HAIGAZIAN UNIVERSITY

The Relation Between Coping Styles and Posttraumatic Stress and Growth Among Lebanese Nurses

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A Thesis submitted to the Faculty of Social and Behavioral Sciences in partial fulfillment of the requirements for the Master of Art in Psychology – Emphasis: Clinical at Haigazian University.

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The Relation Between Coping Styles and Posttraumatic Stress and Growth Among Lebanese Nurses

By Elie Sarkis

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DEDICATION

This dissertation is dedicated to all nurses fueling their efforts with compassion. This dedication is made in the hopes of nurses getting their due rights.

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List of abbreviations

COVID-19…….Corona Virus Disease 19

HCW……..Healthcare Workers

PCL5……..…PTSD Checklist for DSM-5

PTG……Posttraumatic Growth

PTGI…….. Posttraumatic Growth Inventory

PTS…….……..Posttraumatic Stress

PTSD……..Posttraumatic Stress Disorder

Abstract

A coping style is the type of strategy used to reactively manage emotional distress in response to a stressor (Xiong et al., 2020). Coping style can be *adaptive*, whereby appropriate approaches are employed, or *maladaptive*, whereby unhealthy, or harmful methods are used (Lazarus & Folkman, 1986). Coping styles have been studied in relation to posttraumatic outcomes including post-traumatic stress (PTS) and growth (PTG), and many other predictors. However, recent events including the eruption of the COVID-19 pandemic and the August 4th explosion in Beirut have called for investigation of these models among Lebanese nurses. Therefore, the aim of this study was to investigate the influence of coping styles on posttraumatic growth and stress models among 130 nurses in Lebanon while moderating for the effect of proximity to the traumatic events. A study with a cross sectional design using 3 tools to measure PTS, PTG and coping styles were respectively PCL5, PTGI and BRIEF COPE .Results showed that only avoidant coping style was a significant positive predictor of PTS. Seeking social support and problem-solving coping styles were revealed to be significant predictors of PTG. The findings of this study can be used to empower nurse education programs and clinical interventions to shift their approach to dealing with trauma among this population by focusing more on posttraumatic growth (PTG).

Keywords: PTS, PTG, Trauma, Lebanon, Nurses

The Relation Between Coping Styles and Posttraumatic Stress and Growth Among Lebanese Nurses

The Coronavirus outbreak in 2019 (COVID-19) resulted in a pandemic with an unprecedented worldwide impact on mental health. The perpetual fear of a potentially life-threatening virus rendered people socially isolated, and the global economy stunted, leading to what is being called the "deepest global recession since the Second World War" (World Bank, 2020). Rising suicide rates have been reported in Germany, Pakistan, Italy, India, France, and the USA (Mamun and Ullah, 2020; Thakur and Jain, 2020). A recent systematic review of the existing literature on the psychological effects of COVID-19 reported increased rates of depression, stress, psychological distress, post-traumatic stress disorder and anxiety (Xiong et al., 2020).

In particular, healthcare workers (HCW), due to the nature of their work, have repeatedly exhibited elevated levels of post-traumatic stress symptoms (PTSS) during the COVID-19 pandemic, and this finding is consistent with research from the previous Severe Acute Respiratory Syndrome (SARS) epidemic in 2003 (Maunder et al., 2006) and the Middle Eastern Respiratory Syndrome (MERS) outbreak in 2012 (Lee et al., 2018). A recent study on HCW in Iran showed intrusion to be the most common symptom, followed by hyper-arousal and avoidance, respectively (Zandifar et al., 2020). In Lebanon, 59% of HCW showed acute distress, and about 35% demonstrated PTSS, which was most significantly found in nurses (Bizri et al., 2021).

