- PASSIVE: Allow him/her to continue doing the task.
- AGGRESSIVE: "I'm sick of you treating me like a baby. Stop fussing all the time and let me do it myself."
- ASSERTIVE: "I know you care and are just trying to help but I think it would be better for me if you let me do some things myself."

You are in a taxi and you see that the price the driver has charged you is more than that on the meter. When he asks for the money, what do you do?

- PASSIVE: Give them the money.
- AGGRESSIVE: "Look, just because I have a disability doesn't give you the right to rip me off."
- ASSERTIVE: "Excuse me, but could you check your meter because I do believe you have overcharged me."

A health professional working in the SCI Unit is rude to you (e.g., treating you like a baby). What do you do?

- PASSIVE: Feel angry but do nothing, except thank them for their help.
- AGGRESSIVE: Become very angry, yelling back at them rude things, and then demand an apology.
- ASSERTIVE: “I know you are very busy, but I am not a child. I am very happy to learn to look after myself.”

You now try to complete the following interactions in a passive, aggressive than an assertive manner. (Role-play)

You have bought an electric kettle from a large department store. You return it when you find it isn't working; expecting a replacement, instead, you are told it will be repaired by the manufacturer. You need a new kettle today.

- PASSIVE:
- AGGRESSIVE:
- ASSERTIVE:

You have a urinary tract infection and your doctor wants to prescribe a drug that you know will result in negative symptoms. What do you say to the doctor?

- PASSIVE:
- AGGRESSIVE:
- ASSERTIVE:

A close and respected friend is always late.

- PASSIVE:
- AGGRESSIVE:
- ASSERTIVE:

When communicating with people, you can also consider the following technique:

Conversation skills:

- Asking open-ended questions
- Listening for free information

- Self-disclosure
- Changing topics

Protective skills: Dealing with criticism

- Broken record
- Selective ignoring
- Disarming anger
- Guilt reduction and the no “I am sorry” rule

Homework: Practice your social skills in interactions you have with Hospital staff, your friends and family as well as your fellow SCI friends in the Unit.

Group session eight: social support and future

We get practical support in the form of information and advice from a variety of people, including your doctors, the other members of your group, etc. There is also emotional support that comes from the people with whom you are very close, like your friends and family. (We also get tangible support from close friends and relatives, and we get emotional support from people with whom we are very close).

Asking for help:

- Don't beat around the bush. When you don't ask directly for help, you may not be understood, or they may think you are manipulating them.
- Make sure your request is clear.
- If you are afraid the other person will say "yes" but really they want to say "no", you can avoid experiencing someone else's resentment by saying "If you don't want to do this, it's really okay."
- Avoid waiting until you're desperate for help. When you get to this stage you will probably be more likely to place unfair pressure on others to say "yes".
- Think about whether you are demanding rather than requesting help. In a request, you are accepting the other person's right to refuse. If the person refuses to help and you react with anger or sarcasm, you were probably demanding rather than requesting.
- Make sure when you ask for help that your body language is appropriate. For instance, if you ask in a helpless way, such as no eye contact, low voice

and speaking meekly, it may result in the person refusing to help because of your passive approach.

Maintain support:

- You should always acknowledge the help and support you receive from others. Also, it is important to recognize that the people who support you may need support themselves at times.
- Please discuss this issue with their partner and/or close family members/ carer. Like everyone, you need to have the good social support that involves some degree of affection. We encourage you to discuss your social and sexual needs now over the next 30 minutes. Be frank and honest about your fears or concerns in these areas. Also, please raise any concerns you may have about family issues, or with carer issues.

Crisis self-management

- Assess the crisis
- Assess your available resources
- Take immediate action

Self-mastery beliefs

Self-mastery is a belief, perception or an expectation that you can successfully manage and control your behaviour and life. If you expect or believe that you can achieve what you want to then you are more likely to cope actively and successfully. Increased self-mastery has been found to improve mood and reduce anxiety and pain.

- I can reduce my breathing rate if I do my exercise
- I can control my chronic pain by thinking about my pain differently
- I do not have to fear exercising
- I do not have to rely on alcohol to have fun
- If I self-manage I can reduce my risk of infections
- I can control and resolve most difficulties I experience in life

To end the programme

"Now that the program is ending, we'd like you to take some time to think about the things you have learned. It is hoped that the skills you've acquired in this course will increase your ability to cope and manage your life in the future. The next tasks for you are to develop new life goals, continue working on those goals you've already established, and plan for your future."

Appendix 2 COSP intervention-Patient Pamphlet

有效应对脊髓损伤——有意义的人生

以应对为导向的支持性干预方案

简介

本研究干预方案是针对脊髓损伤患者制定的社会心理关怀方案。目的在于帮助患者有效应对脊髓损伤带来的各项心理上的挑战。本干预共包括八个部分。在接下来的八个星期，患者可以学到各种应对压力的方法和技巧。患者可以通过有效应对各种压力，减轻心理压力并重建康复信心。本干预方案是从台湾学者 Hsiao Yu Chen 的 DVD 方案，英国学者 Kennedy 的 “Coping effectively with spinal cord injury”和澳大利亚学者 Craig 的 “surviving and thriving with SCI”改编而来。

第一节 项目介绍

脊髓损伤及相关压力源

四肢瘫/截瘫

完全性损伤/非完全性损伤

与脊髓损伤相关的压力源包括：

- ✓ 损伤引起的运动或感觉功能障碍
- ✓ 医学并发症（疼痛，抑郁，性功能障碍）
- ✓ 完成日常活动所需的时间增长
- ✓ 对自己和身边的人不满
- ✓ 达不到期望的社会角色和社交关系

你从 **DVD** 中学到了什么？请尝试设定一个预期目标以及期望的收获。

第二节： 认知评价

什么是压力？

- 情绪低落
- 负面想法
- 睡眠质量低下
- 肌肉紧张
- 疲劳

应对是你如何看待生活中遇到的压力事件，以及你如何应对这些压力事件的方法。从本干预方案中，你将学到各种应对压力的适应性方法。首先要学会如何对复杂的压力源进行分析并将其分解。

应对策略与压力源的匹配（适应性应对）

- 解决问题的应对方法 （对可以改变的情形）
- 针对情绪的应对方法 （不可改变的情形）

家庭作业 (我的压力症状)

1. 这项练习帮助你深入了解自身的压力症状

当你有压力时候会发生什么？

当你面临压力的时候你注意到了什么？

你怎么想的？感受怎么样？

你会怎么做？

有没有察觉到任何身体上的变化和反应？

2. 分析压力源，了解其是否可以改变。

列举和损伤有关的压力源，并标明该压力源是否可以改变。

压力源	可改变的	不可改变的

第三节: 解决问题

解决问题方案 (家庭作业)：

第一步，发现问题，问题的后果以及期望得到的结果

第二步，找出可能的解决方案

第三步， 评估每种方案的优缺点

第四步， 选择最好的方案

第五步， 制定一个计划来实施你选择的方案

当制定计划的时候，你应该考虑：

什么让这个方案比较难实施

谁或什么因素能够帮助完成方案

我怎么知道方案是否已经成功完成

第六步，回顾你解决问题的结果，记住：如果你成功地解决了问题，一定要表扬自己；如果没有成功，告诉你自己已经尽最大的努力，现在需要进一步改善。请继续改进你所用的方案，并重新应用本方法来解决问题。

第四节：控制情绪

想象练习

进行下列练习

- 想象一朵红色玫瑰花并保持 5 秒钟
- 想象一枚金币并保持 5 秒钟
- 想象在一个炎热的天气，一个冰凉的瓶子贴在你的脸颊上。保持 5 秒钟
- 想象正在奏国歌国歌并保持 5 秒钟
- 想象一面飘舞的国旗 10 秒钟。首先想象这面国旗插在旗杆上（5 秒钟），然后想象它被风吹动（5 秒钟），接着，风力加大，国旗被吹的四处摇摆（5 秒钟），最后，想象风吹动着旁边的树（5 秒钟），叶子随风飘散（5 秒钟）。

