Determinants of Resilience in People Who Sustained Spinal Cord Injury From Earthquake in Nepal

Muna Bhattarai

A Thesis Submitted in Partial Fulfillment of the Requirements for

the Degree of Master of Nursing Science (International Program)

Prince of Songkla University

2017

Thesis Title Determinants of Resilience in People Who Sustained Spinal
Cord Injury From Earthquake in Nepal

Author   Miss Muna Bhattarai

Major Program Nursing Science (International Program)

Major Advisor   **Examining Committee:**

…………………………………..   …………………………...Chairperson
(Asst. Prof. Dr. Khomapak Maneewat)   (Assoc. Prof. Dr. Waraporn Kongsuwan)

                                                    ………………………………….Committee
                                                    (Asst. Prof. Dr. Khomapak Maneewat)

Co-Advisor

                                                    …………………………….……Committee
………………………………….…   (Asst. Prof. Dr Wipa Sae-Sia)
(Asst. Prof. Dr. Wipa Sae-Sia)

                                                    …………………………….……Committee
                                                    (Dr. Charuwan Kritpracha)

                                                    ………………………………….Committee
                                                    (Dr. Marisa Suwanraj)

    The Graduate School, Prince of Songkla University, has approved this thesis
as partial fulfillment of the requirements for the Master of Nursing Science
(International Program).

                                        …………………………………………

                                        (Assoc. Prof. Dr. Teerapol Srichana)

                                        Dean of Graduate School

This is to certify that the work here submitted is the result of the candidate's own investigations. Due acknowledgement has been made of any assistance received.

..…………………………… Signature

(Asst. Prof. Dr. Khomapak Maneewat)

Major advisor

.…………………………… Signature

(Miss Muna Bhattarai)

Candidate

I hereby certify that this work has not been accepted in substance for any degree, and is not being currently submitted in candidature for any degree.

..……………………………Signature

(Miss Muna Bhattarai)

Candidate

Thesis Title   Determinants of Resilience in People Who Sustained Spinal
                       Cord Injury From Earthquake in Nepal

Author   Miss Muna Bhattarai

Major Program   Nursing Science (International Program)

Academic Year   2016

ABSTRACT

This cross-sectional study was conducted to identify the level of resilience and determinants of resilience among individuals with 2015 earthquake-related spinal cord injury (SCI) in Nepal. The study included 82 Nepalese with earthquake-related SCI who met the inclusion criteria from the Spinal Injury Rehabilitation Center (SIRC) and 14 communities between December 2016 and February 2017. The Demographic and Injury-related Questionnaire (DIQ), Connor-Davidson Resilience Scale (CD-RISC), Multidimensional Scale of Perceived Social Support (MSPSS), Moorong Self-efficacy Scale (MSES), Intrinsic Spirituality Scale (ISS), and Patient Health Questionnaire-9 (PHQ-9) were used to measure the demographic and injury-related characteristics, resilience, social support, self-efficacy, spirituality, and depressive mood, respectively. The Cronbach's alpha coefficients for the CD-RISC, MSPSS, MSES, ISS, and PHQ-9 were .82, .89, .79, .76, and .88, respectively. The data analysis was done using descriptive statistics, Pearson's correlation, and hierarchical multiple regression.

The study findings revealed that 61% ($n = 50$) of the participants had low level of resilience. The Pearson's correlation demonstrated a significant positive correlation

between resilience and social support ($r = .42$, $p < .001$) and self-efficacy ($r = .53$, $p < .001$). There was a significant negative correlation between resilience and depressive mood ($r = -.50$, $p < .001$). In the regression analysis, gender, self-efficacy, and depressive mood emerged as significant predictors which explained 46% of the variance (adjusted $R^2 = .46$, $F (6, 75) = 12.57$, $p < .001$) in resilience of the participants. Spirituality did not show a significant contribution to the resilience of those individuals ($r = -.12$, $p > .05$). A further longitudinal study related to this issue is needed to identify changes in resilience and determinants over a period of time. In addition, development and implementation of nursing interventions to strengthen resilience among this group is recommended.

ชื่อวิทยานิพนธ์ ปัจจัยทำนายความยืดหยุ่นฟื้นสภาพได้ของบุคคลที่ได้รับบาดเจ็บ

ไขสันหลังจากแผ่นดินไหวที่ประเทศเนปาล

ผู้เขียน นางสาว มุนา บัททาราย

สาขาวิชา พยาบาลศาสตร์ (หลักสูตรนานาชาติ)

ปีการศึกษา 2559

บทคัดย่อ

การวิจัยเชิงทำนายครั้งนี้มีวัตถุประสงค์เพื่อศึกษาระดับความยืดหยุ่นฟื้นสภาพได้และศึกษา

ปัจจัยทำนายความยืดหยุ่นฟื้นสภาพได้ของบุคคลที่ได้รับบาดเจ็บไขสันหลังจากแผ่นดินไหวเมื่อปี ค.ศ.

2015 ที่ประเทศเนปาล โดยเก็บรวบรวมข้อมูลจากชาวเนปาลที่ได้รับบาดเจ็บไขสันหลังจาก

แผ่นดินไหวที่มีคุณสมบัติตรงตามเกณฑ์ คัดเลือกกลุ่มตัวอย่างจำนวน 82 ราย ที่มารับบริการที่ศูนย์

ฟื้นฟูสภาพผู้บาดเจ็บไขสันหลังและที่อาศัยอยู่ใน 14 ชุมชนของเนปาล เก็บข้อมูลระหว่างเดือน

ธันวาคม 2559 ถึงเดือนกุมภาพันธ์ 2560 โดยใช้แบบสอบถามเกี่ยวกับข้อมูลทั่วไปและที่เกี่ยวข้องกับ

ภาวะสุขภาพ ประเมินระดับของความยืดหยุ่นฟื้นสภาพได้โดยใช้มาตรวัตรความยืดหยุ่นฟื้นสภาพได้

ของคอนเนอร์เดวิสัน (CD-RISC) ร่วมกับการใช้เครื่องมือเพื่อศึกษาแต่ละตัวแปร ได้แก่ แบบประเมิน

การรับรู้ต่อการสนับสนุนทางสังคม (MSPSS) แบบประเมินการรับรู้สมรรถนะของตนเองของมูรอง

(MSES) มาตรวัดความเข้มแข็งด้านจิตวิญญาณ (ISS) และแบบสอบถามเพื่อประเมินอารมณ์ซึมเศร้า

(PHQ-9) ทดสอบความเชื่อมั่นของแบบสอบถามโดยการหาสัมประสิทธิ์ความเชื่อมั่นแบบครอน

แบคอัลฟา (Cronbach's alpha coefficients) ได้ .82 .89 .79 .76 และ .88 ตามลำดับ วิเคราะห์

ข้อมูลโดยใช้สถิติเชิงพรรณา การหาสัมประสิทธ์สหสัมพันธ์แบบเพียร์สัน (Pearson's correlation) และการวิเคราะห์สหสัมพันธ์ถดถอยแบบพหุคูณ (hierarchical multiple regression)

ผลการวิจัยพบว่ากลุ่มตัวอย่างร้อยละ 61 (n = 50) มีระดับความยืดหยุ่นฟื้นสภาพได้ใน ระดับต่ำ การวิเคราะห์สัมประสิทธ์สหสัมพันธ์แบบเพียร์สันพบว่าระดับความยืดหยุ่นฟื้นสภาพได้มี ความสัมพันธ์ทางบวกอย่างมีนัยสำคัญทางสถิติกับการสนับสนุนทางสังคม (r = .42, p < .001) และ การรับรู้สมรรถนะของตนเอง (r = .53, p < .001) ในขณะที่มีความสัมพันธ์ทางลบอย่างมีนัยสำคัญ ทางสถิติกับอารมณ์ซึมเศร้า (r = -.50, p < .001) ผลการวิเคราะห์สหสัมพันธ์ถดถอยแบบพหุคูณ พบว่า เพศ การรับรู้สมรรถนะของตนเอง และอารมณ์ซึมเศร้า มีอำนาจในการทำนายระดับความ ยืดหยุ่นฟื้นสภาพได้ของกลุ่มตัวอย่าง (R^2 = .46, F (6, 75) = 12.57, p < .001) ในขณะที่ความ เข้มแข็งด้านจิตวิญญาณไม่มีอำนาจทำนายระดับความยืดหยุ่นฟื้นสภาพได้ของกลุ่มตัวอย่างใน การศึกษาครั้งนี้ (r = -.12, p > .05) จึงเสนอให้มีการทำวิจัยแบบระยะยาว (longitudinal study) เพื่อศึกษาระดับของความยืดหยุ่นฟื้นสภาพรวมทั้งปัจจัยที่มีอิทธิพลต่อระดับความยืดหยุ่นฟื้นสภาพ ตลอดจนการพัฒนารูปแบบการพยาบาลที่คำนึงถึงปัจจัยที่เกี่ยวข้องเพื่อช่วยส่งเสริมให้ชาวเนปาลที่ ได้รับบาดเจ็บไขสันหลังจากแผ่นดินไหวสามารถรักษาระดับความยืดหยุ่นฟื้นสภาพได้ให้อยู่ในระดับที่ เข้มแข็งเพื่อมีคุณภาพชิวิตที่ดีต่อไป

ACKNOWLEDGEMENTS

CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

This chapter presents the background and significance of the problem, objectives of the study, research questions, conceptual framework of the study, research hypothesis, definition of terms, the scope of the study, and significance of the study.

Background and Significance of the Problem

A natural disaster is a sudden event that causes widespread destruction, lots of collateral damage or loss of life. In general, a natural disaster includes earthquakes, floods, volcanic eruptions, landslides, hurricanes, and tsunamis (Below, Wirtz, & Guha-Sapir, 2009). Earthquakes are one of the devastating natural disasters (World Health Organization [WHO], 2016). Every year, around 500,000 detectable earthquakes strike the world and approximately 100 of them cause devastating impacts and high mortality. During the past 20 years, earthquakes have caused more than a million deaths worldwide (United States Geological Survey [USGS], 2016).

Exposure, susceptibility, coping capacities, and adaptive capacities were used for the World Risk Index to predict a region's vulnerability in developing an earthquake. Based on this risk index, Asia and the pacific regions are highly vulnerable to develop earthquakes (United Nations, 2011). Amongst those countries, Nepal is one of the most prone Asian countries to have earthquakes and is ranked as 11th in the world for the risk of developing an earthquake (Koirala, 2014; National

Seismological Center, 2015). This was evidenced by a major earthquake of 7.8 magnitude that struck Nepal on April 25, 2015, followed by an aftershock of 7.3 magnitude on May 12, 2015 which left 8,702 people dead and 22,493 others injured (United Nation High Commissioner for Refugee [UNHCR], 2015; USGS, 2015).

Earthquakes cause catastrophic impacts and extensive damage to property, residences, economics, physical health, clinical consequences, and even human life. Earthquakes-related injuries were reported as one of the common physical impacts followed by earthquakes (WHO, 2016). Major injuries which include multiple fractures, traumatic brain injury, crush injury, damage to intrathoracic, intra-abdominal, intrapelvic organs, including spines injury or spinal cord injury (SCI) with neurologic impairment may require hospitalization (Doocy, Daniels, Packer, Dick, & Kirsch, 2013). Among those, SCI is a life-long medically complex injury and high-cost health problem that impacts physical, psychological, social health, and wellbeing of an individual (WHO, 2013).

SCI refers to disruption of the spinal cord which results in loss of sensation and mobility (Spinal Research, 2011). Although the number of casualties caused by an earthquake depends on its magnitude, the incidence of SCI after an earthquake attack in developing countries was relatively high. For instance, more than 600 people sustained SCI in the Pakistan earthquake in 2005 (Priebe, 2007). Similarly, Iran's earthquake in 2003 and Haiti's earthquake in 2010 left a total of 240 and 150 people, respectively, who suffered from SCI (Burns, O'Connell, & Landry, 2010; Priebe, 2007). Additionally, the earthquake of 7.8 magnitude and a subsequent aftershock in Nepal in 2015 left more than 173 Nepalese people suffering from SCI (Muldoon, 2015). The high incidence of SCI in developing regions could result from an

inadequate emergency preparedness system and untrained rescuers in developing countries (Priebe, 2007).

Earthquake-related SCI has a profound immediate and long-term impact on the people who sustained SCI. The potential impact of SCI includes the aggravation of old and new problems. The long-lasting impacts of SCI on an individual's life include the negative consequences on physical and psychosocial aspects (O'Connor & Murray, 2006; WHO, 2013). Some of the physical impacts involve the complete or incomplete loss of motor and sensory function, inability to control bladder and bowel function, and impaired sexual function (Somers, 2010). The changes in life from the physical impacts of SCI further affect psychosocial aspects of people who sustained SCI (Somers, 2010). Some of the psychosocial impacts involve anxiety, depression, difficulties in social participation, low self-confidence, post-traumatic stress disorder (PTSD), and suicidal thoughts (Craig, Tran, & Middleton, 2009; Kilic, Dorstyn, & Guiver, 2013; Migliorini, Sinclair, Brown, Tonge, & New, 2015).

The changes and impacts from the consequences of SCI fostered SCI survivors to be resilient or able to cope with those changes. The response to and coping with the consequences of SCI is, however, different among SCI individuals and not all SCI individuals develop negative outcomes (Southwick, Litz, Charney, & Friedman, 2011). Some SCI individuals were resilient enough to adjust or cope with the consequences of SCI and achieve a good quality of life (Kilic et al., 2013). Adjustment to SCI has gained essential attention and has been explored to shed light on the adjustment in terms of effective coping and resilience (Bonanno, Kennedy, Galatzer-Levy, Lude, & Elfström, 2012; Driver et al., 2015; Min et al., 2014).

Resilience is considered as an important attribute which helps individuals to cope and adjust to the consequences of traumatic events, including SCI (White, 2013).

Resilience is "the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress" (American Psychological Association, 2010, para. 4). Resilience is also viewed as a personal quality or skill to adapt in the face of adversity (Connor & Davidson, 2003; Richardson, 2002). Additionally, resilience reflects the ability of an individual to confront and handle disruptive events or traumatic experiences, maintain a stable equilibrium and relatively stable healthy level of psychological and physical functioning (Bonanno, 2004).

Resilience is related to the positive consequences following disaster and SCI (Dodd, Driver, Warren, Riggs, & Clark, 2015; Driver et al., 2015). Previous studies conducted in Australia revealed that 68% of SCI people have shown an acceptable level of resilience (Guest et al., 2015b; Guest, Craig, Tran, & Middleton, 2015a). The higher level of resilience was associated with higher successful adaptation outcomes after disasters and after SCI (Kilic et al., 2013; Rodriguez-Llanes, Vos, & Guha-Sapir, 2013; White, Driver, & Warren, 2010). Furthermore, SCI people with greater resilience tended to have greater acceptance, less maladaptive coping, better quality of life (Bonanno et al., 2012), strong self-efficacy, and stable mood (Guest et al., 2015a). Here, resilience plays a crucial role to thrive after adversity.

Several factors are evidenced to enhance or impede an individual's resilience. Previous studies have focused on factors that predicted resilience in either people with SCI or disaster victims (Bonanno, Galea, Bucciarelli, & Vlahov, 2006; Driver et al., 2015; Kilic et al., 2013; Rodriguez-Llanes et al., 2013). Factors enhancing the resilience of SCI individuals include social support, self-efficacy, and spirituality (Dodd et al., 2015; Guest et al., 2015a; Monden et al., 2014). Similarly, social support was correlated with the resilience of disaster victims as well (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Hobfoll et al., 2012). While a depressive mood was

found as a factor impeding resilience among people with SCI (Driver et al., 2015; Guest et al., 2015a; Kilic et al., 2013; White et al., 2010) and disaster survivors (Bonanno et al., 2007; Kukihara, Yamawaki, Uchiyama, Arai, & Horikawa, 2014).

Resilience is a dynamic and complex process which can vary according to time, context, and cultural origin (Bonanno et al., 2012; Kilic et al., 2013). Also, determinants of resilience could vary or have different impacts on individuals in different cultures, society, and geographical regions (Kumpfer, 1999). Previous studies were however, mostly conducted in developed and/or western contexts which are different from Nepal in terms of culture, geography, and healthcare accessibility. Nepal is a patriarchal and collectivist society where people are group-oriented and males have higher authorities than those of females (Carteret, 2011; Pokharel, 2009). In addition, Nepal has a geographical diversity with inaccessibility of health services including rehabilitation services in many parts of the rural areas (Central Bureau of Statistics [CBS], 2011). From this, the determinants of resilience among Nepalese as well as SCI Nepalese might be different from people in another geographical and cultural context.

To date, there have been remarkable advances in an understanding of the status of resilience and factors contributing to resilience amongst SCI people and among disaster survivors. However, there is a scarcity of evidence to illuminate this issue among people who sustained SCI from a disaster such as an earthquake and in particular under the Nepalese context. Factors contributing to resilience in earthquake-related SCI people in the context of Nepal was indicated. Therefore, this study was conducted to examine the status of resilience and identify the determinants of resilience in people who sustained SCI from the 2015 earthquake in Nepal.

Objectives of the Study

In order to construct the evidence to understand the factors contributing to resilience among the Nepalese people who sustained SCI from the 2015 earthquake, this study aimed to:

1. Assess the status or level of resilience in people who sustained SCI from the 2015 earthquake in Nepal.

2. Determine the predictive roles of social support, self-efficacy, spirituality, and depressive mood in resilience among people who sustained SCI from the 2015 earthquake in Nepal.

Research Questions

The research questions of this study were:

1. What is the status/level of resilience in people who sustained SCI from the 2015 earthquake in Nepal?

2. Do social support, self-efficacy, spirituality, and depressive mood significantly predict the resilience of people who sustained SCI from the 2015 earthquake in Nepal?

Conceptual Framework

In order to examine the status of resilience and factors contributing to resilience of earthquake survivors who sustained SCI, this study was conducted based on two vital concepts: 1) the concept of resilience proposed by Connor and Davidson

(2003) and 2) factors contributing to resilience proposed by Craig (2012), including relevant evidence regarding resilience of people who sustained SCI from earthquakes.

Concept of Resilience in People Who Sustained SCI From an Earthquake

The concept of resilience proposed by Connor and Davidson (2003) was mainly used to underpin this study including the current relevant evidence. Resilience, in accordance with Connor and Davidson (2003), embodies the personal qualities that enable one to thrive in the face of adversity. Resilience was defined in terms of personal capabilities that enable the individual to thrive in the face of adversity or stressful events. Resilience also reflects the ability of individuals to cope with stress (Connor & Davidson, 2003).

In the context of SCI, resilience is viewed as the process or ability of SCI people to adjust positively in terms of healthy physical, psychological, and social functioning (Driver et al., 2015; Guest et al., 2015b; Kilic et al., 2013). Similarly, in the case of earthquake survivors, resilience refers to the ability of individuals to cope with or adapt to traumas or adversities (Ni, Chow, Jiang, Li, & Pang, 2015).

Resilience is a multidimensional characteristic that varies with context, time, age, gender, and cultural origin, as well as within the individual subjected to different life circumstances (Kumpfer, 1999). Connor and Davidson (2003) addressed aspects of resilience derived from Kobasa (1979), Rutter (1985), and Lyons (as cited in Connor and Davidson, 2003) to measure resilience in clinical practice. The aspects of resilience were grouped by Connor and Davidson (2003) based on a literature review of studies among a variety of populations including patients in treatment for PTSD and survivors of various trauma.

According to Connor and Davidson (2003), characteristics of resilience include commitment, recognition of limits to control, viewing change as a challenge, engaging the support of others, close attachment with others, personal goals, action orientation, self-confidence, social problem solving skills, sense of control, accepting change, humor in face of stress, taking responsibility to deal with stress, able to tolerate stress, patience, optimism, and faith. Then, a factor analysis was done to assess the factor composition of the resilience (Connor & Davidson, 2003). Finally, these 17 characteristics were further grouped into a five-factor structure: 1) personal competence, high standards, and tenacity; 2) trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; 3) positive acceptance of change and secure relationships; 4) control; and 5) spiritual influences (Connor & Davidson, 2003).

These characteristics have been used to assess or measure the status of resilience among SCI people (Guest et al., 2015a; Min et al., 2014; White et al., 2010) as well as earthquake survivors (Kukihara et al., 2014; Ni et al., 2015). From this, the resilience was viewed as the ability of individuals who sustained SCI from the earthquake to have a positive adjustment. Hence, the characteristics of resilience that were proposed by Connor and Davidson (2003) were used in this study to examine the status of resilience in people who sustained SCI from the earthquake in Nepal.

Moreover, resilience reflects the personal capabilities to adjust to the adversity in all aspects of an individual or whole person. Therefore, in this study, resilience was viewed and measured as a whole or holistic measure instead of describing each characteristic separately.

Factors Contributing to Resilience in People Who Sustained SCI From an Earthquake

In this study, the determinants of resilience were studied based on the factors contributing to resilience among SCI people and among earthquake as well as disaster survivors. Based on the current evidence, determinants of resilience among SCI people include social support, self-efficacy, spirituality, and depressive mood.

According to Craig (2012) social support, self-efficacy, and depressive mood were highly associated with the resilience of people who sustained SCI. In addition, these three factors were found to be the determinants of resilience in the previous studies conducted among SCI survivors (Dodd et al., 2015; Guest et al., 2015a) and disaster survivors (Bonanno et al., 2006; Kukihara et al., 2014). Additionally, spirituality was also found as one of the strong factors of resilience among SCI people (Kumpfer, 1999; Monden et al., 2014; White et al., 2010).

Social support is a key factor related to the resilience of individuals after a SCI and disaster (Catalano, Chan, Wilson, Chiu, & Muller, 2011; Craig, 2012; Dodd et al., 2015; Ni et al., 2015). Social support refers to an individual's perception of support received from family, friends, and others (Zimet, Dahlem, Zimet, & Farley, 1988). Social support directly motivates an individual to adapt effective coping and engage in adaptive behavior (Craig, 2012; Janicki-Deverts & Cohen, 2011). Social support received from the family encourages SCI individuals to adhere to rehabilitation (Monden et al., 2014). In addition, social support buffers against the negative consequences of SCI such as chronic pain and depression, thus, sustaining resilience (Catalano et al., 2011; Dodd et al., 2015).

Self-efficacy was established to be a strong predictor of resilience in previous studies conducted among individuals who sustained SCI (Craig, 2012; Driver et al.,

2015; Guest et al., 2015a; Kilic et al., 2013). Self-efficacy is the confidence a SCI individual has in the ability to perform daily activities and social functions. It regulates the cognitive process or emotion while confronting the consequences of SCI (Middleton, Tate, & Geraghty, 2003). If one has the confidence to deal with a stressful situation effectively, one is not distressed by such adversity; hence, the individual develops the ability to adjust (Bandura, 1998). In addition, self-efficacy facilitates an individual's sense of control to access and utilize resources, thus, maintain or enhance resilience (Benight & Cieslak, 2011).

Spirituality is one of the key factors of resilience in SCI people, which helps to confront with the consequences of SCI (Monden et al., 2014; White et al., 2010). Spirituality is also embraced as an individual resiliency factor in the resilience framework proposed by Kumpfer (1999). Spirituality refers to an individual's relationship to God or what he/she perceives to be ultimate transcendence or higher power. Spirituality is considered as one of the cognitive strategies that provides motives for life and directs thoughts and behaviors of an individual (Hodge, 2003). Furthermore, spirituality was found to mitigate the negative consequences of traumatic events (Drescher et al., 2004). A person who has faith or who involves himself/herself in prayer or meditation demonstrates emotional wellbeing, which can be simplified as resilience (Hodge, 2003).

The depressive mood of SCI individuals and disaster survivors was negatively associated with the status of resilience (Bonanno et al., 2006; Craig, 2012; Driver et al., 2015; Kilic et al., 2013). People with a highly depressive mood presented with poor coping and maladjustment, whereas people who have few depressive symptoms or a stable mood possess a higher ability to adapt to the consequences of adversity (Bonanno et al., 2006; Kilic et al., 2013).

As mentioned above, in this study, social support, self-efficacy, depressive mood, and spirituality were used as variables to examine the predictive characters with regard to enhancing or impeding the resilience in people who sustained SCI from the earthquake in Nepal. Craig (2012) further categorized factors contributing to resilience into protective and risk factors. Protective factors are those environmental, social and interpersonal, and personal (psychological and physical) factors that minimize the risks or act as a buffer against negative consequences of adversity or stressful events. First, the environmental factors include a healthy environment, education opportunities, community resources, community cohesion, and access to recreation. Next, the social and interpersonal factors include stable family support, support from friends, employment, positive attachment, available affection, and social activities. Then, the personal factors comprise self-esteem, sense of mastery or self-efficacy, stable mood state, adequate coping, social and problem-solving skills, and good physical health. On the other hand, risk factors are those environmental, social and interpersonal, and personal factors that increase the vulnerability to poor adjustment. The reverse of the protective factors can be considered as the risk factors (Craig, 2012).

According to Craig (2012), social support, self-efficacy, and spirituality were categorized as protective factors enhancing the resilience and depressive mood was categorized as a risk factor which impedes the resilience. In addition, social support was further grouped into social and interpersonal factors. While self-efficacy, spirituality, and depressive mood were grouped into personal psychological factors (Craig, 2012).

The knowledge derived from the literature review provided a basis to develop a conceptual framework underpinning this study (Figure 1).
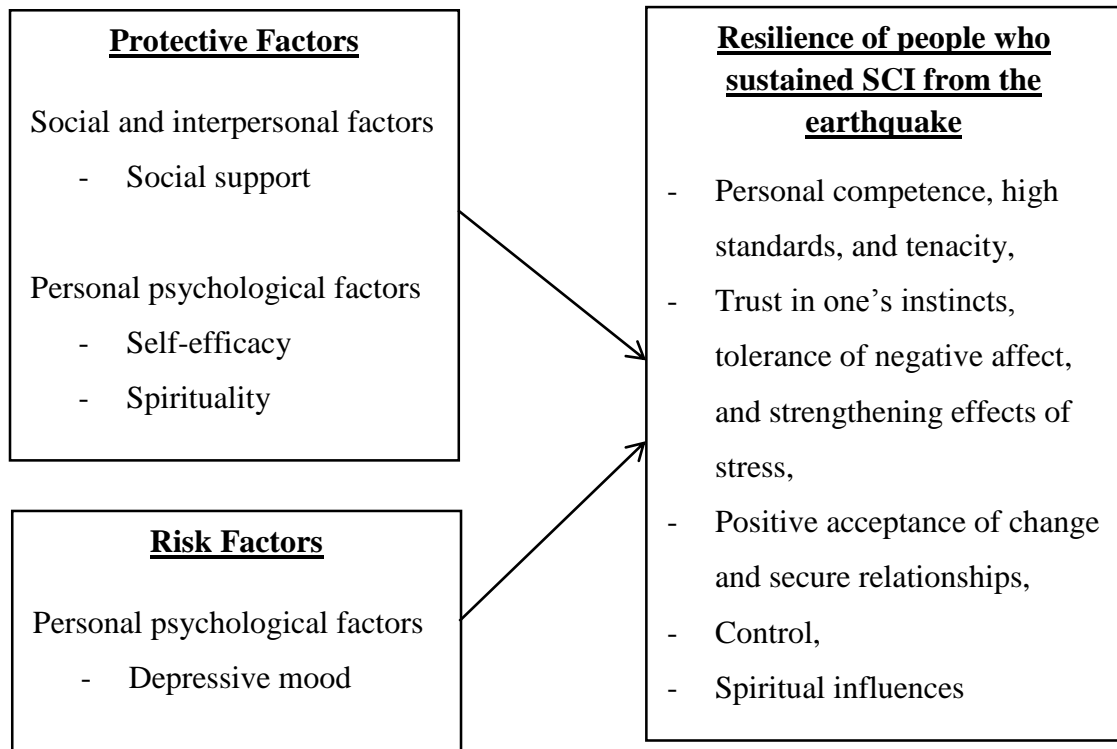
Figure 1. Conceptual framework of the study

Hypothesis

Social support, self-efficacy, spirituality, and depressive mood significantly predict the resilience of people who sustained SCI from the earthquake in Nepal.

Definition of Terms

Resilience

Resilience is the perceived ability of an individual who sustained a SCI from an earthquake to maintain a positive physical, psychosocial, and spiritual adjustment. Resilience was assessed in terms of five characteristics: 1) personal competence, high

standards, and tenacity; 2) trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; 3) positive acceptance of change and secure relationships; 4) control; and 5) spiritual influences. The Connor-Davidson Resilience Scale (CD-RISC) proposed by Connor and Davidson (2003) was used to measure the level of resilience. Since resilience is the aggregate of all five characteristics, resilience was measured and interpreted as a whole rather than defining each characteristic separately.

Determinants

Determinants are the factors that contribute to or determine the status of resilience in individuals who sustained SCI from the earthquake. The determinants of resilience in this study included social support, self-efficacy, spirituality, and depressive mood.

Social support

Social support is the perception of a SCI individual regarding the received support from his/her family, friends, and significant others. Social support was measured by 12-item Multidimensional Scale of Perceived Social Support (MSPSS) developed by Zimet, Dahlem, Zimet, and Farley (1988).

Self-efficacy

Self-efficacy is the perceived confidence of a SCI individual to perform activities of daily living, social functioning, and other specific tasks to maintain wellbeing. These activities include: maintaining personal hygiene, good health and wellbeing, and having a satisfying sexual relationship; maintaining relationships with family, friends, and others, and household participation; managing the bowel system; enjoying with friends and leisure pursuits; dealing with unexpected problems;

persistence in learning new things; and expecting to work in the future and having a fulfilling lifestyle. Self-efficacy was measured by 16-item Moorong Self-efficacy Scale (MSES) proposed by Middleton and collegues (2003).

Spirituality

Spirituality is the perceived relationship of a SCI individual with God or what he/she perceives to be the ultimate transcendence or higher power which was measured by 6-item Intrinsic Spirituality Scale (ISS) proposed by Hodge (2003).

Depressive mood

A depressive mood is the perception of the presence of any depressive symptoms or negative feelings of a SCI individual which was measured by 9-item Patient Health Questionnaire-9 (PHQ-9) proposed by Spitzer, Kroenke, Williams, and colleagues (1999).

Scope of the Study

This study was conducted to assess the status and determinants of resilience among people who sustained SCI from the 2015 earthquake in Nepal. The study was carried out at the Spinal Injury Rehabilitation Center (SIRC) in Kavre district and communities in Nepal. The community settings included 14 districts of Nepal that were affected by the earthquake. The data collection was conducted between December 2016 and February 2017.

Significance of the Study

An earthquake-related SCI has a profound impact on SCI survivors, which requires effective adjustment to maintain positive physical and psychosocial aspects. The findings from this study regarding the status of the resilience of people who sustained SCI from the 2015 earthquake in Nepal will raise the nation's awareness to provide better care and services for the SCI survivors across the country. Furthermore, the study results regarding determinants of resilience will provide a basis for developing the continuing nursing care model or program to enhance resilience among SCI survivors as a result in increasing their quality of life.

CHAPTER 2

LITERATURE REVIEW

This chapter presents a review of literature related to an overview of SCI and earthquake-related SCI with a specific focus on earthquakes in Nepal, resilience in people following SCI, assessment and measurement of resilience, and factors associated with resilience following disaster and SCI.

1. Earthquake disaster

    1.1 Introduction to disaster and earthquake disaster

    1.2 Overview of earthquake disaster in Nepal

2. Overview of the SCI and earthquake-related SCI

    2.1 Prevalence, incidence, causes, mechanism, types, and severity of SCI

    2.2 Prevalence, incidence, causes, and mechanism of earthquake-related SCI

    2.3 Impacts and consequences of earthquake-related SCI

    2.4 The essential roles of nurses in caring SCI individuals in rehabilitation and community settings

3. Resilience following SCI

    3.1 Definitions and concept of resilience

    3.2 Resilience in people who sustained SCI from an earthquake

4. Measuring resilience after SCI

    4.1 Measuring resilience in general population

    4.2 Measuring resilience in people who sustained SCI from an earthquake

5. Factors associated with resilience

Earthquake Disaster

Introduction to Disaster and Earthquake Disaster

Nowadays, the frequency of natural and man-made disasters is increasing around the world (Landry et al., 2016). Globally, around 324 disasters were reported in 2014 (Guha-Sapir, Hoyois, & Below, 2014). The occurrence of natural disasters increased by threefold from between 1980 and 1989 to 2000 and 2009 (United Nations, 2014). Disasters in Asia happen more often than in other continents. In 2014, more than 40% of the worldwide natural disasters and 69.5% of the global disaster victims occurred in Asia (Guha-Sapir et al., 2014; United Nations, 2014). Also, between 2004 and 2009, nearly 714,000 deaths resulted from natural disasters in the Asia-Pacific region and affected 1.5 billion people (United Nations, 2014). Nepal was ranked in the 20th topmost disaster prone country and 11th earthquake-prone country in the world (Koirala, 2014).