However, research on the ways the general population is handling pandemic-related stress suggests that coping styles substantially influence psychological outcome (Jurado et al., 2021). For example, in a study conducted by Oflaz et al. (2008), they tested a psychoeducation intervention program on PTSS and coping styles for earthquake survivors in Turkey. Results showed that

avoidant coping style was positively associated with PTSD and depression outcomes and social support seeking skills increased with the administration of the intervention. Similarly, a study conducted by Oni et al. (2012) among pregnant women exposed to hurricane Katrina on the relationship between coping styles, PTSD and depression showed that avoidant coping style was associated with higher PTSD rates and positive thinking showed lower PTSD rates. Moreover, it is also believed that in certain situations, trauma can promote positive Post-Traumatic Growth (PTG) (Tedeschi & Calhoun, 1996), which is a process of adaptation wherein the traumatic experience is reevaluated. For instance, Peters et al. (2021) conducted a study to test the relationship between coping styles and trauma outcomes (PTG or PTS) in which they found that positive thinking is positively associated with growth but negatively related to PTSD symptoms. In addition to that, they also found that maladaptive coping styles are negatively associated with growth and positively associated with PTSD. More extensively, a meta-analysis conducted by Prati & Pietrantoni (2009) in which they presented results from 103 studies, showed that seeking social support coping was moderately associated with posttraumatic growth and positive thinking coping strategy showed the strongest relationship with posttraumatic growth.

Purpose of the Study

Based on the above briefly discussed review of literature, the purpose of this study was to investigate the different coping styles (Independent variables), in relation to PTG and PTS (Dependent variables) and compare their impact in a population of Lebanese nurses.

Research Questions

1) Which coping style is a predictor of PTSS among a sample of Lebanese nurses?
2) Which coping style is a predictor of PTG among a sample of Lebanese nurses?

Rationale

Throughout the COVID-19 pandemic, Lebanese HCW have shown to be a particularly vulnerable population for developing PTSS (Fawaz & Itani, 2021). Several factors mediate the tendency towards developing psychological outcomes, and coping style appears to be a dominant predictor. Since substance abuse is on the rise in Lebanon (Bizri et al., 2021), it was important to identify whether negative coping will lead to elevated levels of PTSS within a population of essential workers. Furthermore, HCW in Lebanon have undergone extensive traumas in the last year. Evidence suggests that prior trauma is associated with future PTG (Hamam et al., 2021). Therefore, this study aimed to examine not only whether different coping styles predicted PTSS but also PTG among Lebanese nurses, who have witnessed many traumas since the beginning of the pandemic.

Moreover, the study elucidated the reality and mental health needs of essential HCW, specifically nurses, in Lebanon. It aimed to identify those who are more susceptible to PTSS, allowing for early detection to avoid developing more severe disorders. This is crucial as some studies have shown that elevated acute stress associated with PTSS is likely to later lead to PTSD over time (Arora & Grey, 2020; Pappa et al., 2020).

Additionally, not many studies were conducted on the predictors of PTSS and PTG in Lebanon. Of these studies, the focus was mainly on the psychological flexibility (PF) components of growth rather than other predictors (Abboud & Al Jamil, 2017). Thus, this study sheds a light on different predictors such as coping styles that have been understudied in the Lebanese literature. Furthermore, many studies in Lebanon considered either clinical populations or student samples (Abboud & Al Jamil, 2017; Karam et al, 2008) which leaves the healthcare worker sample an understudied group.

Finally, considering recent events of the Beirut explosion on August 4, 2020, most of the Lebanese population experienced emotional and psychological distress (Moukaddem et al., 2020). Supporting that, the study of Al Hajj et al (2021) suggested that reports presented by the American University of Beirut Psychiatric clinic indicated an increase in psychological disorders following the Beirut Blast. Additionally, nurses being the frontlines of this disaster has made them more exposed to the psychological and physical distress imposed by the urgent care needs of those injured (Fawaz & Itani, 2021). Therefore, there is a need to investigate the following research questions in this sample.

Significance of the Study

Understanding predictive coping styles can shed light on types of interventions that can be used in the future. This population should be prioritized and provided with mental health support services. The results of this study could also help improve government healthcare policies and regulations related to mental health deterioration and burnout. Already, in collaboration with UNICEF and WHO, the Lebanese Ministry of Public Health has developed a National Mental Health Program (NMHP) that includes an action plan for psychosocial support as part of the COVID-19 response (Chammay & Roberts, 2020). The third goal of this action plan is to support frontline HCW. Hence, studies of this nature are well needed to design the most effective and targeted support programs.

Moreover, the need for investigation on coping styles is essential to bridge the gap and strengthen the connections made in the literature between PTG, PTSS and their predictors among Lebanese samples and particularly those of nurses. It also sets a stepping stone for future research to come up with more well-constructed holistic theoretical models that predict Posttraumatic stress

and Posttraumatic growth in a country where trauma research in the west have failed to replicate Moukaddem et al. (2020).