可视化练习（喜欢的地点）

去一个让你感到舒服的地方，闭上眼睛，开始放松。

慢慢的吸气、呼气。

继续放松。

在接下来 60 秒内，将注意力集中在缓慢呼吸上。

现在，想象一个你喜欢的地方，一片风景优美的，安静的草地。

想象你躺下来，看到广阔的蓝天和朵朵白云

一片绿色的草地，上面开着鲜花

想象在寒冷的冬天，舒服的坐在温暖的火炉前，或躺在卧室的床上

继续缓慢呼吸

感受到平静，继续放松

现在你能看到什么颜色 （黄色的沙子，绿色的草地，或者红色/蓝色的花朵？）

现在能听到什么声音？（轻拍的海浪，孩子们在远处玩耍，鸟儿在近处鸣叫）

描述你能闻到的味道 （卧室里的味道，咸湿的空气的味道，草地的味道）

继续想象你所看到的景象，让它继续停留在你的脑海里

停留在所想的景象里，尽情的享受

慢慢的，不要着急，继续放松

将注意力集中在缓慢的呼吸上

慢慢的呼、吸

现在，改变你想象中的景象 （比如一朵云朵飘过天空，有木头在燃烧并发出声响，鸟儿飞翔）

继续观察你看到的景象，让景象自然而然的变化着，不要请强行改变它或特别关注于某一事物。

继续想象你脑海中的景象，保持放松。

留意你减慢了的呼吸

享受这种感觉，放松 5 分钟，然后慢慢地睁开眼睛，让这些景象从脑海中远去。继续享受这种放松的感觉。安静地坐一会儿，保持减慢的呼吸直到你准备开始活动。

一个简单的正念练习：

在接下来的三分钟时间里做这个简单的练习：

- 请你环顾整个房间。观察并注意房间里不同颜色的东西。什么东西是蓝色的？什么东西是棕色的或是木头色的， 什么东西是红色的， 绿色的或者黄色的？ 尽可能的发现更多的色彩并且告诉你自己。
- 观察房间里的任何图案，并且描述给自己。
- 同样的观察房间里面不同形状的东西， 用一分钟时间观察所有你能看到的形状并且描述给自己。
- 现在用你的听觉。数一数你一共能听到多少种声音并且列出来给自己。注意留心每一个微小的声音。
- 现在集中注意力在地板上，看看它是瓷砖的，还是铺着毯子的，还是木质的？地板有没有衬边？ 向自己描述地板。
- 如果你能接触到身旁的某些东西，描述给自己这个物体的光滑度， 粗糙度，柔软度，看看它是否有纹理等等。

- 如有任何不愉快的情绪（愤怒，或者焦虑）或者关于过去或者未来不益的想法 （比如：“我不能再这样下去了， 没有希望了”，“我是个没用的人”， “这将是可怕的”，等等）， 不要过于关注或者集中注意力在它们身上，给他们一个大概的总结，比如说 “这是一个悲伤的感觉” 或者“这是个让人痛苦的回忆”。 放下这些不好的感觉或情绪，重新将注意力集中在身边周围的事物上。

- 你成功的经历了这些吗？ 喜欢这种感觉吗？在这段时间你有没有再想自己的问题？你有没有关注任何痛苦或者不好的回忆或者想法？如果有的话，你又是怎么样把它们从你脑海中移除的呢？

家庭作业（方法：如果有任何不舒服的感觉，或者觉得进行不下去的时候，不要勉强自己，循序渐进地进行练习。）。

进行上述可视化练习，每周至少一次，每次 **10-15** 分钟。

- 尝试每个星期花三天时间做正念练习，每次十分钟左右。 这个练习可以在任何地方完成， 但理想的场所是一个不受干扰的地方。 可以在医院周围的花园， 或者沿着附近某一条街道， 只要这个地方是安全的，并且使你能够感受到平静。

- 开始对自己讲：“我在观察我周围的事物。”然后开始观察，比如周围的植物，树木，地面，道路，水，房屋，路灯，路面上的树叶，小鸟，蚂蚁，风吹着树叶，天上的云朵，晒在皮肤上的太阳，阳光的温度，风吹着你的头发，水中的波浪等等。整个过程中，全身心的注意在身边这些事物上，享受一切你所看到的。

- 当你开始观察身边的事物，也请你注意一下你身体中的任何感觉。注意下你的手臂，随着时间的流逝，有没有什么变化呢？还有你的呼吸，在你做正念练习的过程中有没有变化？

- 总结一些不好的想法或情绪，让它们从你的脑海里渐渐散去。不要专注于这些不好的想法和情绪，重新的将思绪集中在身边的事物上。

大概十五分钟后，对自己说：我可以停止练习了

尝试在日常生活中的其他领域做正念练习，并且记录下来。

我可以运用正念练习的地方，简单的描述怎么练习（每周的频率，在哪里练习，练习了多久等等）

1.

2.

3．

4．

安排娱乐活动

- 第一步：决定活动的内容，什么时候，怎么完成，和谁一起
- 第二步：制定可实现的目标
- 第三步：行动起来，完成计划

娱乐活动计划 **(**请在你想做的事情后面打钩，并且说明你想做这件事情的频率**)**

活动 （频率）

- 计划出行和假期

- 逛商场、购物
- 绘画，画图或雕刻、雕塑
- 读小说，诗歌或者舞台剧
- 和朋友或家人去酒吧或其他娱乐场所
- 开车兜兜风
- 唱歌
- 玩扑克
- 看喜剧或者有趣的电影
- 猜谜语或做填字游戏
- 和朋友一起吃午饭
- 和宠物玩耍
- 学习一门外国语
- 和家人及朋友一起吃饭
- 下象棋或其它游戏

- 买新衣服，穿新衣服
- 坐在阳光下并放松
- 玩电脑游戏
- 去参加聚会
- 和朋友进行有趣的谈话
- 听广播，看电视
- 让朋友和家人来看望自己
- 做按摩
- 写信或者卡片
- 听或者讲笑话
- 去看看漂亮的景色
- 做运动比如网球，篮球，乒乓球，射箭等
- 练习举重训练
- 弹奏乐器

- 进行射靶游戏

- 写日记

- 织或钩物品

- 去餐馆，或者咖啡厅吃早餐，午餐或晚餐

- 去博物馆或展览

- 给朋友和家人打电话

- 去看电影

- 全家人一起聚会

- 冥想放松

- 看望朋友

- 读报纸

- 听音乐

- 坐在自己的轮椅上练习正念

- 帮助他人

- 读杂志
- 去图书馆
- 和一群人出去游玩
- 去骑马
- 画画

家庭作业

从下周开始，从上面勾选的活动中选择三个最想做的，决定哪一天，哪个时候，和谁做这项活动。记录下来以便我们下次继续讨论这个话题。

活动	日期	时间	和谁一起
喝咖啡	星期一	早上十点	我自己
去看电影	星期五	晚上七点	和朋友
去看望家人	周六	中午一点	和配偶

第五节：改变负面想法

负面想法会让你感觉抑郁，害怕，士气低落。这些会影响你的动作和行为，会进一步加深你的负面想法。

例子：小伟认为自从他损伤了以后没有人想和他成为朋友。

想法：在我受伤前，我不和有残疾的人说话。现在我受伤了并有残疾，为什么现在人们会愿意和我成为朋友。

感觉：在社交场合没自信，无用感，抑郁，焦虑

动作：回避一些社交场合，负面想法进一步加深。

常见思维误区

- 过度泛化
- 忽略事物的正面性
- 非黑即白，过于绝对化
- 小题大做

- 个人化

- 急于下定论

- 以己度人

- 感情用事

- 事必要

改变消极想法

下次当你感觉心情不好的时候，你尝试读取你自己的想法。然后用下面的方法来挑战你的负性思维：

- 第一步：发现负面/没有帮助的想法，写下来；

- 第二步：寻找对抗负面想法的思想，从最负面的想法开始。

- 第三步：建立有帮助的、符合实际的想法。

其他负面的想法

我不能再养家了，我不能完成任何事情。

我的伴侣不能承受我作为他（她）的负担。他（她）将会离开我。

我原来是一名专业运动员。我从来没有做过其他工作。我再也不能重新工作了。

没有人想和我在一起因为我残疾了。

我永远都不能照顾自己，还有什么意义继续活着呢？

我的手不能动，腿也不能动，什么都不能动，我没什么用了。

如果我 在轮椅上，我就不能照看我的孩子。

以我损伤的程度，我只能经常依赖其他人，那么康复还有什么意义呢？我还不如放弃。

我的康复进展不是很快。

没有人会觉得我有吸引力。

我不能再对家庭和社会做出贡献了。我是个无用的人。

我不是一个合格的父亲（母亲）或丈夫 （妻子）。我是一个无用的人。

我对家庭来说是个沉重的负担，还有什么意义继续下去。

家庭作业：填写下面的思维表格来重新审视自己的负面想法。将发现的负面思维填写在第一栏，然后对自己的情绪进行打分 （0-100）。在后面的表格中列出造成这一思维的证据以及减弱或消除这一思维的证据。然后，得出另外一个更加理性的结论，重新评估情绪并打分。