Definition and types of disaster

The Centre for Research on the Epidemiology of Disasters (CRED) defines disaster as an unforeseen and often sudden event that causes great damage, destruction, and human suffering which overwhelms the local capacity, necessitating a request at the national or international level for external assistance (Below et al.,

2009). Generally, disasters are classified into two types which are either manmade disasters or natural disasters (Below et al., 2009; International Federation of Red Cross and Red Crescent Societies [IFRCRCS], 2008). Man-made disasters occur from human activities such as accidents, the release of hazardous materials, the collapse of buildings, conflicts, and explosions. Whereas, natural disasters happen in nature as a result of the natural forces which include events such as tropical storms (hurricane, cyclone), extreme heat or cold, drought, flood, tsunami, and landslide as well as an earthquake (IFRCRCS, 2008).

Earthquake disaster

An earthquake is one of the natural disasters and refers to the shaking of the earth due to the interaction of two plates of earth sliding past each other (USGS, 2016). Millions of earthquakes strike the world annually. However, few of the earthquakes are noticeable and devastating (USGS, 2015). Generally, the Richter scale (RS) has been used to measure the magnitude or the size and energy released from an earthquake (Webb, 2008). USGS (2015) reported that every year, an average of 16 major earthquakes with a magnitude of more than 7 RS, 134 moderate earthquakes with a magnitude between 6 and 6.9 RS, and a large number of small earthquakes (magnitude less than 6 RS) occur around the world. In addition, a number of smaller earthquakes or aftershocks persist over periods of time following an earthquake (USGS, 2015).

Most of the Asian countries are highly prone to earthquakes. For instance, major earthquakes struck Iran (2003), Pakistan (2005), China (2008), Indonesia (2009), Haiti (2010), Japan (2011), and Nepal (2015) within a decade which caused large numbers of fatalities, casualties, and destructions of infrastructures (Gautschi, Cadosch, Rajan, & Zellweger, 2008; United Nations, 2014; USGS, 2015). Between

1980 and 2009, approximately 61.5 million people were affected by different magnitudes of earthquakes (Doocy et al., 2013).

There are some factors which increase the vulnerability of a region to have a disaster including earthquake disaster. The factors include the rapid and uncontrolled growth of population, uncontrolled development, environmental degradation, the fragility of landmass, unstable topography, poor design of buildings or infrastructure, and geography (Doocy et al., 2013; Koirala, 2014). In case of Nepal, it lies across the boundaries of the Indian and Tibetan tectonic plates which frequently move toward each other. The complex geographical structure with the active tectonic process and continuous seismic activities make Nepal highly vulnerable to frequently develop earthquakes (Koirala, 2014).

Impacts and consequences of earthquake

The consequences of the earthquake affect people in terms of tremendous infrastructure damage, human loss, physical and psychosocial morbidities, and physical impairments and disability (Reinhardt et al., 2011). Moreover, high mortality due to trauma and asphyxia from the earthquake is evidenced. For instance, high mortality was recorded after the earthquake in China (2008) and Haiti (2010) with approximately 90,000 and 225,570 deaths respectively (Guha-Sapir et al., 2014; Wang & Liu, 2012). The high mortality rate following an earthquake was found to be associated with the high intensity of the earthquake, distance of epicenter, condition of construction materials or buildings, poor socioeconomic status, and unavailability of rescue services and early emergency care (Doocy et al., 2013).

Earthquake victims suffer from various types of physical injuries due to fall, collapse of buildings, and hit by falling debris. For instance, nearly one million people got injured from earthquakes between 1980 and 2009. The most common types of

injuries following an earthquake were cuts and abrasions, lacerations, multiple compound fractures, dislocation, amputation, internal organ injury, head injury, crush injuries/syndrome, and SCI (Doocy et al., 2013; WHO, 2016).

Furthermore, various psychosocial problems were also found among earthquake survivors (Doocy et al., 2013; Thapa, 2015; Wang & Liu, 2012). Psychological distress may occur rapidly or be delayed and may persist for several years following the earthquake (Thapa, 2015). Mental problems including depression, anxiety, PTSD, and personality and cognitive disorders were found common among earthquake survivors. The incidence of PTSD was reported high among paraplegic survivors than that of normal survivors of the earthquake (Wang & Liu, 2012). Consequently, social impacts included less social interaction, a decrease in community relationship and participation as well as an increment in the suicidal rate (Tachibana, Kitamura, Shindo, Honma, & Someya, 2014). Interestingly, not all earthquake victims had negative responses. From this, it was essential to study the factors that enhance the ability of earthquake survivors to adjust to the impacts and consequences of the earthquake.

Overview of Earthquake Disaster in Nepal

Nepal is one of the developing Asian countries which often encounters different natural disasters including earthquake disaster (Koirala, 2014). Geographically, Nepal lays at a ridge of Tibetan and Indian tectonic plates which collide with each other in the Himalayan region, which is very high prone to earthquakes. Therefore, Nepal is ranked 11th in the world risk of having an earthquake (Koirala, 2014).

In Nepal, a number of earthquake disasters have occurred and recorded in terms of severity and consequences. In 1255, an earthquake of 7.7 RS was first recorded in Kathmandu and the death rate was about one-third of the total Nepalese population. In addition, in 1934, a large earthquake with a magnitude of 8.4 RS hit Nepal which caused 8,519 fatalities, more than a thousand people injured, and the destruction of about 126,355 houses (Disaster Preparedness Network-Nepal [DPNN], 2016). Also, between 1971 and 2011, earthquake disasters happened with different magnitudes and affected around 40,000 people in the different regions of Nepal. Among these numbers, approximately 882 and 7,024 people died and were injured, respectively (Koirala, 2014).

Moreover, the last devastating earthquake disaster of 7.8 RS attacked Nepal on April 25, 2015. A number of aftershocks occurred which included an aftershock of 7.3 RS on May 12, 2015 (USGS, 2015). As a result, 8,702 and 22,493 people were killed and injured, respectively (UNHCR, 2015). Additionally, millions of people were displaced from Kathmandu valley and the rural hilly and mountains areas (Ministry of Home Affairs, 2015). Among those injuries, SCI was one of the major injuries resulted from the disastrous earthquake (Muldoon, 2015).

Previously, a variety of disaster preparedness plans and training programs had been activated for clinicians and community staff in Nepal. In addition, a variety of preparedness plans had been proposed for rehabilitation services in Nepal by the Ministry of Health and Population, WHO, and other organizations. To date, the government and non-government organizations have been launched in Nepal to increase the capability regarding disaster preparedness, response, and risk reduction (Landry et al., 2016). These organizations are concerned with increasing the

awareness and providing training for health professionals and community people
regarding the preparation and management of disasters (DPNN, 2016).

Following the recent earthquake in 2015, the Government of Nepal and other
organizations offered different services to the victims. Immediately after the
earthquake, the Government of Nepal, Ministry of Home Affairs announced that they
would provide free treatment for all injured survivors. Furthermore, commutation or
financial remedies were provided for the people who sustained disability from the
earthquake (Government of Nepal, 2015). Under the cooperation of WHO and
Ministry of Health and Population of Nepal (MOHP), funding was also allocated for
the rehabilitation of SCI people. The medical teams from overseas were deployed to
allocate care for the people with disabilities including SCI. Also, financial support and
equipment was provided in rehabilitation centers to deliver long-term care for SCI
people (WHO, 2015). In addition, immediately after the earthquake, different
organizations distributed mobility aids, prosthesis, and orthotic devices to the people
who sustained physical disabilities including SCI from the earthquake (Koirala as
cited in Landry et al., 2016).

In Nepal, physical rehabilitation services have been provided to the
individuals with disabilities and SCI. Currently, there are five rehabilitation centers in
Nepal. Among these, the Spinal Injury Rehabilitation Center (SIRC) serves as the
major rehabilitation center with 150 in-patient beds and most of the SCI cases are
referred to this center. A total of 117 cases of SCI from the 2015 earthquake were
admitted for the rehabilitation program at SIRC. In addition, the other 24 SCI cases
attended rehabilitation program at Green Pastures Hospital in Pokhara and Bharatpur
Hospital in Chitwan (Groves, Poudel, Baniya, Rana, & House, 2017). The
rehabilitation centers also provide peer counseling service for the people who

sustained SCI from the earthquake (Khan et al., 2015). Rehabilitation professionals were trained for early mobilization, transfer, and safe handling of patients in order to prevent further disabilities (Landry et al., 2016). Since primary healthcare centers (PHC) are available in each district, SCI people are able to visit the PHC if any complications arise.

Currently, there are no published data regarding the current situation of people who sustained SCI from the 2015 earthquake in Nepal. All of the SCI patients have been discharged from the rehabilitation centers and they live in their communities. The information received from the staff working at the SIRC revealed that not all people who sustained SCI from the earthquake are attending the rehabilitation program regularly. Although the rehabilitation centers provide cost-free rehabilitation services, currently, very few SCI people re-attended a rehabilitation program and visited for follow up (M. Baniya, personal communication, November 15, 2016).

The major barriers that keep SCI survivors away from attending the rehabilitation program at the rehabilitation centers are financial problems, inaccessibility, traveling as well as transportation. Nepal has a diverse geographical distribution with steep Hills and Mountains regions. Therefore, road transportation is not accessible for all regions, including some earthquake affected areas (CBS, 2011). Consequently, fewer SCI people have access to rehabilitation services. This poses a certain question of quality of rehabilitation as well as the quality of life of people who sustained SCI from the earthquake in Nepal.

Overview of SCI and Earthquake-related SCI

Prevalence, Incidence, Causes, Mechanism, Types, and Severity of SCI

    Prevalence and incidence of SCI

Spinal cord injury (SCI), or damage to the spinal cord, is one of the catastrophic health problems which lead to death and disabilities (White, Duncan, & Baumle, 2013). Globally, between 250,000 and 500,000 people suffer from SCI each year (WHO, 2013). The worldwide annual incidence and prevalence of SCI vary in different geographical regions ranging from 8.0 to 246.0 cases per million and 236.0 to 1,298.0 cases per million, respectively (Furlan, Sakakibara, Miller, & Krassioukov, 2013). In the United States, the annual estimated incidence and prevalence of SCI are approximately 54 cases per million population and 282,000 people, respectively (National Spinal Cord Injury Statistical Center [NSCISC], 2016).

In Asian countries, the incidence of SCI varies from 12.06 to 61.6 cases per million (Ning, Wu, Li, & Feng, 2012). From 1989 to 2000, around 700 SCI cases were reported in Thailand (Rahimi-Movaghar et al., 2013). In Nepal, there are no currently published reports on the incidence and prevalence of SCI; however, the data can be estimated from the number of SCI patients who attended rehabilitation centers. For instance, at the SIRC, the major rehabilitation center in Nepal, 1,888 SCI patients were recorded while they attended rehabilitation program between April 7, 2002 and December 31, 2016 (Spinal Injury Rehabilitation Center, 2017). There is no currently published data regarding the number of SCI patients in other four rehabilitation centers.

Causes of SCI

In general, the causes of SCI can be categorized as traumatic and non-traumatic (Somers, 2010). For traumatic causes, vehicle accidents are the leading cause of traumatic SCI which accounted for 39.08% of SCI (NSCISC, 2015). The second most common traumatic cause of SCI is fall injury which accounted for 29.54% of SCI. The additional traumatic causes of SCI include violence, sports, recreational activities, machinery accidents, hit by flying objects, and disasters including earthquake disaster (NSCISC, 2015; WHO, 2013). Non-traumatic causes of SCI include medical and surgical complications such as spinal infection, spinal hematoma, transverse myelitis, neoplasm, interruption of the blood supply to the spinal cord due to surgery, rheumatoid arthritis, radiation spondylitis, and cardiac arrest (Somers, 2010; WHO, 2013).

Mechanism of SCI

Injury or damage that occurs to the spinal cord due to either traumatic or non-traumatic causes affects the functions of the spinal cord (Crew & Krause, 2009). Generally, the spinal cord functions as a pathway for signals from the brain to the peripheral nerves. Further, sensory stimuli from the body travel to the brain and nerve impulses from the brain travel down to the body through the spinal cord. This mechanism results in sensation or tactile perception and coordinated movement of the body parts (Crew & Krause, 2009).

Injury to the spinal cord results in the destruction of neurons at the level of injury; progressive neural or tissue destruction in the cord leads to ischemia, edema, and necrosis of spinal cord (Somers, 2010). Hence, damage to the spinal cord disrupts communication between the brain and body parts, subsequently, affecting the normal functions below the lesion in the cord. Consequently, it leads to the loss of voluntary

movement and sensation below the lesion, including functional impairment in the complete and higher level of neurological injury (Crew & Krause, 2009).

Types of SCI

Generally, the classification of SCI is based on the completeness of injury, and the level of injury (Crew & Krause, 2009; Spinal Research, 2011). With regard to the completeness of injury, SCI is mainly classified into complete and incomplete cord injury or lesion. In a complete injury, nerve fibers below the level of injury do not function completely and equally affect both sides of the body. Whereas, in incomplete injury, some of the nerve fibers are still functioning and one side of the body is affected more than the other side (Crew & Krause, 2009; Spinal Research, 2011).

In terms of the level of injury, SCI is classified into quadriplegia and paraplegia. If an injury occurs at or above the first thoracic level, it results in loss of sensation and movement in both upper and lower extremities which is known as tetraplegia or quadriplegia. Whereas paraplegia is a condition resulting from the injury below the first thoracic level preserving the functioning of upper extremities and impairing the functioning of the lower half of the body. The severity of motor or sensory loss depends on the level and completeness of injury (Crew & Krause, 2009).

Severity of SCI

The American Spinal Injury Association (ASIA) system proposed by the ASIA has been globally used to categorize the severity of SCI (Spinal Cord Injury Research Evidence, 2013). According to the ASIA system, the severity of SCI is categorized into 5-level as A, B, C, D, and E (Table 1).

Table 1

ASIA Classification of Spinal Cord Injury

ASIA Classification	Description
A	Complete injury with no sensory or motor function preserved in the sacral segments S4-S5
B	Sensory incomplete injury where sensory but not motor function is preserved below the neurological level and include the sacral segments S4-S5
C	Motor incomplete injury indicating preserved motor function below the neurological level and more than half of key muscles below the injury have muscle grade less than 3
D	Motor incomplete injury with preserved motor function and at least half of the key muscles below the neurological level have muscle grade of 3 or more than 3
E	Normal, where sensory and motor functions are intact

To conclude, SCI is a chronic devastating condition occurring from traumatic or non-traumatic causes. SCI can be classified based on cause, the severity of the injury, and damage to the motor or sensory neurons. The functional impairments result based on the severity of nerve damage.

Prevalence, Incidence, Causes, and Mechanism of Earthquake-Related SCI

Prevalence and incidence of earthquake-related SCI

A number of people who sustained SCI from earthquakes have been reported around the world. In 2003, about 240 people sustained SCI due to a high magnitude earthquake in Iran (Raissi, 2007). Additionally, a 2005 earthquake in Pakistan resulted in more than 600 SCI people in which most of the them had paraplegia (89.3%) (Rathore et al., 2007). In China, an earthquake with a magnitude of 8.0 RS in 2008

left more than 300,000 people injured and 78 people acquired SCI (Chen, Song, Kong, Zhou, & Liu, 2009).

In addition, an earthquake in 2010 with a magnitude of 7.0 RS in Haiti caused approximately 150 people to suffer from SCI (Burns et al., 2010). Moreover, the main shock and the aftershock of the high magnitude earthquake in Nepal in 2015 caused more than 173 people to suffer from SCI (Muldoon, 2015). Among those, 117 SCI people were admitted to the SIRC for the rehabilitation. Out of the 117 SCI victims, 60% presented with incomplete paraplegia and the majority of victims were women (Groves et al., 2017).

As mentioned above, the incidence of earthquake-related SCI was reported higher in developing countries than in developed countries (Priebe, 2007; Rathore et al., 2007) with no exception to Nepal. This may be due to adequate emergency preparedness systems and trained rescuers in the developed countries. In contrast, most of the rescuers in developing countries are the local people or volunteers who were never trained in skills used to respond to trauma or disaster events. Consequently, inappropriate cervical spine protection and transportation such as dragging and pulling of victims without considering safety could increase the number of SCI people in developing countries (Priebe, 2007).

Causes and mechanism of earthquake-related SCI

Most of the SCI injuries that occur due to an earthquake are the result of falls, being hit by falling objects or ceilings (Maruo & Matumoto, 1996), and being pulled or dragged with back or spine fracture (Priebe, 2007). In Nepal, people sustained earthquake-related SCI due to burring by rubble, felling from buildings, and intentionally jumping from buildings during the earthquake (Groves et al., 2017). The mechanism of earthquake-related SCI is similar to that of traumatic SCI. Injury to the

nerves in the spinal cord damages the cord resulting in loss of sensation and voluntary movement below the lesion.

Impacts and Consequences of Earthquake-related SCI

SCI as well as earthquake-related SCI has profound impacts on the physical, psychological, and social well-being of individuals and/or family (WHO, 2016). The risk of premature mortality is two to five times higher in SCI people than in people without SCI (WHO, 2016). Following SCI, individuals suffer from various physical conditions or complications which depend on the extent of damage to the cord or severity of the injury (Somers, 2010).

The SCI has numerous immediate and long-term negative physical impacts on an individual. Damage or injury to the spinal cord, as mentioned previously, has persistent impairment in the sensation, voluntary movement, and functioning of the body parts (Crew & Krause, 2009). Paralysis of the voluntary muscles is the most obvious physical impact following SCI. In addition, SCI disrupts thermoregulation, increases muscle tone (spasticity), impairs sensation resulting in dis-coordination of body movements, and increases vulnerability to trauma. Furthermore, SCI results in difficulty in breathing and coughing, cardiovascular impairment, flaccid paralysis, decreased venous return to the heart, loss of voluntary control of bladder and bowel, and disrupts sexual functioning (Somers, 2010).

Following a SCI, individuals have to confront with abundant secondary physical complications (Crew & Krause, 2009; Somers, 2010). As mentioned previously, most of the SCI individuals do not have voluntary bladder and bowel control which may lead to recurrent urinary tract infection, incontinence, and renal problems. Other secondary conditions include pressure injury, chronic pain,

autonomic hyperreflexia, sexual dysfunction, contracture, subsequent injuries, osteoporosis and fracture, respiratory complications, gastrointestinal complications (e.g. ulcer, paralytic ileus, constipation, bowel obstructions, and esophagitis), deep vein thrombosis, pulmonary embolism, and cardiovascular problem (Crew & Krause, 2009; Somers, 2010).

Among those, pressure injury (33%), urinary tract infection (29%), and deep vein thrombosis (6%) were evidenced as the most common physical complications that occurred in people who sustained SCI (Groves et al., 2017; Rathore et al., 2007; Tauqir, Mirza, Gul, Ghaffar, & Zafar, 2007). Moreover, the majority of SCI people suffer from a moderate to severe level of chronic pain (Ataoğlu et al., 2013; Driver et al., 2015; Min et al., 2014). In addition, a study conducted in Nepal revealed that individuals who sustained SCI from the earthquake also experienced heterotopic ossification (Groves et al., 2017).

Along with physical problems, SCI individuals also experienced a high prevalence of psychosocial problems (Bonanno et al., 2006; Khazaeipour et al., 2014; Migliorini et al., 2015). The impacts and consequences of SCI affect an individual's mobility or the ability to perform daily activities, hinder social participation, and experience a loss of independence. The adjustment problems, stigma, coping problems, depressive disorders, as well as suicidal ideation could develop among the people in this group (Crew & Krause, 2009). According to WHO (2013), approximately 20% to 30% of SCI people presented with depressive symptoms. Furthermore, a study conducted among 573 community SCI individuals revealed that about half of them presented with depressive symptoms (Migliorini et al., 2015). Similarly, a systematic review carried out by Craig and colleagues (2009) revealed that 20% to 40% of SCI people developed depressive disorders and around 30%

reported anxiety. Other studies have also found the presence of depression or mood disturbances among SCI people (Bonanno et al., 2012; Kilic et al., 2013).

Additionally, around 28% of people with SCI sustained from earthquake demonstrated features of PTSD one year after the event (Zhou et al., 2015). Khazaeipour and colleagues (2014) mentioned the development of psychosocial problems such as sadness, depression, irritability, suicidal thoughts, and low self-confidence among SCI people. Furthermore, Craig and others (2015) also found that the majority of people with SCI (55%) faced difficulties in participating social activities. In addition, the global unemployment rate which becomes one of the contributing factors for developing psychosocial problems among the SCI population is higher than 60% (WHO, 2013).

As a result, people who sustained SCI have to adjust or cope with these impacts through the trajectory of SCI as well as throughout their life. The ability of the SCI individual to cope or adjust with the adversity and threats from the consequences of SCI is, however, individual differences. While some people have the ability to cope or adjust with that consequences of SCI and adapt to the challenges (Crew & Krause, 2009), others use ineffective coping strategies and develop a variety of psychological problems (Bonanno et al., 2012; Craig et al., 2015; Craig et al., 2009). Here, it reflects the importance to study the adjustment ability or resilience of SCI individuals.

The Essential Roles of Nurses in Caring SCI Individuals in Rehabilitation and Community Settings

Nurses are one of the integral parts of interdisciplinary team for providing care to SCI people throughout the trajectory of SCI in rehabilitation center and community

(Rundquist et al., 2011; WHO, 2010). In the rehabilitation center, nurses play a crucial role in educating and counseling SCI patients and their family members in order to achieve and maintain optimum level of physical, psychological, and social functioning (Somers, 2010). According to Rundquist and colleagues (2011), both knowledge and consultaion given to SCI individuals and family members should include physiological changes following SCI, possible complications, and prevention and management of those complications. Adequate and continue education and consultation could enhance functional independence, social reintegration, and quality of life of SCI people (Rundquist et al., 2011).

In Nepal, nurses in rehabilitation center allocate total care to meet the need of SCI individuals such as administering medications and assisting in performing activities of daily living. With regard to education and consultation, Nepalese nurses in rehabilitation center teach and train SCI individuals and family members to perform bowel and bladder care, skin care, proper use of medications and orthotic devices, nutrition, exercises, and prevention of pressure injuries and overuse injuries. In addition, Nepalese nurses in rehabilitation center are responsible to perform wound care, assess neurogenic bladder and bowel function, and plan strategies to enhance independence among SCI individuals involving caregivers as well. Nepalese nurses also act as a member of a multidisciplinary care team in the rehabilitation centers. They involve in the discharge planning to ensure that SCI individuals are able to perform self-care at home/community with as much independency as possible (Spinal Injury Rehabilitation Center, 2016).

Since SCI is a chronic problem, besides physical care, psychosocial care is an essential component of the nursing management of SCI individuals and family (Rundquist et al., 2011; Somers, 2010). Therefore, nurses are responsible for meeting

psychosocial need of SCI people to maintain community reintegration and enhance resilience. In order to maximize health, autonomy, and participation, nurses also play an important role to empower and increase competency of SCI individuals in problem solving and decision making regarding their care and treatment. Furthermore, nurses have a vital role in maintaining a positive atmosphere, counseling patients, and family members, and providing cognitive behavioral therapy, social skill training, functional training, and recreation training (Somers, 2010). Currently, Nepalese nurses together with clinical psychologists provide psychosocial counseling to the SCI individuals and their family (Spinal Injury Rehabilitation Center, 2016).

For public health nurse or community health nurse who work in the community settings, their roles are mainly focused on assisting people with chronic disease and disability to cope with physical and psychosocial consequences of disease or disability. These roles include assessing and motivating patients to perform self-care activities and providing care, consultation, and education or training as needed (WHO, 2010). The roles of public health nurse or community health nurse, however, could be different depending on national health policies and resources available.

In Nepal, currently, nurses working in PHC provide care to the SCI people in community such as management of pain, other complications, and wound care. In addition, they are responsible to provide education to the SCI individuals and families regarding SCI relevant contents as discussed previously. However, due to the geographical variations of Nepal, it is difficult for some SCI individuals to access to the PHC in some mountainous or hills areas (M. Baniya, personal communication, June 10, 2017).

Resilience Following SCI

Definitions and Concept of Resilience

Resilience has become an important concept in the area of psychology and mental health (Garcia-Dia, DiNapoli, Garcia-Ona, Jakubowski, & O'Flaherty, 2013). Currently, resilience is widely used across the areas of nursing and health care, including trauma and disaster nursing (Bonanno et al., 2006; Kilic et al., 2013; Lowe, Sampson, Gruebner, & Galea, 2015).

The term resilience was derived from the Latin word 'resiliens', which means 'to rebound, recoil' (Harper, 2012). To date, 'resilience' has been defined in both general and specific terms for particular areas or disciplines. For instance, generally, resilience is defined in terms of ability or traits, process, and outcomes after exposure to any adversity (Craig, 2012; Southwick et al., 2011). Resilience is also defined in terms of process, capacity or outcomes of successful adaptation in spite of challenging or threatening situations (Masten, Best, & Garmezy, 1990).

In addition, resilience has been defined with regard to personal ability or trait. Connor and Davidson (2003) viewed resilience as the personal qualities that enable an individual to thrive in the face of adversity or stressful situations. Similarly, Bonanno (2004) defines resilience as an individual's ability to maintain a stable equilibrium in the face of highly disruptive events and life-threatening situations. Likewise, resilience was defined as the ability of a human being to adapt in the face of tragedy, trauma, adversity, hardship, and ongoing significant life stressors (Newman, 2005).

On the other hand, resilience was defined in terms of process. According to Luthar, Cicchetti, and Becker (2000), resilience is "a dynamic process encompassing positive adaptation within the context of significant adversity" (p. 543). In addition,

American Psychological Association (2010) states, "resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress" (para. 4).

Additionally, resilience is also viewed as an outcome. According to Rutter (as cited in Kaplan, 2002, p. 20), resilience is "a fact of maintaining adaptive functioning in spite of serious risk hazard." Furthermore, resilience is referred to an outcome characterized by a particular pattern of functional behavior despite the risk (Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003).

Resilience is constructed from the thoughts, behavior, and actions that are adaptive in response to stress or trauma (American Psychological Association, 2010; Southwick et al., 2011). Resilience can also be viewed in terms of components or individual characteristics which affect resilience. According to Connor and Davidson (2003), an individual's resilience can be described from different characteristics or attributes. These attributes are further grouped into five factors which include: 1) personal competence, high standards, and tenacity which encompasses one's internal competency and strong determination to obtain a goal despite any obstacles or challenges in life; 2) trust in one's instincts, tolerance of negative affect, and strengthening effects of stress which reflects one's ability to handle stressful situations, cope with difficulties, and attempt to find the solution to problems in a calm manner; 3) positive acceptance of change and secure relationships represents one's ability to adapt to changes that occur in life and maintain close relationships with others; 4) control describes a sense of perceived control on one's life, have strong purpose of life, and the ability to use available resources while confronting difficulties; and 5) spiritual influences constitutes one's belief in his/her faith or God (Connor & Davidson, 2003).

Furthermore, individual resilience is attributed to a rebounding or reintegration or the quality to bounce back and get back to normal after adversity, self-determination or the ability to overcome or move on despite the barriers and any circumstance, positive relationships with others, sense of humor, flexibility, adaptability or ability to adapt to change, and self-esteem/self-efficacy (Earvolino-Ramirez, 2007). Additionally, the attributes of an individual's resilience include rebounding, determination, social support, and self-efficacy (Garcia-Dia et al., 2013).

The antecedent of resilience is adversity and the consequences include effective coping, mastery and positive adaptation (Earvolino-Ramirez, 2007). In addition, according to Garcia-Dia and colleagues (2013), the presence of adverse or traumatic events which is interpreted as being physically and/or psychologically traumatic is considered as antecedent. The consequences of resilience are effective coping process, integration, personal growth, personal control, and psychological adjustment (Garcia-Dia et al., 2013).

To conclude, resilience refers to the ability of adapting or thriving successfully despite exposure to any significant adversity, trauma or stressful situations. Resilience is adaptive thoughts, behaviors, and actions. Resilience consists of two components which include exposure to any significant adversity or trauma and successful or positive adaptation regardless of any adversity or trauma. The attributes or aspects of resilience include personal competence, self-confidence, self-determination, believing in oneself, and tolerance of negative affect, acceptance of changes/flexibility, positive relationship with others, control over oneself, and spiritual influence. Since the attributes of resilience proposed by Connor and Davidson (2003) reflect well the whole picture of resilience among people who sustained SCI from the earthquake, the status of resilience in this study was examined based on this concept.

Resilience in People Who Sustained SCI From an Earthquake

This part presents a literature review with a specific focus and analysis on resilience following earthquake-related SCI. Previous empirical studies have been conducted to assess the resilience and factors related to resilience among people post-SCI in rehabilitation as well as community settings. Here, the meaning and components or aspects, as well as the state of resilience following earthquake-related SCI, including factors contributing to resilience are illuminated and evidenced.

Resilience, according to Craig (2012), refers to an individual's adjustment process in order to maintain stable physical and psychosocial functioning despite effects of physical disability and disability-related negative consequences. Likewise, resilience is viewed as the ability of SCI people to overcome and adapt to SCI and SCI-related consequences, thus, achieving positive physical and psychological health outcomes (Monden et al., 2014). In addition, resilience is viewed as a complex process that buffers against physical and psychosocial problems related to SCI which is influenced by several factors (Guest et al., 2015a).

Furthermore, resilience is viewed in terms of healthy psychological and social functioning and absence of psychopathology following SCI (Guest et al., 2015b). Accordingly, Bonanno and colleagues (2012) state that resilient individuals are those who endure post-SCI compromised physical functioning and independence and maintain stable positive psychological adjustment. Further, the psychological adjustment is an adaptation without increasing psychological distress and the loss of social, sexual, and vocational roles (Helgeson & Cohen as cited in Janicki-Deverts & Cohen, 2011). Previous longitudinal studies regarding resilience following long-term SCI revealed that resilience is a trait or personal ability that did not change significantly over time (Driver et al., 2015; White et al., 2010).

A number of studies have been conducted to examine the status of resilience among SCI people. For instance, a study conducted by Kilic and colleagues (2013) among SCI people living in the community revealed approximately 60% of SCI people demonstrated an acceptable level of resilience to adapt to the SCI-related consequences. Furthermore, an acceptable level of resilience at the time of discharge from a rehabilitation center was mainly found among SCI individuals in Australia (68.3%); however, 31.7% of individuals had poor resilience (Guest et al., 2015b; Guest et al., 2015a).

Previous studies were also conducted to examine the relationship between resilience and other factors. SCI individuals with greater resilience capability tended to have high self-efficacy (Driver et al., 2015; Guest et al., 2015a), life satisfaction (White et al., 2010), low pain perception, low anxiety and depressive symptoms (Guest et al., 2015a; Kilic et al., 2013). The state of resilience was evidenced by positive adaptation or the outcomes that were significantly better than expected outcomes following exposure to risk or adversity (Luthar et al., 2000). The details of factors contributing to resilience are discussed further in the next section.

To conclude, resilience following SCI could be viewed as the ability of SCI individuals to maintain a stable positive physical, psychological, and social adjustment despite physical disability and disability-related negative consequences following earthquake-related SCI. Various instruments have been developed to measure or assess the status of resilience in different populations including SCI which are illustrated in the following section.

Measuring Resilience After SCI

Assessment and measurement of resilience can be evidenced in the overall population and in particular in the SCI population. Since the aim of this study was to assess the status of resilience in people who sustained SCI from the earthquake in Nepal, the literature review of this part mainly presented the assessments and measurements of resilience among the general population and SCI population with a special emphasis on resilience in people who sustained SCI from the earthquake.