Chapter 2

Literature Review

The coronavirus began to spread in Lebanon against a backdrop of unparalleled political and economic crises. Overcrowding Syrian refugees, civil unrest, governmental instability, hyperinflation, unemployment, poverty, and the collapse of the banking sector were only further exacerbated by a calamitous explosion at the Beirut port on August 4th, 2020 (Khoury et al., 2020). The blast resulted in 218 deaths, over 5,000 injuries, and more than 300,000 homeless citizens (Bizri et al., 2020). What has been referred to as the "quadruple crises" has evoked unrelenting psychological sequelae related to collective trauma (Bizri et al., 2020). Bizri and colleagues (2020) report escalating rates of substance abuse as a means of coping with chronic stress and psychosocial adversity. They warn that the nation is vulnerable to addiction. Another study conducted on the general population during the pandemic found elevated rates of stress, anxiety, depression, and obsessive-compulsive traits (Othman et al. 2021). Post-traumatic stress symptoms (PTSS) were also found to have progressively increased in Lebanon during the early stages of the pandemic (Fawaz & Samaha, 2020). If Lebanese, in general, are suffering from PTSS due to the pandemic as well as the country's unprecedented economic and political instabilities, what can we say about the Lebanese nurses?

Lebanese Nurses

Nurses are supporting patients on the frontlines who are risking their lives in the process. They endure a tremendous amount of pressure and exhaustion amid social isolation to avoid infecting others (Brooks et al., 2020). HCW at large, including nurses, are also subjected to the social stigma of being perceived as '*infectious'*. To add to that, they regularly face ethical challenges in order to follow safety protocol all the while providing patients with the necessary

medical care (Jia et al., 2020). These adverse conditions cause detrimental consequences to their mental health. Moreover, nurses tend to seek help and receive psychological treatment at lower frequencies (Cai et al., 2020). Several large-scale recent surveys conducted in various countries showed high anxiety, insomnia, depressive symptoms and PTSD in HCW (Silva & Neto, 2021; Chew et al., 2020; Lai et al., 2020; Pappa et al., 2020). Nurses, in particular, have shown to be the most vulnerable HCW to experience PTSS (Bizri et al., 2021). This may be because nurses see patients more closely and frequently.

When compared with other medical professionals, nurses in Lebanon exhibited augmented rates of work-related burnout and depression (Talih et al., 2018). A qualitative study conducted shortly after the Beirut port explosion suggested that frontline nurses in Lebanon faced severe psychological trauma following the incident, which took place in the midst of the pandemic (Fawaz & Itani, 2021). Carryover effects of trauma were expected, especially that hospitals, treating hundreds of patients infected with COVID-19, suffered serious destruction to infrastructure, injuries, or death to staff members, and were quickly flooded with wounded patients (Abouzeid et al., 2020). The result was a heavily overwhelmed, understaffed, underfunded, and effectively crippled healthcare system (Human Rights Watch, 2020). Moreover, due to currency devaluation, imported supplies, such as personal protective equipment, are short and salaries have lost more than 80% of their values. For these reasons, many Lebanese HCW have migrated, leaving those left in Lebanon “overworked and underpaid”. Adding insult to injury, a third of the doctors and nurses interviewed by Human Rights Watch (2020) stated that they were subjected to physical as well as verbal abuse and attacks from frustrated patients, further threatening their safety at work (Human Rights Watch, 2020).

COVID-19, PTSD and PTSS

Post-Traumatic Stress Disorder (PTSD) was found to be amongst the most prevalent outcomes of COVID-19 (Zhang & Ma, 2020; Liu et al., 2020; Wang et al., 2020; González-Sanguino et al., 2020). According to Diagnostic and Statistical Manual of Mental Disorders (5th ed.), trauma is an emotional response to "actual or threatened death, serious injury, or sexual violence". Trauma can shatter one's sense of self and core beliefs, impact one's appraisal of themselves and others, and increase emotional distress (Boykin, Anyanwu, Calvin, & Orcutt, 2019). In the long term, flashbacks, unstable emotions, and psychosomatic symptoms cause strain to relationships as well as acute stress. In addition, individuals, as a result of trauma, can develop post-traumatic stress disorder (PTSD). In the DSM 5, symptoms of PTSD comprise of four categories: negative internal experiences such as intrusive memories known as flashbacks, physiological hyper-arousal, avoidance of traumatic stimuli and symptoms relating to alterations in negative cognitions and mood. Similarly, PTSS is the combination of the abovementioned symptoms following a traumatic event without formal diagnosis of an official mental disorder, which would take at least 6 months to establish (Fawaz & Samaha, 2020; Zandifar et al., 2020). In effect, PTSS is a precursor for a PTSD diagnosis.