想法	情绪及其强度等级评分	支持想法的证据	反对想法的证据	另外一种想法	情绪及其强度等级评分
坐在轮椅上我的生命已经结束了	没有希望（95）	我现在瘫痪了，不能再做以前喜欢的事情。我总需要别人的帮助，我 不能自己照顾自己。	上个星期我和孩子们玩捉迷藏。我甚至自己去市场的杂货铺拿自己的衣服。	我或许瘫痪了，但这并不代表我不能参加一些有趣的活动和过一个充实的生活。	有希望的（75）

第六节：非适应性/适应性应对

附加的一些应对策略（这些策略可以帮助你应对压力）

- 接受
- 看到积极的一面
- 积极思考和计划
- 优先化
- 面对
- 社会支持
- 认命并努力

非适应性应对（这些应对方法会增加你的压力）

- 不采取行动解决问题
- 思想上回避已经发生的身体损伤以及它对自身的意义
- 否认自己已经有损伤，不去做该做的事情（例如：物理治疗）
- 抒发自己极端的负面情绪（持续的告诉别人自己感觉很不好）

- 用一些药物或酒精麻痹自己

家庭作业

想一想你平时经常用的一些应对方法，看看它们是适应性的还是非适应性的。

想一种你可以继续坚持使用的适应性应对方法，和一种你可以放弃使用的非适应性应对方法。

继续练习放松训练，并且专心于自己安排的娱乐活动。

第七节 社会技能训练

有效沟通非常重要

果敢

- ✓ 诚实的表达自己的想法和感觉
- ✓ 勇于冒险
- ✓ 尊重别人
- ✓ 能够顾及他人的感受
- ✓ 对自己的行为负责
- ✓ 独立
- ✓ 改变自己的想法
- ✓ 说你不知道
- ✓ 说你不理解
- ✓ 说你不关心
- ✓ 犯错误

- ✓ 表达愤怒
- ✓ 和其他人观点不一致

面对不同压力源的时候其他两种不适应性行为

- ➢ 被动的
- ➢ 激进的

练习下面的场景，试着比较一下被动，激进的和果敢的区别。

- 你有泌尿系的感染，你的主治医生想给你开一种药，你知道这个药对你有副作用。你将对医生说什么？
- 一个关系好的，你尊重的朋友经常迟到。

和他人交流时还可以考虑下面的一些沟通技巧：

<u>对话技巧</u>

- ✓ 问开放式问题
- ✓ 听取谈话中的信息

✓ 自我表露

✓ 转换话题

保护自己的技巧：应对批评

✓ 反复重申自己的观点

✓ 选择性忽略

✓ 表达自己的愤怒

✓ 少说“对不起”，减轻负罪感

家庭作业：和医院的员工，朋友，家人，以及病友练习使用社交技巧。

第八节 社会支持及未来

- ➢ 寻求帮助
- ➢ 保持支持

危机自我管理

- ✓ 评估危机
- ✓ 评估现有的资源
- ✓ 及时采取行动

自制信念

- ✓ 如果我做运动的话我可以减少我的呼吸频率
- ✓ 如果我从不同的角度思考我的疼痛我就可以控制它
- ✓ 我不需要害怕运动

- ✓ 我不需要依赖酒精去享乐

- ✓ 如果我能自我管理，我可以减少感染的几率

- ✓ 我可以解决我生活中遇到的困难

结束干预

这个干预项目即将结束，希望你能够简单回顾所学的知识和技巧。希望你从这个干预项目中学到的应对策略可以增强你应对压力的能力。 下一个任务是要重新建立新的人生目标，继续努力实现你制订的人生目标，然后为你的将来制订计划。

Appendix 3 Fidelity Checklist of the COSP intervention

Date: ______ Group: ______

Rate your fidelity to each session element on a scale of 1 to 7, with 1 indicating poor fidelity and 7 indicating high fidelity.

Group session one

- ✓ To provide overview of the programme _____
- ✓ To give practical information about group meetings _____
- ✓ To provide basic knowledge of SCI _____
- ✓ To facilitate practical role model for SCI patients to imitate _____

Group session two

- ✓ To discuss stress and its relates to SCI _____
- ✓ To present the cognitive model of stress and coping _____
- ✓ To improve SCI patients' ability to break down complex stressors into specific one, and distinguish between the changeable and unchangeable aspects of the stressor _____
- ✓ To introduce the concept of "adaptive coping" _____

Group session three

- ✓ To discuss and practice problem-solving _____

Group session four

- ✓ To describe the emotional reactions and present cognitive model of emotions _____
- ✓ To facilitate group participants' relaxation training and pleasant activity scheduling _____

Group session five

- ✓ To provide negative automatic thoughts and review common thinking errors at post-SCI _____
- ✓ Review steps for challenging negative thoughts _____

Group session six

- ✓ To review general information about stress, appraisal and coping _____
- ✓ To review coping strategies, and discussion maladaptive coping _____

Group session seven

- ✓ To discuss the importance of social skills _____
- ✓ To facilitate participants good communication skills, assertion skills, conversation skills and protective skills _____
- ✓ To encourage effective communication with family members, and to provide didactic information and knowledge regarding sexuality issues

Group session eight

- ✓ To know the importance and different types of social support, and provide strategies for obtaining and maintaining social support _____

- ✓ To discuss the importance of self-efficacy and provide participants with the self-efficacy beliefs _____
- ✓ To end the programme _____

干预完成度评分

日期：　　　　　组别：

对干预的完成度进行评分，每项最低评分为 1 分，最高评分为 7 分。

第一节

- ✓ 干预整体介绍_____
- ✓ 小组见面的信息及安排 _____
- ✓ 脊髓损伤知识的讲解_____
- ✓ 向成功适应的脊髓损伤例子学习_____

第二节

- ✓ 讨论什么是压力以及其与脊髓损伤的关系_____
- ✓ 展示压力和应对的理论模型 _____
- ✓ 改善病人将大的压力源分为小压力源的方法，区分可变的部分和不可变的部分_____
- ✓ 介绍什么是适应性应对 _____

第三节

- ✓ 讨论和练习解决问题的应对方法_____

第四节

- ✓ 描述脊髓损伤后的情绪反应及情绪的认知模型_____
- ✓ 放松训练和娱乐活动安排_____

第五节

- ✓ 分析脊髓损伤后的负面想法和常有的思维误区 _____
- ✓ 回顾如何挑战负面想法 _____

第六节

- ✓ 回顾学习过的应对技巧_____
- ✓ 讨论什么是不适应性应对 _____

第七节

- ✓ 讨论社交技巧的重要性 _____

- ✓ 训练沟通技巧，自我权益维护技巧，对话技巧，自我保护技巧
- ✓ 鼓励小组成员邀请自己的家属加入第八节干预,鼓励患者与家属的有效沟通，提供残疾后性生活教育并讨论

第八节

- ✓ 社会支持的重要性及不同种类的社会支持，如何获取和保持社会支持
- ✓ 讨论自我效能的重要性和自我效能的相关信念 _____
- ✓ 结束和小结 _____

Appendix 4 Instrument sheet for study outcome measurements

PART ONE: PERSONAL INFORMATION

1. Birthday (yyyy/mm/dd) ________
2. Gender: ☐Male ☐Female
3. Marital status：

   ☐Single ☐Married/De facto relationship ☐Separate/Divorced/Widow

4. Education level： Mean (years) ______

   ☐Primary school or below ☐ Secondary ☐Tertiary or vocational training ☐University or above

5. Employment before injury：

   ☐Full-time ☐part-time ☐others (e.g., retired and unemployed)

6. Religion： ☐Buddhism ☐Taoism/Christian/Catholic/Others ☐None
7. Average family income： ☐ Below 3000 RMB ☐ 3001-6000 RMB ☐ 6100-9000RMB
   ☐ More than 9000 RMB
8. How do you consider your financial status at present：

   ☐More than enough ☐Barely enough for daily expenses
   ☐Not enough for daily expenses ☐Very insufficient

9. Are you the financial support (Breadwinner) of the family before injury：

   ☐Yes ☐No

10. Where do you receive financial support for current medical care: ☐Insurance from the government or others ☐No insurance

11. Who is taking care of your currently： ☐Spouse ☐Children _____(persons) ☐Maid ☐Friend/siblings/Neighbours/Parent

PART TWO: DISEASE INFORMATION

12. Cause of injury： ☐Traumatic ☐Non-traumatic

13. Injury type：☐Tetraplegia ☐Paraplegia

14. Completeness of the injury： ☐Complete injury ☐Incomplete injury

15. Time since injury (month) ______

16. Length of rehabilitation stay (month) ______

17. Current medication: ☐ Psychotropic ☐ Pain ☐ Others

18. Traumatic brain injury (history): ☐ Yes ☐ No

PART THREE: INSTRUMENTS FOR OUTCOME MEASURES

A. Brief COPE (Carver, Scheier, & Weintraub, 1989)

These items deal with ways you’ve been coping with the stress in your life since you found out you were going to have this operation. There are many ways to try to deal with problems. These items ask what you’ve been doing to cope with this one. Obviously, different people deal with things in different ways, but I am interested in how you’ve tried to deal with it. Each item says something about particular ways of coping. I want to know to what extent you’ve been doing what the item says. How much or how frequently, don't answer on the basis of whether it seems to be working or not---just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.