Measuring Resilience in General Population

A number of tools have been developed to measure resilience in different populations in terms of a process or an ability of the individual to adapt to negative impacts of adversity or stressful situations. However, only a few tools have shown acceptable validity and reliability to measure resilience in the adult population (Windle, Bennett, & Noyes, 2011). Based on the current evidence, there are four most frequently used instruments that revealed good validity and reliability which include the Connor-Davidson Resilience Scale (CD-RISC), the Resilience Scale for Adults (RSA), the Brief Resilience Scale (BRS), and the Resilience Scale (RS).

The Connor-Davidson Resilience Scale (CD-RISC)

The CD-RISC is a brief self-report assessment tool developed by Connor and Davidson (2003) to measure the ability of an individual to adapt positively despite adversity. In order to examine the outcome of treatment in individuals with anxiety, depression, and stress reactions, Connor and Davidson (2003) developed the CD-RISC from a review of the literature. The tool was primarily developed by using the resilience relevant contents from the works of three authors: Kobasa (1979); Rutter

(1985); and Lyons (as cited in Connor & Davidson, 2003). Initially, the CD-RISC was employed in a population of 828 people in six groups: individuals not seeking help (*n* = 577); primary care outpatients (*n* = 139); psychiatric outpatients in private practice (*n* = 43); generalized anxiety disorder patients (*n* = 25); and two groups of individuals with PTSD (*n* = 44) (Connor & Davidson, 2003).

The CD-RISC consists of 25 items rated on a 5-point Likert scale which includes five major attributes: 1) factor reflecting the notion of personal competence, high standards, and tenacity; 2) factor reflecting trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; 3) factor corresponding to the positive acceptance of change, and secure relationships; 4) factor related to control; and 5) factor related to spiritual influences (Campbell-Sills & Stein, 2007; Connor & Davidson, 2003). The response ranges from 0 to 4, where 0 indicates not true at all, 1 indicates rarely true, 2 indicates sometimes true, 3 indicates often true, and 4 indicates true nearly at all of the time. The participants will be asked to rate the scale based on how they felt over the past month.

The total score ranges from 0-100, where higher scores indicate greater resilience and lower scores indicate lower resilience. Since there is instability of factor scores, the total score should be used for data analysis rather than using individual subscales (Connor & Davidson, 2003). The mean resilience scores for the general population, outpatients psychiatric sample, general anxiety disorder patients, and PTSD patients were reported as 80, 68, 62, and 52.8, respectively (Connor & Davidson, 2003).

The CD-RISC has established adequate validity and reliability in different populations. The tool has been tested in general and clinical samples and reported a high internal consistency with Cronbach's alpha of .89 (577 samples). The test-retest

reliability was assessed in 24 subjects with generalized anxiety disorder and 44 subjects with PTSD. It demonstrated a high level of agreement with an intra-class correlation coefficient of .87. The tool is also considered valid with good convergent validity (r = .83) and discriminate validity (r = -.30) (Campbell-Sills & Stein, 2007; Connor & Davidson, 2003). Furthermore, the CD-RISC has been used to assess resilience among SCI people (Catalano et al., 2011; Guest et al., 2015a; Min et al., 2014). It has established acceptable reliability with Cronbach's alpha of .75 and an intraclass correlation of .71. Similarly, the tool has demonstrated high reliability with Cronbach's alpha of .87 in people who survived the earthquake (Kukihara et al., 2014; Ni et al., 2015).

Some limitations of the CD-RISC can be noticed. The authors did not mention the reason to choose attributes from the work of only three authors. Further psychometric analysis of the CD-RISC demonstrated that there was instability in the factor structure of the CD-RISC. Therefore, Campbell-Sills and Stein (2007) developed the short version of CD-RISC, which is known as the CD-RISC-10.

The CD-RISC-10 comprised of 10 items rating on a 5-point Likert scale. The possible total scores range from 0 to 40 with higher scores indicating greater resilience and lower scores indicating lower resilience (Campbell-Sills & Stein, 2007). The CD-RISC-10 also proved to be a valid and reliable tool to measure resilience and was initially tested in 1,743 undergraduate students. The psychometric evaluation showed the Cronbach's alpha of .85 and good construct validity. Moreover, the scores of the short version were highly correlated with the scores of the original one (r = .92).

The Resilience Scale for Adults (RSA)

The RSA is a self-reporting scale developed by Friborg, Hjemdal, Rosenvinge, and Martinussen (2003) to measure the intrapersonal and interpersonal protective factors that promote the resilience among adults (Windle et al., 2011). The tool consists of 37 items and each item is rated on a 7-point semantic differential scale. The participants mark one of the seven boxes reflecting how they felt in the past month. A high score indicates higher levels of protective resilience factors. The tool consists of five factors or dimensions which include personal competence, social competence, family coherence, social support, and personal structure. Inter-correlation between factors were reported as low to moderate ($r = .22$ to .46) (Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003).

The RSA was proved to be a valid and reliable instrument to measure resilience. The psychometric testing of the tool was done with 59 psychiatric patients and 276 respondents in a normal control group from Northern Norway. Internal consistency of subscale of RSA ranged from .67 to .90. The test-retest correlations were all satisfactory which ranged from .69 to .84 ($p < .01$). The subscales of RSA were positively correlated with the Sense of Coherence (SOC) that ranged from $r = .29$ to $r = .75$ and negatively correlated with the Hopkins Symptoms Checklist (HSCL) with $r = -.19$ to $r = -.61$, which demonstrate good construct validity (Friborg et al., 2003). The scale was also tested in 363 Belgian samples for the reliability and reported Cronbach's alpha of .84 (Hjemdal et al., 2011).

The limitations of this tool are also evidenced and reported. The tool was primarily developed by identifying the key features of the resilient people from the different longitudinal research. Then the questionnaire was developed using these features such as family support and cohesion, external support system, and

dispositional attitudes and behaviors. However, it has not clearly mentioned how the researchers constructed each item, or whether the target population was involved in the item selection (Windle et al., 2011). In addition, initial validity and reliability were tested in Norwegian samples. Although this tool has been used in English-speaking people, validity and reliability were not tested in this group of people (White, Driver, & Warren, 2008). Overall, this tool is effective for utilizing in the area of mental health and clinical psychology in order to assess the presence of factors that promote resilience to bounce back after any stressful situation (Windle et al., 2011).

The Brief Resilience Scale (BRS)

The BRS is a unidimensional scale developed by Smith and colleagues (2008) with a specific focus to assess resilience in terms of the ability of an individual to bounce back or recover from stress. It is a self-report scale consisting of six items which include: 1) I tend to bounce back quickly after hard times; 2) I have a hard time making it through stressful events; 3) It does not take me long to recover from a stressful events; 4) It is hard for me to snap back when something bad happens; 5) I usually come through difficult times with little trouble; and 6) I tend to take a long time to get over setbacks in my life. Each item is reported in a 5-point Likert scale, in which 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree (Smith et al., 2008).

The BRS had been evaluated for validity and reliability. The psychometric testing of the tool was done in four samples from the southwestern part of the United States which included two groups of undergraduate students ($n = 192$), one sample of cardiac rehabilitation patients ($n = 112$), and another sample of chronic pain patients ($n = 50$). For convergent validity, the BRS was positively related to personal characteristics, social relations, coping and health in all four samples, whereas it was

negatively correlated with anxiety, depression, negative affect, and physical symptoms. For discriminate validity, a significant difference was found in the BRS scores between cardiac patients with and without type D personality and women with and without fibromyalgia. The tool showed high reliability with Cronbach's alpha ranging from .80 to .91 (.84, .87, .80, and .91 in 1 to 4 samples). The final six items were selected from different potential items after the pilot test and feedback; however, the original full list of items and empirical validation of data reduction have not been reported (Windle et al., 2011).

The Resilience Scale (RS)

The RS was developed by Wagnild and Young (1993) in order to measure resilience in a different population. The tool was originally developed based on a qualitative study of 24 older American women who had adapted successfully after a major life event. The initial resilience scale had 50 items; however, after analysis, it was reduced to 25 items. Each item consists of a 7-point Likert scale (1-7). The tool measures five characteristics of resilience: 1) preservation or act of persistent despite adversity (keep going despite adversity); 2) equanimity (balanced perspective of life); 3) meaningfulness (realizing that life has a purpose); 4) self-reliant (believing in oneself); and 5) existential aloneness (sense of uniqueness) (Wagnild & Young, 1993). The total possible score ranges from 25 to175, where, scores greater than 145 indicates moderate to high resilience and scores of 120 and below represents low resilience (Wagnild, 2009).

The validity and reliability of the scale were tested and proved to be adequate. The RS was initially examined in 810 middle-aged and older adults. The tool showed good convergent validity as the score of the RS was significantly correlated with the scores of self-esteem, moral, life satisfaction, depression, and perceived stress tools.

Furthermore, high internal consistency with an alpha coefficient of .91 was reported. Additionally, a review of 12 studies that used the RS has shown the good reliability of the tool with Cronbach's alpha ranging from .72 to .94 (Wagnild, 2009).

The RS has been used in a variety of populations such as different age groups ranging from adolescents to the very old and sample with different socioeconomic status and educational backgrounds (Windle et al., 2011). However, the limitations of this tool were also evidenced and reported. Since the scale was developed by interviewing women in the age range of 53 to 95 years, this sample was not representative of a larger population. Therefore, it cannot be generalized to other populations. Furthermore, items were generated on the basis of interviews with only older women and the content validity was not established by a panel of experts. It was not mentioned in the literature on how researchers concluded the five factors and how it was linked with the literature (Windle et al., 2011). Therefore, this tool could be used to measure resilience but with consideration of the above limitations.

The current tools to measure resilience in general populations is summarized and presented in Table 2.

Table 2

Tools to Measure Resilience in General Population

Name of tool	Authors/ year/country	Number of items/dimensions	Validity/ reliability	Limitations
The Connor-Davidson Resilience Scale (CD-RISC)	Connor & Davidson, 2003, North Caroline, USA	25 items/5 dimensions: Personal competence, high standards, tenacity; Trust in one's instinct, tolerance of negative affect, and strengthening effect of stress; Positive acceptance and secure relationships; Control; and Spiritual influences	Cronbach's alpha .89 Test-retest reliability .87 Good construct, convergent, and discriminate validity	Not mentioned reason to choose the resilience attributes from only three authors
The Connor-Davidson Resilience Scale-10 (CD-RISC-10)	Campbell-Sills & Stein, 2007, USA	10 items/single dimension: ability to cope stress	Cronbach's alpha of .85 Good construct validity, correlated with original one (r = .92)	Not included the attributes of resilience in-depth
The Brief Resilience scale (BRS)	Smith et al., 2008 USA	6 items/Unitary construct: bounce back ability of individuals	Cronbach's alpha (.80 to .91) Good Convergent and Discriminate validity	To date, clinical application of tool are not reported, no empirical validation of items reduction

Table 2 (continued)

Name of tool	Authors/ year/country	Number of items/dimensions	Validity/ reliability	Limitations
The Resilience Scale (RS)	Wagnild & Young, 1993 USA	25 items/5 dimensions: Preservation, Equanimity, Meaningfulness, Self-reliant, Existential aloneness	Cronbach's alpha .91 Other studies: Cronbach's alpha .72 to .94	Definition underpinning this tool is not clear, not mentioned clearly about the process of concluding these five dimensions
The Resilience Scale for Adults (RAS)	Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003, Northern Norway	37 items/5 dimensions: Personal competence, Social competence, Family coherence, Social support, Personal structure	Cronbach's alpha .67 to .90 Intraclass reliability .69 to .84 Convergent validity ($r = .27$ to $r = .75$)	The way of selecting words for items are not defined and it is not clear whether target population involved

In summary, these four tools have been used to measure resilience in the general population. For application in the SCI population, it is evidenced that the CD-RISC has been used in many studies to measure resilience among the SCI people. The assessment and measurement of resilience in people with SCI as well as SCI from the earthquake is further presented in the following section.

Measuring Resilience in People Who Sustained SCI From an Earthquake

As discussed previously, all of the tools used to measure resilience in the general population are not feasible or practical to measure resilience among the SCI population. In contrast with the tools to measure resilience in general populations, search revealed a limited published tools to measure resilience among the SCI

population as well as earthquake-related SCI. Based on the current evidence, there are two published instruments which include the Connor-Davidson Resilience Scale (CD-RISC) and the Spinal Cord Injury-Quality of Life or 'SCI-QOL' Resilience item bank.

To date, the CD-RISC and the CD-RISC-10 have been evidenced as valid and reliable tools used to assess resilience among SCI people (Catalano et al., 2011; Guest et al., 2015a; Min et al., 2014; White et al., 2010). The CD-RISC has established good validity and reliability in SCI samples with Cronbach's alpha of .75 and an intra-class correlation of .71 in a longitudinal study conducted in 42 SCI patients (White et al., 2010). Similarly, in studies conducted among SCI people, the CD-RISC-10 demonstrated a Cronbach's alpha coefficient of .80 (Driver et al., 2015) and .85 (Dodd et al., 2015). The details of the CD-RISC and the CD-RISC-10 were discussed in the previous section.

The CD-RISC is a multidimensional tool which consists of five different attributes of resilience. It was primarily developed to measure resilience among people with mental health problems. The tool has been used in several studies conducted among SCI people and earthquake survivors. It has established appropriate validity and reliability in both SCI and earthquake survivors. On the other hand, the CD-RISC-10 is a unidimensional tool that was primarily tested in undergraduates. Even though CD-RISC-10 has been used among SCI people, there is a lack of evidence to show the applicability of this tool in earthquake survivors.

The Spinal Cord Injury-Quality of Life (SCI-QOL) Resilience item bank

Recently, the Spinal Cord Injury-Quality of Life or 'SCI-QOL' Resilience item bank was developed by Victorson and colleagues (2015). It is a unidimensional tool to measure resilience in SCI people (Victorson et al., 2015). It is a self-report

instrument which consists of 21 items rating in a 5-point Likert scale ranging from 1 (never) to 5 (always). A higher score reflects the higher resilience and a lower score reflects the lower resilience in SCI people.

The SCI-QOL Resilience item bank was developed based on the definition of resilience proposed by Windle and others (2011). According to Windle and others (2011), resilience is viewed as the process of successful adaptation despite exposure to a source of stress or trauma which is facilitated by an individual's psychological resources, life experiences, and the environment. The tool was also developed based on interviews and focus group discussions of 717 SCI individuals and clinical expertise in SCI. The reliability of the instrument was tested in community SCI individuals and it showed an alpha coefficient of .95 and items correlation from .54 to .78 (Victorson et al., 2015). However, there are no currently published studies that used the SCI-QOL Resilience item bank to assess resilience in SCI people.

To date, for assessment and measurement of resilience in people who sustained SCI from the earthquake, there are no published studies or evidence identified regarding this issue. In conclusion, the CD-RISC and the CD-RISC-10 are currently the best available tools to measure resilience in SCI individuals. Although the SCI-QOL Resilience item bank was developed to assess resilience particularly among SCI people, no published study has been evidenced that has used this instrument. Hence, the 25-item CD-RISC was used to measure the resilience of people who sustained SCI from the earthquake in this study since the CD-RISC-25 demonstrated good validity and reliability among SCI people and earthquake survivors.

Factors Associated With Resilience

As discussed earlier, people who encountered the same devastating situation provided different responses or adaptation and with different outcomes. Here, a study regarding factors determining or contributing to resilience is important. Several factors have been explored and were found to have either positive or negative contributions to an individual's resilience. In general, factors contributing to resilience can be divided into protective and risk factors (Craig, 2012).

Craig (2012) has summarized the possible resilience factors based on the review of studies carried out in children and adolescents without a disability. Nevertheless, Craig (2012) argued that there is a large overlap between the factors that operate in physically able children and adolescents facing adversity and physically disabled adults.

Protective factors, according to Craig (2012), are the factors that minimize the risk directly or act as a buffer or mediate against negative consequences. Craig (2012) has further categorized protective factors into three aspects as environmental factors, social and interpersonal factors, and personal factors. Environmental factors consist of a healthy environment, education opportunity, community resources, community cohesion, and access to recreation. Social and interpersonal factors consist of stable family support, support from friends, employment, positive attachment, available affection, and socially active. Personal factors (psychological and physical) include self-esteem, sense of mastery or self-efficacy, stable mood state, adequate coping, social and problem-solving skills, and good physical health (Craig, 2012).

Risk factors, on the other hand, refer to those environmental, social, or internal threats that can increase the vulnerability to poor adjustment and maladaptive coping

(Fergus & Zimmerman, 2005). The reverse of protective factors can be considered as risk factors which increase the vulnerability to poor adjustment. For instance, high self-efficacy and high family support act as protective factors in individuals; however, low self-efficacy and low family support threaten the process of adaptation (Craig, 2012).

Along with general factors contributing to resilience, this study aimed at examining resilience factors among people who sustained SCI from the earthquake. The review of the literature with a specific focus on both earthquake in terms of disaster and SCI is presented in a later section.

Factors Associated With Resilience of Disaster Survivors

Disaster is an unexpected stressful event which results in abundant negative physical as well psychosocial impacts to the survivors. However, some of the disaster survivors were resilient enough to tolerate the negative consequences and adapt relatively well (Bonanno, 2005; Bonanno et al., 2007).

A number of studies were conducted to examine factors contributing to resilience among disaster survivors (Bonanno et al., 2007; Kukihara et al., 2014; Lowe et al., 2015; Rodriguez-Llanes et al., 2013). The studies have explored several factors of resilience. For instance, level of education, marital status, age, gender (Bonanno et al., 2007; Johannesson, Lundin, Fröjd, Hultman, & Michel, 2011), employment status, state of mood/depression (Kukihara et al., 2014; Lee, Shen, & Tran, 2008), and social support (Bonanno et al., 2007; Hobfoll et al., 2012; Johannesson et al., 2011) were associated with the level of resilience among disaster survivors. The details of factors associated with the resilience of earthquake disaster survivors are presented in the following section.

Level of education

The evidence suggests that educational level of the disaster victims determines their resilience following a disaster but it is still inconclusive. People with a higher education were found to have more resilience after the terrorist attack, tsunami, or political violence (Bonanno et al., 2006; Frankenberg, Sikoki, Sumantri, Suriastini, & Thomas, 2013; Hobfoll et al., 2012), whereas disaster survivors with lower education were more likely to develop post-traumatic stress and lower resilience to adjust to the disaster than those with a high educational level (Johannesson et al., 2011). It is argued that educated people search for and adopt new opportunities and they have better access to social or financial resources than uneducated people which helps them to adjust effectively to the changes that resulted from adversity (Frankenberg et al., 2013).

However, a study conducted by Bonanno and colleagues (2007) revealed lower resilience in college degree participants compared to low degree participants. Furthermore, the educational level was not significantly associated with resilience in earthquake survivors in a study conducted in China (Ni et al., 2015). Hence, there is inconsistency in findings regarding the direction or relationship.

Marital status

Most of the previous studies revealed that those survivors who were married or living with a partner had a relatively higher level of resilience than those who were living alone (Bonanno et al., 2006; Johannesson et al., 2011; Kukihara et al., 2014). The marital status of men was positively correlated with resilience, while no relationship was found between the marital status of females and their resilience (Johannesson et al., 2011).

Contrary to previous findings, another study revealed that unmarried women presented with greater resilience than married women ($\beta = -.16$, $p < .05$) after the earthquake in China (Ni et al., 2015). The researchers argued that unmarried women have fewer responsibilities in the family and comparatively fewer burdens than married women; subsequently, they showed greater resilience (Ni et al., 2015). Hence, the direction of the relationship between marital status and resilience is still inconsistent.

Employment status

Employment status is also one of the contributing factors of resilience following a disaster. Individuals who are employed have shown greater resilience or adaptation to negative consequences of a disaster than the individuals who are unemployed (Kukihara et al., 2014; Lowe et al., 2015).

Social support

Social support was evidenced as one of the social or interpersonal factors that are highly associated with the resilience of disaster survivors (Bonanno et al., 2007; Hobfoll et al., 2012; Lowe et al., 2015). Social support is viewed as the psychological and materials resources provided by the social network in order to enhance the ability of individuals to cope with a stressful situation (Cohen, 2004). The support often includes three types of resources: 1) instrumental support in terms of material, financial help or tangible help in daily activities; 2) informational support in terms of providing relevant information, advice or guidance in order to help individuals to deal or cope with current problems; and 3) emotional support in terms of expression of caring, trust, empathy, reassurance, and providing opportunity to ventilate their feelings and emotions (House & Kahn as cited in Janicki-Deverts & Cohen, 2011).

Social support causes either direct positive impacts on an individual's adjustment or acts as a buffer to protect an individual from negative outcomes following adversity (Cohen & Wills, 1985). If emotional or tangible support is available from family, friends or others, there will be a lower probability of appraising a stressful situation as threatening or harmful (Zimet et al., 1988). In addition, support from others reinforce to adapt effective coping, promote the positive psychological state, and motivate to perform the positive healthy behavior; thus, reflecting an increase in the resilience of an individual (Janicki-Deverts & Cohen, 2011).

Social support can be perceived and received. The former one reflects the perception of social support by the recipient, whereas the later one reflects the actual support received from others. Nevertheless, perceived social support is highly associated with resilience according to the literature (Janicki-Deverts & Cohen, 2011). Zimet and colleagues (1988) argued that subjective or perceived social support needs to be assessed from different specific sources which include support from family, friends, and significant others. Significant others are those persons whom the recipients consider as special persons who are close to him/her in the time of need (Zimet et al., 1988).

The studies conducted after natural and manmade disasters demonstrated that people who have high social support from their family or friends reported greater resilience in terms of psychosocial adjustment (Bonanno et al., 2007; Hobfoll et al., 2012; Johannesson et al., 2011). Similarly, Ni and colleagues (2015) also found that support seeking behavior and subjective social support have a correlation with the resilience of survivors ($r = .24$, $p < .01$). Social capital which includes perceived and received social support, place attachment, and sense of community are one of the factors that promote resilience to adapt to disaster-related consequences (Lowe et al.,

2015). Concordantly, social cohesion, a kind of social support enhanced the resilience of England flood survivors as it promoted adoption, increased access to protective resources, and motivated healthy behavior (Greene, Paranjothy, & Palmer, 2015).

Age

The age of the disaster victims was found associated with the level of resilience following a disaster. A study conducted after the earthquake in China reported that older female survivors were more resilient than the younger ones. However, in the same study, age did not correlate in the male participants (Ni et al., 2015). Similarly, other studies demonstrated that greater resilience was present in older people than in younger people (Bonanno et al., 2007; Johannesson et al., 2011).

In contrast, post-traumatic stress and depressive symptoms occurred more frequently in the older population than in the younger population which indicated lower resilience in the older age group (Lowe et al., 2015). In addition, a study conducted by Hobfoll and colleagues (2012) also revealed that younger participants bounced back better than the older participants. To date, there are still inconsistent findings regarding age as a determinant of resilience following disasters.

Gender

The evidence related to resilience in disaster survivors indicates that in the aftermath of disasters, female survivors are more likely to develop PTSD or depressive symptoms than male survivors which reflect a low resilience among females (Johannesson et al., 2011). On the other hand, males are more likely to have higher resilience after exposure to a disaster (Bonanno et al., 2006; Ni et al., 2015). A study conducted by Ni and others (2015) also found a higher mean resilience in male (61.25) than in females (58.0) among earthquake survivors. The researchers argued in terms of cultural context as females are psychologically dependent on males, and as a

result, they become less resilient than the males (Ni et al., 2015). It is also valued that males should be protective and should be able to handle a situation in the face of adversity. Biologically and socially, females are more sensitive and become overwhelmed by traumatic events; thus, they cannot use effective coping strategies while confronting stressful events (Zhou et al., 2015). Hence, there are still inconsistent findings regarding the association of gender and resilience.

Depression/Depressive mood

There is an association between the state of the individuals' mood and the level of resilience. According to Bonanno and colleagues (2006), disaster survivors who had higher depressive mood or symptoms were less resilient compared to those whose moods were stable or lowly depressive. Likewise, a study conducted after the earthquake in Japan revealed that depression and presence of PTSD in the survivors were highly correlated with their low level of resilience (Kukihara et al., 2014). In addition, Lee and colleagues (2008) also reported that individuals with higher post-disaster psychological distress such as depressive symptoms reported an inadequate ability to confront the situation and adjust positively.

Miscellaneous

Other factors were also related to resilience among different disaster survivors but with limited levels of good evidence for support. These factors included previous experience, perceived general and mental health, the perception of role limitation, bodily pain, high exposure, other stressors, loss of resources, and human loss (Bonanno et al., 2007; Kukihara et al., 2014; Rodriguez-Llanes et al., 2013).

Individuals who have a previous experience with trauma or traumatic events were presented with negative psychological health; thus, indicating inadequate resilience to adapt (Bonanno et al., 2007). Furthermore, an individual's perception of

good general and mental health reported greater resilience. Whereas, the perception of role limitation and bodily pain related to disaster were associated with a low ability to adapt to the disaster-related outcomes (Kukihara et al., 2014). Additionally, highly exposed groups, victims who had other stressors, and those who had lost their resources and relatives or friends in the catastrophe have shown significantly lower resilience than groups with low exposure and those who did not lose human or other resources (Rodriguez-Llanes et al., 2013). The determinants or factors contributing to resilience following disasters are summarized and presented in Table 3.

Table 3

Factors Associated With Resilience of People Surviving From Disasters

Author/Year	Disaster/ Location	Determinants or factors	Association of factors with resilience
Lowe et al., 2015	Hurricane, USA	Age (older) Employment Social capital	Negative Positive Positive
Ni et al., 2015	Earthquake, China	Age (older) Unmarried Gender (male)	Positive Positive Positive
Green et al., 2015	Flood, England	Social cohesion	Positive
Kukihara et al., 2014	Earthquake, Japan	Employment Bodily pain Married Depression/PTSD	Positive Negative Positive Negative
Frakenberg et al., 2013	Tsunami, Indonesia	Education	Positive

Table 3 (continued)

Author/Year	Disaster/ Location	Determinants or factors	Association of factors with resilience
Hobfoll et al., 2012	Chronic political violence, Palestine	Age (older)	Negative
		Gender (male)	Positive
		Education	Positive
		Social support	Positive
		Religiosity	Positive
		Loss of resources	Negative
Johannesson et al., 2011	Tsunami, South East Asia	Age (older)	Positive
		Gender (male)	Positive
		Married	Positive
		Loss of relatives	Negative
		Highly exposed	Negative
Lee et al., 2008	Hurricane Katrina, USA	Psychological distress	Negative
		Income (high)	Positive
		Human loss	Negative
Bonanno et al., 2007	9/11 Terrorist attack, USA	Age (older)	Positive
		Gender (male)	Positive
		Education	Negative
		Social support	Positive
		Depression	Negative
		Income (high)	Positive
		Other stressors	Negative

Factors Associated With Resilience of People After SCI

Similarly, most of the factors associated with resilience in other populations as well as among disaster survivors also contribute to the resilience of SCI people. These factors include social support, self-efficacy, depressive mood, spirituality, pain, age, and miscellaneous.

Social support

Social support is evidenced as one of the strongest determinants of resilience among SCI people. Dodd and colleagues (2015) examined the resilience in 106 SCI

people and found that social support was highly associated ($r = .48$, $p < .01$) with their ability to adapt to the consequence of SCI. In the Dodd and colleagues' (2015) study, social support was measured in terms of attachment, social integration, reassurance of worth, reliable alliance, guidance, and opportunity for nurturance proposed by Cutrona and Russell (1987).

Likewise, Catalano and colleagues (2011) also found that perceived social support from family, friends, and significant others among SCI people was positively associated with their resilience. Here, significant others were considered as special persons who are around in need and provide help and support for SCI people. Similarly, other correlational studies conducted among SCI people also demonstrated that social support is highly positively correlated with the resilience of SCI individuals (Guest et al., 2015b; Guest et al., 2015a). Guest and colleagues (2015a) assessed social support in terms of a number of available persons the individual perceived in a time of need and how much individuals are satisfied with the support they received.

Furthermore, a qualitative study conducted by Monden and colleagues (2014) reported that support received from family, friends, rehabilitation staffs, caregivers, and peer mentors were the key variables that helped SCI people adapt to the injury-related negative consequences. Hence, tangible or emotionally perceived social support from family, friends or others helps the SCI individuals appraise stressful events positively and adapt successfully.

Self-efficacy

Self-efficacy is evidenced as one of the determinants of resilience among SCI people. Self-efficacy is a cognitive process referring to the perceived ability or confidence of an individual to perform certain activities or behaviors (Benight &

Cieslak, 2011). In general, Bandura (1998) defines self-efficacy as "beliefs in one's capabilities to organize and execute the course of action required to produce given levels of attainment" (p. 3). According to Bandura (as cited in Benight & Cieslak, 2011), human adaptation occurs through dynamic interaction between the person, environment, and behavior; and self-efficacy is the key variable throughout this process. When individuals confront any adversity or stressful situation, self-efficacy modifies the relationship between the individuals' resources and demand by regulating their own thought process, regulating emotion, or changing the environmental condition or behavior (Bandura, 1998; Benight & Cieslak, 2011).

Furthermore, in order to regain, maintain, or enhance wellbeing or resilience, self-efficacy facilitates the individual's sense of control to access and utilize the personal or social resources (Benight & Cieslak, 2011). Low self-efficacy is related to the feelings or sense of defeat and low confidence, whereas high self-efficacy alleviates the detrimental psychological impacts related to trauma or adversity (Benight & Cieslak, 2011). In addition, perceived self-efficacy in daily activities and social functioning reinforces the SCI individuals to adapt to the appropriate behavior as well as perform that behavior consistently while dealing with consequences related to SCI (Middleton et al., 2003).

Previous studies conducted in SCI people revealed that high self-efficacy is one of the strong protective factors of resilience. The self-efficacy of SCI people in performing daily activities and social functioning was strongly positively associated ($r = .65, p < .001; r = .54, p < .001$) with the resilience in different studies (Driver et al., 2015; Guest et al., 2015a; Kilic et al., 2013). Moreover, a study conducted by Driver and colleagues (2015) reported self-efficacy as the single predictor of resilience in SCI people ($\beta = .46, p = .006$).

Depressive mood

Several studies have indicated that the state of mood has impacts on the ability

of individuals to adapt to the SCI-related outcomes. Depressive mood was strongly

and negatively associated with resilience in SCI people ($r = -.65$, $p < .01$) (Guest et

al., 2015a). Depressive mood was also moderately related to resilience in other studies

carried out in SCI samples (Dodd et al., 2015; Driver et al., 2015; Kilic et al., 2013;

White et al., 2010). Moreover, depression was found as a strong predictor of

resilience in SCI people living in the community ($\beta = -.80$, $p = .007$). Subsequently, it

denotes that SCI people who have a high level of depressive symptoms or negative

mood possess poor resilience. Thus, they are less capable of adapting to the situation

and are highly vulnerable to maladjustment (Driver et al., 2015).

On the other hand, SCI individuals who have a stable mood or low depressive

mood present with high resilience or they are capable of adjusting to injury-related

consequences (Dodd et al., 2015; Driver et al., 2015). Hence, the mood state of SCI

individuals has an influence on their resilience.

Spirituality

Spirituality, faith or making meaning in a stressful situation, is reported as one

of the cognitive strategies to overcome negative feelings and consequences related to

SCI (Monden et al., 2014; White et al., 2010). According to Drescher and colleagues

(2004), spirituality is an individual's understanding of, experience with, and

connection to a higher power or which transcends the self. Sometimes, spirituality and

religion are used interchangeably; however, an individual can be spiritual but not

religious (Foy & Drescher, 2011). Hodge (2003) viewed spirituality as an individual's

relationship to God or whatever the individual perceives to be ultimate transcendence.

According to Allport and Ross (as cited in Hodge, 2003), intrinsic beliefs or

connectedness with transcendence provides motives for life and directs thoughts and

actions. Intrinsic spirituality is the internal faith or spiritual commitment that provides

motivation in life, whereas in extrinsic spirituality, external factors such as a support

system and social acceptance motivate or influence life (Hodge, 2003).

 In the literature, spirituality is related to a psychological adjustment in terms

of acceptance, emotional well-being, happiness, and self-esteem (Foy & Drescher,

2011). In addition, it was evidenced that spirituality mitigated the negative

consequences of traumatic events, thus, enhancing posttraumatic growth and quality

of life (Drescher et al., 2004). Moreover, positive associations between higher

intrinsic spirituality and greater resilience ($r = .56$, $p < .05$) and vice versa were found

in a study conducted among SCI people by White and colleagues (2010).