In the general population, several studies found an increase in PTSD during the pandemic from 7% to 53.8% in several countries (Zhang & Ma, 2020; Liu et al., 2020; Wang et al., 2020; González-Sanguino et al., 2020). Notably, there is a great deal of heterogeneity in the research. The disparity in prevalence rates can be attributed to variations in measurement scales, reporting systems, and cultural differences.

Post-traumatic Growth

Traumatic events do not exclusively elicit negative psychological results. In fact, a growing body of evidence shows that, in certain situations, trauma can promote positive Post-Traumatic Growth (PTG) (Tedeschi & Calhoun, 1996). Some findings suggest that PTG is more likely to occur in individuals who experienced past trauma (Hamam et al., 2021). PTG, which is a process of adaptation wherein the traumatic experience is reevaluated. Growth requires deliberate cognitive restructuring, which allows for a better understanding of the event circumstances and promotes a positive outlook (Tedeschi & Calhoun, 1996). *Personal growth* can be demonstrated in terms of self-awareness and adopting a healthy lifestyle. *Social growth* can emerge as forming and cultivating relationships with others, and *spiritual growth* entails gratitude and appreciation (Lau et al., 2006).

Studies have shown that active and adaptive coping styles are positively associated with PTG (Ogińska-Bulik & Zadworna-Cieślak, 2018). It has been suggested that lengthy traumatic experiences allow professionals to learn coping skills, specifically cognitive restructuring (Moreno-Jiménez et al., 2021). Adaptive coping styles, namely help-seeking, showed to be associated with better wellbeing and quality of life in HCW during the pandemic; while negative coping styles, such as avoidance, showed to be associated with acute stress (McFadden et al., 2021). One study found that within adaptive styles, problem-focused approaches to the pandemic were associated with lower anxiety levels than emotion-focused coping in HCW (Subasi et al., 2021). An Italian study revealed that HCW were most inclined to use problem-focused coping, which similarly served as a protective factor against secondary trauma (Vagni et al., 2020). Another study found that both approaches concurrently are associated with the most resilience and well-being (Lorente et al., 2021).

Coping Styles

Different studies on the ways individuals are handling pandemic-related stress suggests that coping styles substantially influence psychological outcomes (Jurado et al., 2021). A coping style is the type of strategy used to reactively manage emotional distress in response to a stressor (Xiong et al., 2020). Coping style can be *adaptive*, whereby appropriate approaches are employed, or *maladaptive*, whereby unhealthy, or harmful methods are used (Lazarus & Folkman, 1986). Adaptive coping includes *emotion-focused* strategies, such as managing hostility, meditating and mindfulness practices, venting, seeking social support, positive reappraisal of stressor(s), and accepting responsibility. *Problem-focused* strategies include gathering information regarding the problem at hand, taking control, and evaluating pros and cons. Maladaptive coping styles include paranoid sensitization, anxious avoidance behaviors, escape behaviors, and dissociation, which is most significantly associated with PTSD (Xiong et al., 2020).

Research has shown that individuals with maladaptive coping styles are more susceptible to experience negative psychological outcomes during the pandemic while those with adaptive coping experienced considerably less stress and anxiety (Jurado et al., 2021). Recent findings show that coping strategies are major risk factors for PTSS in HCW working with COVID-19 patients (Chen et al., 2020). Those with negative coping styles were 6.77 times more likely to have PTSS. Avoidance coping, in specific, was found to be a dominant risk factor (Babore et al., 2020). These findings confirm those from the SARS epidemic (Maunder et al., 2006). Tamiolaki and Kalaitzaki (2020) emphasized the importance of identifying coping strategies associated with PTG as an alternative prevention approach to studying the consequences of the pandemic.

Therefore, in this study, four different coping styles were tested: Seeking social support, problem solving, avoidance, and positive thinking.