No.	**Items**	I haven't been doing this at all	I've been doing this a little bit	I've been doing this a medium amount	I've been doing this a lot
1	I have been turning to work or other activities to take my mind off things	1	2	3	4
2	I have been concentrating my efforts on doing something about the situation I am in	1	2	3	4
3	I have been saying to myself this isn't real	1	2	3	4
4	I have been using alcohol or other drugs to make myself feel better	1	2	3	4
5	I have been getting emotional support from others	1	2	3	4
6	I have been giving up trying to deal with it	1	2	3	4
7	I have been taking action to try to make the situation better	1	2	3	4
8	I have been refusing to believe that it has happened	1	2	3	4
9	I have been saying thinks to let my	1	2	3	4

	unpleasant feelings escape				
10	I have been getting help and advice from other people	1	2	3	4
11	I have been using alcohol or other drugs to help me get through it	1	2	3	4
12	I have been trying to see it in a different light, to make it seem more positive	1	2	3	4
13	I have been criticizing myself	1	2	3	4
14	I have been trying to come up with a strategy about what to do	1	2	3	4
15	I have been getting comfort and understanding from someone	1	2	3	4
16	I have been giving up the attempt to cope	1	2	3	4
17	I have been looking for something good in what is happening	1	2	3	4
18	I have been making jokes about it	1	2	3	4
19	I have been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping	1	2	3	4
20	I have been accept the reality of the fact that it has happened	1	2	3	4

21	I have been expressing my negative feelings	1	2	3	4
22	I have been trying to find comfort in my religion or spiritual beliefs	1	2	3	4
23	I have been trying to get advice or help from other people about what to do	1	2	3	4
24	I have been learning to live with it	1	2	3	4
25	I have been thinking hard about what steps to take	1	2	3	4
26	I have been blaming myself for things that happened	1	2	3	4
27	I have been praying or meditating	1	2	3	4
28	I have been making fun of the situation	1	2	3	4

(Wang et al., 2015)

B. Moorong self-efficacy scale (MSES) (Middleton, Tate, & Geraghty, 2003)

The MSES is a 16-item scale rating confidence in performing everyday activities on a 7-point Likert Scale

No.	**Items**	**Very uncertain**						**Very certain**
1	I can maintain my personal hygiene with or without help	1	2	3	4	5	6	7
2	I can avoid having bowel accidents	1	2	3	4	5	6	7
3	I can participate as an active member of the household	1	2	3	4	5	6	7

4	I can maintain relationships in my family	1	2	3	4	5	6	7
5	I can get out of my house whenever I need to	1	2	3	4	5	6	7
6	I can have a satisfying sexual relationship	1	2	3	4	5	6	7
7	I can enjoy spending time with my friends	1	2	3	4	5	6	7
8	I can find hobbies and leisure pursuits that interest me	1	2	3	4	5	6	7
9	I can maintain contact with people who are important to me	1	2	3	4	5	6	7
10	I can deal with unexpected problems that come up in life	1	2	3	4	5	6	7
11	I can imagine being able to work at some time in the future	1	2	3	4	5	6	7
12	I can accomplish most things I set out to do	1	2	3	4	5	6	7
13	When trying to learn something new, I will persist until I am successful	1	2	3	4	5	6	7
14	When I see someone I would like to meet, I am able to make the first contact	1	2	3	4	5	6	7
15	I can maintain good health and well-being	1	2	3	4	5	6	7
16	I can imagine having a fulfilling lifestyle in the future	1	2	3	4	5	6	7

C HADS (Woolrich, Kennedy, & Tasiemski, 2006).

This questionnaire helps your physician to know how you are feeling. Read every sentence. Choose the answer that best describes how you have been feeling during the last month. You do not have to think too much to answer. In this questionnaire, spontaneously answers are more important.

1）I feel tense or wound up（A）：

Not at all——0

From time to time, occasionally——1

A lot of the time——2

Most of the time——3

２）I still enjoy the things I used to enjoy（D）：

Definitely as much——0

Note quite so much——1

Only a little——2

Hardly at all——3

３）I get a lot of frightened feeling as if something awful is about to happen（A）：

Not at all——0

A little, but it does not worry me——1

Yes, but not too badly——2

Very definitely and quite badly——3 分

４）I can laugh and see the funny side of things（D）：

As much as I always could——0

Not quite so much now——1

Definitely not so much now——2

Not at all——3

５）Worrying thoughts go through my mind（A）：

Only occasionally ——0

From time to time, but not too often——1

A lot of the time——2

A great deal of the time——3

6）I feel cheerful（D）：

Most of the time——0

Sometimes——1

Not often ——2

Not at all——3

7）I can sit at ease and feel relaxed（A）：

Definitely ——0

Usually ——1

Not often——2

Not at all——3

8）I feel as if I am slowed down（D）：

Not at all——0

Sometimes——1

Very often——2

Nearly all the time——3

9）I get a sort of frightened feeling like “butterflies” in the stomach:（A）：

Not at all——0

Occasionally ——1

Quite often——2

Very often——3

10）I have lost interest in my appearance（D）:

I take just as much care as ever——0

I may not take quite as much care——1

I don’t care as much care as I should——2

Definitely——3

11）I feel restless as I have to be on the move（A）:

Not at all——0

Not very much——1

Quite a lot ——2

Very much indeed——3

12）I look forward with enjoyment to things（D）:

As much as I ever did——0

Rather less than I used to ——1

Definitely less than I used to——2

Hardly at all ——3

13）I get sudden feeling of panic（A）:

Not at all——0

Not very often——1

Quite often ——2

Very often indeed——3

14）I can enjoy a good book or radio or TV programme（D）：

Often ——0

Sometimes——1

Not often——2

Very seldom——3

D. Q-LES-Q-SF (Stevanovic, 2011)

No.	**In the past week how satisfied have you been with your….**	**Very poor**	**poor**	**Fair**	**Good**	**Very good**
1	Physical health	1	2	3	4	5
2	Mood	1	2	3	4	5
3	Work	1	2	3	4	5
4	Household activities	1	2	3	4	5
5	Social relationships	1	2	3	4	5
6	Family relationships	1	2	3	4	5
7	Leisure time activities	1	2	3	4	5
8	Ability to foundation in daily life	1	2	3	4	5
9	Sexual drive, interests and/or performance	1	2	3	4	5

10	Economic status	1	2	3	4	5
11	Living /housing situations	1	2	3	4	5
12	Ability to around physically without feeling dizzy of unsteady or failing	1	2	3	4	5
13	Your vision in terms of ability to do work or hobbies	1	2	3	4	5
14	Overall sense of well being	1	2	3	4	5
15	Medication? (if not taking any, check here and leave item blank)	1	2	3	4	5
16	How would you rate your overall life satisfaction and contentment during the past week	1	2	3	4	5

F. SSQ6 (Sarason, Sarason, Shearin, & Pierce, 1987)

Instructions

The following questions ask about people (family/friends) in your environment who provide you with help or support. Each question has two parts.

For the first part, list all the people you know, excluding yourself, whom you can count on for help or support in the manner described. Give the person's initials and their relationship to you (see the example). Do not list more than I person for each of the numbers beneath the question. Do not list more than nine persons per question.

For the second part, circle how satisfied you are with the overall support you have.

If the best answer for a particular question is no one, put a tick in the bracket next to "No one", but still rate your level o f satisfaction. Please answer all questions as best you can. All your responses will be kept confidential.

Example: Who can you count on to console you when you are very upset?

No one ( ) 2) L.M. (friend) 4) T.N (father) 6) 8)

1) T.N. (brother) 3) R.S. (friend) 5) 7) 9)

How satisfied overall?