Pain

Pain following SCI is evidenced as one of the factors determining resilience in

SCI individuals. Chronic pain is one of the common complications found among SCI

people (Ataoğlu et al., 2013; Connor & Davidson, 2003; Min et al., 2014). The high

prevalence of chronic pain which includes both neuropathic and musculoskeletal pain

was reported in 78% of SCI people (Ataoğlu et al., 2013). Moreover, another study

demonstrated that 89.2% SCI individuals complained of pain and the pain was

extremely severe in 27% of participants (Min et al., 2014). Importantly, the high level

of pain intensity was associated with lower resilience (Driver et al., 2015; Min et al.,

2014). Individuals who have chronic pain were more likely to report depressive

symptoms or emotional distress than those who do not report pain.

Additionally, higher pain interference in daily life also decreases the ability of

SCI people to effectively cope with the consequences of SCI (Guest et al., 2015a). In

addition, chronic pain is associated with lower social functioning, impaired mental

health (Ataoğlu et al., 2013), and lower post-traumatic growth in SCI people (Min et al., 2014) which further indicate a lower ability to adapt positively or demonstrate resilience.

Nevertheless, some studies have found a non-significant relationship between chronic pain and resilience following SCI (Guest et al., 2015a; Kilic et al., 2013). In conclusion, there are yet inconsistent findings regarding the association between pain and resilience among SCI people.

Age

To date, there are still incongruent findings regarding the association between age and the resilience among SCI people. From the current literature review, only one study had evidence that older SCI people showed greater resilience ($r = 33, \; p = .031$) than younger SCI people (Driver et al., 2015). Others studies found a non-significant association between the age of participants and resilience following SCI (Guest et al., 2015b; Kilic et al., 2013; Min et al., 2014; White et al., 2010).

Miscellaneous

Other factors also found to be related to resilience among SCI people. These factors include employment status, satisfaction with life, positive attitude, adaptive coping, sense of humor, the locus of control, stress, anxiety, being a role model, and psychological strength (Min et al., 2014; Monden et al., 2014; White et al., 2010).

A study conducted by Min and colleagues (2014) demonstrated that employed SCI people reported significantly greater resilience ($p = .003$) and post-traumatic growth than those who were unemployed. Furthermore, a positive association was found between satisfaction with life and resilience among SCI people (White et al., 2010). Similarly, psychological strength (positive attitude, determination, independence, assertiveness, and proactive behavior), adaptive coping, perspective,

and being a role model were evidenced as positive determinants of resilience following SCI (Monden et al., 2014). Additionally, post-traumatic growth was positively associated with the resilience of SCI people (Min et al., 2014). In contrast, the locus of control, stress, and anxiety were negatively correlated with resilience indicating maladaptation or poor coping (Kilic et al., 2013).

The determinants or factors contributing to resilience following SCI are summarized and presented in Table 4.

Table 4

Factors Associated With Resilience of People Who Sustained SCI

Author/Year	Country/Setting	Determinants or factors	Association of factors with resilience
Guest et al., 2015a	Australia, Rehabilitation unit	Social support Self-efficacy Anxiety Depression Pain interference	Positive Positive Negative Negative Negative
Guest et al., 2015b	Australia, Rehabilitation unit	Social support Self-efficacy Anxiety Depression	Positive Positive Negative Negative
Driver et al., 2015	USA, Rehabilitation unit and community	Self-efficacy Age (older) Depressed mood Pain	Positive Positive Negative Negative
Dodd et al., 2015	USA, Rehabilitation unit	Social support Attachment-avoidance Attachment-anxiety Depression	Positive Negative Negative Negative

Table 4 (continued)

Author/Year	Country/Setting	Determinants or factors	Association of factors with resilience
Min et al., 2014	Korea, Community	Employment	Positive
		Pain	Negative
		Depression	Negative
		Post-traumatic growth	Positive
Monden et al., 2014	USA, Community	Psychological strength	Positive
		Social support	Positive
		Spirituality	Positive
		Adaptive coping	Positive
		Perspective	Positive
		Being role model	Positive
Kilic et al., 2013	Australia, Community	Self-efficacy	Positive
		Stress and anxiety	Negative
		Depression	Negative
		Locus of control	Negative
Catalano et al., 2011	Canada, Community	Problem-focused coping	Positive
		Social support	Positive
		Perceived stress	Negative
		Depression	Negative
White et al., 2010	USA, Rehabilitation	Spirituality	Positive
		Satisfaction with life	Positive
		Depression	Negative

Factors Associated With Resilience of People Who Sustained SCI From an Earthquake

To date, there is still a lack of studies that specifically explore the determinants of resilience in earthquake-related SCI people. A study conducted in China one-year after the 2008 earthquake revealed that PTSD was highly prevalent

(27.42%) in earthquake survivors who sustained physical disabilities including SCI due to the earthquake (Zhou et al., 2015). The occurrence of PTSD was reported as higher in female survivors than in male survivors. Furthermore, other factors such as residential area proximal to the epicenter and suffering from paralysis or coma after the earthquake significantly increased the occurrence of PTSD in disabled survivors (Zhou et al., 2015). However, that study did not explore the factors related to resilience.

In conclusion, there is a dearth of studies that assess resilience status and resilience factors in an earthquake or any disaster-related SCI or disabled people. Therefore, the determinants or factors contributing to resilience among the people in this study were selected and examined based on a critical appraisal of relevant evidence. From this, social factor and interpersonal factors which include social support and personal psychological factors which include self-efficacy, spirituality, and depressive mood were employed as the variables in this study as shown in Table 5.

Table 5

Determinants of Resilience in People Following Disasters and SCI

Determinants of resilience	Previous studies in disasters	Previous studies in SCI	Association of determinants with resilience
Social support	Bonanno et al., 2007, Hobfoll et al., 2012, Lowe et al., 2015, Green et al., 2015	Catalano et al., 2011, Monden et al., 2014, Dodd et al., 2015, Guest et al, 2015a	Positive Positive Positive Positive
Self-efficacy	-	Kilic et al., 2013, Guest et al, 2015a, Driver et al., 2015	Positive Positive Positive
Spirituality	-	White et al., 2010, Monden et al., 2014	Positive Positive
Depressive mood	Bonanno et al., 2006, Lee et al., 2008, Kukihara et al., 2014	White et al., 2010, Catalano et al., 2011, Kilic et al., 2013, Min et al., 2014, Guest et al, 2015a, Driver et al., 2015, Dodd et al., 2015	Negative Negative Negative Negative Negative Negative Negative

The cultural and contextual factors contributing to resilience

Culture is a shared beliefs, values, norms, or faith of a group of people that affects the pattern of thinking, behaving, and the way of forming and utilizing social networks. Cultural origin and context of an individual can influence level of an individual's resilience and factors of resilience can vary in different cultures (Gunnestad, 2006; Kumpfer, 1999).

In some cultures, family support is considered as an important factor to enhance resilience whereas in other cultures, individualism is preferred and viewed

family as a burden. For instance, in collectivist society, if a family member is violent or alcoholic, it can affect other members of the family (Gunnestad, 2006). Similarly, there is a cultural belief that trauma, accident or disability are caused due to witchcraft or divine punishment, which make victims more vulnerable to have low resilience (Blanc, 2016). In some cultures, ethnic minority group were likely to have low resilience than majority group. A previous study found that Asian were tended to have higher resilience than Hispanics (Bonanno et al., 2007). Minorities can be vulnerable when majority groups imposed their cultures to those minorities and change their way of thinking and living (Gunnestad, 2006).

Nepal is a collectivist society where family and social support play important roles to enhance resilience of Nepalese. In addition, Nepal has different ethnic groups who have their own cultural beliefs, practices, and ways to perceive or respond to illness (Boreson & Askesjö, 2015). In rural and suburban areas of Nepal, people have negative beliefs and attitudes regarding disabilities as they view disabilities as social stigma. They believe that the disabilities are punishment from God or divine due to committing sins in the previous life. Therefore, those disabled people are ignored in the society and treated differently. This may lead to the diminished self-respect and self-esteem among those people which can impact their resilience (Dhungana & Kusakabe, 2010).

The environmental context where an individual is exposed determines his/her resilience. Factors contributing to resilience can also differ in each individual context and field (Kumpfer, 1999). Nepal is a developing country with a wide geographical distribution. The healthcare services are unevenly distributed and mostly centralized in the urban areas (CBS, 2011; Mitra, Posarac, & Vick, 2013). The rural areas of Nepal mainly consist of mountains and steep hills. From this reason, majority of

Nepalese living in the rural areas are unable to access healthcare resources including rehabilitation services (CBS, 2011).

Since the 2015 earthquake affected mostly the rural areas of Nepal, most of the SCI victims live in these areas (World Vision, 2015). In the rural Nepal, people mostly need to walk to reach healthcare services, followed by using public transportation (Bhattarai, Parajuli, Rayamajhi, Paudel, & Jha, 2015). Currently, there is still lack of paved roads, in particular lack of wheelchair-friendly infrastructures, and bus services in rural Nepal. Here, it is difficult for Nepalese SCI people to access to healthcare as well as rehabilitation services. Since SCI people are highly vulnerable to develop numerous secondary complications, they require to visit healthcare or rehabilitation center frequently (Crew & Krause, 2009). Inaccessibility of healthcare or rehabilitation centers placed Nepalese SCI individual to develop secondary complications and delay rehabilitation. Poor health conditions of those individuals affect their resilience as suggested in the literature (Peter, Müller, Cieza, & Geyh, 2012).

Long-term rehabilitation is imperative for those SCI individuals. The rehabilitation of SCI individuals includes strengthening physical, psychological, and social wellbeing to enhance resilience, social re-integration, and quality of life (Harvey, 2016). A dearth of transportation and rehabilitation facilities can result in developing low resilience. Hence, culture and context have some impacts on the ability of SCI individuals to achieve high resilience.

Summary of Literature Review

One of the serious injuries that can result from disasters including an earthquake disaster is a SCI. SCI has profound negative consequences in physical as well as psychosocial aspects of individuals. Despite several negative consequences following SCI, some SCI people are able to adapt well and show successful adjustment. Resilience reflects an individual's ability to adapt in the face of adversity such as a disaster and SCI. In Australia, 68% of SCI people were found to have acceptable resilience. Several factors were evidenced to enhance or impede resilience of disaster survivors and SCI survivors.

The resilience of disaster survivors and SCI people was frequently associated with their level of social support and depressive mood. In addition, the personal psychological factors which include self-efficacy and spirituality of individuals demonstrated a great influence on the ability to adjust positively to the consequences of SCI. Also, resilience and the determinants of resilience vary according to the culture, context, origin, and geographical region.

To date, there is no published literature that has examined the status of resilience and determinants of resilience in people who sustained SCI from a disaster as well as an earthquake disaster. Moreover, previous studies related to resilience among SCI people and disaster survivors were conducted in developed and/or western context which is different from Nepal.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the details of the research methodology including research design, settings, population and sample, research instruments, translation of the instruments, validity and reliability of the instruments, data collection procedure, ethical considerations, and data analysis.

Research Design

A predictive research study was conducted to illuminate the determinants of resilience among people who sustained SCI from the 2015 earthquake in Nepal. According to Grove, Burns, and Gray (2013), a predictive research is used to predict the value of one variable (dependent variable) on the basis of values obtained from other variables (independent variables). Therefore, that design fits this study.

Settings

This study was carried out at the Spinal Injury Rehabilitation Center (SIRC) in Kavre district, and in Nepalese communities. To date, there is a total of five rehabilitation centers in Nepal; however, the SIRC is the major rehabilitation center that serves for Nepalese SCI people across the nation. The SIRC is located around 23 kilometers from Kathmandu, which is the capital city of Nepal. A total of 117 people

who sustained SCI from the 2015 earthquake were admitted for rehabilitation in the SIRC.

After discharge from this rehabilitation center, the SCI survivors were living in communities which included 14 highly affected earthquake districts in Nepal. These districts included Gorkha, Sindupalchowk, Dhading, Kavre, Dolakha, Nuwakot, Ramechhap, Sindhuli, Rasuwa, Kathmandu, Lalitpur, Bhaktapur, Makwanpur, and Okhaldhunga (Ministry of Home Affair, 2015). There is a wide geographical diversity in Nepal. Nepal consists of three specific regions: Tarai (plain); Hills; and Mountains (Himalayan). Most of the areas affected by the earthquake were rural areas and located in the Hills and Mountains regions. Therefore, it is difficult to access some parts of the affected districts via road transportation. Four affected districts are near Kathmandu (less than 50 kilometers); however, some affected districts are located more than 150 kilometers from Kathmandu.

Most of the SCI survivors from rural districts were living temporarily in urban districts, which included Kathmandu, Bhaktapur, Lalitpur, and Kavre, for ease of access to healthcare and rehabilitation services. Hence, the researcher visited and collected data from eight districts which included Kathmandu, Lalitpur, Bhaktapur, Kavre, Sindhupalchwok, Gorkha, Nuwakot, and Dhading.

Population and Sample

Target Population

The target population of this study was individuals who sustained SCI from the 2015 earthquake in Nepal.

Sample and sampling procedure

  The individuals with SCI from the 2015 earthquake who met the inclusion criteria and who agreed to participate were recruited into the study. The inclusion criteria were: 1) adults aged $\geq$ 18 years; 2) attending the rehabilitation center (SIRC) or living in the community; 3) able to understand and speak the Nepali language; 4) fully conscious; and 5) no history of mental health problems or mental disorders that was based on information from the medical records of the SIRC. The convenience sampling technique was used to select the participants in the study. According to Polit and Beck (2012), convenience sampling entails including the most conveniently available people in the study as participants. Here, participants who were accessible and proximal to the researcher were selected. The process of sample selection is presented in Figure 2.
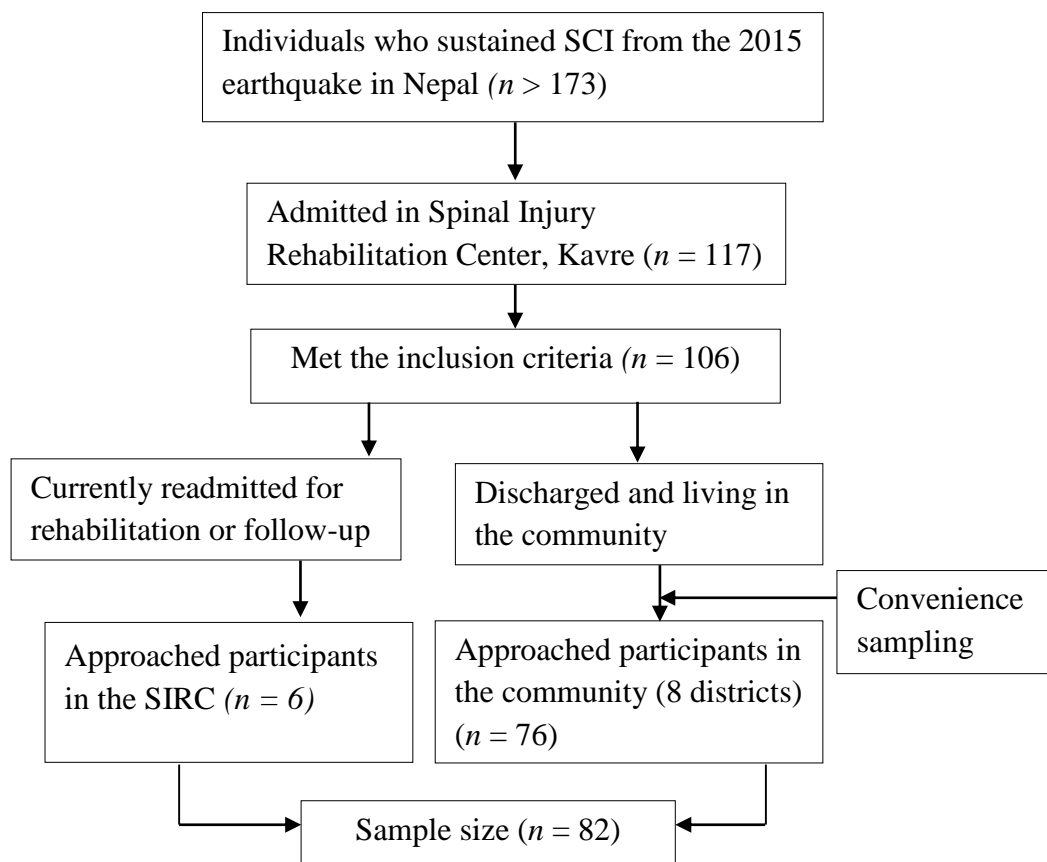
Figure 2. Process of sample selection

Sample Size Estimation

The sample size was calculated based on the sample size calculation technique of multiple regression proposed by Green (1991). According to Green (1991), the sample size for the multiple regression analysis should be equal to or greater than 50 + (8 times the number of predictors). Since a total of four predictors or determinants were selected, a total of 82 (50 + [8 × 4]) participants were included in this study.

Research Instruments

In this study, the data were collected using structured self-report questionnaires which included six parts: 1) Demographic and Injury-related Questionnaire (DIQ); 2) Connor-Davidson Resilience Scale (CD-RISC); 3) Multidimensional Scale of Perceived Social Support-Nepali (MSPSS-N); 4) Moorong Self-efficacy Scale (MSES); 5) Intrinsic Spirituality Scale (ISS); and 6) Patient Health Questionnaire-9 (PHQ-9).

Part I: Demographic and Injury-related Questionnaire (DIQ)

The DIQ was developed by the researchers based on a literature review in order to obtain demographic and injury-related data. This questionnaire consisted of 15 items. The items are comprised of information related to age, gender, religion, ethnicity, marital status, educational status, current occupation, income, area of approach, level of injury, completeness of injury, presence of comorbidities, presence of secondary complications, re-attending a rehabilitation center, and types of caregivers (Appendix B). The information related to the level and completeness of injury was collected from the medical records of the participants at SIRC. The

participants' comorbidities and complications were assessed by asking the participants and their families and included data obtained from their medical records or medical profile.

Part II: Connor-Davidson Resilience Scale (CD-RISC)

The CD-RISC was used to measure resilience in this study. The CD-RISC is a self-report assessment tool developed by Connor and Davidson (2003) to measure resilience among the general population and individuals with anxiety, depression, and PTSD. The tool measures five attributes of resilience: 1) personal competence, high standards, and tenacity; 2) trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; 3) positive acceptance of change and secure relationships; 4) control; and 5) spiritual influences.

The CD-RISC consists of 25 items using a 5-point Likert scale (Appendix B). The response ranges from 0 to 4, where 0 = not true at all; 1 = rarely true; 2 = sometimes true; 3 = often true; 4 = true nearly all of the time. The total scores range from 0-100; higher scores indicate greater resilience and lower scores indicate low resilience (Connor & Davidson, 2003). Total scores less than or equal to 68 were considered as poor resilience, whereas scores more than 68 was considered as acceptable resilience in studies conducted among SCI people (Guest et al., 2015b; Guest et al., 2015a).

The CD-RISC is considered a valid and reliable tool to measure resilience among earthquake survivors and SCI people. Cronbach's alpha of .87 was reported in studies conducted among earthquake survivors (Kukihara et al., 2014; Ni et al., 2015). Similarly, Cronbach's alpha of .75 and an intra-class correlation of .71 was reported among people who sustained SCI (White et al., 2010).

In this study, the total score was calculated and the status or level of resilience was categorized into two levels based on the previous related studies by Guest and colleagues (2015a, 2015b).

High resilience: Scores > 68

Low resilience: Scores ≤ 68

Part III: Multidimensional Scale of Perceived Social Support-Nepali (MSPSS-N)

Social support was measured by the MSPSS in this study. The MSPSS is a 12-item self-report scale developed by Zimet, Dahlem, Zimet, and Farley (1988). The MSPSS-N is a Nepali version of the original MSPSS which was translated and validated among Nepalese by Tonsing, Zimet, and Tse (2012). The tool measures the perceived social support from three different sources which include family, friends, and significant others. Each item is rated on a 7-point Likert scale ranging from 1 = very strongly disagree to 7 = very strongly agree (Appendix B). Total possible scores range from 12 to 84; higher scores indicate greater perceived social support and vice versa.

The MSPSS and the MSPSS-N have established appropriate validity and reliability. Cronbach's alpha of the MSPSS for the family, friends, and significant others subscale were reported as .93, .93, and .96, respectively among SCI people (Catalano et al., 2011). The MSPSS-N was tested in 153 Nepalese and an appropriate content validity was reported. In addition, the MSPSS-N demonstrated Cronbach's alpha of .90 for the total scale, and .86, .84, and .80, for the subscales of family, friends, and significant others, respectively (Tonsing et al., 2012).

In this study, the total scale scores were interpreted rather than the subscale scores and the higher scores were interpreted as higher social support and the lower scores were interpreted as lower social support.

Part IV: Moorong Self-efficacy Scale (MSES)

The 16-item MSES, developed by Middleton and colleagues (2003) was used to measure self-efficacy of SCI individuals in this study. The MSES measures the confidence of SCI people in specific aspects of self-efficacy which include performing daily activities and social functioning (Appendix B). The response is rated in a 7-point semantic differential scale ranging from 1 (very uncertain) to 7 (very certain). The total scores range from 16 to 112, where a higher score indicates greater perceived self-efficacy and a lower score indicates low self-efficacy.

The MSES has demonstrated adequate validity and reliability in outpatient and inpatient SCI people. The reliability, which includes an acceptable internal consistency (range .46 to .80) and stability (.74), was reported in 275 SCI people. Furthermore, good convergent validity ($r = .70$) and discriminate validity ($r = .15$) were also reported among the SCI population (Middleton et al., 2003). The total scores were calculated and interpreted as higher self-efficacy for higher scores and the lower scores were interpreted as lower self-efficacy.

Part V: Intrinsic Spirituality Scale (ISS)

The ISS is a 6-item self-report scale that was used to measure spirituality (Appendix B). It was developed by Hodge (2003) to measure the intrinsic spirituality in both theistic and non-theistic individuals. The ISS is comprised of six items and each item consists of phrase completion. The participants are asked to complete a

phrase by selecting an option from a list of 11 responses ranging from 0 to 10 (e.g., when I am faced with an important decision, my spirituality: 0- plays absolutely no role, 10- is always the overriding consideration). The score is calculated by summing the obtained scores and dividing the total score by six. The total scores range from 0 to 10, where 0 denotes that an individual does not have relationship with God or transcendence. Whereas, 10 indicates that the individual is highly spiritual (Hodge, 2003).

The ISS has shown good validity and reliability in a study conducted among SCI people. A Cronbach's alpha of .86 and an intraclass correlation of .64 was reported among SCI people (White et al., 2010). In this study, the scores was interpreted as higher the scores, higher the spirituality and lower the scores, lower the spirituality.

Part VI: Patient Health Questionnaire-9 (PHQ-9)

Depressive mood of the participants was measured by the PHQ-9 instrument. The PHQ- 9 is a self-report questionnaire developed by Spitzer, Kroencke, Williams, and group (1999) to assess the symptoms and severity of depressive mood. The tool is comprised of nine items which are based on nine diagnostic criteria for depressive disorder mentioned in the Diagnostic and Statistical Manual of Mental Disorders-IV. The response is rated by a 4-point Likert scale, where 0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day (Appendix B). The total scores range from 0 to 27, where a higher score indicates higher depressive mood and vice versa. The cut-off score of 10 was established where 10 or greater than 10 indicates the presence of depressive symptoms (Kroencke, Spitzer, & Williams, 2001; Spitzer, Kroenke, Williams, & Group, 1999).

The PHQ-9 has shown good validity and reliability in studies conducted among SCI people. Cronbach's alphas of .85 and .79 were reported in two different studies conducted among SCI people (Dodd et al., 2015; Driver et al., 2015). In this study, higher total scores were interpreted as higher depressive mood and lower scores were interpreted as lower depressive mood.

Translation of the Instruments

All of the questionnaires were developed originally in the English version, except the MSPSS-N which was in a Nepali version. Since this study had to be conducted in the Nepali language and in order to ensure the semantic equivalence of these instruments in Nepali, the researcher used the back translation technique proposed by Brislin (as cited in Polit & Beck, 2012). For the back translation, Brislin suggested three steps: 1) selecting and preparing translators; 2) undertaking an iterative process; and 3) testing the translated version (as cited in Polit & Beck, 2012).

For the first step, the researcher selected three bilingual translators who were familiar with both the English and Nepali languages and capable of understanding the variables of this study. The translators were selected based on their qualifications, experience, and familiarities with both cultures and the variables of this study (Appendix H). One lecturer was selected to translate the instruments from the English versions to the Nepali versions. Next, a lecturer was selected to translate back from the Nepali versions into the English versions without seeing the original version.

The second step of back translation aimed to undertake an iterative process. After translation and back translation into English version, both the original English version and back-translated English version questionnaires were compared by another bilingual translator. Finally, a third translator detected and clarified minor

discrepancies and ensured that the translated instruments were equivalent in meaning with the original version. Then, the translated versions of the instruments were tested.

Validity and Reliability of the Instruments

The validity and reliability of the instruments were tested and qualified prior to collect the data. Validity refers to the degree to which an instrument measures what is intended to be measured. While, reliability refers to the consistency of an instrument in the measurement of the targeted variable (Polit & Beck, 2012).

Validity of the instruments

The content validity, which is concerned with the appropriateness and adequacy of the items of the variables in the tools, was tested in this study. Three resilience experts consisted of: 1) a psychiatric doctor from Songkhla Rajanagarindra Psychiatric Hospital, Thailand; 2) a nursing lecturer from the Faculty of Nursing Prince of Songkla University, Thailand; and 3) a clinical psychologist from Patan Hospital, Nepal (Appendix G). Each item was evaluated for the appropriateness and adequacy with its related construct. Some modifications were done in the DIQ based on the suggestions from the experts and based on the cultural context of Nepal.

Reliability of the instruments

The reliability of each Nepali version of the instruments, except the DIQ, was examined for internal consistency using Cronbach's alpha coefficient. Cronbach's alpha evaluates the internal consistency of each item of the instrument to estimate the extent to which each item is reliable to measure the intended construct (Polit & Beck, 2012). According to Radhakrishna (2007), a pretest of the instruments can be determined from a minimum of 20 samples who have the same characteristics as the research samples. Therefore, the instruments used in this study were piloted with 20

individuals with SCI who had the same inclusion and exclusion criteria as the SCI
participants. The Cronbach's alpha coefficients for the CD-RISC, MSPSS-N, MSES,
ISS, and PHQ-9 were .82, .89, .79, .76, and .88, respectively. These values can be
regarded as acceptable since Cronbach's alpha of more than .70 can be considered as
acceptable reliability of the instruments (Polit & Beck, 2012).

Data Collection Procedure

The data collection procedure in this study consisted of two phases;
preparation phase and implementation phase.

Preparation Phase

The preparation phase of data collection included obtaining ethical approval
and psychometric testing of the research instruments. The researcher obtained ethical
approval from the Institutional Review Board (IRB) of the Faculty of Nursing at
Prince of Songkla University in Thailand, the Nepal Health Research Council
(NHRC), and the SIRC (Appendix E). The researcher then prepared all of the
instruments and materials including the informed consent forms. The translated
Nepali versions of the instruments were tested for reliability.

Implementation Phase

In this study, the implementation phase of the data collection procedure
included recruitment of the participants and the following steps of data collection.

1. The researcher built a good rapport with the staff at the SIRC and explained
the purpose of accessing the SIRC. Then, with assistance from the staff, the researcher

identified 117 earthquake-related SCI people from the SIRC and assessed the eligible participants from their medical records.

2. For the recruitment, the researcher approached six participants at the SIRC who were readmitted for the management of complications and visited for follow-up.

3. For the participants living in the communities, contact numbers and address details of 101 participants were collected from the SIRC. Then, the researcher called the participants and informed them well in advance about the purpose, procedure, and risks and benefits of the study. The researcher then made appointments with the participants who gave verbal consent via a phone call. Thereafter, the researcher visited the participants at the appointed place and time.

4. Fully informed consents were employed for the participants from both the rehabilitation center and communities. They were then asked to sign the written informed consent forms to show their agreement for participation in the study. Only verbal consent under the family member's witness was obtained from the participants who were unable to write and alone at the time of data collection. A copy of the informed consent form was also given to each participant.

5. After completing the recruitment process, the researcher clearly explained all of the instructions to complete the questionnaires and distributed the sets of questionnaires to the participants. The researcher read and filled out the answers for 36 participants who were unable to read and/or write.

6. Approaching from within the 'researcher role', the researcher stayed with the participants until they completed the questionnaires. Then, the researcher checked for completion and requested the participants to complete any missing responses. The participants took 20 to 30 minutes to complete all the questionnaires.

7. Finally, the researcher thanked all the participants prior to leave the setting.

Ethical Considerations

The study was conducted based on the ethical considerations in nursing research and ethical principles. These principles consisted of beneficence, respect for human dignity, justice, and informed consent (Cabanto, 2013; Polit & Beck, 2012). Concerning the rights of the human participants, the researcher obtained approval from the Institutional Review Board (IRB), Faculty of Nursing, Prince of Songkla University, Thailand, the NHRC, and the SIRC in Nepal (Appendix E). There was no risk or harm to the participants and no exploitation.

Considering the principle of respect for human dignity (Cabanto, 2013), the participants were allowed to decide voluntarily to participate or withdraw from the study without any penalty. Informed consent was obtained from all of the participants after explaining the details of the study, purpose, procedure, role of the participants, and the likely risks and benefits of the study (Appendix A). A verbal or written informed consent was taken from each participant. Consent was taken from caregivers for the participants who were not able to write. Some participants were alone at the time of data collection and they were not able to give written consent; hence only verbal consent was obtained from those participants.

The principle of justice concerns the right of the participants to fair treatment and privacy (Cabanto, 2013). All participants were treated fairly without bias. A number coding system was used for each participant to maintain their confidentiality and anonymity. The participants were assured of being able to exit the study anytime they wanted. All questionnaires and information were kept confidential and did not disclose information unless it was pertinent to the study in question and only to individuals directly involved with the study.

Data Analysis

The data was analyzed using statistical software. Descriptive and inferential statistics were used to analyze the data in order to answer the research questions.

1. Descriptive statistics were used to describe the demographic and injury-related characteristics of the participants in terms of frequency, percentage, range, mean, and standard deviation (SD).

2. The resilience, social support, self-efficacy, spirituality, and depressive mood were analyzed and presented in terms of mean, standard deviation, and range.

3. In this study, one of the items in the Moroong Self-efficacy Scale related to 'satisfying sexual relationship' had 18 missing responses (22%) since a sexual relationship before marriage is uncommon in Nepal and some participants felt reluctant to provide information about sexual issues. Missing data were managed using the Expectation Maximization (EM) imputation. EM is considered as one of the best techniques to manage missing data (Pallant, 2011). A pattern of missing responses was investigated by Little's Missing Completely at Random (MCAR) test. This test was non-significant (Little's MCAR chi square = 15.70, $p = .20$) which indicated missing completely at random pattern; therefore, EM imputation was carried out.

4. The hypothesis of this study was tested using inferential statistics. Pearson's correlation was used to compute the association between resilience and potential predictors (i.e. social support, self-efficacy, spirituality, and depressive mood) since the data met the assumptions of normality and homogeneity. Correlation between resilience and potential confounding demographic and injury-related

variables were examined using Spearman's rank correlation since those variables were categorical.

5. The assumption of normality, linearity, homoscedasticity, and multicollinearity of the variables were tested before performing hierarchical multiple regression analysis (Appendix C).

5.1 For this study, normality of the CD-RISC, MSPSS, MSES, ISS, and PHQ-9 instruments was tested by examining skewness and kurtosis. The distribution of data was considered normal if the values of skewness and standard error (SE) ratio and kurtosis and SE ratio were in the range of $\pm$ 3 (Pallant, 2011). Since these scores were found within this range, all of the data were normally distributed. Scatterplot was also inspected for the normality and data showed normal distribution.

5.2 Linearity can be detected by scatterplot or statistics. A straight line relationship between each predictor and dependent variable represents a linear relation (Pallant, 2011). For this study, linearity was determined by the inspection of a bivariate (dependent and each independent variable) scatterplot. Since a straight line scatterplot was identified in this study, the assumption of linearity was met. In addition, assumption of linearity was also checked through the scatterplot of the regression standardized residual and regression standardized predicted value.