Seeking Social Support. Social support allows individuals to explore diverse perspective of the adversity they had experienced, especially when such support is given from close family and friends. This helps individuals concerned to share different perspectives which can include growth. Seeking social support can also promote social resources and decrease one's feeling of being alone and isolated and facilitate adaptive coping strategies (Tedeschi & Calhoun, 2004). Trauma survivors use seeking social support as a coping strategy after traumatic incidents (Chaffin, Wherry, & Dykman, 1997). Prati and Pietrantoni (2009) investigated different factors in relation to growth. Researchers showed in their meta-analysis that seeking social support as coping had a moderate effect on PTG.

Yet, compared to receiving social support, Ullman and Relyea (2016) revealed that participants who received negative social support, reported increased PTS symptoms and maladaptive coping. Researchers correspondingly presumed that these symptoms and coping strategies may also lead individuals to receiving more unsupportive and negative social reactions. Felsten (1998) investigated different coping strategies including support seeking, as well as stress and depression, across genders in a population of undergraduate students. Results showed that seeking social support was associated with lower depressive symptoms, and that females were found to seek more social support than males.

Problem Solving. Tiet et al. (2006) defined active coping as attempting to solve problems directly by analyzing, generating alternative solutions, focusing on key aspects, planning, and actively confronting the situation. Deficits in interpersonal problem solving have been linked to depression, anxiety, and poor adjustment in recent research (Nezu, 1986). Regardless of the presence of PTSD symptoms, active coping improves PTSD patients' functional efficiency and communication levels while decreasing conflicts (Tiet et al., 2006). For instance, in one study

conducted by Fedros & Seyed-Hossein (2007) to investigate and evaluate the effectiveness of problem-solving program training in survivors of the Bam earthquake in Iran in 2003, a total of 160 residents were matched and divided into two groups: control and experimental. The study found that the experimental group demonstrated a significant shift in coping skills from emotion-focused to problem-focused. Furthermore, the experimental group's PTSD symptoms decreased significantly from pre-test to post-test. It appears that coping skill training, specifically problem-focused problem solving, may be a major factor in reducing the psychological effects of disasters. Another study conducted on five subjects who survived life-threatening experiences without developing PTSD to examine their coping strategies in said traumatic situations, showed a common pattern of response among subjects in these situations. All five respondents used problem solving as their primary cognitive strategy, drawing on specific information from their previous experience that was relevant to their life-threatening situation (Macaskill, 2003).

Avoidance. Minimization, wishful thinking, not thinking about the problem, withdrawal, externalization, and expression of negative emotions are all examples of avoidant coping. According to Tiet et al. (2006), cognitive avoidance predicts more PTSD symptoms, particularly intrusion, which predicts more behavioral avoidance. Behavioral avoidance entails avoiding places and people that remind a survivor of their experience, as well as refusing to act on the situation (Boeschen et al., 2008). Furthermore, in a study conducted by Boeschen et al. (2008) to examine casual attributions, cognitive schemas, and memory characteristics as mediators between avoidance and PTSD among women who were raped, women who scored high on this measure attempted to block out memories of their rapes or minimize or rationalize their rape experiences in some way.

Positive thinking. Positive thinking can include humor, positive reframing, and acceptance (Baumstarck et al., 2017). The idea that humor is a valuable coping mechanism is widely held in our society, and previous research has generally supported the conclusion that humor can counteract the effects of stress (Martin & Lefcourt, 1983; Moran & Massam, 1997; Overholser, 1992). For example, one study found that a sense of humor is associated with lower levels of loneliness and depression, as well as higher self-esteem in college students who are experiencing significant levels of life stress (Overholser, 1992). Another study with students found that a sense of humor moderates the relationship between stressors and mood disturbance, with subjects with low humor scores experiencing higher levels of mood disturbance (Martin & Lefcourt, 1983).

Positive reframing is the process of changing one's thinking to find something positive in stressful situations, and it has been consistently linked to lower psychopathology (e.g., Hegelson et al., 2006).

Acceptance focuses on allowing our feelings and thoughts to come and go as they are. It encourages people to open up and make room for these experiences, rather than struggling with them (Harris & Hayes, 2019). As an alternative to experiential avoidance, acceptance comprises abandoning maladaptive ways to alter internal events or control them by being experientially and fully open to the present moment (Kollman, Brown, & Barlow, 2009). Acceptance was also conceptualized as the willingness to experience pain and discomfort, when change attempts don’t work (Vowles, Sowden, & Ashworth, 2014), and to acknowledge and deal with unwanted internal feelings, thoughts and physical experiences (Scott, McCracken, & Norton, 2016). In the concept of trauma, acceptance in therapy can directly promote change in the frequency or intensity of distressing internal experiences (Levin, Hildebrandt, Lillis, & Hayes, 2012).