6 – Very satisfied 5 – fairly satisfied 4 -a little satisfied 3 -a little dissatisfied 2 – fairly dissatisfied 1-very dissatisfied

1. Who can you count on to distract you from your worries when you feel under stress?

No one ( ) 1) 4) 7)

2) 5) 8)

3) 6) 9)

How satisfied overall?

6 – Very satisfied 5 – fairly satisfied 4 -a little satisfied 3 -a little dissatisfied 2 – fairly dissatisfied 1-very dissatisfied

2. Who can you really count on to help you feel more relaxed when you are under pressure or tense?

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

How satisfied overall?

6 – Very satisfied 5 – fairly satisfied 4 -a little satisfied 3 -a little dissatisfied 2 – fairly dissatisfied 1-very dissatisfied

3. Who accepts you totally, including both your worst and your best points?

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

How satisfied overall?

6 – Very satisfied 5 – fairly satisfied 4 -a little satisfied 3 -a little dissatisfied 2 – fairly dissatisfied 1-very dissatisfied

4. Who can you really count on to care about you, regardless o f what is happening to you?

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

How satisfied overall?

6 – Very satisfied 5 – fairly satisfied 4 -a little satisfied 3 -a little dissatisfied 2 – fairly dissatisfied 1-very dissatisfied

5. Who can you really count on to help you feel better when you are feeling

No one ( ) 1) 4) 7)

2) 5) 8)

3) 6) 9)

How satisfied overall?

6 – Very satisfied 5 – fairly satisfied 4 -a little satisfied 3 -a little dissatisfied 2 – fairly dissatisfied 1-very dissatisfied

6. Who can you count on to console you when you are very upset?

No one ( ) 1) 4) 7)

2) 5) 8)

3) 6) 9)

How satisfied overall?

6 – Very satisfied 5 – fairly satisfied 4 -a little satisfied 3 -a little dissatisfied 2 – fairly dissatisfied 1-very dissatisfied

G 0-10 NRS (Raichle et al., 2006).

Please choose a number from 0 to 10 that best describes their current pain. 0 would mean ‘No pain’ and 10 would mean ‘Worst possible pain’.

I-----I-----I-----I-----I-----I-----I-----I-----I-----I

1 2 3 4 5 6 7 8 9 10

脊髓损伤病人调查问卷

编号（ ） 填写时间：_____年_____月_____日

尊敬的病人朋友：

您好！本问卷旨在了解您目前的心理社会健康状况， 给我们更好的为您提供服务提供参考依据。 本调查不会对您造成任何负面影响， 答案均无对错之分， 请您根据自己的情况在您认为最适合的选项后面打“√”。 我们会完全对您所填的内容保密。 您的参与对您自身的健康有所帮助， 更能作为很好的参考材料以便我们将来帮助更多的像您一样的病友。 衷心感谢您的合作！

第一部分 个人资料

1. 出生日期：_____年_____月_____日

2. 性别：□ 男 □ 女

3. 婚姻状况：□单身 □已婚或同居 □分居或离婚或丧偶 其他 _____

4. 教育程度：平均（年）_____

   □小学及以下 □初中 □高中或中专 □大学或以上

5. 受伤前职业：□全职_____ □兼职_____ □退休 学生 其他 _____

6. 您的宗教信仰：□佛教 □道教/基督教/天主教/其他 □ 无宗教信仰

7. 您的家庭平均收入：□3000 元以下 □3001-6000 元 □6001-9000 元 □9000 元以上

8. 您觉得您的经济状况如何:

   □足够有余 □刚刚足够支付日常开支 □不足够支付日常开支 □十分不足够

9. 您的医疗费来源：□自费 □社会医疗保险金或赔偿金

10. 您在损伤前是家里的经济支柱吗？□是 □不是

11. 您的起居饮食由谁照顾：□配偶 □保姆 □子女 □朋友 邻居 其他_____

第二部分 临床资料

19. 损伤原因： □外伤型 □非外伤型

20. 损伤类型：□四肢瘫 □截瘫

21. 损伤程度： □完全性损伤 不完全性损伤

22. 损伤时间： ____月

23. 康复住院时间有 _____ (月)

24. 目前服用药物： □ 精神疾病药物 □ 止痛药物 □ 其他 _____

25. 有无脑损伤史： □ 有 □ 无

第三部分 干预效果评估问卷

A 问题处理方式调查 (Wang et al., 2015)

这个问卷希望能了解你在面对困境或是压力事件时候，会有什么样的反应。当然， 每个人处理事情的方式不一样，但我们关心的是你如何处理问题。每一项都描述着一个特殊的应对方式， 我们想了解你会采用这些项目来处理问题的程度有多少或多常使用。不要根据你认为这项目适不适合用来处理问题来回答， 只要根据你采用或不采用来回答就好。 使用下列的评分选项，

试着在心中对每一个题目分别的评分， 尽量越接近你自己的真实情况越好。

请根据使用频率圈选符合的数字。

编号	题目	不会这么做	很少这么做	有时这么做	经常这么做
1	我会转向工作或其他活动以避免去想问题	1	2	3	4
2	我会尽全力解决我所遇到的问题	1	2	3	4
3	我会告诉自己这不是真的	1	2	3	4
4	我会使用酒或其他药物让自己感觉变好	1	2	3	4
5	我会从他人身上得到情感支持	1	2	3	4
6	我会放弃去尝试解决问题	1	2	3	4
7	我会采取行动来把情况变好	1	2	3	4
8	我会拒绝相信这件事情已经发生	1	2	3	4
9	我会诉说以让不愉快的感觉消失	1	2	3	4
10	我会去获取别人的协助与建议	1	2	3	4
11	我会借由酒或其他药物来度过	1	2	3	4
12	我会试着从不同角度看问题， 让问题变得正向	1	2	3	4
13	我会批评我自己	1	2	3	4
14	我会试着相处处理的策略	1	2	3	4
15	我会寻求其他人的安慰与了解	1	2	3	4
16	我会放弃去处理问题	1	2	3	4
17	我会从发生的事情中找出它正向意义	1	2	3	4
18	我常用开玩笑的方式来处理问题	1	2	3	4
19	我会借着做一些事情以减少去想问题的次数， 例如看电影， 看电视， 阅读， 做白日梦， 睡觉或逛街	1	2	3	4
20	我会接受事情已经发生的事实	1	2	3	4

21	我会表达负向的感觉	1	2	3	4
22	我会试着在我的宗教或信仰中寻求安慰	1	2	3	4
23	我会寻求别人的帮助和建议	1	2	3	4
24	我会学着与事情共处	1	2	3	4
25	我很认真的想下一步要怎么做	1	2	3	4
26	对于那件发生的事情，我会责怪自己	1	2	3	4
27	我会祈祷， 冥想 或拜拜、念经	1	2	3	4
28	我会让情况变的更有乐趣	1	2	3	4

B： 自我效能量表 (Chen, Lai, & Wu, 2011)

说明： 请您在阅读各题叙述后， 依您现在的感觉， 在“完全没有信心”，“没有信心”， “经常没有信心”， “普通有信心”， “有信心”， “大部分有信心”， “非常有信心” 的七个选项中， 选择一个最接近的一项打“√”。

编号	**题目**	**完全没有信心**	**没有信心**	**经常没有信心**	**普通有信心**	**有信心**	**大部分有信心**	**非常有信心**
1	无论有没有其他人协助，我能够维持我的跟人卫生	1	2	3	4	5	6	7
2	我能够避免有排便失禁 的意外	1	2	3	4	5	6	7
3	我能够主动参与家庭活动	1	2	3	4	5	6	7
4	我能够与家人维持关系	1	2	3	4	5	6	7

5	当我需要时，我能够自己外出	1	2	3	4	5	6	7
6	我能够拥有满意的性关系	1	2	3	4	5	6	7
7	我能够享受与朋友共度的时光	1	2	3	4	5	6	7
8	我能够找到令我感到有兴趣的兴趣和休闲活动	1	2	3	4	5	6	7
9	我能够与我重要的人保持联络	1	2	3	4	5	6	7
10	我能够处理生活中无法预期的问题	1	2	3	4	5	6	7
11	我能够想像未来回到工作的样子	1	2	3	4	5	6	7
12	我能够完成大部分我开始进行的事情	1	2	3	4	5	6	7
13	当我开始学习新事物，我能够坚持到成功	1	2	3	4	5	6	7
14	当我想要会见某人时，我能够与他做初步的联系	1	2	3	4	5	6	7
15	我能够维持良好的健康与幸福感	1	2	3	4	5	6	7
16	我能够想像在未来我可以拥有丰富的生活方式	1	2	3	4	5	6	7