5.3 Homoscedasticity was determined by visual examination of a scatterplot. In the scatterplot of the standardized residuals, the residual should be distributed roughly rectangularly to meet the assumption of homoscedasticity. The data met the assumption.

5.4 In addition, multicollinearity was determined by testing tolerance and Variance-Inflating Factors (VIF). Tolerance refers to the amount of variability of

the one independent variable that is not explained by the other independent variable. VIF is the inverse of tolerance value. The tolerance value of less than .10 or a VIF value more than 10 reflects the problem of multicollinearity (Pallant, 2011). In this study, since the tolerance values were more than .01 and VIF values were less than 10, the assumption was met.

     5.5 Non-autocorrelation was tested using Durbin-Watson statistics from the regression model to detect the correlation between errors or residuals. The study revealed a Durbin-Watson value of 1.77 which indicated non-autocorrelation (Pallant, 2011).

    6. Since the data met the assumption, hierarchical multiple regression analysis was performed to determine the significant predictors of resilience. In the first block of hierarchical regression analysis, demographic characteristics (i.e. gender, occupational status, and educational status) as confounding variables were entered. Occupational status and educational status were categorized into two groups: 1) employed and unemployed or students; and 2) illiterate or primary education and secondary or higher education. Then these variables were dummy coded as 0 (female, unemployed or students, illiterate or primary education) and 1 (male, employed, secondary or higher education) before entering into the regression model. Next, in the second, third, and fourth blocks, self-efficacy, depressive mood, and social support were entered respectively based on the theoretical assumptions. Each predictive value was presented as standardized beta (β). The level of significance was set at alpha < .05.

    7. Additional analyses were performed using the independent samples t-tests and ANOVA to examine potential differences in the mean resilience based on age, gender, religion, marital status, educational status, occupational status, income, level

of injury, completeness of injury, presence of comorbidities and secondary

complications, re-attending rehabilitation, and types of caregivers. The data met the

assumptions of normality and homogeneity (Levene's test).

CHAPTER 4

RESULTS AND DISCUSSION

This chapter sequentially presents the results and discussion on the findings of this study. The results and discussion are presented according to the objectives of this study. This study was designed to assess the status of resilience and to determine determinants of resilience in people who sustained SCI from the earthquake in Nepal. The data collection was conducted from December 2016 to February 2017 among Nepalese who sustained SCI from the 2015 earthquake using six structured self-report questionnaires.

Results

The results are described in five main parts: 1) demographic and injury-related characteristics of participants; 2) status or level of resilience; 3) determinants or predictors of resilience; 4) relationship between resilience and determinants; and 5) predictive determinants of resilience.

Demographic and Injury-related Characteristics of Participants

In this study, data were obtained from 82 Nepalese participants who sustained SCI from the 2015 earthquake and who met the inclusion criteria. Nine specific demographic characteristics were analyzed: age, gender, religion, ethnicity, marital status, educational status, current occupation, income, and area of approach. The injury-related characteristics included level of injury, completeness of injury, present

of co-morbidities, present of secondary complications, re-attending rehabilitation center, and types of caregiver. The number and percentages of the participants in each demographic and injury-related characteristic are presented in Table 6.

Table 6

Demographic and Injury-related Characteristics of Participants (N = 82)

Variables	*n*	*%*
Age (years)		
(*M* = 34.80, *SD* = 11.28, Min-Max = 18-64)		
18-30	32	39.0
31-45	35	42.7
46-60	14	17.1
60+	1	1.2
Gender		
Female	34	41.5
Male	48	58.5
Religion		
Hindu	53	64.6
Buddhist	17	20.7
Christian	12	14.6
Ethnicity		
Brahmin	13	15.9
Chhetri	17	20.7
Newar	14	17.1
Tamang	15	18.3
Magar/Gurung	12	14.6
Others	11	13.4
Marital status		
Single	26	31.7
Married	50	61.0
Widowed/Separated	6	7.3
Educational status		
Illiterate	30	36.6
Primary level	12	14.6
Secondary level	22	26.8
Higher level	18	22.0

Table 6 (continued)

Variables	*n*	*%*
Current occupation		
Student	12	14.6
Household chores	33	40.2
Employed	10	12.2
Self-employed	11	13.4
Retired	1	1.2
Disabled pension	7	8.5
Taking training	8	9.8
Income (Nepali currency)[a]		
No income	55	67.1
Below Rs. 10,000	12	14.6
Rs. 10,000-20,000	9	11.0
Above Rs. 20,000	6	7.3
Area of approach		
Rehabilitation center	6	7.3
Community	76	92.7
Level of injury		
Quadriplegia	4	4.9
Paraplegia	78	95.1
Completeness of injury		
Complete	29	35.4
Incomplete	53	64.6
Presence of co-morbidities		
No	66	80.5
Yes	16	19.5
Hypertension	7	43.7
Asthma	1	6.3
GI problems	5	31.3
Diabetes mellitus	2	12.5
Gout	1	6.3
Presence of secondary complications		
No	9	11.0
Yes	73	89.0
Pain[b]	66	90.4
Pressure injury[b]	10	13.7
UTI[b]	8	11.0
Spasticity[b]	21	28.8

Table 6 (continued)

Variables	*n*	*%*
Re-attended rehabilitation center		
No	63	76.8
Yes	19	23.2
Caregivers		
Self-care (No caregiver)	26	31.7
Family members	53	64.6
Institutional caregivers	3	3.7

The mean age of the participants was 34.80 (*SD* =11.38) years and the ages ranged from 18 to 64 years. Most of the participants in this study were male (58.5%), and other demographic data included married (61.0%), Hindu (64.6%), illiterate (36.6%), and doing household chores or not working (40.2%) with no income (67.1%) (Table 6). The majority of the participants (92.7%) were approached in the community setting since 76.8% did not attend a rehabilitation program after discharge from a rehabilitation center.

The majority of participants (95.1%) had paraplegia and incomplete injuries (64%). Most of the participants did not have comorbidities. Only a few participants reported comorbidities (19.5%). Among those with comorbidities, almost half of the participants had hypertension (*n* = 7) followed by GI problems (*n* = 5). The majority of participants (89%) had secondary complications related to SCI. Among those complications, pain was reported as the highest prevalence (*n* = 66) followed by spasticity (*n* = 21), pressure injury (*n* = 10), and urinary tract infection (*n* = 8). Family members were reported as the primary caregivers for most of the SCI participants (64.6%).

Status or Level of Resilience

In this study, the status or level of resilience was measured using the CD-RISC. The total scores were calculated and the status of resilience was categorized into two levels as high resilience (score > 68) and low resilience (score ≤ 68). Table 7 illustrates the mean score and levels of resilience.

Table 7

Status or Level of Resilience of Participants (N =82)

Measure	*M (SD)*	Score range	*n*	*%*
Resilience (CD-RISC)	64.76 (14.02)	33-95		
High (> 68)			32	39
Low (≤ 68)			50	61

Overall, the average resilience score of SCI participants was categorized into low level (*M* = 64.76, *SD* = 14.02). As seen, the majority of participants (61%) had low resilience, while only 39% (*n* = 32) had higher resilience scores (Table 7).

Determinants or Predictors of Resilience

In this study, social support, self-efficacy, spirituality, and depressive mood were selected to examine as determinants of resilience. The mean and standard deviations of these determinants are displayed in Table 8.

Table 8

Social Support, Self-efficacy, Spirituality, and Depressive Mood of Participants (N = 82)

Measures	*M*	*SD*	Scale range	Score range
Social support (MSPSS)	62.74	10.74	12-84	36-84
Self-efficacy (MSES)	81.63	16.88	16-112	41-111
Spirituality (ISS)	6.17	2.91	0-10	0-10
Depressive mood (PHQ-9)	8.76	5.30	0-27	0-25

The mean scores of social support, self-efficacy, spirituality, and depressive mood of SCI participants were 62.74 ($SD = 10.74$), 81.63 ($SD = 16.88$), 6.17 ($SD = 2.91$), and 8.76 ($SD = 5.30$), respectively (Table 8).

Relationship Between Resilience and Determinants

The correlation between resilience and the selected predictive variables which were social support, self-efficacy, spirituality, and depressive mood was examined using Pearson's correlation (Table 9).

Table 9

Correlation Matrix Between Resilience and Predictors

	1	2	3	4	5
1. Resilience	1				
2. Social support	.42**	1			
3. Self-efficacy	.53**	.37**	1		
4. Spirituality	-.12	-.01	-.02	1	
5. Depressive mood	-.50**	-.31**	-.49**	-.04	1

$*p < .05; **p < .01$

Overall, social support, self-efficacy, and depressive mood were significantly associated with resilience (Table 9). There was a significantly moderate positive correlation between resilience and social support ($r = .42$, $p < .001$). Furthermore, self-efficacy was strongly and positively associated with resilience ($r = .53$, $p < .001$). Depressive mood was significantly and negatively correlated with resilience of the SCI participants ($r = -.50$, $p < .001$). However, a non-significant weak negative association was identified between spirituality and resilience ($r = -.12$, $p > .05$).

In addition, Spearman's rank correlation was used to examine the correlation between resilience and demographic and injury-related characteristics of participants (i.e. gender, marital status, occupational status, educational status, completeness of injury, and level of injury) (Table 10).

Table 10

Correlation Matrix Between Resilience and Demographic and Injury-related Variables

	1	2	3	4	5	6	7
1. Resilience	1						
2. Gender	.48**	1					
3. Marital status	-.03	-.12					
4. Occupational status	.27*	.32**	.18	1			
5. Educational status	.27*	.33**	-.42**	.21	1		
6. Completeness of injury	-.11	-.26*	-.07	-.20	-.15	1	
7. Level of injury	.20	-.19	-.07	.13	-.006	-.05	1

*$p < .05$; **$p < .01$

A significant and positive association was found between resilience and gender, occupational status, and educational status (Table 10). There was no

significant association found between resilience and marital status, completeness of injury, and level of injury. Only the variables that were significantly correlated with resilience were included in the regression analysis.

Predictive Determinants of Resilience

Hierarchical multiple regression analysis was used to determine the predictive value of social support, self-efficacy, spirituality, and depressive mood. The demographic variables which included gender, occupational status, and educational status were also included to analyze for predictive value. During the hierarchical regression analysis, variables were entered into four blocks or models. The first block consisted of the demographic variables (gender, occupational status, and educational status) that might cause confounding effects in the relationship between resilience and proposed predictors. After controlling the effects of demographic variables that were entered into the first block, self-efficacy, depressive mood, and social support were entered into the subsequent blocks. Since there was a non-significant association between spirituality and resilience, spirituality was not included into the regression analysis. The hierarchical regression analysis predicting resilience is presented in Table 11.

Table 11

Hierarchical Regression Analysis Predicting Resilience

	Predictors	Unstandardized Coefficients		Standardized Coefficients		
		B	SE	β	t	p
Block 1	Gender[a]	11.95	3.08	.42	3.89	<.001
	Occupational status[b]	3.84	3.36	.12	1.14	.26
	Educational status[c]	1.06	2.93	.04	.36	.72

Model: constant = 56.26, R^2 = .24, adjusted R^2 = .21, $F(3,78)$ = 8.18, $p < .001$

	Predictors	B	SE	β	t	p
Block 2	Gender[a]	11.43	2.68	.40	4.27	<.001
	Occupational status[b]	.23	3.00	.007	.08	.94
	Educational status[c]	-1.80	2.61	-.064	-.69	.49
	Self-efficacy	.39	.08	.47	5.11	<.001

Model: constant = 26.79, R^2 = .43, adjusted R^2 = .40, $F(4,77)$ = 14.65, adjusted R^2 change = .19, $p < .001$

	Predictors	B	SE	β	t	p
Block 3	Gender[a]	10.17	2.61	.36	3.89	<.001
	Occupational status[b]	.59	2.89	.02	.20	.84
	Educational status[c]	-1.36	2.51	-.05	-.54	.59
	Self-efficacy	.29	.08	.35	3.45	.001
	Depressive mood	-.69	.25	-.26	-2.74	.008

Model: constant = 41.91, R^2 = .48, adjusted R^2 = .45, $F(5,76)$ = 14.20, adjusted R^2 change = .05, $p < .001$

	Predictors	B	SE	β	t	p
Block 4	Gender[a]	9.35	2.63	.33	3.56	.001
	Occupational status[b]	.65	2.86	.02	.23	.82
	Educational status[c]	-1.43	2.49	-.05	-.57	.57
	Self-efficacy	.25	.09	.30	3.00	.004
	Depressive mood	-.64	.25	-.24	-2.52	.014
	Social support	.20	.12	.15	1.66	.10

Model: constant = 32.26, R^2 = .50, adjusted R^2 = .46, $F(6,75)$ = 12.57, adjusted R^2 change = .01, $p < .001$

Note. Dummy coded variables [a] (0 = female, 1 = male), [b] (0 = unemployed, 1 = employed), [c] (0 = illiterate or primary, 1 = secondary or higher).

Gender, occupational status, and educational status were entered into the first

block of the regression analysis which accounted for 21% of the variance in resilience

(adjusted $R^2 = .21$, $F (3, 78) = 8.18$, $p < .001$) (Table 11). The addition of self-efficacy into the second block greatly increased the variance explained in resilience to 40%, which was a change of 19% (adjusted R^2 change $= .19$, F change $(1, 77) = 26.15$, $p < .001$). Furthermore, depressive mood was entered into the third block which explained the 5% additional variance on resilience (adjusted R^2 change $= .05$, F change $(1, 76) = 7.48$, $p < .001$). The addition of social support into the fourth block explained the additional 1% of variance on resilience; however, the increment was not significant (adjusted R^2 change $= .01$, F change $(1, 75) = 2.76$, $p > .05$). The full regression model was able to explain 46% of the variance in resilience (adjusted $R^2 = .46$, $F (6, 75) = 12.57$, $p < .001$).

Overall, gender, self-efficacy, and depressive mood were statistically significant predictors of resilience among Nepalese SCI participants. Among those, gender showed a higher beta value ($\beta = .33$, $t = 3.56$, $p = .001$) indicating that gender was the strongest predictor of resilience in this study. Furthermore, self-efficacy was found as a significantly strong psychosocial predictor of resilience ($\beta = .30$, $t = 3.00$, $p = .004$), followed by depressive mood ($\beta = -.24$, $t = -2.52$, $p = .014$). The regression equation is therefore constructed as: R^2 Resilience $= 32.26 + 9.35$ (gender) $+ .65$ (occupational status) -1.43 (educational status) $+ .25$ (self-efficacy) $-.64$ (depressive mood) $+ .20$ (social support).

Additional Analysis of Resilience by Each Demographic and Injury-related Characteristic of the Participants

Additional univariate analysis (independent samples t-tests and ANOVA) was done to compare the differences of resilience between the single variable of each demographic and injury-related characteristic of the participants. The findings

revealed that male participants had significantly higher resilience scores ($M = 70.31$, $SD = 12.75$) than female participants ($M = 56.91$, $SD = 11.96$; $t(80) = -4.80$, $p < .001$). Also, the employed participants had significantly higher resilience scores ($M = 71.04$, $SD = 12.36$) than the unemployed participants ($M = 62.59$, $SD = 14.00$; $t(80) = -2.45$, $p = .016$). Similarly, SCI participants with paraplegia reported significantly higher resilience scores ($M = 65.34$, $SD = 14.09$) than those with quadriplegia ($M = 53.25$, $SD = 5.25$; $t(80) = -3.93$, $p = .009$). There was no significant difference in resilience ($p > .05$) between participants who had a different age, religion, ethnicity, marital status, educational status, income, area of approach, completeness of injury, comorbidities, secondary complications, re-attending rehabilitation center, and types of caregiver (Appendix D).

The study results, which included demographic and injury-related characteristics of participants, status or level of resilience, relationship between resilience and determinants, and determinants or predictive determinants of resilience, lead to the discussion in the next section.

Discussion

This discussion section aims to state interpretations and make arguments to the findings of this study, including suggestions and implications of this study. The discussion is made relevant to the findings and according to the objectives, the research questions, and hypothesis of the study. The study results of the demographic and injury-related characteristics of the participants along with their status of resilience, and predictive determinants of resilience are sequentially discussed.

Demographic and Injury-related Characteristics of the Participants

Similar to previous studies conducted among SCI people (Monden et al., 2014; White et al., 2010), the majority of participants in this study were adults whose ages ranged from 18 to 64 years old and the mean age was 34.80 years old. Accordingly, a systematic review conducted among traumatic SCI people in developed and developing counties revealed that people aged from 30 to 50 years were at risk of sustaining traumatic SCI. Adults within this age group are considered active and mostly engaged in productive work. As a consequence, they are more vulnerable to sustain SCI than those of other ages (Chiu et al., 2010).

In regard to gender, the majority of participants in this study were male, which was consistent with the previous studies (Catalano et al., 2011; Dodd et al., 2015; Guest et al., 2015a; Min et al., 2014). Generally, males are more prone to sustain traumatic SCI than females (Chiu et al., 2010). NSCISC (2016) also reported that 80% of people with SCI were male in the United States. The roles and lifestyles of males, who tend to take risks or engage in dangerous activities more than the females, might be the reason for the higher prevalence of SCI among males (Chiu et al., 2010).

However, a report from previous study revealed more females than males were among the SCI survivors of the 2015 earthquake in Nepal (Groves et al., 2017). The authors argued that the earthquake occurred on Saturday afternoon around the residential areas when most of the females were at home. In addition, the high migration rate of males for employment and women who live in the village might have increased the likelihood of SCI among females. Nonetheless, the higher number of male participants in the present study could be attributed to the limited sample size of this study and convenience sampling. Therefore, a further survey is indicated to confirm an accurate proportion of male and female earthquake-related SCI individuals.

In this study, around 37% of participants were illiterate which is incongruent with previous studies conducted in Canada and Australia, which reported higher education levels of the study participants. Since the previous studies were conducted in developed countries, the literacy rate was high (Catalano et al., 2011; Kilic et al., 2013). However, Nepal is a developing country and the 2015 earthquake affected mostly the rural areas (World Vision, 2015) and most of the study participants lived in rural areas. In comparison to the urban population, the adult illiteracy rate is reported to be higher in the rural districts of Nepal. A lack of awareness regarding the importance of education, compulsion to work at home, no interest in academic study, unaffordability of education, and a lack of accessibility to schools in rural Nepal are the vital factors for the low literacy rate (CBS, 2011).

The education and employment opportunities for individuals with disabilities are low in developed countries and even worse in developing countries (Mitra et al., 2013). Similarly, only one-fourth of the participants were employed in this study. Accordingly, WHO (2013) reported that more than 60% people with SCI were unemployed in the world. The finding is somewhat congruent with previous studies

which reported that the unemployment rate was more than 50% among SCI individuals (Kilic et al., 2013; Min et al., 2014). Since SCI individuals are unable to walk and need to rely on others for many activities, there are fewer employment opportunities for them (Crew & Krause, 2009). In addition, the higher unemployment rate in this study possibly resulted from the lack of a wheelchair-friendly infrastructure as well as poor transportation services in the rural areas of Nepal.

In this study, the high prevalence of secondary complications resulted from the SCI reported by the participants. As mentioned previously, the majority of participants (89%) experienced pain, pressure injury, urinary tract infection, and spasticity. Some of the participants also reported the presence of more than one complication. According to Somers (2010), SCI individuals tend to suffer from various secondary physical complications due to loss of sensation and voluntary movement. Furthermore, pressure injury, urinary tract infection, and deep vein thrombosis were found to be common secondary complications among SCI individuals (Groves et al., 2017; Rathore et al., 2007).

In congruence with previous studies conducted by Ataoglu and colleagues (2013) and Min and colleagues (2014), pain became the highest secondary complication found among the majority of the participants (80%) in this study. Following SCI, individuals often suffer from pain. Pain after SCI could be either neuropathic pain or musculoskeletal pain and/or visceral pain (Somers, 2010). Neuropathic pain among SCI individuals results from nerve damage following injury to the spinal cord. While musculoskeletal pain can be caused by overuse of muscles (e.g., wheelchair use, transferring, and pressure release activities), arthritic changes, and muscle strain from spasticity. In addition, medical conditions such as constipation, peptic ulcer or nephrolithiasis can induce visceral pain (Somers, 2010).

Continuing rehabilitation is essential for SCI individuals in order to promote psychosocial adjustment, social re-integration, and a satisfying life (Craig & Perry, 2014; Harvey, 2016). However, only 23.2% of participants in this study re-attended a rehabilitation program after being discharged from the SIRC. The barriers to participate in a rehabilitation program for Nepalese SCI survivors included personal factors and systemic barriers as well as infrastructure barriers. Systemic barriers and infrastructure barriers included inaccessibility to rehabilitation services in the community settings, limited number of rehabilitation centers allocated in Nepal, inaccessibility of transportation in the rural areas, and financial problems. Additionally, some SCI individuals also lack the awareness of the importance of rehabilitation.

In this study, family members were the primary caregivers for most of the participants. Under the collectivist society of Nepal, family and relatives are the major sources of support and care during a troubled time (Carteret, 2011). According to Hofstede (2011), collectivistic societies have advantages such as strong family or social support, resources, protective environment, and harmony which can be efficacious in the positive psychological adjustment of an individual. Under the Nepalese context, family is the strongest support system for their entire lives. Nepalese family members provide support and care for each other, in particular for sick people (Boreson & Askesjö, 2015). As discussed previously, family members in this study play an integral role in providing care during the hospitalization and enhancing the wellbeing of SCI individuals.

Status or Level of Resilience

Overall, the SCI participants showed low level of resilience and only 39% of the participants had high level of resilience. Currently, there are still no previously published studies that have examined the level of resilience among people with earthquake-related SCI. However, some previous studies examined the status of resilience either among the SCI population or among earthquake survivors. The level of resilience of earthquake-related SCI individuals in this study is inconsistent with the findings of previous studies conducted among either SCI individuals (Guest et al., 2015a; Kilic et al., 2013) or earthquake survivors (Kukihara et al., 2014). The majority of SCI individuals (68%) living in the communities of Australia demonstrated an acceptable level of resilience (Guest et al., 2015a). Similarly, a moderate to high level of resilience was reported by 58% of SCI people at the rehabilitation center in Australia (Kilic et al., 2013).

In addition, a previous study conducted in an Asian context to identify the status of resilience among earthquake survivors revealed almost half of the participants (48%) had high resilience five years after an earthquake in Japan (Kukihara et al., 2014). Presently, there is still a lack of published evidence that examined the status of resilience among the SCI population in Asian countries or developing countries.

The low resilience among the SCI participants in this study could be resulted from some vital reasons which include loss and damage from the earthquake, culture, geography, inaccessibility of health services and transportation, employment status, income, education status, self-efficacy, and depressive mood.

Since the participants in this study had sustained SCI from the 2015 earthquake in Nepal for a period of two years, they had to face both the consequences

of a devastating earthquake and SCI. Generally, an earthquake disaster is an event that

causes loss of human life, infrastructure, and personal belongings and has profound

negative physical and psychosocial impacts on the survivors (Rodriguez-Llanes et al.,

2013). An earthquake results in minor to major physical injuries as well as

impairments and disabilities (Doocy et al., 2013). Furthermore, earthquake survivors

are more likely to suffer from several psychosocial problems, which include anxiety,

depression, cognitive disorders, PTSD, social withdrawal, and suicidal thoughts or

suicide (Tachibana et al., 2014; Wang & Liu, 2012).

In addition, SCI is a chronic condition that has a tremendous negative impact

on the physical, psychological, and social aspects of an individual's life (Crew &

Krause, 2009). Depending on the extent of injury, people with SCI suffer from

paralysis of voluntary muscles and loss of sensations which further result in various

secondary complications (Somers, 2010). Also, evidence suggests that individuals

with SCI are highly vulnerable to develop psychosocial problems such as depressive

symptoms, adjustment problems, PTSD, suicidal ideation, social withdrawal,

unemployment, and low self-confidence (Craig et al., 2015; WHO, 2013).

Taken together, an earthquake and SCI are stressful traumatic events that have

numerous negative consequences affecting the physical and psychosocial health of an

individual. Since participants of this study were confronted with both of these

adversities simultaneously, they tended to suffer from the negative consequences of

both events. The 2015 earthquakes in Nepal left over half a million homes destroyed

and many additional households damaged. Currently, the study participants as well as

a number of Nepalese earthquake survivors are still living in temporary shelters.

Political dispute in the country procrastinated the government's reconstruction

process and most of the earthquake survivors were financially incapable of building permanent houses by themselves (Wolfson, 2016).

Nowadays, Nepalese are still experiencing a number of aftershocks following the 2015 earthquake (National Seismological Center, 2017). Evidently, when the researcher approached the participants in the community, participants as well as other earthquake survivors were living in rudimentary dwellings. As a result, they are still suffering from other disastrous situations such as the lack of drinking water, heavy rains and flooding during the monsoon season, heat waves in the summer, extreme cold in the winter, storms, and thunderstorms (Adhikari, 2017; Wolfson, 2016). Additionally, different social media frequently reported that another huge earthquake might occur in Nepal since the last earthquake did not release all of the seismic energy (The Himalayan Times, 2016). Therefore, the Nepalese people are still living with the fear of another major earthquake and the frequent occurrences of aftershocks have heightened their fears and distress (Quinlan, 2016; Wolfson, 2016). The participants of this study also attested to subsequent chronic fear and anxiety related to the aftershocks and the speculation of another earthquake. Similarly, individuals who sustained disabilities, including SCI from an earthquake, reported higher psychological distress than the normal survivors of the earthquake in China (Zhou et al., 2015). Consequently, low resilience of the participants was observed in this study.

Resilience also differs according to the cultural origin, geography, and context (Kumpfer, 1999). Culture and context influence people's beliefs and values of things and the way they behave or respond to a situation or crisis. In the context of Nepal, the Nepalese, particularly from rural areas, view disabilities as 'karma' or punishment from God for the misdeeds in a previous life and those disabled persons are treated differently. Disability is seen as a social stigma. Hence, disabled persons are more

likely to lose their self-esteem or self-efficacy in the community (Dhungana &
Kusakabe, 2010) which could result in low resilience among them including SCI
individuals (Guest et al., 2015a; Kilic et al., 2013).

The vital reasons why the Nepalese participants exhibit less participation
(23%) in rehabilitation programs are due to the landscape and infrastructure of Nepal,
which limits the availability and accessibility of rehabilitation services. Presently,
there are a total of five rehabilitation services allocated for the Nepalese with SCI and
almost all rehabilitation services are located in the urban areas (Spinal Injury
Rehabilitation Center, 2017). Road transportation is the mode of travel to the
rehabilitation services. Since the landscape of rural Nepal includes steep mountains
and hills where paved roads and public transportation are nearly nonexistent, the rural
Nepalese with SCI spend more than an hour and up to four hours to catch a bus.
Importantly, there is still a lack of disabled-friendly facilities (CBS, 2011). Therefore,
low participation in a rehabilitation program by Nepalese with SCI is not uncommon.
Consequently, SCI individuals in Nepal are prone to develop co-morbidities and
secondary complications. As mentioned earlier, 19.5% of the participants developed
co-morbidities and 89% experienced secondary complications. Poor physical health
further causes low self-efficacy and depressive mood among SCI individuals (Peter et
al., 2012). Similarly, those SCI individuals are likely to have low resilience (Kilic et
al., 2013).

Most of the participants in this study, as discussed previously, were
unemployed and the overall resilience was low. In congruence with previous studies,
employed SCI individuals were more highly resilient than the unemployed SCI
individuals (Kukihara et al., 2014; Lowe et al., 2015; Min et al., 2014). Engagement
in social activities and productive work enhances self-esteem and satisfaction with

life, which further increases resilience (Min et al., 2014). Employed SCI individuals do not have to depend financially on others for survival which enhances their sense of worth or self-esteem (Crew & Krause, 2009). Concordantly, previous studies conducted among disaster survivors reported that persons with a high income were likely to report greater resilience and vice versa (Bonanno et al., 2007; Lee et al., 2008). In this study, the majority of participants had no income and very few ($n = 6$) of them had a high income. Though the result is not significant, an additional analysis also indicated that the mean resilience increased with an increment in income (Appendix D). Hence, low income was also associated with the low resilience of Nepalese SCI individuals.

While educational status was shown to be associated with resilience, majority of the study participants were illiterate. Previous studies reported that disaster survivors with a higher education tended to have greater resilience than those with lower or no education (Frankenberg et al., 2013; Hobfoll et al., 2012). The opportunities to find employment was higher in the educated SCI individuals than in the uneducated SCI individuals (Crew & Krause, 2009). Educated individuals are likely to search for and adapt to a new opportunity. Compared with uneducated individuals, the educated individuals have better access to social and financial resources which can help them effectively cope with a life changing situation (Hobfoll et al., 2012).

Self-efficacy, which is the confidence to perform daily activities and social functions following SCI, was found to be lower in the participants of this study than the SCI individuals in previous studies (Guest et al., 2015a; Kilic et al., 2013). Similar to previous studies, self-efficacy was found to positively contribute to resilience indicating high resilience in SCI individuals who had high self-efficacy (Guest et al.,

2015a; Kilic et al., 2013). According to Bandura (1998), self-efficacy enables the individuals to regulate their thought process and emotions, adopt appropriate behavior, and frequently practice that behavior while confronting a stressful situation. Hence, low self-efficacy among the Nepalese SCI people could be associated with their low level of resilience.

Depressive mood could become another possible reason for low resilience of SCI participants in this study. The average score of depressive mood of the participants in this study (8.76) was higher than in the previous studies conducted among SCI individuals (< 6) (Dodd et al., 2015; Driver et al., 2015; White et al., 2010). In this study, depressive mood was negatively associated with resilience which is congruent with previous studies conducted among SCI people and disaster survivors (Driver et al., 2015; Guest et al., 2015a; Lee et al., 2008; Min et al., 2014). A depressed mood tends to cause an individual to be ineffective in managing and responding to catastrophic events and stress with a lower desire to seek social support which in turns reduces their resilience (Bandura, 1998). In addition, the persons with depressive mood are unable to accurately and positively appraise their own capabilities and strengths. Also, they often perform a negative appraisal of the realities which in turn decreases their resilience (Kumpfer, 1999).

To conclude, approximately two years after the 2015 earthquake, the majority of the Nepalese SCI participants had low resilience. The low resilience possibly resulted from both the devastating earthquake and the consequences of SCI. These factors included loss, damage, and disability (SCI) due to the earthquake, cultural beliefs, geographical variations, inaccessibility of health services and transportation, high unemployment rate, no or low income, low educational status, low self-efficacy, and high depressive mood among the Nepalese SCI participants.

Predictive Determinants of Resilience

As mentioned previously, demographic variables (i.e. gender, occupational status, and educational status) and psychosocial factors (i.e. social support, self-efficacy, and depressive mood) accounted for 46% variance of resilience. Similarly with previous studies, self-efficacy and depressive mood were significant predictors of resilience among SCI individuals (Driver et al., 2015; Guest et al., 2015a). In this study, gender was a stronger predictor of resilience than self-efficacy and depressive mood. This finding is congruent with a study conducted among earthquake survivors which showed gender as the determinant of resilience (Ni et al., 2015). However, other previous studies conducted among SCI people revealed no contribution of gender in resilience (Dodd et al., 2015; Kilic et al., 2013).

The inconsistency in the predictive role of gender on resilience possibly resulted from differences in the contexts and cultures of the studies. As discussed earlier, gender emerged as a significant predictor of resilience among earthquake-related SCI victims in Nepal. An individual's context and culture provide a basis in cultivating the characters or prototypes of gender as feminine and masculine. Cultural context influences a person's perception regarding the interpretation of traumatic events, meaning of life, sense of self-importance or self-worth, value or importance of resources such as family/social support, way of utilizing resources, faith and religious beliefs, communicating concerns with others, and gender roles and priorities (Gunnestad, 2006). Hence, gender could impact resilience differently among diverse cultures (Gunnestad, 2006; Ni et al., 2015).

Nepal is a patriarchal society where powers or authorities are held by the men, and the women are under control by the society (Pokharel, 2009). In the Nepalese patriarchal society, females are considered as subordinates or inferior to males. Also,

they are confined to household chores and they rely on their husbands or their family members for psychological and financial support. They have fewer employment and education opportunities and lower incomes compared to the males. Moreover, disabled women are less likely to get married and have a family than disabled men since disabled women are considered incapable of accomplishing the household responsibilities and reproductive activities (Dhungana & Kusakabe, 2010). These conditions of the females in the society can decrease their self-esteem and sense of self-worth which result in impeding resilience (Dhungana & Kusakabe, 2010; Niaz & Hassan, 2006; Pokharel, 2009).