Proximity to the Traumatic Event

Studies have shown that proximity is a psychological characteristic that can be used to describe the effects of PTSD. It has been shown that individuals who are close to an event are more prone to experiencing symptoms of PTSD (Blanchard et al., 2004; Furr et al., 2010; Matt & Vázquez, 2008; Schuster et al., 2001). Previous research on trauma and PTSD has explored the amount and intensity of exposure one is subjected to and assess its relation to posttraumatic stress symptoms (PTSS) (Hughes et al., 2011). However, specific information on how close one is to the traumatic event (proximity) can be more useful when investigating the effects of trauma and PTSD (May & Wisco, 2016). Previous studies have used different methods to measure the effects of proximity. For instance, they used a scale that was specific to an individual's address. In some studies, researchers focused on the symptoms of individuals living in regions affected by the September 11 attacks (Neria et al., 2011). These studies usually find that people living in regions that are close to the site of the attack experience more symptoms of PTSD. Similar findings can also be found in other ways, such as by asking people about their current location at the time of the incident (Sprang, 1999). In a systematic review conducted by May & Wisc (2016) on the effects of proximity and exposure to trauma as risk factors for developing PTSD, they showed that proximity to the traumatic event was a contributing factor but only through direct exposure to trauma. In another study conducted by Sahin et al. (2007), researchers looked into the effects of proximity on the mental health of young people in Turkey who were affected by an earthquake that occurred in 1999. They divided the participants into three groups based on their geographical location. The researchers found that those who lived near the epicenter of the earthquake had higher scores on measures of PTSD and impact.

These results suggested that geographical distance to the traumatic event can serve as risk factors. Nonetheless, disregarding such measures in our study might not provide accurate results since the proximity could vary among participants. Therefore, this study examined the moderating effect of participants' proximity to the August 4 explosion in Beirut.

Hypotheses

Based on the above discussed review of literature, the current study investigated the following hypotheses:

H1: Seeking social support negatively predicts Posttraumatic stress for those farther from the port compared to those closer to the port.

H2: Seeking social support positively predicts Posttraumatic Growth for those farther from the port compared to those closer to the port.

H3: Problem solving negatively predicts Posttraumatic stress for those farther from the port compared to those closer to the port.

H4: Problem solving positively predicts Posttraumatic Growth for those farther from the port compared to those closer to the port.

H5: Avoidance positively predicts Posttraumatic stress for those closer to the port compared to those farther from the port.

H6: Avoidance negatively predicts Posttraumatic Growth for those closer to the port compared to those farther from the port.

H7: Positive thinking negatively predicts Posttraumatic stress for those farther from the port compared to those closer to the port.

H8: Positive thinking positively predicts Posttraumatic Growth for those farther from the port compared to those closer to the port.

Chapter 3

Method

Research Design

This study adopted a cross-sectional survey design which allowed the investigator to collect data from a number of participants at a single point in time. The purpose of this study was to test a regression model that predicted posttraumatic stress and posttraumatic growth from four different coping styles implemented by Lebanese nurses after the COVID-19 pandemic and August 4 explosion.

Participants

Based on the desired effect size of the study, small to medium effect, and the presence of five predictors, 97 participants are the required minimum to reach statistical power as computed on G*power. According to Field (2017), using five independent variables, the sample size was 635 for a small effect and 92 for a medium effect (Cohen, 1988; Field, 2017). This study sought to obtain a sample size with a small to medium effect size. Therefore, 130 participants took part in this study. The inclusion criteria for this study were nurses. The minimum required age range of participants is 21-64 years old since the prerequisite of becoming a registered nurse requires a bachelor's degree (BSN) or a technical baccalaureate (BT). Both programs have a 3-year long curriculum post high school graduation (usually at 18). Furthermore, registered nurses in Lebanon keep on working until the age of retirement (64) in accordance with the Lebanese work law. Both females and males were included in this study. Only Lebanese nationals were be included in this study to control for the trauma faced by non-Lebanese people such as Syrians and Palestinians in their own countries or as refugees. Nurses were sampled using a non-random purposeful

convenience sampling method. The access to this population was limited but established professional relations with a sample of registered nurses helped the recruitment process of this study. Therefore, 130 nurses were selected from a variety of hospitals in Beirut and Mount Lebanon region due to convenient connections with registered nurses at hospitals in the specified regions. The exclusion criteria for this study was any nurse that was hired after the onset of the pandemic to ensure that all participants have been exposed to the stressors that concern this study and control for any extraneous factors. The survey was administered in the English and Arabic language. Valid and reliable Arabic measures of our scales were already accessible online which meant that translation was not needed.