C 医院焦虑抑郁量表（Leung, Ho, Kan, Hung, and Chen, 1993)

情绪在大多数疾病中起着重要作用， 这个测量表是专门设计帮助了解你的情绪， 您阅读以下各个项目，在其中最符合你过去一个月的情绪评分上画一个圈。对这些问题的回答不要做过多的考虑，立即做出的回答往往更符合实际情况。

1）我感到紧张（或痛苦）（A）：

根本没有——0 分

有时候——1 分

大多时候——2 分

几乎所有时候——3 分

2）我对以往感兴趣的事情还是有兴趣（D）：

肯定一样——0 分

不像以前那样多——1 分

只有一点——2 分

基本上没有了——3 分

3）我感到有点害怕好像预感到什么可怕的事情要发生（A）：

根本没有——0 分

有一点，但并不使我苦恼——1 分

是有，不太严重——2 分

非常肯定和十分严重——3 分

4）我能够哈哈大笑，并看到事物好的一面（D）：

我经常这样——0 分

现在已经不太这样了——1 分

现在肯定是不太多了——2 分

根本没有——3 分

5）我的心中充满烦恼（A）：

偶然如此——0 分

时时，但并不轻松——1 分

时常如此——2 分

大多数时间——3 分

6）我感到愉快（D）：

大多数时间——0 分

有时——1 分

并不经常 ——2 分

根本没有——3 分

7）我能够安闲而轻松地坐着（A）：

肯定——0 分

经常——1 分

并不经常——2 分

根本没有——3 分

8）我对自己的仪容失去兴趣（D）：

我仍然像以往一样关心——0 分

我可能不是非常关心——1 分

并不像我应该做的那样关心我——2 分

肯定——3 分

9）我有点坐立不安，好像感到非要活动不可（A）：

根本没有——0 分

并不很少——1 分

是不少——2 分

确实非常多——3 分

10）我对一切都是乐观地向前看（D）：

差不多是这样做——0 分

并不完全是这样做的——1 分

很少这样做——2 分

几乎从不这样做——3 分

11）我突然发现有恐慌感（A）：

根本没有——0 分

并非经常——1 分

非常肯定，十分严重 ——2 分

确实很经常——3 分

12）我好像感到情绪在渐渐低落（D）：

根本没有——0 分

有时——1 分

很经常——2 分

几乎所有时间——3 分

13）我感到有点害怕，好像某个内脏器官变化了（A）：

根本没有——0 分

有时——1 分

很经常 ——2 分

非常经常——3 分

14）我能欣赏一本好书或意向好的广播或电视节目（D）：

常常如此——0 分

有时——1 分

并非经常——2 分

很少——3 分

D 简明幸福和生活质量满意度 (Lee et al., 2014)

简明幸福与生活质量满意度问卷共包括 16 个自评项目。 每个项目分为非常不好（1分），不好（2分），普通（3分），好（4分），非常好（5分）等 5 个等级。 评分越高说明被试者幸福与生活质量满意度越好。 前 14 个项目会用于产生总分， 剩余 2 项是单独项目， 分别用于测评与研究药物相关的满意程度和整体生活质量。

编号	**过去的一周中， 整体来看您对您的___（下列题项）满意程度为何？**	**非常不好**	**不好**	**普通**	**好**	**非常好**
1	身体健康?	1	2	3	4	5
2	心情?	1	2	3	4	5
3	工作？	1	2	3	4	5
4	家族活动？	1	2	3	4	5
5	社会关系？	1	2	3	4	5
6	家庭关系？	1	2	3	4	5
7	休闲时间的活动？	1	2	3	4	5
8	每天生活中能去工作？	1	2	3	4	5
9	性的精力、兴趣、及/或表现？	1	2	3	4	5
10	经济状况？	1	2	3	4	5
11	居住/居家环境？	1	2	3	4	5
12	身体能自在活动， 不会觉得眩晕或走路不稳或跌倒？	1	2	3	4	5
13	你的视力可以工作或从事休闲嗜好？	1	2	3	4	5
14	整体的健康安适感？	1	2	3	4	5

15	药物（如果过去一周没服药，请打勾□，此题不答）	1	2	3	4	5
16	过去一周，你对整体生活满意满足程度？	1	2	3	4	5

F 社会支持量表（6 条目） (Chang, 1999).

以下的问卷是问及在你周围能给与你帮助或支持的人物（家人或朋友）。每条问题共有甲、乙两部分。甲部：请列出所有你认为能给与你帮助或支持的人和物，并在 1-9 中填出他们的名字及和你的关系。请注意每个只可以填写一个人的资料，而每条问题不可列出多于九个人物。乙部: 请圈出你对你所列出的人物所给与的帮助或支持的满意程度。假设你认为“有人”是某题目的最适当答案，请在有人的方格内打勾。但要注意你仍需对满意程度做出评估。请尽量回答所有问题，所有答案将会为您保密。

例如：当你感到烦乱不安时候，你会依赖谁来给与你安慰？

□有人	1. 辉（哥哥）	4. 光（爸爸）	7.
	2. 涂（朋友）	5.	8.
	3. 珠（朋友）	6.	9.

你对你上列的所有人物给与你的帮助或支持的满意程度？

6-非常满意 5-颇为满意 4- 少许满意 3- 少许不满意 2- 颇为不满意 1-非常不满意

问题：

1 当你受到压力时，你会依赖谁来转移你的忧虑？

□有人 1.　4.　7.

2.　5.　8.

3.　6.　9.

你对你上列的所有人物给与你的帮助或支持的满意程度？

6-非常满意 5-颇为满意 4- 少许满意 3- 少许不满意 2- 颇为不满意 1-非常不满意

2. 当你感到紧张或压力时，你会依赖谁来令你放松一些？

□有人 1.　4.　7.

2.　5.　8.

3.　6.　9.

你对你上列的所有人物给与你的帮助或支持的满意程度？

6-非常满意 5-颇为满意 4- 少许满意 3- 少许不满意 2- 颇为不满意 1-非常不满意

3. 谁能完完全全的接纳你， 包括你最坏和最好的一面？

□有人 1. 4. 7.

2. 5. 8.

3. 6. 9.

你对你上列的所有人物给与你的帮助或支持的满意程度？

6-非常满意 5-颇为满意 4- 少许满意 3- 少许不满意 2- 颇为不满意 1-非常不满意

4. 你会依赖谁来关怀和照顾你， 不管你发生任何事？

□有人 1. 4. 7.

2. 5. 8.

3. 6. 9.

你对你上列的所有人物给与你的帮助或支持的满意程度？

6-非常满意 5-颇为满意 4- 少许满意 3- 少许不满意 2- 颇为不满意 1-非常不满意

5. 当你感到沮丧，心情不佳时，你会依赖谁来令你感到好过一些？

□有人 1. 4. 7.

2. 5. 8.

3. 6. 9.

你对你上列的所有人物给与你的帮助或支持的满意程度？

6-非常满意 5-颇为满意 4- 少许满意 3- 少许不满意 2- 颇为不满意 1-非常不满意

6. 当你感到烦乱不安时，你会依赖谁来给你安慰？

□有人 1. 4. 7.

2. 5. 8.

3. 6. 9.

你对你上列的所有人物给与你的帮助或支持的满意程度？

6-非常满意 5-颇为满意 4- 少许满意 3- 少许不满意 2- 颇为不满意 1-非常不满意

G 疼痛量表 (Raichle et al., 2006).

请您用 0-10 这 11 个数字描述您的疼痛强度， 0-无痛， 1-3 为轻度疼痛， 3-7 为中度疼痛，8-9 为重度疼痛， 10 为剧烈疼痛。

I-----I-----I-----I-----I-----I-----I-----I-----I-----I

1 2 3 4 5 6 7 8 9 10

Appendix 5 Evaluation form of the COSP intervention (for expert panel use): Testing its content validity

Dear Expert:

You are invited to evaluate the coping-oriented supportive programme (COSP) for its content validity. This COSP intervention is a psychosocial care intervention with eight group sessions. It aims at helping people manage the demands aroused from spinal cord injury (SCI). Over the coming eight weeks, SCI patients will be encouraged to recapture the stressful situations that they have experienced following the injury and then find ways to deal with these situations effectively and thus reduce their related-stress. One important component of stress management is to make decision about where to focus one's effort. The goal of this COSP intervention is to build their confidence and ability in coping with the current injury and subsequently managing their future life. Content and tools used in this pamphlet are modified from Hsiao Yu Chen's DVD-based educational programme, Kennedy (2008)'s handbook of "Coping effectively with Spinal Cord Injury" and Craig (2012)'s handbook of "surviving and thriving with SCI" with their permissions. We will do further modifications of the COSP intervention based on your invaluable comments. The descriptions of the intervention content and scoring instructions are presented at below.