On the other hand, males are considered as the leader of the family and they hold a major position in Nepalese society. Moreover, males are expected to be strong and are given higher importance even though they may be illiterate or disabled (Niaz & Hassan, 2006). The superior position in the society facilitates disabled males to achieve appropriate care and adequate support from their family and society. Consequently, a sense of worth or self-esteem is greater among the disabled males. Higher literacy and employment rates among the Nepalese males also enhance resilience among disabled males. Thus, higher self-esteem and education and employment opportunities were found to be associated with a positive adjustment and life satisfaction which resulted in achieving higher resilience (Min et al., 2014; Peter et al., 2012).

As with previous studies, self-efficacy became one of the significant predictors of resilience among SCI individuals (Driver et al., 2015; Guest et al., 2015a; Kilic et al., 2013). As discussed earlier, self-efficacy is a vital factor which motivates and reinforces individuals to adopt health promoting behaviors. Individuals who are highly self-confident of their own capabilities can better manage a stressful

situation or adversity without experiencing any negative psychological consequences. A feeling of high self-confidence to have control over things that one desires can result in resilience (Bandura, 1998). In addition, an individual with strong self-efficacy has the capability to control his/her situation for a better outcome in the future (Van Leeuwen, Kraaijeveld, Lindeman, & Post, 2012). For these reasons, self-efficacy becomes a significant determinant of resilience among SCI individuals.

In congruence with previous studies, depressive mood could predict low resilience among SCI individuals (Driver et al., 2015; Guest et al., 2015a; Kilic et al., 2013). A depressive mood among SCI individuals can develop as a result of long-term consequences following SCI. These consequences or impacts include restriction in mobility, difficulty in adjustment or re-integration into the community, financial loss, burden of new expenses for frequent treatments, interferences in physical functioning, social participation, and job opportunities, loss of independence in daily activities, chronic pain, and a perceived bias due to the disability (Craig et al., 2015; Crew & Krause, 2009).

In this study, SCI participants might have developed depressive mood from secondary complications which included pain, pressure injury, urinary tract infection, and spasticity. Most of SCI participants were dependent and relied on family members due to impaired mobility and unemployment. In addition, many participants also experienced loss of family members or relatives and their personal belongings due to the earthquake.

Depressive mood increases the likelihood of a poor outcome among SCI people. SCI individuals with a depressive mood tend to diminish self-care activities, avoid eating and performing exercises, increase risk to develop medical complications, visit the hospital more frequently, and develop suicidal ideas which

can in turn reduce resilience (Craig & Perry, 2014). In addition, persons with depressive mood have low self-efficacy to manage stressors and have less desire to seek social support, which results in diminished resilience (Bandura, 1998). From this, a depressive mood becomes one of the predictive factors of resilience of earthquake-related SCI among Nepalese participants in this study.

Even though social support was found to be one of the significant determinants of resilience among disaster survivors (Bonanno et al., 2007; Ni et al., 2015), social support had no significant prediction to the resilience among SCI participants in this study. This finding is similar to a study conducted among SCI people in Australia which revealed no predictive role of social support in resilience (Guest et al., 2015a). It has been shown that an individual's resilience is affected by various internal or personal and external factors (Dodd et al., 2015; Driver et al., 2015; Kumpfer, 1999). However, personal factors/resources including cognitive competency and emotional stability play greater roles in contributing to resilience than the external resources (Guest et al., 2015a; Kumpfer, 1999).

Social support is not a self-forming entity which can directly buffer against stressors (Bandura, 1998). Social support however, indirectly fosters a coping ability or resilience by enhancing perceived efficacy (Bandura, 1998). In addition, an individual requires a strong sense of efficacy in order to seek or obtain social support. The predictive role of social support to resilience remained non-significant in this study. This might be resulted due to another stronger factor such as self-efficacy. According to Bandura (1998), self-confidence in one's own competency to overcome stressors has a significant influence on their ability to change their adverse situation.

In this study, there was no significant correlation between spirituality and resilience. This finding is contrary to previous studies conducted among SCI people,

which revealed the positive and significant relationship between spirituality and resilience (Monden et al., 2014; White et al., 2010). Differences in the research settings, durations after sustaining injury, and causes of SCI could be noticed between previous studies and this study. As mentioned earlier, most of the earthquake-related SCI participants in this study lived in the rural communities, whereas the previous study was conducted at rehabilitation centers in the Unites States in acute SCI samples (White et al., 2010). In another study, the SCI samples had sustained SCI seven years earlier from traumatic and non-traumatic causes (Monden et al., 2014). Spirituality is dynamic and varies according to circumstances (Hodge, 2003). A traumatic event influences spirituality either positively or negatively. Some traumas enhance spirituality whereas others may impede spirituality by losing faith, meaning of life or trust in God (U.S. Department of Veteran affairs, 2016). Furthermore, meaning and importance of spirituality tend to vary among different cultures since belief systems, nature of rituals, spiritual support groups/communities, and religious traditions differ in diverse cultures (Van Hook, 2013). In addition, over a period of time, the rehabilitation process can alter the spirituality of SCI individuals during a stay in a rehabilitation center by promoting adaptation and functional recovery (White et al., 2010). On the other hand, spirituality can increase after exposure to a significant adversity in life; however, it might drop to a previous level after a period of time (Hodge, 2003).

Since this study is a cross sectional study, the dynamic nature of spirituality can neither be ascertained nor represented for a complete picture of the predictive value to resilience. According to the compensating reciprocal causation model, it is a complex issue to understand the role of spirituality from cross-sectional data. A stressful event reduces wellbeing that consequently increases spirituality which

further helps to enhance resilience in terms of coping ability or wellbeing. Because of this compensating bidirectional causation, there is a high possibility of underestimating the correlation which results in a low or no association between spirituality and the variables in cross-sectional studies (Kennedy, Davis, & Taylor, 1998). Since the Nepalese participants were exposed to traumatic events that occurred two years ago, it is difficult to identify whether the events developed spirituality or spirituality was influenced by the events. Hence, the finding revealed that spirituality did not make any contribution to the resilience of Nepalese participants in this cross-sectional study.

In addition, the ISS was used to measure spirituality in this study due to its acceptable reliability among SCI people, ability to assess spirituality among both theistic and nontheistic individuals, and conciseness (Hodge, 2003; White et al., 2010). However, the instrument has a narrow scale range of 0 to 10, which could make it difficult to identify the subtle changes in score and it lacks sensitivity (White et al., 2010). For this reason, there is a possibility that most of the participants could not differentiate the definitions of the scale. Most of them answered 0, 5 or 10 as no spirituality, average spirituality, and high spirituality, respectively, for ease of completing the questionnaire. Since spirituality is conceptualized as connectedness with God or a higher power rather than only religion in the ISS (Hodge, 2013), most of the Nepalese participants most likely considered spirituality as religious beliefs or religious behaviors and answered accordingly.

Furthermore, there was a negative correlation between spirituality and resilience in this study though a statistical analysis was not significant. This finding suggests that SCI individuals who had higher spirituality might have lower resilience and who had lower spirituality might have higher resilience. It was shown that

spirituality is also likely to reduce resilience following adversity. Some statements from participants' expression could reflect the negative spiritual coping such as "I am worthless", "God has delivered punishment or abandoned me" or "I'm angry towards God". Also, a statement from the participants could reflect a sense of demoralization or fatalistic thoughts, such as "I can do nothing because God is beyond my reach". Both negative spiritual coping and a sense of demoralization or fatalistic thoughts could result in developing distress which is further related to low resilience. In addition, the inability to perform religious rituals (e.g., prayer, meditation, and worship) or participate in spiritual or religious community activities also decreased resilience (Van Hook, 2013). Here, the cross sectional design, the sensitivity of the instrument, the Nepalese' religious beliefs on spirituality, and negative aspects of spirituality might have resulted in the non-significant and negative correlation between resilience and spirituality in this study.

To conclude, the predictive determinants of resilience among Nepalese with earthquake-related SCI after two years were gender, self-efficacy, and depressive mood. Gender enhances resilience in terms of male gender predicting high resilience. Strong self-efficacy also increases resilience by changing negative thoughts and emotions and persistently engaging in healthy behaviors. On the other hand, a depressive mood impedes resilience since it impairs self-confidence, support seeking behavior, and aids or prolongs complications related to SCI.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the study findings, strengths and limitations of the study, and recommendations including implications of the findings.

Conclusion

This predictive cross-sectional study was conducted to identify the level of resilience and predictors of resilience among the 2015 earthquake-related SCI individuals in Nepal. This study was undertaken based on the vital concepts of resilience and determinants of resilience among SCI people. The data collection was done in 82 Nepalese with earthquake-related SCI at the SIRC and in 14 communities between December 2016 and February 2017. The Demographic and Injury-related Questionnaire (DIQ), Connor-Davidson Resilience Scale (CD-RISC), Multidimensional Scale of Perceived Social Support-Nepali (MSPSS-N), Moorong Self-efficacy Scale (MSES), Intrinsic Spirituality Scale (ISS), and the Patient Health Questionnaire-9 (PHQ-9) were used to collect data related to demographic and injury-related characteristics, resilience, self-efficacy, social support, spirituality, and depressive mood, respectively. All the instruments were validated by three experts. The reliability of the instruments was tested for internal consistency using the Cronbach's alpha and yielded acceptable values.

Descriptive statistics was used to describe demographic and injury-related characteristics, resilience, and determinants. Inferential statistics were used to test the

hypothesis of the study. Pearson's correlation was used to examine the correlation between resilience and the proposed predictors. Hierarchical multiple regression was performed to identify the predictive role of each determinant. Confounding variables (gender, occupational status, and educational status) were entered into the first block of the regression model. Self-efficacy, depressive mood, and social support were entered into the second, third, and fourth blocks, respectively.

The study findings revealed that the majority of the participants were male, married, Hindu, unemployed, paraplegic, and had incomplete injuries. Secondary complications related to SCI were reported by the majority of the participants. Among those, pain had the highest prevalence. More than half of the participants had low level of resilience. Resilience was found significantly higher in participants who were male, employed, and paraplegic than those who were female, unemployed, and quadriplegic.

Self-efficacy and social support were significantly and positively associated with resilience. On the other hand, depressive mood had a significant and negative correlation with resilience. For spirituality, a non-significant and negative association with resilience was identified. Hierarchical regression analysis revealed that gender, self-efficacy, and depressive mood were significant predictors of resilience among the Nepalese SCI participants, which explained the 46% variance in resilience. Self-efficacy made a large contribution to resilience. With regard to the study hypothesis, only self-efficacy ($\beta = .30$, $p = .004$) and depressive mood ($\beta = -.24$, $p = .014$) could significantly predict the status of resilience in people who sustained SCI from the earthquake in Nepal, while social support ($\beta = .15$, $p > .05$) revealed less predictive value for resilience and spirituality did not correlate significantly with resilience ($r = -.12$, $p > .05$).

Strengths and Limitations of the Study

The strengths and limitations of this study were appraised based on the Critical Appraisal-Checklist for Analytical Cross Sectional Studies (Joanna Briggs Institute, 2016).

Strengths of the Study

This research is the first study to explore resilience and determinants of resilience among earthquake-related SCI survivors. The strengths of this study, based on the Joanna Briggs Institute (2016) critical appraisal, could be identified as follows:

1. The study clearly specified the inclusion and exclusion criteria for the selection of participants prior to the recruitment.

2. The study provided a clear and sufficient description of the study population and samples, setting of the study, and the time period to conduct the study. In terms of generalization of the results, this study was carried out at the major rehabilitation center in Nepal and covered a wide range of individuals who sustained SCI from the 2015 earthquake in Nepal. Therefore, the findings could represent the entire earthquake-related SCI people in Nepal.

3. Standard self-report instruments were used for the data collection. All of the instruments had demonstrated acceptable validity and reliability among the SCI individuals in previous empirical studies as well as adequate internal consistency (Cronbach's alpha) in this study.

4. To deal with possible confounding variables which included demographic and injury-related characteristics, a hierarchical multiple regression analysis was conducted and the confounding variables were adjusted in the regression analysis.

5. An appropriate statistical analysis was used to test the hypothesis of the study. The possible confounders were also measured and controlled. Proposed predictors were entered into the hierarchical model based on the theoretical assumptions.

Limitations of the Study

Despite the aforementioned strengths, some limitations were also identified.

1. A characteristic of the participants was the heterogeneity in terms of the educational status. Since many of the participants were illiterate, the researcher had to read the questions and fill in the questionnaires for them. At this point, bias may have entered the study because the participants were likely to give desirable answers rather than answering their true feelings.

2. Though the instrument used to measure spirituality was a standard instrument with good validity and reliability, the narrow scale range and lower sensitivity to change might have influenced the findings of this study.

3. There is still a lack of evidence for a clear cut-off point to categorize the level of resilience in the Nepalese context. The cut-off score from a previous study conducted among SCI individuals in a Western context was used to categorize the resilience level in this study. Therefore, it possibly affected the results that might be an over- or underestimation of the level of resilience among the Nepalese with earthquake-related SCI.

4. The reliability of the instruments was piloted only in SCI people admitted for the rehabilitation in the SIRC. Therefore, it might have influenced the reliability of instruments since the study was conducted in both rehabilitation and community settings.

Recommendations

The findings of this study can be utilized or transformed into policy making, nursing education, clinical practice, and future nursing research.

Policy Making

The study findings raise a major national concern for enhancement of resilience status of the Nepalese SCI population. Since the findings revealed some obstacles in accessing the rehabilitation services, the health policy makers as well as the Nepalese government should allocate more financial supports for the rehabilitation services. With regard to the nation's infrastructure, the Nepalese government should increase more rehabilitation centers and the associated infrastructure and transportation services that are disability or wheelchair friendly. This would provide easy access to the rehabilitation services which could in turn help strengthen the resilience of SCI individuals. Since SCI is a chronic problem, the health care system needs to allocate frequent home visits or home healthcare services including SCI caregiver training program.

Nursing Education

The study findings illustrate the necessity to incorporate a continuing nursing education program regarding this issue. Short training courses or workshops should be organized to increase the awareness and update the knowledge among the nurses as well as nursing students regarding strategies to enhance the resilience of SCI individuals. A clinical nurse specialist or advanced nurse practitioner in this area is also highly needed. The study findings also suggest the importance of incorporating

measures into the nursing curriculum to prevent depression and to strengthen self-efficacy and social support to enhance the resilience of SCI individuals. Furthermore, SCI people often suffer from several secondary complications, which make them more vulnerable to have low resilience. Therefore, the prevention, early recognition, and management of secondary complications should be integrated into the community health nursing program and rehabilitation nursing curriculum.

Clinical Practice

The low level of resilience among the Nepalese SCI population raises the awareness of the nurses to allocate nursing interventions to enhance the resilience in this group. Follow-ups to attend a rehabilitation program were found to be very low among the participants. Therefore, health care providers, in particular the rehabilitation nurses, should plan and implement strategies to encourage the SCI population to attend follow-up appointments or continue rehabilitation at home. In addition, it is essential to provide continuous care for those individuals since problems often arise after discharge from a rehabilitation center. Factors that influence resilience should be taken into account to identify a vulnerable group and focus on those who are vulnerable while designing and implementing interventions. Furthermore, involvement by family members during the rehabilitation or nursing intervention needs to be considered since high social support is related to high resilience in this group. The strategies to manage secondary complications, in particular chronic pain should be integrated in rehabilitation services.

Nursing Research

Future study can be conducted to explore more factors that significantly predict resilience in this population. Since this was a cross-sectional study that was conducted two years after the earthquake, a longitudinal study is required to assess the changes in resilience over time. Furthermore, an interventional study using strategies that alleviate depressive symptoms and strengthen self-efficacy would be significant. Although there is evidence that supports spirituality as a determinant of resilience, it did not make a contribution to resilience in the present study. Hence, further research related to spirituality using other multidimensional tool need to be conducted. Also, a longitudinal study is recommended since the dynamic nature of spirituality is too complex to be identified via a cross-sectional study. At last, testing the psychometric properties of the resilience instrument (CD-RISC) is needed to determine the sensitivity and feasibility in the Nepalese context.

References

Adhikari, N. (2017). *Nepal's earthquake disaster: Two years and $4.1bn later*. Retrieved from http://www.aljazeera.com/indepth/opinion/2017/04/nepal-earthquake-disaster-years-41bn-170412110550808.html

American Psychological Association. (2010). *The road to resilience*. Retrieved from http://www.apa.org/helpcenter/road-resilience.aspx

Ataoğlu, E., Tiftik, T., Kara, M., Tunc, H., Ersöz, M., & Akkuş, S. (2013). Effects of chronic pain on quality of life and depression in patients with spinal cord injury. *Spinal Cord, 51*, 23-26. doi:10.1038/sc.2012.51

Bandura, A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology and Health, 13*, 623-649. doi:10.1080/08870449808407422

Below, R., Wirtz, A., & Guha-Sapir, D. (2009). *Disaster category classification and peril terminology for operational purposes*. Retrieved from http://cred.be/sites/default/files/DisCatClass_264.pdf

Benight, C. C., & Cieslak, R. (2011). Cognitive factors and resilience: how self-efficacy contributes to coping with adversities. In S. M. Southwick, T. L. Brett, D. Charney, & M. J. Friedman (Eds.), *Resilience and mental health: Challenges across the lifespan* (pp. 45-52). UK: Cambridge University Press.

Bhattarai, S., Parajuli, S. B., Rayamajhi, R. B., Paudel, I. S., & Jha, N. (2015). Health seeking behavior and utilization of health care services in eastern Hilly region of Nepal. *Journal of College of Medical Sciences-Nepal, 11*, 8-16.

Blanc J, R. G., Laconi S, Mouchenik Y. (2016). Religious beliefs, PTSD, depression and resilience in survivors of the 2010 Haiti earthquake. *Journal of Affective Disorders, 190*, 697-703.

Bonanno, G. A. (2004). Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events?. *American Psychologist, 59*, 20. doi:10.1037/0003-066X.59.1.20

Bonanno, G. A. (2005). Resilience in the face of potential trauma. *Current Directions in Psychological Science, 14*, 135-138. doi:10.1111/j.0963-7214.2005.00347.x

Bonanno, G. A., Galea, S., Bucciarelli, A., & Vlahov, D. (2006). Psychological resilience after disaster New York city in the aftermath of the September 11th Terrorist Attack. *Psychological Science, 17*, 181-186. doi:10.1111/j.1467-9280.2006.01682.x

Bonanno, G. A., Galea, S., Bucciarelli, A., & Vlahov, D. (2007). What predicts psychological resilience after disaster? The role of demographics, resources, and life stress. *Journal of Consulting and Clinical Psychology, 75*, 671. doi:10.1037/0022-006X.75.5.671

Bonanno, G. A., Kennedy, P., Galatzer-Levy, I. R., Lude, P., & Elfström, M. L. (2012). Trajectories of resilience, depression, and anxiety following spinal cord injury. *Rehabilitation Psychology, 57*, 236. doi:10.1037/a0029256

Boreson, H., & Askesjö, L. (2015). *Nepalese nurses' experiences of the family′s importance in healthcare.* Retrieved from http://www.diva-portal.org/smash/get/diva2:872953/fulltext01.pdf

Burns, A. S., O'Connell, C., & Landry, M. D. (2010). Spinal cord injury in postearthquake Haiti: Lessons learned and future needs. *Physical Medicine and Rehabilitation Journal, 2*, 695-697. doi:10.1016/j.pmrj.2010.06.006

Cabanto, J. C. (2013). *Ethical considerations in conducting nursing research.* Retrieved from http://www.academia.edu/4362154/ethical_considerations_in_conducting_nursing_research

Campbell-Sills, L., & Stein, M. B. (2007). Psychometric analysis and refinement of the Connor–Davidson resilience scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of Traumatic Stress, 20*, 1019-1028. doi:10.1002/jts.20271

Carteret, M. (2011). Cultural values of Asian patients and families. Retrieved from http://www.dimensionsofculture.com/2010/10/cultural-values-of-asian-patients-and-families/

Catalano, D., Chan, F., Wilson, L., Chiu, C.-Y., & Muller, V. R. (2011). The buffering effect of resilience on depression among individuals with spinal cord injury: a structural equation model. *Rehabilitation Psychology, 56*, 200. doi:10.1037/a0024571

Central Bereau of Statistics. (2011). *Nepal living standards survey 2010/11.* Retrieved from http://cbs.gov.np/poverty/nlsse

Chen, R., Song, Y., Kong, Q., Zhou, C., & Liu, L. (2009). Analysis of 78 patients with spinal injuries in the 2008 Sichuan, China, earthquake. *Orthopedics, 32*, 322-326. doi:10.3928/01477447-20090501-01

Chiu, W.-T., Lin, H.-C., Lam, C., Chu, S.-F., Chiang, Y.-H., & Tsai, S.-H. (2010). Review paper: Epidemiology of traumatic spinal cord injury: Comparisons between developed and developing countries. *Asia Pacific Journal of Public Health, 22*, 9-18. doi:10.1177/1010539509355470

Cohen, S. (2004). Social relationships and health. *American Psychologist, 59*, 676. doi:10.1037/0003-066X.59.8.676

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310. Retrieved from http://psycnet.apa.org/ index.cfm?fa=buy.optionToBuy&uid=1986-01119-001

Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety, 18*, 76-82. doi:10.1002/da.10113

Craig, A. (2012). Resilience in people with physical disabilities. In P. Kennedy (Ed.), *The Oxford handbook of rehabilitation psychology* (pp. 474-479): Oxford University Press.

Craig, A., & Perry, K. N. (2014). Guide for health professionals on the psychosocial care of adults with spinal cord injury. Retrieved from http://www.aci.health.gov.au

Craig, A., Perry, K. N., Guest, R., Tran, Y., Dezarnaulds, A., Hales, A., . . . Middleton, J. (2015). Prospective study of the occurrence of psychological disorders and comorbidities after spinal cord injury. *Archives of Physical Medicine and Rehabilitation, 96*, 1426-1434. doi:10.1111/bjhp.12143

Craig, A., Tran, Y., & Middleton, J. (2009). Psychological morbidity and spinal cord injury: A systematic review. *Spinal Cord, 47*, 108-114. doi:10.1038/sc.2008.115

Crew, N. M., & Krause, J. S. (2009). Spinal cord injury. In M. G. Brodwin, F. W. Siu, J. Howard, & E. R. Brodwin (Eds.), *Medical, psychosocial and vocational aspects of disability* (3rd ed., pp. 289-303). Athens, USA: Elliott & Fitzpatrick, Inc.

Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. *Advances in Personal Relationships, 1*, 37-67. Retrieved from https://www.researchgate.net/profile/Daniel_Russell4/ publication/271507385_the_provisions_of_social_ relationships_and_adaptation_to_stress/links/54c960b40cf2807dcc265ce2.pdf

Dhungana, B. M., & Kusakabe, K. (2010). The role of self-help groups in empowering disabled women: A case study in Kathmandu Valley, Nepal. *Development in Practice*, 20, 855-865. doi:10.1080/09614524.2010.508244

Disaster Prepardness Network Nepal. (2016). *Earthquake.* Retrieved from http://www.dpnet.org.np/index.php?pageName=earthquake

Dodd, Z., Driver, S., Warren, A. M., Riggs, S., & Clark, M. (2015). Effects of adult romantic attachment and social support on resilience and depression in individuals with spinal cord injuries. *Top Spinal Cord Injury Rehabilitation, 21*, 156-165. doi:10.1310/sci2102-156

Doocy, S., Daniels, A., Packer, C., Dick, A., & Kirsch, T. D. (2013). The human impact of earthquakes: A historical review of events 1980-2009 and systematic literature review. *Public Library of Science Currents*. 5. doi:10.1371/currents.dis.67bd14fe457f1db0b5433a8ee20fb833

Drescher, K. D., Ramirez, G., Leoni, J. J., Romesser, J. M., Sornborger, J., & Foy, D. W. (2004). Spirituality and trauma: Development of a group therapy module. *Group, 28*, 71-87. Retrieved from http://www.jstor.org/stable/41719067

Driver, S., Warren, A. M., Reynolds, M., Agtarap, S., Hamilton, R., Trost, Z., & Monden, K. (2015). Identifying predictors of resilience at inpatient and 3-month post-spinal cord injury. *The Journal of Spinal Cord Medicine, 39,* 77-84. doi:10.1179/2045772314Y.0000000270

Earvolino-Ramirez, M. (2007). Resilience: A concept analysis. *Nursing Forum. 42*, 73-82. doi:10.1111/j.1744-6198.2007.00070.x

Fergus, S., & Zimmerman, M. A. (2005). Adolescent resilience: A framework for understanding healthy development in the face of risk. *Annual Review of Public Health, 26*, 399-419. doi:10.1146/annurev.publhealth.26.021 304.144357

Foy, D. W., & Drescher, K. D. (2011). Religious and spiritual factors in resilience. In S. M. southwick, B. T. litz, D. charney, & M. J. Friedman (Eds.), *Resilinece and mental health: Challenges across the lifespan* (pp. 90-101). Cambridge: Cambridge University Press.

Frankenberg, E., Sikoki, B., Sumantri, C., Suriastini, W., & Thomas, D. (2013). Education, vulnerability, and resilience after a natural disaster. *Ecology and Society: A Journal of Integrative Science for Resilience and Sustainability, 18*, 16. doi:10.5751/ES-05377-180216

Friborg, O., Hjemdal, O., Rosenvinge, J. H., & Martinussen, M. (2003). A new rating scale for adult resilience: what are the central protective resources behind healthy adjustment?. *International Journal of Methods in Psychiatric Research, 12*, 65-76. doi: 10.1002/mpr.143

Furlan, J. C., Sakakibara, B. M., Miller, W. C., & Krassioukov, A. V. (2013). Global incidence and prevalence of traumatic spinal cord injury. *The Canadian Journal of Neurological Sciences, 40*, 456-464. doi:10.1017/S0317167100014530

Garcia-Dia, M. J., DiNapoli, J. M., Garcia-Ona, L., Jakubowski, R., & O'Flaherty, D. (2013). Concept analysis: Resilience. *Archives of Psychiatric Nursing, 27*, 264-270. doi:10.1016/j.apnu.2013.07.003

Gautschi, O. P., Cadosch, D., Rajan, G., & Zellweger, R. (2008). Earthquakes and trauma: Review of triage and injury-specific, immediate care. *Prehospital and Disaster Medicine, 23*, 195-201. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/18557301

Government of Nepal. (2015). *Post-Earthquake Relief, Rehabilitation and Reconstruction Measures undertaken by the Government of Nepal.* Retrieved from http://reliefweb.int/report/nepal/post-earthquake-relief-rehabilitation-and-reconstruction-measures-undertaken-government

Green, S. B. (1991). How many subjects does it take to do a regression analysis. *Multivariate Behavioral Research, 26*, 499-510. doi:10.1207/s15327906mbr2603_7

Greene, G., Paranjothy, S., & Palmer, S. R. (2015). Resilience and vulnerability to the psychological harm from flooding: The role of social cohesion. *American Journal of Public Health, 105*, 1792-1795. doi:10.2105/AJPH.2015.302709

Grove, S. K., Burns, N., & Gray, J. R. (2013). *The practice of nursing research: Aprraisal, synthesis, and generation of evidence.* Missouri: Elsevier Health Sciences.

Groves, C. C., Poudel, M. K., Baniya, M., Rana, C., & House, D. R. (2017). Descriptive study of earthquake-related spinal cord injury in Nepal. *Spinal Cord*, *55,* 1-6 doi:10.1038/sc.2017.25

Guest, R., Craig, A., Nicholson Perry, K., Tran, Y., Ephraums, C., Hales, A., . . . Middleton, J. (2015b). Resilience following spinal cord injury: A prospective controlled study investigating the influence of the provision of group cognitive behavior therapy during inpatient rehabilitation. *Rehabilitation Psychology, 60*, 311. doi:10.1037/rep0000052

Guest, R., Craig, A., Tran, Y., & Middleton, J. (2015a). Factors predicting resilience in people with spinal cord injury during transition from inpatient rehabilitation to the community. *Spinal Cord, 53*, 682-686. doi:10.1038/sc.2015.32

Guha-Sapir, D., Hoyois, P., & Below, R. (2014). *Annual disaster statistical review 2014: The numbers and trends.* Retrieved from cred.be/sites/default/files/ADSR_2014.pd

Gunnestad, A. (2006). Resilience in a Cross-Cultural Perspective: How resilience is generated in different cultures. *Journal of Intercultural Communication, 11*. Retrieved from https://www.immi.se/intercultural/nr11/gunnestad.htm

Harper, D. (2012). *In Etymonline.com.* Retrieved from http://www.etymonline.com/index.php?allowed_in_frame=0&search=resilience& searchmode=none

Harvey, L. A. (2016). Physiotherapy rehabilitation for people with spinal cord injuries. *Journal of Physiotherapy*, *62*, 4-11. doi:10.1016/j.jphys.2015.11.004

Hjemdal, O., Friborg, O., Braun, S., Kempenaers, C., Linkowski, P., & Fossion, P. (2011). The resilience scale for adults: Construct validity and measurement in a belgian sample. *International Journal of Testing, 11*, 53-70. doi:10.1080/15305058.2010.508570

Hobfoll, S. E., Johnson, R. J., Canetti, D., Palmieri, P. A., Hall, B. J., Lavi, I., & Galea, S. (2012). Can people remain engaged and vigorous in the face of trauma? Palestinians in the West Bank and Gaza. *Psychiatry, 75*, 60-75. Retrieved from http://www.tandfonline.com/doi/pdf/10.1521/psyc.20 12.75.1.60?needAccess=true

Hodge, D. R. (2003). The intrinsic spirituality scale: A new six-item instrument for assessing the salience of spirituality as a motivational construct. *Journal of Social Service Research, 30*, 41-61. doi:10.1300/J079v30n01_03

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, *2*, 8. doi:10.9707/2307-0919.1014

International Federation of Red Cross and Red Crescent Societies. (2008). *Disaster definition. The Johns Hopkins and Red Cross Red Crescent Public health guide in emergencies* (2nd ed., pp. 24-39). Retrieved from http://www.jhsph.edu/research/centers-and-institutes/center-for-refugee-and-disaster-response/publications_tools/publications/_CRDR_ICRC_public_ health_guide_book/forward.pdf.

Janicki-Deverts, D., & Cohen, S. (2011). Social ties and resilience in chronic disease. In S. M. Southwick, B. T. Litz, D. Charney, & M. J. Friedman (Eds.), *Resilience and Mental Health: Challenges Across the Lifespan* (pp. 78-89). Newyork: Cambridge University Press.

Joanna Briggs Institute. (2016). *Checklist for analytical cross sectional studies.* Retrieved from http://joannabriggs.org/research/critical-appraisal-tools.html

Johannesson, K. B., Lundin, T., Fröjd, T., Hultman, C. M., & Michel, P.-O. (2011). Tsunami-exposed tourist survivors: Signs of recovery in a 3-year perspective. *The Journal of Nervous and Mental Disease, 199*, 162-169. doi:10.1097/NMD.0b013e31820c73d1

Kaplan, H. B. (2002). Toward an understanding of resilience: A critical review of definition and models. In M. D. Glantz & J. L. Johnson (Eds.), *Resilience and development: Positive life adaptations* (pp. 17-76). New York: Kluwer Academic Publishers.