Ethical Considerations

The present study protocol received ethical approval from the SBS Ethics Committee at Haigazian University. Participation was free, voluntary, and requires written consent. No incentive or reward was provided for participation. Participants were informed of the study objectives upon beginning the questionnaire. Debriefing was used to reiterate the purpose of the study as well as any foreseeable risks with regards to resurfacing of trauma. Surveys remained anonymous, and a contact email of the primary investigator was provided to send any further questions about the study. Participants were made clearly aware of their right to withdraw from the questionnaire at any time, in which case the data was not utilized. Finally, participant information remained confidential.

Measures

A questionnaire in hard copy was disseminated to gather information for this study from registered nurses. It contained a participant information letter outlining the purpose of this study and a letter of consent. It also consisted of the tools used to measure the variables in this study

such as the Brief Coping Orientation to Problems Experienced (COPE) Scale, The PTSD Checklist, Civilian version (PCL-C), the Post Traumatic Growth Inventory (PTGI), and a demographic information form. The survey was administered in both English and Arabic in which participants chose the language they're comfortable engaging in.

Posttraumatic Stress Symptoms (PTSS). PTSS was measured using the validated and standardized self-report *PTSD Checklist* (PCL-5) (Weathers et al., 2013). This 20-item self-report questionnaire was created to present and identify the presence and severity of PTSD symptoms as defined by the DSM–5 (American Psychological Association, 2013). This 17-item questionnaire uses a 5-point Likert scale to assess key PTSD symptom categories. Responses of 3 or more are considered moderate to severe. The PCL-5 has four subscales that correspond to the DSM-5 symptom categories. They include avoidance, intrusion, negative mood and cognition changes, and changes in arousal and reactivity. A total symptom severity score (range 0-80) can be obtained by summing the scores for each of the 20 items. *DSM-5* symptom cluster severity scores can be obtained by summing the scores for the items within a given cluster, i.e., cluster B (items 1-5), cluster C (items 6-7), cluster D (items 8-14), and cluster E (items 15-20). Participants were asked to rate the severity of a specific symptom in the previous month on a scale ranging from 0 ("not at all") to 4 ("extremely"). "Feeling very upset when something reminded you of the stressful experience?", "Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?", and "Avoiding memories, thoughts, or feelings related to the stressful experience?" are some examples. The items are added together to produce a total score. In the literature, PCL-5 demonstrated good internal consistency; for example, Richardson and Jost (2019) reported an internal consistency of 0.92.

Posttraumatic Growth Inventory (PTG). The PTGI was used to assess posttraumatic growth symptoms. Researchers used this 21-item scale to assess perceived PTG, which differs from actual growth. The Post Traumatic Growth Inventory (PTGI) is scored by adding all the responses. Individual factors are scored by adding responses to items on each factor or subscale.

PTGI Factors

Factor I: Relating to Others

Factor II: New Possibilities

Factor III: Personal Strength

Factor IV: Spiritual Change

Factor V: Appreciation of Life

"I changed my priorities about what is important in life," "I have a greater appreciation for the value of my own life," and "I am able to do better things with my life" are some examples. Participants rate their symptoms in relation to the traumatic event they identified on a scale ranging from 0 ("I did not experience this change as a result of my traumatic experience") to 5 ("I experienced this change to a very great extent as a result of my traumatic experience"). The items are added together to produce a total score, with higher scores representing higher levels of PTG. The PTGI has demonstrated excellent internal consistency, test–retest reliability, and validity (Tedeschi & Calhoun, 1996). For example, studies revealed a high level of internal consistency (Cronbach's alpha.97) (Boykin, Anyanwu, Calvin, & Orcutt, 2019). A study conducted with a sample of undergraduate students from the American University of Beirut's psychology introductory course revealed very good internal consistency (Cronbach's alpha.90)(Abboud and Al-Jamil, 2017).