Instructions

For each session of the COSP intervention, please rate each of the items according to how appropriate its content is in representing the steps in the COSP intervention. In each category, rate each item on a scale from 1 to 4 where:

- “1” means that the item is inappropriate.
- “2” means that the item is somewhat inappropriate and needs major revision.
- “3” means that the item is appropriate and needs minor revision.
- “4” means that the item is very appropriate.

When providing your ratings, please consider whether each item/variable is relevant and/or with a clear logic order. Please also specify your comments in the “COMMENTS” section provided if the item rating is 1 or 2.

Content	Level of appropriateness				Comments given on the item (s) if its/their rating is/are 1 or 2
Group Session One					
1. Provide overview of the programme to the participants with addressing the content, goal of the intervention, elaborating the role of the researcher and patients themselves.	**1**	**2**	**3**	**4**	
2. Encourage group members to attend all the meetings and show up on time; emphasize the importance of talking and listening to others, as well as the promise of confidentiality.	**1**	**2**	**3**	**4**	
3. Explain to the group about what is SCI, classification of SCI, health-related disability and medical complications at post-SCI, and psychosocial consequences related to SCI.	**1**	**2**	**3**	**4**	
4. Show the group about previous patients with SCI	**1**	**2**	**3**	**4**	

sharing their successful experiences by playing DVD.				
Group Session Two				
5. Discuss stress and stress reactions, ask the participants to identify their own stress reactions (e.g., low mood, negative thinking, poor sleep, muscular tension, and general fatigue).	**1**	**2**	**3**	**4**
6. Discuss the stressors caused by SCI, and explain to the group about how their thoughts and interpretations about the stressors that will finally lead to stress reaction; and using figures and examples to illustrate the cognitive theory of stress and coping	**1**	**2**	**3**	**4**
7. Teach the participants the way of breaking down stressors by using the example "Ignore by the staff in the ward". The situations will be divided into details by asking questions (who is involved?	**1**	**2**	**3**	**4**

What is the situation/context? Where are these situations likely to occur? When did they last occur and are they likely to occur again?).				
8. Explain the concept of two types of coping (i.e., problem-focused coping and emotion-focused coping) to the group, and discuss the “fit/match” between the changeability of stressors and coping strategies.	**1**	**2**	**3**	**4**
Group Session Three				
9. Explain to the group of problem-solving strategy: first step is to identify the problem and goal to be achieved. Describe the problem and its context (e.g., where, how, who, what)--generate possible solutions--assess the advantages and disadvantages of each solution—select the best solution—develop a plan to carry out your preferred	**1**	**2**	**3**	**4**

solution—review your problem outcome.				
10. Using examples (e.g., a person on the street was asked why he is in a wheelchair) to illustrate how to adopt problem-solving strategies.	**1**	**2**	**3**	**4**
11. List some common problem-solving scenarios (relationship scenarios, wheelchair-access situations, and other's reactions to your disability); and encourage the participants to think about their life problems.	**1**	**2**	**3**	**4**
Group Session Four				
12. Explain to the group the common emotional reactions to SCI, and the cognitive model of emotions.	**1**	**2**	**3**	**4**
13. Relaxation training: a), let the participants learn relaxation through visualization/guided imagery;	**1**	**2**	**3**	**4**

b) a simple mindfulness exercise.				
14. Activity scheduling: illustrate and introduce the three steps of doing pleasant activity: decide what, when, how, and with who—set realistic goals—commit you to doing it and do it.	**1**	**2**	**3**	**4**
15. List the sample pleasant activities to the participants, and let them think about what kind of activities that they can do/prefer to do.	**1**	**2**	**3**	**4**
Group <u>Session Five</u>				
16. Explain to the group about the common negative beliefs in SCI population; and explain to the group about the emotional and action consequences following negative thinking.	**1**	**2**	**3**	**4**
17. List the common thinking errors of SCI people, and let the participant to find evidence	**1**	**2**	**3**	**4**

for these thinking errors, and then guide them to find out more realistic and more rational thoughts.				
Group Session Six				
18. Review the participants about stress and coping theory.	**1**	**2**	**3**	**4**
19. Review the two types of coping (problem-solved and emotion focused), and provide additional coping strategies that might helpful to the participants.	**1**	**2**	**3**	**4**
20. Explain to the group of the concept of maladaptive coping by listing out examples, and encourage them to think whether they adopted these strategies and consider alternatives that are more helpful.	**1**	**2**	**3**	**4**
Group Session Seven				
21. Explain to the group about the importance of social skills.	**1**	**2**	**3**	**4**

22. Teach and practice (role-play) communication skills, conversation skills, assertion skills, and protective skills.	**1**	**2**	**3**	**4**
23. Encourage family members to join the group communication if they prefer, and provide didactic education about sexuality issues at post-SCI				
Group Session Eight 24. Explain to the group the importance of social support, and different types of social support.	**1**	**2**	**3**	**4**
25. Discuss how to obtain and maintain social support.	**1**	**2**	**3**	**4**
26. Guide participants to assess their social networks and resources that they can seek help when needed.	**1**	**2**	**3**	**4**

27. Encourage effective communication between SCI patients and their family members/partners/carers.	**1**	**2**	**3**	**4**
28. Provide local helpline (medical care, psychiatric department referral, and local ambulance and police emergency ring, local association for disabled people, financial support solutions or organizations).	**1**	**2**	**3**	**4**
29. Explain the importance of self-efficacy in managing their life at post-SCI, and provide examples of self-efficacy beliefs, as well as discuss how self-efficacy can protect the participants.	**1**	**2**	**3**	**4**
30. End the programme, and encourage participants to practice what they have learnt in the programme to their daily lives.	**1**	**2**	**3**	**4**

Overall remarks:

Thank you for taking time to complete this evaluation form for us. We will do a review of the intervention manual again and make revisions based on your invaluable comments.

Sincerely,

Yan LI, PhD student. School of Nursing, the Hong Kong Polytechnic University

Appendix 6 Assessment form of participants' feedback on the COSP intervention after the pilot study

Dear participant,

Please complete this form and return it to me at the end of this group programme. Thanks for your cooperation!