Kennedy, J. E., Davis, R. C., & Taylor, B. G. (1998). Changes in spirituality and well-being among victims of sexual assault. *Journal for the Scientific Study of Religion, 37*, 322-328. Retrieved from http://www.jstor.org/stable/1387531

Khan, F., Amatya, B., Dhakal, R., Abbott, G., Graf, M., Ramirez, S., . . . Galea, M. P. (2015). Rehabilitation needs assessment in persons following spinal cord injury in disaster settings: Lessons learnt in 2015 Nepal earthquakes. *International Journal of Physical Medicine & Rehabilitation*, 3, 316. doi:10.4172/2329-9096.1000316

Khazaeipour, Z., Norouzi-Javidan, A., Kaveh, M., Khanzadeh Mehrabani, F., Kazazi, E., & Emami-Razavi, S.-H. (2014). Psychosocial outcomes following spinal cord injury in Iran. *The Journal of Spinal Cord Medicine*, *37*, 338-345. doi:10.1179/2045772313Y.0000000174

Kilic, S. A., Dorstyn, D. S., & Guiver, N. G. (2013). Examining factors that contribute to the process of resilience following spinal cord injury. *Spinal Cord, 51*, 553-557. doi:10.1038/sc.2013.25

Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37*(1), 1-11. doi:10.1037/0022-3514.37.1.1

Koirala, P. (2014). *Disaster management institution and system in Nepal*. Retrieved from http://reliefweb.int/report/nepal/disaster-management-institution-and-system-nepal

Kroencke, K., Spitzer, R., & Williams, J. (2001). The phq-9: Validity of a brief depression severity measure [Electronic version]. *Journal of General Internal Medicine, 16*, 606-613. doi:10.1046/j.1525-1497.2001.016009606.x

Kukihara, H., Yamawaki, N., Uchiyama, K., Arai, S., & Horikawa, E. (2014). Trauma, depression, and resilience of earthquake/tsunami/nuclear disaster survivors of Hirono, Fukushima, Japan. *Psychiatry and Clinical Neurosciences, 68*, 524-533. doi:10.1111/pcn.12159

Kumpfer, K. L. (1999). Factors and processes contributing to resilience: The resilience framework. In M. D. Glantz & J. L. Johnson (Eds.), *Resilience and development: Positive life adaptations* (pp. 179-224). New York: Kluwer Academic/Plenum Press Publishers.

Landry, M. D., Sheppard, P. S., Leung, K., Retis, C., Salvadore, E. C., & Raman, S. R. (2016). The 2015 Nepal earthquake (s): Lessons learned from the disability and rehabilitation sector's preparation for, and response to, natural disasters. *Physical Therapy*. doi:10.2522/ptj.20150677

Lee, E.-K. O., Shen, C., & Tran, T. V. (2008). Coping with Hurricane Katrina: Psychological distress and resilience among African American evacuees. *Journal of Black Psychology.* 35, 5-23. doi: 10.1177/0095798408323354

Lowe, S. R., Sampson, L., Gruebner, O., & Galea, S. (2015). Psychological resilience after Hurricane Sandy: The influence of individual and community-level factors on mental health after a large-scale natural disaster. *Public Library of Science One, 10*, e0125761. doi:10.1371/journal.pone.0125761

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*, 543-562. doi:10.1111/1467-8624.00164

Maruo, S., & Matumoto, M. (1996). Spinal fractures resulting from the 1995 Great Hanshin Earthquake of the Kobe-Osaka area of Japan. *Spinal Cord, 34*, 382-386. doi:10.1038/sc.1996.69

Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology, 2*, 425-444. doi:10.1017/S0954579400005812

Middleton, J. W., Tate, R. L., & Geraghty, T. J. (2003). Self-efficacy and spinal cord injury: Psychometric properties of a new scale. *Rehabilitation Psychology, 48*, 281. doi:10.1037/0090-5550.48.4.281

Migliorini, C., Sinclair, A., Brown, D., Tonge, B., & New, P. (2015). Prevalence of mood disturbance in Australian adults with chronic spinal cord injury. *Internal Medicine Journal, 45*, 1014-1019. doi:10.1111/imj.12825.

Min, J.-A., Lee, C.-U., Hwang, S.-I., Shin, J.-I., Lee, B.-S., Han, S.-H., . . . Chae, J.-H. (2014). The moderation of resilience on the negative effect of pain on depression and post-traumatic growth in individuals with spinal cord injury. *Disability and Rehabilitation, 36*, 1196-1202. doi:10.3109/09638288.2013.834985

Ministry of Home Affairs. (2015). *Nepal earthquake 2072: Situation update as of 11th May.* Retrieved from http://drrportal.gov.np/uploads/document/14.pdf

Mitra, S., Posarac, A., & Vick, B. (2013). Disability and poverty in developing countries: A multidimensional study. *World Development, 41*, 1-18. doi:10.1016/j.worlddev.2012.05.024

Monden, K. R., Trost, Z., Catalano, D., Garner, A. N., Symcox, J., Driver, S., . . . Warren, A. M. (2014). Resilience following spinal cord injury: A phenomenological view. *Spinal Cord, 52*, 197-201. doi:10.1038/sc.2013.159

Muldoon, S. (2015). *Nepal quakes: Treating the spinally injured*. Retrieved from http://www.bbc.com/news/blogs-ouch-32847101

National Seismological Center. (2015). *Recent earthquake.* Retrieved from http://www.seismonepal.gov.np/index.php?action=earthquakes&show=recent

National Seismological Center. (2017). *Aftershocks of Gorkha earthquake*. Retrieved from http://www.seismonepal.gov.np/

National Spinal Cord Injury Statistical Center (NSCISC). (2015). *Recent trends in causes of spinal cord injury.* Retrieved from https://www.nscisc.uab.edu/PublicDocuments/fact_sheets/Recent%20trends%20in%20causes%20of%20SCI.pdf

National Spinal Cord Injury Statistical Center (NSCISC). (2016). *Spinal cord injury (SCI) facts and figures at a glance.* Retrieved from https://www.nscisc. uab.edu/Public/Facts%202016.pdf

Newman, R. (2005). APA's resilience initiative. *Professional Psychology: Research and Practice, 36*, 227. doi:10.1037/0735-7028.36.3.227

Ni, C., Chow, M. C. M., Jiang, X., Li, S., & Pang, S. M. C. (2015). Factors associated with resilience of adult survivors five years after the 2008 Sichuan earthquake in China. *Public Library of Science One, 10*, e0121033. doi:10.1371/journal.pone.0121033

Niaz, U., & Hassan, S. (2006). Culture and mental health of women in South-East Asia. *World Psychiatry, 5*, 118-120. doi:10.1002/9780470746738.ch22

Ning, G.-Z., Wu, Q., Li, Y.-L., & Feng, S.-Q. (2012). Epidemiology of traumatic spinal cord injury in Asia: A systematic review. *The Journal of Spinal Cord Medicine, 35*, 229-239. doi:10.1179/2045772312Y.0000000021

O'Connor, R., & Murray, P. (2006). Review of spinal cord injuries in Ireland. *Spinal Cord, 44*, 445-448. doi:10.1038/sj.sc.3101856

Olsson, C. A., Bond, L., Burns, J. M., Vella-Brodrick, D. A., & Sawyer, S. M. (2003). Adolescent resilience: A concept analysis. *Journal of Adolescence, 26*(1), 1-11. doi:10.1016/S0140-1971(02)00118-5

Pallant, J. (2011). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4 ed.). Australia: McGraw-Hill Education.

Peter, C., Müller, R., Cieza, A., & Geyh, S. (2012). Psychological resources in spinal cord injury: A systematic literature review. *Spinal Cord, 50,* 188-201. doi:10.1038/sc.2011.125

Pokharel, S. (2009). Gender discriminatory practices in Tamang and Brahmin communities. *Tribhuvan University Journal*, *26*, 85-98. Retrieved from http://www.nepjol.info/index.php/TUJ/article/view/2619/2316

Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia: Lippincott Williams & Wilkins.

Priebe, M. M. (2007). Spinal cord injuries as a result of earthquakes: Lessons from Iran and Pakistan. *The Journal of Spinal Cord Medicine, 30*, 367. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2031935/

Quinlan, A. (2016). *Meeting the people of Nepal who live in fear of a repeat earthquake.* Retrieved from http://www.irishexaminer.com/viewpoints/ analysis/meeting-the-people-of-nepal-who-live-in-fear-of-a-repeat-earthquake-394766.html

Radhakrishna, R. B. (2007). Tips for developing and testing questionnaires/instruments. *Journal of Extension, 45*, 11. Retrieved from http://www.joe.org/joe/2007february/tt2.php

Rahimi-Movaghar, V., Sayyah, M. K., Akbari, H., Khorramirouz, R., Rasouli, M. R., Moradi-Lakeh, M., . . . Vaccaro, A. R. (2013). Epidemiology of traumatic spinal cord injury in developing countries: A systematic review. *Neuroepidemiology*, *41*, 65-85. doi:10.1159/000350710

Raissi, G. R. (2007). Earthquakes and rehabilitation needs: Experiences from Bam, Iran. *The Journal of Spinal Cord Medicine 30*, 369. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2031928/

Rathore, M., Rashid, P., Butt, A., Malik, A., Gill, Z., & Haig, A. J. (2007). Epidemiology of spinal cord injuries in the 2005 Pakistan earthquake. *Spinal Cord, 45*, 658-663. doi:10.1038/sj.sc.3102023

Reinhardt, J. D., Li, J., Gosney, J., Rathore, F. A., Haig, A. J., Marx, M., & DeLisa, J. A. (2011). Disability and health-related rehabilitation in international disaster relief. *Global Health Action*, 4, 7191. doi:10.3402/gha.v4i0.7191

Richardson, G. E. (2002). The metatheory of resilience and resiliency. *Journal of Clinical Psychology, 58*, 307-321. doi:10.1002/jclp.10020

Rodriguez-Llanes, J. M., Vos, F., & Guha-Sapir, D. (2013). Measuring psychological resilience to disasters: Are evidence-based indicators an achievable goal. *Environmental Health, 12*, 115. doi:10.1186/1476-069X-12-115

Rundquist, J., Gassaway, J., Bailey, J., Lingefelt, P., Reyes, I. A., & Thomas, J. (2011). Nursing bedside education and care management time during inpatient spinal cord injury rehabilitation. *The journal of spinal cord medicine, 34*, 205-215.

Rutter, M. (1985). Resilience in the face of adversity. Protective factors and resistance to psychiatric disorder. *The British Journal of Psychiatry, 147*, 598-611. doi:10.1192/bjp.147.6.598

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine, 15*, 194-200. doi:10.1080/10705500802222972

Somers, M. F. (2010). *Spinal cord injury: Functional rehabilitation* (3rd ed.). Boston: Julie Levin Alexander.

Southwick, S. M., Litz, B. T., Charney, D., & Friedman, M. J. (2011). *Resilience and mental health: Challenges across the lifespan*: Cambridge: Cambridge University Press.

Spinal Injury Rehabilitation Center. (2017). [Spinal cord injury patients by development regions]. Unpublished raw data.

Spinal Injury Rehabilitation Center. (2016). [Job description of nursing staff in SCI rehabilitaion center]. Unpublished raw data.

Spinal Research. (2011). *Spinal cord injury.* Retrieved from http://www.spinal-research.org/research-matters/spinal-cord-injury/

Spinal Cord Injury Research Evidence. (2013). *American Spinal Injury Association Impairment Scale (AIS): International standards for neurological classification of spinal cord injury.* Retrieved from https://www.scireproject.com/outcome-measures-new/american-spinal-injury-association-impairment-scale-ais-international-standards

Spitzer, R. L., Kroenke, K., Williams, J. B., & Group, P. H. Q. P. C. S. (1999). Validation and utility of a self-report version of PRIME-MD: The PHQ primary care study. *Jama, 282*, 1737-1744. doi:10.1001/jama.282.18.1737

Tachibana, A., Kitamura, H., Shindo, M., Honma, H., & Someya, T. (2014). Psychological distress in an earthquake-devastated area with pre-existing high rate of suicide. *Psychiatry Research, 219*, 336-340. doi:10.1016/j.psychres.2014.01.028

Tauqir, S. F., Mirza, S., Gul, S., Ghaffar, H., & Zafar, A. (2007). Complications in patients with spinal cord injuries sustained in an earthquake in Northern Pakistan. *Journal of Spinal Cord Medicine, 30*, 373. Retrieved from https://www.researchgate.net/publication/5986287_Complications_in_patients_with_spinal_cord_injuries_sustained_in_an_earthquake_in_NorthernPakistan

Thapa, K. (2015). Mental health in post-earthquake Nepal. *Nepal Journal of Epidemiology, 5*, 520-521. doi:10.3126/nje.v5i4.14261

The Himalayan Times. (2016). *One year on, fear of earthquake continues to haunt people*. Retrieved from https://thehimalayantimes.com/nepal/one-year-fear-earthquake-continues-haunt-people/

Tonsing, K., Zimet, G. D., & Tse, S. (2012). Assessing social support among South Asians: The multidimensional scale of perceived social support. *Asian Journal of Psychiatry, 5*, 164-168. doi:10.1016/j.ajp.2012.02.012

United Nations. (2011). *Statistical yearbook for Asia and the Pacific 2011.* Retrieved from http://www.unescap.org/stat/data/syb2011/II-Environment/Natural-disasters.asp

United Nations. (2014). *Statistical yearbook for asia and the pacific.* Retrieved from www.unescap.org/sites/default/files/ESCAP-SYB2014.pdf

United Nation High Commissioner for Refugees (UNHCR). (2016). *Nepal: 2015 Earthquakes.* Retrieved from http://data.unhcr.org/nepal/

U.S. Department of Veteran affairs. (2016). *Spirituality and Trauma: Professionals working together*. Retrieved from http://www.ptsd.va.gov/professional/ provider-type/community/fs-spirituality.asp

United States Geological Survey. (2015). *Magnitude 7.8 earthquake in Nepal & aftershocks*. Retrieved from https://www2.usgs.gov/blogs/features/usgs _top_story/magnitude-7-8-earthquake-in-nepal/

United States Geological Survey. (2016). *Earthquake facts*. Retrieved from http://earthquake.usgs.gov/learn/facts.php

Van Hook, M. (2013). Resiliency and spirituality: A framework for assessing and helping. *Atlanta,* 2013. Retrieved from http://www.nacsw.org/Publications/ Proceedings2013/VanHookMResiliencyFINAL.pdf

Van Leeuwen, C., Kraaijeveld, S., Lindeman, E., & Post, M. (2012). Associations between psychological factors and quality of life ratings in persons with spinal cord injury: A systematic review. *Spinal Cord, 50,* 174-187. doi:10.1038/sc.2011.120

Victorson, D., Tulsky, D. S., Kisala, P. A., Kalpakjian, C. Z., Weiland, B., & Choi, S. W. (2015). Measuring resilience after spinal cord injury: Development, validation and psychometric characteristics of the SCI-QOL Resilience item bank and short form. *The Journal of Spinal Cord Medicine, 38*, 366-376. doi:10.1179/2045772315Y.0000000016

Wagnild, G. (2009). A review of the Resilience Scale. *Journal of Nursing Measurement, 17*, 105-113. doi:10.1891/1061-3749.17.2.105

Wagnild, G., & Young, H. (1993). Development and psychometric. *Journal of Nursing Measurement, 1*, 165-178. Retrieved from http://www.resiliencescale .com/wp-content/uploads/2014/06/Wagnild-Young-psychom-R.pdf

Wang, X., & Liu, K. (2012). *Earthquake and mental health*. Retrieved from http://cdn.intechopen.com/pdfs/26612/InTech-Earthquake_and_mental_ health.pdf

Webb, R. (2008). *Earthquake - what are the long term trends?*. Retrieved from http://www.earth.webecs.co.uk/

White, B. (2013). Resilience profile among people with spinal cord injury: A cluster analysis. (Master Thesis), The University of Texas Southwestern Medical Center, Texas.

White, B., Driver, S., & Warren, A. M. (2008). Considering resilience in the rehabilitation of people with traumatic disabilities. *Rehabilitation Psychology, 53*, 9. doi:10.1037/0090-5550.53.1.9

White, B., Driver, S., & Warren, A. M. (2010). Resilience and indicators of adjustment during rehabilitation from a spinal cord injury. *Rehabilitation Psychology, 55*, 23. doi:10.1037/a0018451

White, L., Duncan, G., & Baumle, W. (2013). *Medical-surgical nursing: An integrated approach* (3rd ed.). USA: Delmar Cengage Learning.

Windle, G., Bennett, K. M., & Noyes, J. (2011). A methodological review of resilience measurement scales. *Health and Quality of Life Outcomes, 9*(1), 1. doi:10.1186/1477-7525-9-8

Wolfson, E. (2016). *One year after a devastating earthquake, Nepal is still in ruins*. Retrieved from http://www.newsweek.com/2016/04/29/nepal-earthquake-anniversary-2015-gorkha-kathmandu-450449.html

World Health Organization. (2010). *A framework for community health nursing education*. Retrieved from http://apps.searo.who.int/PDS_DOCS/B4816.pdf

World Health Organization. (2013). *International perspectives on spinal cord injury*. Retrieved from http://apps.who.int/iris/bitstream/10665/94190/1/9789241564663_eng.pdf

World Health Organization. (2015). *WHO mobilizes funds for long-term spinal cord treatment after Nepal earthquake*. Retrieved from http://www.who.int/mediacentre/news/releases/2015/mobilizing-funds-nepal/en/

World Health Organization. (2016). *Earthquakes - Technical hazard sheet - natural disaster profile*. Retrieved from http://www.who.int/hac/techguidance/ems/earthquakes/en/

World Vision. (2015). *Rapid assessment report: Nepal earthquake*. Retrieved from https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/assessments/150505_world_vision_nepal_earthquake_rapid_assessment_report_6_districts.pdf

Zhou, X., Song, H., Hu, M., Li, X., Cai, Y., Huang, G., . . . Li, J. (2015). Risk factors of severity of post-traumatic stress disorder among survivors with physical disabilities one year after the Wenchuan earthquake. *Psychiatry Research, 228*, 468-474. doi:10.1016/j.psychres.2015.05.062

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*, 30-41. doi:10.1207/s15327752jpa5201_2

APPENDICES

APPENDIX A

Informed Consent

"Determinants of Resilience in People Who Sustained Spinal Cord Injury From Earthquake in Nepal"

Research Team Name,

Muna Bhattarai   Assist. Prof. Dr. Khomapak Maneewat

Master Nursing Student   Faculty of Nursing

Prince of Songkla University, Thailand   Prince of Songkla University, Thailand

Contact Number: +977-9860165082   Contact Number: +66874676066

Email ID: bhattarai.moona@gmail.com   Email ID: khomapak.m@psu.ac.th

Dear Participants,

My name is Muna Bhattarai. I am studying Master of Nursing Science in Prince of Songkla University, Thailand. I am conducting a master thesis entitled "**Determinants of Resilience in People Who Sustained Spinal Cord Injury From Earthquake in Nepal.**" The purpose of this study is to identify the level of resilience and factors contributing to resilience after sustaining spinal cord injury from 2015 earthquake. Your participation in this study is voluntary. If you agree to participate, you will be provided a set of questionnaire which includes six questionnaires. These are demographic and injury-related questionnaire, resilience questionnaire, social support, self-efficacy, spirituality, and depressive mood questionnaires.

All of your information is confidential and will be kept in a secure place. The anonymous will be ensured as your name will be coded as number (anonymity) and will be used only for the study purposes. There is no identifiable risk to participate in this study. This study does not have direct benefits on you. However, it will help

rehabilitation team to develop appropriate interventions for the SCI people to enhance positive adaptation.

If you have any questions related to this study, please feel free to ask the researchers. You have right to refuse and withdraw from the study at any time and for any reason without any consequences. There is no provision of payment for participating in this study. Your signature on this form indicates that you understand the purpose of the study and you are willing to participate in this study.

Informed Consent Form

By signing below, I confirm that I have read and understood the information package and in particular have noted that:

- I understand that my involvement in this research will include the completion of a set of six questionnaires for a single time;
- I have had any questions answered to my satisfaction;
- I understand that there will be no direct benefit to me from my participation in this research;
- I understand the risks involved;
- I understand that my participation in this research is voluntary and my decision is no way impacting upon the services I receive from rehabilitation centers;
- I understand that if I have any additional questions, I can contact the research team;
- I understand that I am free to withdraw at any time, without explanation or penalty;
- I understand that I can contact to the Research Ethics Committee at Faculty of Nursing, Prince of Songkla University, Thailand (email address: waraporn.k@psu.ac.th) if I have any concerns about the ethical conduct of the study; and

◯ I agree to participate in the study.

◯ I agree for the inclusion of my personal information in publications or reporting of

the results from this research.

Name: ………………………………………………

Signature: ………………………………………………

Date: ………………………………………………

☺ ☺ Thank You ☺ ☺

APPENDIX B

Data Collection Instruments

Part I: Demographic and Injury-related Questionnaire (DIQ)

<div align="right">

Code……………….

Date………………..

</div>

Please fill in the blank with the correct answer or suitable word or mark a tick (√) in the bracket appropriate to your answer where indicated.

1. Age …………. Years

2. Gender   : 1. ( ) Male   2. ( ) Female

3. Religion   : 1. ( ) Hindu   2. ( ) Buddhist

                          3. ( ) Muslim   4. ( ) Christian

                          5. ( ) Others, please specify…………….

4. Ethnicity   : 1. ( ) Brahmin   2. ( ) Chhetri

                          3. ( ) Newar   4. ( ) Tamang

                          5. ( ) Others, please specify…………….

5. Marital status   : 1. ( ) Single   2. ( ) Married

                          3. ( ) Widow/ widower   4. ( ) Separated/Divorcee

6. Educational status   : 1. ( ) Illiterate   2. ( ) Primary level

                          3. ( ) Secondary level   4. ( ) Higher level

7. Current occupation   : 1. ( ) Student   2. ( ) Household chores

                                         3. ( ) Employed   4. ( ) Self-employed

                                         5. ( ) Retired

                                         6. ( ) Financial support from any other sources

                                         7. ( ) Taking training

8. Income   : 1. ( ) No income   2. ( ) Yes

 (1 USD = Rs.107.26)   If yes, ………………………… Rs.

9. Area of approach   : 1. ( ) Rehabilitation center 2. ( ) Community

10. Level of injury   : 1. ( ) Quadriplegia   2. ( ) Paraplegia

11. Completeness of injury   : 1. ( ) Complete   2. ( ) Incomplete

12. Do you have any other diseases or co-morbidities?

               1. ( ) No   2. ( ) Yes

               If yes, please specify…………………………………………

13. Are you suffering from any secondary complications of spinal cord injury?

               1. ( ) No   2. ( ) Pressure sores   3. ( ) Chronic pain

               4. ( ) Others, specify……………………………………………………..

14. Did you re-attend rehabilitation program after you got discharged from SIRC?

               1. ( ) If yes, place and frequency…………………………………………….

               2. ( ) If no, specify the reason…………………………………………….

15. Who does take care of you? ....

Part II: Connor-Davidson Resilience Scale 25 (CD-RISC-25)

For each item, please mark an "x" in the box below that best indicates how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

		Not true at all (0)	Rarely true (1)	Sometimes true (2)	Often true (3)	True nearly all the time (4)
1.	I am able to adapt when changes occur.					
2.	I have at least one close and secure relationship that helps me when I am stressed.					
3.	When there are no clear solutions to my problems, sometimes fate or god can help me.					
4.	I can deal with whatever comes my way.					
5.	Past successes give me confidence in dealing with new challenges and difficulties.					
6.	I try to see the humorous side of things when I am faced with problems.					
7.	Having to cope with stress can make me stronger.					
8.	I tend to bounce back after illness, injury, or other hardships.					
9.	Good or bad, I believe that most things happen for a reason.					
10.	I give my best effort no matter what the outcome may be.					
11.	I believe I can achieve my goals, even if there are obstacles.					
12.	Even when things look hopeless, I don't give up.					

		Not true at all (0)	Rarely true (1)	Sometimes true (2)	Often true (3)	True nearly all the time (4)
13.	During times of stress/crisis, I know where to turn for help.					
14.	Under pressure, I stay focused and think clearly.					
15.	I prefer to take the lead in solving problems rather than letting others make all the decisions.					
16.	I am not easily discouraged by failure.					
17	I think of myself as a strong person when dealing with life's challenges and difficulties					
18.	I can make unpopular or difficult decisions that affect other people, if it is necessary.					
19.	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.					
20.	In dealing with life's problems, sometimes you have to act on a hunch without knowing why.					
21.	I have a strong sense of purpose in life.					
22.	I feel in control of my life.					
23.	I like challenges.					
24.	I work to attain my goals no matter what roadblocks I encounter along the way.					
25.	I take pride in my achievements.					

Part III: Multidimensional Scale of Perceived Social Support (MSPSS)

 Read the statement clearly and circle in the one column that you feel about each statement.

 Circle the "1" if you feel Very Strongly Disagree
 Circle the "2" if you feel Strongly Disagree
 Circle the "3" if you feel Strongly Disagree
 Circle the "4" if you feel Neutral
 Circle the "5" if you feel Mildly Agree
 Circle the "6" if you feel Strongly Agree
 Circle the "7" if you feel Very Strongly Agree

1.	There is a special person who is around when I am in need.	SO	1	2	3	4	5	6	7
2.	There is a special person with whom I can share my joys and sorrows.	SO	1	2	3	4	5	6	7
3.	My family really tries to help me.	Fam	1	2	3	4	5	6	7
4.	I get the emotional help and support I need from my family.	Fam	1	2	3	4	5	6	7
5.	I have a special person who is a real source of comfort to me.	SO	1	2	3	4	5	6	7
6.	My friends really try to help me.	Fri	1	2	3	4	5	6	7
7.	I can count on my friends when things go wrong.	Fri	1	2	3	4	5	6	7
8.	I can talk about my problems with my family.	Fam	1	2	3	4	5	6	7
9.	I have friends with whom I can share my joys and sorrows.	Fri	1	2	3	4	5	6	7
10	There is a special person in my life who cares about my feelings.	SO	1	2	3	4	5	6	7
11.	My family is willing to help me make decisions.	Fam	1	2	3	4	5	6	7
12.	I can talk about my problems with my friends.	Fri	1	2	3	4	5	6	7

 The items are divided into three sources of social support, namely family (Fam), friends (Fri) and significant other (SO). Here family includes spouse, parents, grandparents, children, or siblings. Significant other includes neighbors or health care personnel or any other person besides your family members or friends.

Part IV: Moorong Self-efficacy Scale (MSES)

Please rate how certain you are that you can do the following things at present, despite your disability. Indicate your answer circling one of the numbers on the scale under each item, where 1 = very uncertain and 7 = very certain.

1.   I can maintain my personal hygiene with or without help.

1	2	3	4	5	6	7

   very uncertain   very certain

2.   I can avoid having bowel accidents.

1	2	3	4	5	6	7

   very uncertain   very certain

3.   I can participate as an active member of the household.

1	2	3	4	5	6	7

   very uncertain   very certain

4.   I can maintain relationships in my family.

1	2	3	4	5	6	7

   very uncertain   very certain

5.   I can get out of my house whenever I need to.

1	2	3	4	5	6	7

   very uncertain   very certain

6.   I can have a satisfying sexual relationship.

1	2	3	4	5	6	7

   very uncertain   very certain

7.   I can enjoy spending time with my friends.

1	2	3	4	5	6	7

   very uncertain   very certain

8.   I can find hobbies and leisure pursuits that interest me.

1	2	3	4	5	6	7

   very uncertain   very certain

9.   I can maintain contact with people who are important to me.

1   2   3   4   5   6   7
very uncertain   very certain

10.   I can deal with unexpected problems that come up in life.

1   2   3   4   5   6   7
very uncertain   very certain

11.   I can imagine being able to work at some time in the future.

1   2   3   4   5   6   7
very uncertain   very certain

12.   I can accomplish most things I set out to do.

1   2   3   4   5   6   7
very uncertain   very certain

13.   When trying to learn something new, I will persist until I am successful.

1   2   3   4   5   6   7
very uncertain   very certain

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
very uncertain   very certain

15.   I can maintain good health and well-being.

1   2   3   4   5   6   7
very uncertain   very certain

16   I can imagine having a fulfilling lifestyle in the future.

1   2   3   4   5   6   7
very uncertain   very certain

TOTAL SCORE : _____

Part V: Intrinsic Spirituality Scale (ISS)

For the following six questions, spirituality is defined as one's relationship to God, or whatever you perceive to be ultimate Transcendence.

The questions use a sentence completion format to measure various attributes associated with spirituality. An incomplete sentence fragment is provided, followed directly below by two phrases that linked to the scale ranging from 0 to 10. The phrases, which complete the sentence fragment, anchor each end of the scale. The 0 to 10 range provides you with continuum on which to reply, with 0 corresponding to absence or Zero amount of attribute, while 10 corresponds to the maximum amount of the attributes. In other words, the end points represent extreme values, while five corresponds to a medium or moderate amount of attribute. Please circle the number along the continuum that best reflects your initial feeling.

1. In terms of questions I have about my life, spirituality answers

   No   absolutely all
   questions   my questions

      0   1   2   3   4   5   6   7   8   9   10

2. Growing spirituality is
   More important than
     anything else   of no
       in my life   importance to me

     10   9   8   7   6   5   4   3   2   1   0

3. When I am faced with an important decision, my spirituality
   Play no role   Is always the overriding
   absolutely   consideration

      0   1   2   3   4   5   6   7   8   9   10

4. Spirituality is
   The master motive of my
   life, directing every other   not part of
      aspect of my life   my life

     10   9   8   7   6   5   4   3   2   1   0

5. When I think of the things that help me to grow and mature as a person, my spirituality

Has no effect   is absolutely the most
on my personal   important factor in
  growth   my personal growth

    0   1   2   3   4   5   6 7   8   9   10

6. My spiritual beliefs affect

Absolutely every   no aspect
aspect of my life   of my life

    10   9   8   7   6   5   4   3   2   1   0

Part VI: Patient Health Questionnaire-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? Tick (√) the number that best indicates your answer.

		Not at all	Several days	More than half the days	Nearly every day
1.	Little interest or pleasure in doing things	0	1	2	3
2.	Feeling down, depressed, or hopeless	0	1	2	3
3.	Trouble falling or staying sleep, or sleeping too much	0	1	2	3
4.	Feeling tired or having little energy	0	1	2	3
5.	Poor appetite or over eating	0	1	2	3
6.	Feeling bad about yourself- or that you are a failure or have let yourself or your family down	0	1	2	3
7.	Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8.	Moving or speaking so slowly that other people could have noticed? Or the opposite- being so fidgety or restless that you have been making around a lot more than usual	0	1	2	3
9.	Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
	Total score	……	…….	…….	……..