Part I

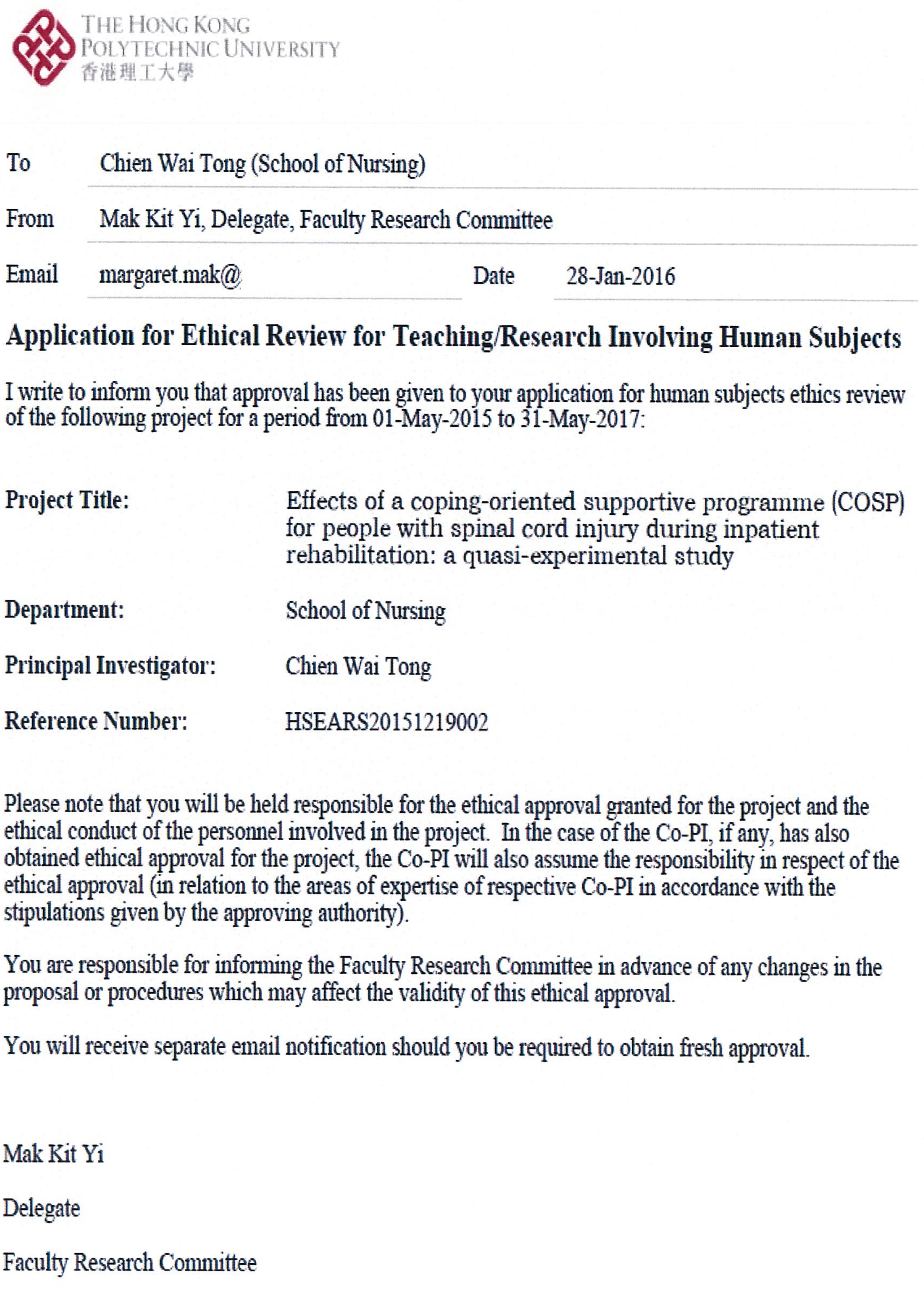
- Please indicate your rating of this group psycho-education programme regarding the following items, and give your further comments for improvement if the rating is "1" or "2".

Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Comments for improvement if the rating is 1 or 2
Group meeting time arrangement (8 sessions) is appropriate	1	2	3	4	5	
Duration (1.5-2 h) of each meeting is appropriate	1	2	3	4	5	
Performance of the group facilitator is satisfactory	1	2	3	4	5	

The venue of group meeting is comfortable	1	2	3	4	5
The intervention improved my behaviour in managing my life at post-SCI. I will use the strategies learnt in future life.	1	2	3	4	5

- What aspects of this intervention do you think are beneficial for you? Some content of the COSP unhelpful or need improvements? Some content of the COSP difficult to understand. ______________________________

Appendix 7 Approval letter from Research Ethics Committee



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

To Chien Wai Tong (School of Nursing)

From Mak Kit Yi, Delegate, Faculty Research Committee

Email margaret.mak@ Date 28-Jan-2016

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-May-2015 to 31-May-2017:

Project Title:	Effects of a coping-oriented supportive programme (COSP) for people with spinal cord injury during inpatient rehabilitation: a quasi-experimental study
Department:	School of Nursing
Principal Investigator:	Chien Wai Tong
Reference Number:	HSEARS20151219002

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

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

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

Mak Kit Yi

Delegate

Faculty Research Committee

Appendix 8 Information sheet

Information sheet

Effects of a coping-oriented supportive programme for people with spinal cord injury during inpatient rehabilitation- A quasi-experimental trial

You are invited to participate in a study conducted by Ms. Yan LI, PhD student of School of Nursing, The Hong Kong Polytechnic University.

The aim of the study

The aim of the proposed study is to examine the effects of a coping-oriented supportive programme in supporting people's psychological adjustment to SCI during their inpatient rehabilitation.

Why have I been chosen?

You have been chosen as you are currently undergoing inpatients rehabilitation in the hospital and being cared by the hospital.

Do I have to participate?

Taking part in this research is totally voluntary. You can decide whether or not to take part. If you do agree, you will be given this information sheet to keep and be asked to sign a consent form. You have every right to withdraw from the current study anytime without any negative consequences. Your decision on this will not influence on your rehabilitation treatment or relationship with staff in the ward.

What will happen to me and what do I have to do?

You will be assigned randomly to one of the two groups, one will receive the COSP intervention, and another group will receive the usual rehabilitation care. The intervention consists of 8 weekly group meetings with each session lasting for 1.5-2 hour. You will be asked to complete a set of questionnaires at baseline assessment, immediately after completion of the intervention programme and at 6-week follow-up, which is estimated to be around 40 minutes for you to finish.

What are the possible benefits of taking part?

It is possible that you may benefit personally to improve your psychological status after the injury, and you will also have the chance to learn from others who are in the same condition with you.

Will what I say in this study be kept confidential?

If you agree to take part in this study all information which is collected about you will be kept strictly confidential. Data with identifiable information will be kept in a locked cabinet, which can only be accessed by the research team. The data will be destroyed after completion of the study and thesis writing.

What will happen to the results of the research study?

The results of the research will be submitted for publication in a peer reviewed professional journal. You will be sent a copy of the findings and publications if you wish. You will not be identifiable from any of the published material.

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

If you would like to know more information about this study, please contact Miss Yan LI at telephone number ______ or her supervisor Prof. Wai Tong CHIEN via email wai.tong.chien@ and Dr. Dan BRESSINGTON via email Dan.bressington@

Thank you for your interests in participating in this study.

Miss Yan LI (PhD student)

Prof. Wai Tong CHIEN (Chief-supervisor)

Dr. Dan BRESSINGTON (Co-supervisor)

以应对为导向的支持性干预对住院康复期脊髓损伤患者的效果研究

诚邀您参加由香港理工大学护理学院学生李妍女士执行的研究计划。本项研究目的在于检验团体心理健康教育对住院康复期脊髓损伤患者心理适应期的支持效果研究。您被选择纳入本次研究主要是您目前正在进行住院康复理疗并且需要一定的心理社会干预及关怀。 您参与本次研究纯属自愿。 您可以选择参加或者不参加。 您需要填写一份之情同意书如果您愿意参加本项研究。 您享有充分的权利在研究开始之前或之后决定退出这项研究， 而不会受到任何对您不公正的待遇或被追究的责任。

该项研究需要您参与一个持续 8 周的团体干预活动，每周进行一次，每次约 1.5 到 2 个小时。 您需要在干预开始之前，干预开始之后及 12 周随访期间填写我们的评估问卷，以此我们将会判断项团体干预活动的效果。 这项研究不会对您造成任何不适的感觉，您的资料及录音将会被保密，并且在一切资料只有本研究团队的人员才可获知。 并且待研究结束之后，所有资料将会被销毁。如果您对这项研究有任何不满， 可以随时联系香港理工大学人类实验对象操守小组委

员会秘书陈博士 （地址： 香港理工大学研究事务处转交）。 如果您想获得更多关于这项研究的资料，请与李妍女士联系。

谢谢您参与这项研究

李妍女士 钱惠堂教授 白承丹博士

Appendix 9 Consent form

Consent to participate in research

Effects of a coping-oriented supportive programme for people with spinal cord injury during inpatient rehabilitation

I ________________________ hereby consent to participate in the captioned research supervised by Prof. Wai Tong Chien and Dr. Dan Bressington, and conducted by Ms Yan LI.

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 procedure as set out in the attached information sheet has been fully explained. I understand the benefits and risks involved. My participation in the project 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 ____

Signature of researcher ____

Date ____

---

*if the form is not signed by the patients, the relationship between the patient the people who sign the consent form should be specified.

知情同意书

参加者编号：______________________________

研究主题：

以应对为导向的支持性干预对住院康复期脊髓损伤患者的效果研究-

本人____________________________已经清楚这项研究的目的及程序， 并且同意参加此项由钱惠堂教授及白承丹博士指导， 李妍女士承担并执行的科研项目。

本人已知此研究所得资料可能会被用做日后研究报告的书写及发表， 但本人的隐私权利将会得以保障， 即本人的资料不会被公开。研究人员已经向本人清楚的解释了所附资料章程上的研究程序， 本人明白当中涉及的利益以及风险， 谨此准许调查员访问和填写问卷及接受有关疗法。本人自愿参加这项研究。本人有足够机会提出疑问得到调查员满意的答复，并有权利随时退出而不受到任何惩处。

参加者姓名：_________________________ 签名*：_________________________

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日期：____________________________

*如果之情同意书不是患者本人签署，请注明签署者与患者的关系

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