APPENDIX C

Test of Assumptions

Table 12

Assumptions of Normality by Skewness and Kurtosis of Study Variables

Variables	Skewness/SE	$Z_{skewness}$	Kurtosis/SE	$Z_{kurtosis}$	Distribution
Resilience	.208/.266	.78	-.710/.526	-1.34	Normal
Social support	-.393/.266	-1.47	-.394/.526	-.74	Normal
Self-efficacy	-.521/.266	-.1.96	-.507/526	0.00	Normal
Spirituality	-.590/.266	-2.21	-.498/.526	-.94	Normal
Depressive mood	.419/.266	1.57	-.020/.526	-.03	Normal
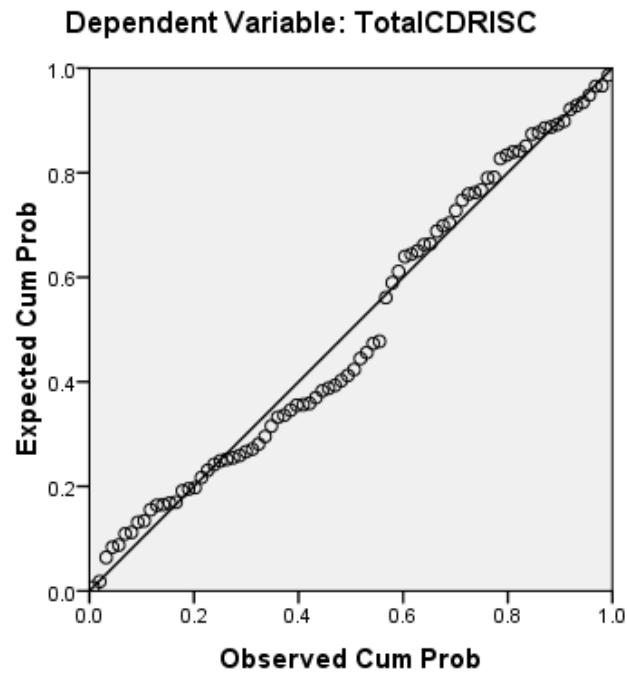
Figure 3. Normality P-P plot
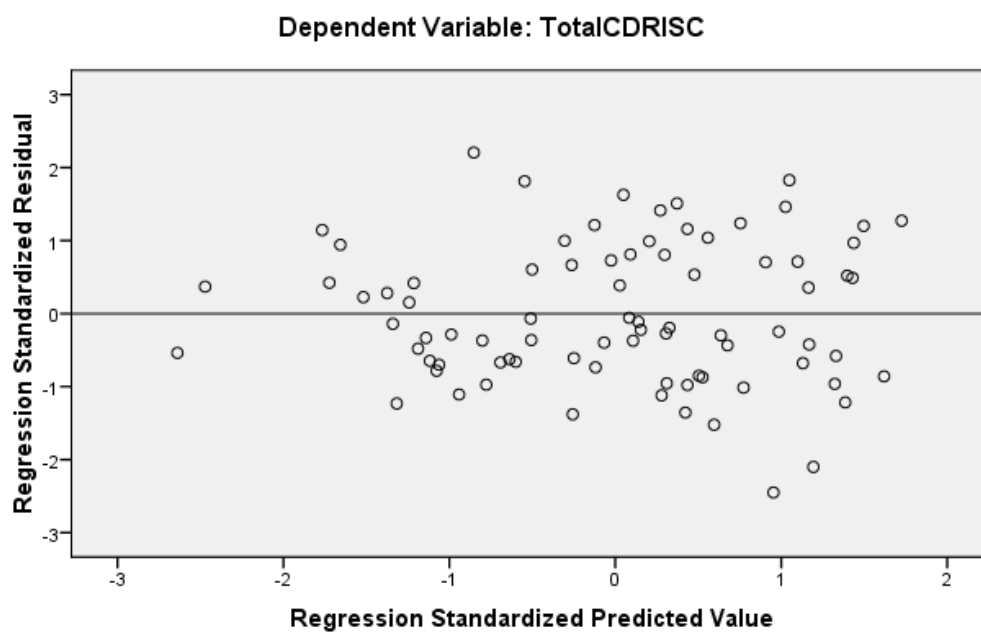
Figure 4. Scatterplot of the regression standardized residual and regression standardized predicted value

APPENDIX D

Additional Analyses

Table 13

Univariate Analysis of Resilience by Demographic and Injury-related Characteristics

of Participants (N = 82)

Variables	*N*	*M (SD)*	*Statistics*	*p*
Age			$F = .38$	.69
18-30 years	32	66.09 (14.59)		
31-45 years	35	64.94 (13.19)		
46-60 years	14	62.14 (15.44)		
60+ years[a]	1	52.00		
Gender			$t = -4.80$	.000
Female	34	56.91 (11.96)		
Male	48	70.31 (12.75)		
Religion			$F = .48$	.61
Hindu	53	63.64 (14.67)		
Buddhist	17	67.23 (11.88)		
Christian	12	66.16 (14.42)		
Ethnicity			$F = .30$	.90
Brahmin	13	65.15 (17.29)		
Chhetri	17	66.76 (14.95)		
Newar	14	63.14 (12.60)		
Tamang	15	61.53 (10.86)		
Magar/Gurung	12	66.67 (11.92)		
Others	11	65.55 (17.82)		
Marital status			$F = 1.20$	.30
Single	26	66.50 (13.34)		
Married	50	64.82 (14.58)		
Widowed/ Separated	6	56.66 (10.81)		
Educational status			$F = 1.8$	.15
Illiterate	30	60.26 (13.61)		
Primary level	12	66.41 (14.84)		
Secondary level	22	68.77 (14.42)		
Higher level	18	66.22 (12.69)		
Occupational status			$t = -2.45$	.016
Unemployed	61	62.59 (14.00)		
Employed	21	71.04 (12.36)		

Table 13 (continued)

Variables	N	M(SD)	Statistics	p
Income (Nepali currency)[b]			$F = 1.20$	.31
No income	55	62.85 (14.45)		
Below Rs. 10,000	12	66.91 (12.12)		
Rs. 10,000-20,000	9	68.66 (12.70)		
Above Rs. 20,000	6	72.00 (14.36)		
Area of approach			$t = .61$	.53
Rehabilitation center	6	68.16 (17.08)		
Community	76	64.48 (13.85)		
Level of injury			$t = -3.93$	.009
Quadriplegia	4	53.25 (5.25)		
Paraplegia	78	65.34 (14.09)		
Completeness of injury			$t = .79$	.43
Complete	29	66.41 (14.04)		
Incomplete	53	63.84 (14.06)		
Presence of co-morbidities			$t = .95$	.34
No	66	65.48 (14.04)		
Yes	16	61.75 (14.01)		
Presence of complications			$t = 1.9$	.05
No	9	73.33 (12.44)		
Yes	73	63.69 (13.92)		
Re-attended rehabilitation			$t = -.85$	.39
No	63	64.03 (13.64)		
Yes	19	67.15 (15.37)		
Caretakers			$F = .97$	.38
Self-care (No caregivers)	26	67.38 (13.23)		
Family members	53	63.19 (14.49)		
Institutional caregivers	3	69.67 (11.59)		

Note. [a] this age group has only one sample; therefore, could not compare mean resilience; [b] 1 USD = Nepalese Rupee (Rs.) 106.78

Table 14

Descriptive Statistics of Resilience (N = 82)

	Resilience items	M	SD
1.	Able to adapt to change	2.67	.87
2.	Close and secure relationships	3.20	1.10
3.	Sometimes fate or God can help	2.44	1.42
4.	Can deal with whatever comes	2.52	1.11
5.	Past success gives confidence for new challenge	2.20	1.03
6.	See the humorous side of things	2.50	1.06
7.	Coping with stress strengthens	2.44	1.17
8.	Tends to bounce back after illness or hardship	2.17	1.10
9.	Things happen for a reason	2.80	.94
10.	Best effort no matter what	3.05	.85
11.	I can achieve my goal	2.83	1.04
12.	When things look hopeless, I don't give up	2.70	1.24
13.	Know where to turn for help	2.73	.84
14.	Under pressure, can focus and think clearly	2.00	1.10
15.	Prefer to take the lead in problem solving	2.76	1.17
16.	Not easily discouraged by failure	2.51	1.13
17.	Think of self as strong person	2.95	.85
18.	Make unpopular or difficult decision	2.12	.98
19.	Can handle unpleasant feelings	2.54	1.09
20.	Have to act on a hunch	2.22	.98
21.	Strong sense of purpose	2.54	1.00
22.	In control of my life	2.27	1.21
23.	I like challenges	2.17	1.21
24.	I work to attain my goals	3.02	1.00
25.	Pride in my achievements	3.41	.66

Table 15

Descriptive Statistics of Social Support (N = 82)

	Social support items	M	SD
1.	Have special person around in need	4.35	1.59
2.	Have special person to share joys and sorrows	4.30	1.60
3.	Family really tries to help	6.32	1.06
4.	Get emotional help and support from family	6.32	1.12
5.	Special person who is a real source of comfort	4.49	1.51
6.	Friends really try to help	4.99	1.48
7.	Count on friends when things go wrong	4.71	1.30
8.	Can talk about problems with family	6.22	1.26
9.	Have friends to share joys and sorrows	5.23	1.36
10.	Special person who cares about feelings	4.24	1.59
11.	Family willing to help make decisions	6.20	1.15
12.	Can talk about problems with friends	5.38	1.43

Table 16

Descriptive Statistics of Self-efficacy (N = 82)

	Self-efficacy items	M	SD
1.	Can maintain personal hygiene with or without help	6.02	1.29
2.	Can avoid having bowel accidents	4.66	2.37
3.	Can participate as an active member of household	4.45	1.86
4.	Can maintain relationships in family	5.94	1.42
5.	Can get out of house whenever need to	4.72	2.10
6.	Can maintain a satisfying sexual relationship	3.32	2.15
7.	Can enjoy spending time with friends	6.22	1.26
8.	Can find hobbies and leisure pursuits	4.59	1.44
9.	Can maintain contact with people who are important	5.85	1.11
10.	Can deal with unexpected problems that come up in life	4.62	1.63
11.	Can imagine being able to work at some time in the future	4.95	2.01
12.	Can accomplish most things set out to do	5.21	1.28
13.	When trying to learn something new, will persist until get success	5.60	1.31
14.	Able to make first contact with someone whom would like to meet	5.73	1.21
15.	Can maintain good health and well-being	5.07	1.56
16.	Can imagine fulfilling lifestyle in the future	4.68	1.87

Table 17

Descriptive Statistics of Spirituality (N = 82)

	Spirituality items	*M*	*SD*
1.	Spirituality answers questions about life	6.13	3.09
2.	Growing spirituality is important in life	6.17	2.95
3.	Spirituality play role while facing with an important decision	6.13	3.13
4.	Master motive of life, directing other aspects of life	6.28	2.94
5.	Thing that help to grow and mature as a person	6.00	2.99
6.	Spiritual belief affect every aspect of life	6.33	3.12

Table 18

Descriptive Statistics of Depressive Mood (N = 82)

	Depressive mood items	*M*	*SD*
1.	Little interest or pleasure in doing things	.77	.82
2.	Feeling down, depressed, or hopeless	1.09	.82
3.	Trouble falling or staying sleep, or sleeping too much	1.00	1.03
4.	Feeling tired or having little energy	1.11	.87
5.	Poor appetite or over eating	.76	.88
6.	Feeling bad about yourself	1.24	1.03
7.	Trouble concentrating on things	.91	.99
8.	Moving or speaking so slowly or being so fidgety or restless	.90	.93
9.	Thoughts that would be better off dead or of hurting ownself	.98	.96

APPENDIX E

Approval Letters

1. Ethical Approval From the Faculty of Nursing, Prince of Songkla University

Certificate of Approval of Human Research Ethics
The Ethics Committee Faculty of Nursing, Prince of Songkla University

Document Number: NREC 2016_035

Research Title: Determinants of Resilience in People Who Sustained Spinal Cord Injury from Earthquake in Nepal

Research Code: 2016-02-I-028

Principal Investigator: Ms.Muna Bhattarai

Workplace: Master in Nursing Science (International) Faculty of Nursing, Prince of Songkla University

Approved Document: 1. Human Subjects
2. Invitation and Informed Consent
3. Instrument

Approved Date: 14 November 2016

Expiration Date: 14 November 2018

The Ethics Committee of Faculty of Nursing, Prince of Songkla University approved for Ethics of this research in accordance with Declaration of Helsinki.

(Assoc. Prof. Dr. Aranya Chaowalit)
Dean, Faculty of Nursing

2. Ethical Approval from Nepal Health Research Council, Nepal

Government of Nepal
Nepal Health Research Council (NHRC)

Ref. No.: 999

08 December 2016

Ms. Muna Bhattarai
Principal Investigator
Prince of Songkla University
Thailand

Subject: Approval of Research Proposal entitled **Determinants of resilience in people who sustained Spinal cord injury from earthquake in Nepal**

Dear Ms. Bhattarai

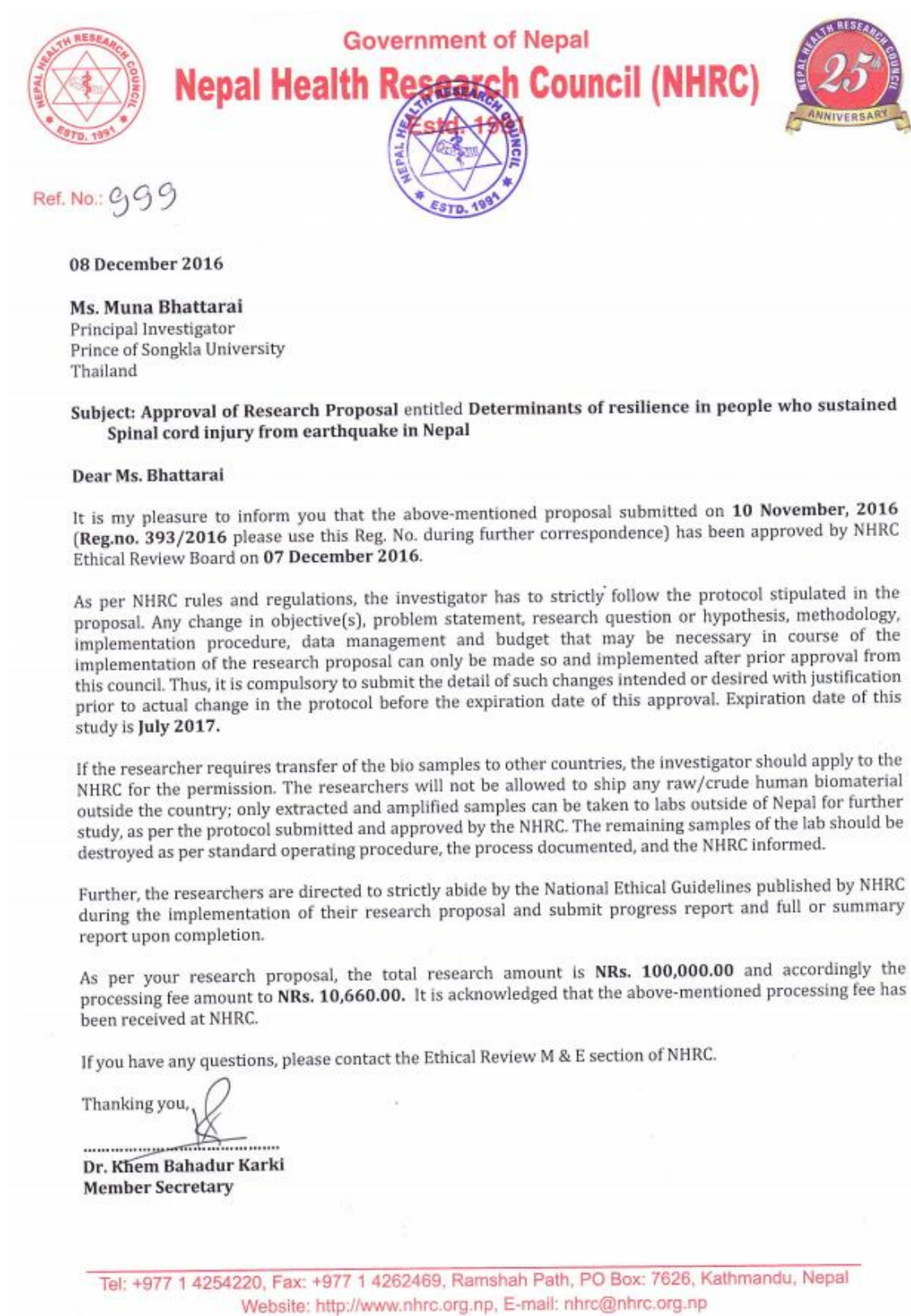It is my pleasure to inform you that the above-mentioned proposal submitted on **10 November, 2016** (**Reg.no. 393/2016** please use this Reg. No. during further correspondence) has been approved by NHRC Ethical Review Board on **07 December 2016.**

As per NHRC rules and regulations, the investigator has to strictly follow the protocol stipulated in the proposal. Any change in objective(s), problem statement, research question or hypothesis, methodology, implementation procedure, data management and budget that may be necessary in course of the implementation of the research proposal can only be made so and implemented after prior approval from this council. Thus, it is compulsory to submit the detail of such changes intended or desired with justification prior to actual change in the protocol before the expiration date of this approval. Expiration date of this study is **July 2017.**

If the researcher requires transfer of the bio samples to other countries, the investigator should apply to the NHRC for the permission. The researchers will not be allowed to ship any raw/crude human biomaterial outside the country; only extracted and amplified samples can be taken to labs outside of Nepal for further study, as per the protocol submitted and approved by the NHRC. The remaining samples of the lab should be destroyed as per standard operating procedure, the process documented, and the NHRC informed.

Further, the researchers are directed to strictly abide by the National Ethical Guidelines published by NHRC during the implementation of their research proposal and submit progress report and full or summary report upon completion.

As per your research proposal, the total research amount is **NRs. 100,000.00** and accordingly the processing fee amount to **NRs. 10,660.00.** It is acknowledged that the above-mentioned processing fee has been received at NHRC.

If you have any questions, please contact the Ethical Review M & E section of NHRC.

Thanking you,

....
Dr. Khem Bahadur Karki
Member Secretary

3. Letter of Permission for Data Collection From Spinal Injury Rehabilitation
Center, Kavre, Nepal

स्पाइनल इन्जरी पुनर्स्थापना केन्द्र
Spinal Injury Rehabilitation Centre
(Run by Spinal Injury Sangh Nepal)

Ref. No. : 119/073/74

Date: November 11, 2016

Miss Muna Bhattarai

Re: Permission to collect data for thesis

Following the careful consideration by the Research and Development Committee (Ethics), I am delighted to inform you that the committee has given you approval for collecting data for your thesis of "Degree of Master of Nursing Science in Prince of Songkla University, Thailand" regarding "Determinants of resilience in people who sustained spinal cord injury from earthquake in Nepal".

Your guide for this work at SIRC would be Miss Mandira Baniya, Nursing Supervisor, SIRC. She will be monitoring your data collection at SIRC.

We would also like to kindly request you to kindly submit a copy of your final thesis report.

Yours Sincerely,

Dr. Anil B. Shrestha

Chair Person

Research and Development Committee

Head Office - Patan Dhoka Lalitpur, Branch Office - Bhainsepati, Sanga, Kavre, Nepal, Phone No.:- 011-660847/ 660848,
Fax No.:011-660847, P. O. Box. No.:-13815, E-mail:- spinalinju@wlink.com.np, Website: www.sirc.org.np

4. Letter of Completion of Data Collection From Spinal Injury Rehabilitation Center, Kavre, Nepal

स्पाइनल इन्जरी पुनर्स्थापना केन्द्र
Spinal Injury Rehabilitation Centre
(Run by Spinal Injury Sangh Nepal)

Ref no 192/073/074

February 15, 2017

To Whom It May Concern

It is pleasure to inform that **Miss Muna Bhattarai**, a final year student of M sc Nursing from Prince of Songkla University, Thailand, has completed the pretest of her research entitled **"Determinants of Resilience in People who Sustained Spinal Cord injury from Earthquake in Nepal"** From December 8 to December 13, 2016. Spinal Injury Rehabilitation Centre (SIRC) provided contact details of all potential participants to her. She has conducted data collection in the SIRC and community setting from December 15, 2016 to February 10, 2017 The finding of this study will be beneficial in identifying the level of adjustment ability and factors influencing the resilience of people who sustained SCI from the earthquake in Nepal consequently enhancing the effectiveness of rehabilitation.

We wish for the successful completion of her thesis

Thank you

Durga Prasad Bhattarai
Research and Development Officer
Spinal Injury Rehabilitation Centre
Sanga, Kavre

Head Office - Patan Dhoka Lalitpur, Branch Office - Bhainsepati, Sanga, Kavre, Nepal, Phone No.:- 011-660847/ 660848, Fax No.:011-660847, P. O. Box. No.:-13815, E-mail:- spinalinju@wlink.com.np, Website: www.sirc.org.np

APPENDIX F

Permission to Translate and Use Research Instruments

1. Permission for Connor-Davidson Resilience Scale

Re: Contact Form submitted

Jonathan Davidson, M.D. <jonathan.davidson@duke.edu>   6/1/16

Dear Muna:

Thank you for your inquiry. We would be pleased to provide the CD-RISC and enclose an agreement for you to sign and return. We do ask for payment of a $10 processing fee, if that is possible, to help cover our administrative costs of managing the scale.

Do you wish to use the Nepali version? We can supply this for the CD-RISC-10.

With kind regards,

Jonathan Davidson

_____

Form details below.

Name: Muna Bhattarai
Email: bhattarai.moona@gmail.com
Contact number: 0955890822
Message: I am from Nepal and currently studying Master in Nursing Science in Thailand. In order to fulfill the requirement of my thesis, I have planned to conduct study on \" resilience in people who sustained SCI from Nepal earthquake\". Therefore, I would like to request for this tool. Thank you

Re: Request Form from: Muna Bhattarai

Jonathan Davidson, M.D. <jonathan.davidson@duke.edu>   6/2/16

to me

Hello Muna:

I just received your email to Dr. Campbell-Sills, and am enclosing an amended agreement to provide the scale at no cost. If you can sign and return it, then we'll

forward the scale. Is it the CD-RISC-10 version that you want to use?

Sincerely,

Jonathan Davidson

---

muna bhattarai <bhattarai.moona@gmail.com>   6/2/16

to Jonathan

Dear Dr. Davidson

 Thank you so much for providing me the scale free of cost. I greatly appreciate your help. I would like to use the CD-RISC-25 for my study. I will sign and return the form soon. Thank you again

Best Regards,
Muna Bhattarai

Re: Nepali translation of CD-RISC

Jonathan Davidson, M.D. <jonathan.davidson@duke.edu>   10/8/16

to me

Dear Muna:

Thank you for your email. I am enclosing the word.doc and pdf forms. The pdf is the one we like you to use. The word.doc is handy to keep on file in case there's need for any other alterations. In fact, if you can translate all the copyright terms into Nepali, rather than keeping it in English, it is more likely that users of the scale will know what it says, since I expect many of them may not understand English. Would that be possible? I'm also attaching the manual in case you do not have that.

All the best,

Jonathan

2. Permission for Multidimensional Scale of Perceived Social Support

Ask permission to use MSPSS

muna bhattarai <bhattarai.moona@gmail.com>   9/3/16

to gzimet

Dear Dr. Zimet,

First of all, I would like to introduce myself; my name is Muna Bhattarai from Nepal. Currently, I am studying Master of Nursing Science in Prince of Songkla University, Thailand. To fulfill the course requirement, I am conducting thesis on "Determinants of resilience in people with SCI in Nepal". In order to assess social support as one of the variables in my study, I am willing to use the Multidimensional Scale of Perceived Social Support (MSPSS). Therefore, I would like to ask your permission to translate and use this tool in my study. I will be grateful to your support. Thank you so much.

Best Regards,
Muna Bhattarai

Zimet, Gregory D <gzimet@iu.edu>   9/3/16

to me

Dear Muna Bhattarai,

You have my permission to translate and use the MSPSS in your research study. I have attached a copy of the original English language version of the scale, which includes scoring information on the second page, as well as a document listing several of the articles that have reported on the reliability and validity of the MSPSS. Also attached is an article on which I am a co-author that reports on a Nepali translation of the MSPSS. The first author, Dr. Kareen Tonsing, is now a faculty member at Oakland University in Rochester, Minnesota, USA. She may be able to provide you with the Nepali translation. Her email address is: kareentonsing@oakland.edu.

I hope your research goes well.

Best regards,
Greg Zimet

==
Gregory D. Zimet, PhD, FSAHM
Professor of Pediatrics & Clinical Psychology

Section of Adolescent Medicine
Indiana University School of Medicine
410 W. 10th Street, HS 1001
Indianapolis, IN 46202   USA
Phone: +1-317-274-8812
Fax: +1-317-274-0133
e-mail: gzimet@iu.edu

President, Society for Adolescent Health and Medicine (SAHM)

3 Attachments

muna bhattarai <bhattarai.moona@gmail.com>   9/4/
                                                                    16

to Gregory

Dear Professor Zimet,

   Thank you very much for the immediate response. I am grateful to you for your permission to use the MSPPS in my study. I am glad to get information about the tool in Nepali version. I will send email to Dr. Kareen for this. Thank you so much once again. Have a wonderful day.

Best regards,
Muna Bhattarai

Re: Request for the MSPSS_N

Kareen Tonsing <kareentonsing@oakland.edu>   9/6/1
                                                                        6

to me

Hello Muna,

I am pleased to share the MSPSS-N with you. Enclosed is a copy of the scale. Wishing you all the best in your studies.

Sincerely,
Kareen

On Sat, Sep 3, 2016 at 10:21 PM, muna bhattarai <bhattarai.moona@gmail.com> wrote:
Dear Dr. Tonsing,

   My name is Muna Bhattarai and I am from Nepal. Currently, I am doing Master in Nursing Science in Prince of Songkla University, Thailand. To fulfill the course

requirement, I am conducting thesis on "Determinants of resilience in people who sustained SCI in Nepal". I am willing to use the Multidimensional Scale of Perceived Social Support (MSPSS) to measure social support in my study. For this, I asked permission with Professor Zimet. He allowed me to use this tool and suggested me to ask you for the Nepali version of the MSPSS. Therefore, I would like to request you to provide MSPSS-N if possible. I will be grateful to your help and looking forward to hear from you.
Thank you so much

Best Regards,
Muna Bhattarai

Attachments area

muna bhattarai <bhattarai.moona@gmail.com>   9/7/
                                                                                    16

to Kareen

Dear Dr. Kareen,

     Thank you so much. I am grateful to your help. I am feeling jubilant to get Nepali version of MSPSS.
Have a wonderful day.

Best regards,
Muna Bhattarai

3. Permission for Moorong's Self-efficacy Scale

Request for the MSES

muna bhattarai <bhattarai.moona@gmail.com> 6/3/16

to j.middleton

Dear Dr. Middleton

 I am a student of Master of Nursing Science. I am from Nepal and currently studying master degree in Prince of Songkla University, Thailand. In order to fulfill the requirement of thesis, I am going to conduct study on " Resilience in people who sustained SCI from earthquake in Nepal (2015)". I am wanting to use the Moorong Self-efficacy Scale; however, I am worried whether I can use this scale or not. Therefore, humbly, I would like to ask for your help to access this tool. I would be grateful If you could help me. I am looking forward to hear you. Thank You

Best Regards,
Muna Bhattarai

James Middleton <james.middleton@sydney.edu.au> 6/5/16

to Ashley, me

Dear Ms Bhattarai,

I would be happy for you to use the MSES in your studies, as long as you intend to use a proper translation process that involves independent forward and backward translation steps to ensure correct and accurate translation.

I would be most interested to hear more about what you are planning, and have also cc'd my close academic colleague, Professor Ashley Craig, who is a clinical psychologist and expert in resilience research, as well as self-efficacy and other psychological constructs, including depression, anxiety, pain and fatigue.

Kind regards, James.

Associate Professor James W Middleton *MBBS, PhD, GradDipExSpSci, FAFRM(RACP), FACRM*
John Walsh Centre for Rehabilitation Research | Sydney Medical School-Northern
THE UNIVERSITY OF SYDNEY
Kolling Institute of Medical Research, Level 12 | Royal North Shore Hospital | St Leonards| NSW | 2065 | AUSTRALIA
T +61 2 9926 4962| **F**+61 2 9926 4045
E james.middleton@sydney.edu.au | **W** **http://www.rehab.med.usyd.edu.au**

From: muna bhattarai [mailto:bhattarai.moona@gmail.com]
Sent: Friday, 3 June 2016 2:04 PM
To: James Middleton
Subject: Request for the MSES

muna bhattarai <bhattarai.moona@gmail.com>   6/5/
                                                                16

to James

Dear Dr. Middleton,

Thank you very much for granting me permission to use your tool. I am feeling glad to know about Dr Craig. I have read his book and articles related to resilience.

I have just started developing proposal. I am willing to assess resilience, self-efficacy, and depression in people who sustained SCI from earthquake of Nepal in April 2015. It's my pleasure so I will share more about my work after I complete proposal.

I searched the MSES but could not find original scale. Therefore, if it is possible, I would like to request you to send the scale. I will translate and back-translate the scale with the help of language experts from Nepal. I believe that you do not mind if I ask for your help in the future. I am looking forward to hearing from you.
Thank You

With best regards,

Muna Bhattarai

James Middleton <james.middleton@sydney.edu.au>   6/6/1
                                                                6

to me

Dear Muna

Please find original MSES scale attached.

Regards, James.

From: muna bhattarai [mailto:bhattarai.moona@gmail.com]
Sent: Sunday, 5 June 2016 6:30 PM
To: James Middleton
Subject: Re: Request for the MSES

Attachments area

4. Permission for Intrinsic Spirituality Scale

muna bhattarai <bhattarai.moona@gmail.com>   7/29/16

to Simon

Dear Dr. Driver,

       I am grateful to you as you helped me a lot to access articles. I need your help once again. As I mentioned previously, I am conducting thesis on "Determinants of resilience among SCI people in Nepal". I am wanting to use "Intrinsic spirituality scale (ISS)" which has been used in your study. However, I could not get authors email ID to take permission. I also tried to contact press, but could not do it. Therefore, I would like to request you to provide me information about the way of getting permission for this. I look forward to hear from you. Thank you so much.

Sincerely,

Muna Bhattarai

Driver, Simon J <SJDriver@bir-rehab.com>   7/29/16

to me

Muna:
The ISS is described, presented and available in the original article and it is not copyrighted. Good luck.

Hodge, D. R. (2003). The Intrinsic Spirituality Scale: A new six-item instrument for assessing the salience of spirituality as a motivational construct. *Journal of Social Service Research, 30,* 41–61.
Regards

Simon Driver, Ph.D
Director of Rehabilitation Research
Ginger Murchison Chair in Traumatic Brain Injury Research
Baylor Institute for Rehabilitation
909 N. Washington, Dallas, TX 75246
Tel: 214-820-9014

Clinical Associate Professor, Department of Internal Medicine, Texas A&M University

5. Permission for Patient Health Questionnaire-9

Ask permission

muna bhattarai <bhattarai.moona@gmail.com>   7/29/16

to kkroenke

 Dear Dr. Kroenke,

      I am Muna Bhattarai from Nepal. Currently, I am doing Master in Nursing Science in Thailand. To fulfill the course requirement of thesis, I am conducting study on " Determinants of resilience among SCI people in Nepal'. For this purpose, I am wanting to use the tool "The Patient Health Questionnaire (PHQ-9)" in my study. I tried to contact Dr. Spitzer to ask permission to use this tool; however, I could not get reply. Therefore, humbly, I would like to request you to grant me permission to translate and use this tool in my study. I am looking forward to hear from you. Thank you

Sincerely,
Muna Bhattarai

Burgett, Donna F <dfburget@regenstrief.org>   7/30/16

to me

Hello,

The PHQ is now in public domain and freely available for use. Copies of the PHQ family of measures, including the GAD-7 are available at the
website: www.phqscreeners.com. Also, translations, a bibliography, an instruction manual (with scoring information) and other information are also provided on the website.

Kind regards,
   Donna

From: Kroenke, Kurt
Sent: Friday, July 29, 2016 9:14 AM
To: Burgett, Donna F <dfburget@regenstrief.org>
Subject: FW: Ask permission

Kurt Kroenke, MD
Professor of Medicine, Indiana University
Research Scientist

APPENDIX G

List of Experts for Validation

Three experts who validated the content of the instruments were:

1. Dr. Nopporn Tantitangsee

   Psychiatrist, Songkhla Rajanagarindra Psychiatric Hospital, Thailand

   Email: nopporntan@hotmail.com

2. Asst. Prof. Dr. Orawan Nukaew

   Nursing Lecturer, Faculty of Nursing, Prince of Songkla University, Thailand

   Email: orawan.n@psu.ac.th

3. Anup Raj Bhandari

   Clinical Psychologist, Patan Hospital, Kathmandu, Nepal

   Grande International Hospital, Kathmandu, Nepal

   Email: anup.simpsn@gmail.com

APPENDIX H

List of Instruments Translators

Three experts who translated the instruments were:

1. Bidur Parajuli, MA Sociology

   Lecturer

   Kumarwarti Multiple Campus, Nawalparasi, Nepal

2. Gobind Pant, MPH

   Lecturer

   Nepal Institute of Health Sciences, Kathmandu, Nepal

3. Sunita Shrestha, MA Psychology, PBBN

   Registered Nurse

   Nepal Army Hospital, Nepal

VITAE

Name	Miss Muna Bhattarai
Student ID	5810420006

Educational Attainment

Degree	Name of Institutions	Year of Graduation
Post Basic Bachelor of Nursing (PBBN)	Nepal Institute of Health Sciences, Kathmandu, Nepal	2012
Proficiency Certificate Level (PCL) Nursing	College of Medical Sciences- Teaching Hospital, *Chitwan, Nepal*	2004

Scholarship Award During Enrolment

Thailand's Educations Hub for Southern Regions of ASEAN Countries (TEC-AC) scholarship, Graduate School, Prince of Songkla University, Thailand

Working Experiences

Nursing Instructor, Faculty of Nursing, Nepal Institute of Health Sciences, Jorpati, Kathmandu, Nepal (April 2013 to July 2015)

Staff Nurse, College of Medical Sciences- Teaching Hospital, Bharatpur, Nepal (June 2005 to November 2010)

List of Publication and Proceeding

Bhattarai, M., Maneewat, K., Sae-Sia, W. (in press). Determinants of resilience among people who sustained spinal cord injury from the 2015 earthquake in Nepal. *Spinal Cord*.