The Brief-Coping Orientation to Problems Experienced (COPE). Coping Styles were evaluated using the *Brief-COPE* (Coping Orientation to Problems Experienced). It is designed to evaluate coping strategies used in a given situation. It is the highest validated and most-frequently used self-report tool for assessing coping strategies (Garcia et al., 2018). The 28-item is both valid and reliable among nurses, with a Cronbach's alpha of .88 (Rahman et al., 2020). The instrument employs a 4-point Likert scale and includes 14 subscales: *Self-Distraction, Active Coping, Denial, Substance Use, Use of Emotional Support, Use of Instrumental Support, Behavioral Disengagement, Venting, Positive Reframing, Planning, Humor, Acceptance, Religion, and Self-Blame.* Participants in this version respond on a 4-point Likert scale (1= I have not been doing this at all; 2= a little bit; 3= a medium amount; 4= I have been doing this a lot); there is no midpoint. The scores indicated which coping style was used by nurses when confronted with the specific stressor. The 14 subscales will be classified into four categories: seeking social support (venting, emotional support, instrumental support, religion), problem solving (active coping, planning), avoidance (behavioral disengagement, self-distraction, substance use, denial, self-blame), and positive thinking (humor, positive reframing, acceptance) according to Baumstarck et al. (2017). The Cronbach's alphas for the Brief COPE's four-factor structure is satisfactory; for social support = 0.82, problem solving = 0.74, and avoidance = 0.64, and optimistic thinking = 0.71 (Baumstarck et al., 2017).

Procedure

Pilot study

A pilot study was conducted to estimate the time needed to complete the surveys, and to make sure that all items and instructions are understood. Ten nurses were recruited using convenience sampling. They voluntarily participated in this pilot study, and they were asked to

complete the surveys online. Lastly, results of the pilot study were interpreted to make sure all the main components of this study are feasible and any recommendations that arise will be made.

Main Study

Nurses were contacted directly through text messages. A date, time and meeting point were set up over the course of two weeks to administer the questionnaire and collect data from nurses face to face. Participants were selected based on the exclusion and inclusion criteria outlined above. They were informed of the study, its purpose, and their right to withdraw at any time within the first page of the questionnaire, which includes the consent form. After signing the consent form, the participants were given an estimation of the time needed to complete the questionnaire which is 15 minutes on average. Counterbalancing was used to control for order and carryover effects. The final section of the survey showcased the demographic sheet which gathered the age, gender. The surveys in this cross-sectional study remained confidential to ensure privacy of participant information. The survey was conducted using hard copies.

Data Analysis

Two linear multiple regression analysis was performed using IBM SPSS software (version 24). This type of analysis tested the predictive value of the four coping styles (seeking social support, avoidance, positive thinking, and problem focused) on post-traumatic stress in one model and post-traumatic growth in another. Spearman correlation coefficient was employed to compare the association between PTSS, PTG, and coping styles. Proximity to the port explosion was controlled for in this study.

Chapter 4

Results

The purpose of this quantitative study was to determine possible predictors of posttraumatic growth (PTG) and Posttraumatic Stress (PTS) amongst a sample of Lebanese nurses after the August 4th port explosion. A total of 130 participants took part and completed this study. Preliminary analyses were conducted which included missing value analysis, checking for outliers and assumptions, sample demographics, descriptive statistics, and a regression analysis.

Missing Value Analysis

A missing value analysis was conducted on the empty answers to check whether the questions had more than 5% missing answers. Results showed that none of the items had more than 5% missing values except for the item 25 on the Brief COPE scale (5.4%). To check whether the data was missing at random or not, Little's MCAR test was conducted. Results of this test were significant, indicating that the missing answers in this study might not be missing completely at random $X^2(3373) = 3820.88$, $p < .001$. After analyzing the patterns of missing values, Figure 1 showed that the missing data is scattered randomly and there is no clear pattern of missingness. Moreover, 48.46% of the data appeared to have missing values on at least one item (Figure 2). Therefore, it would not be feasible to remove incomplete data as it would reduce our sample size to almost half which is below the minimum required sample size. As a result, Estimated Marginal Means (EM) was used as a method to replace missing data and create a new dataset.

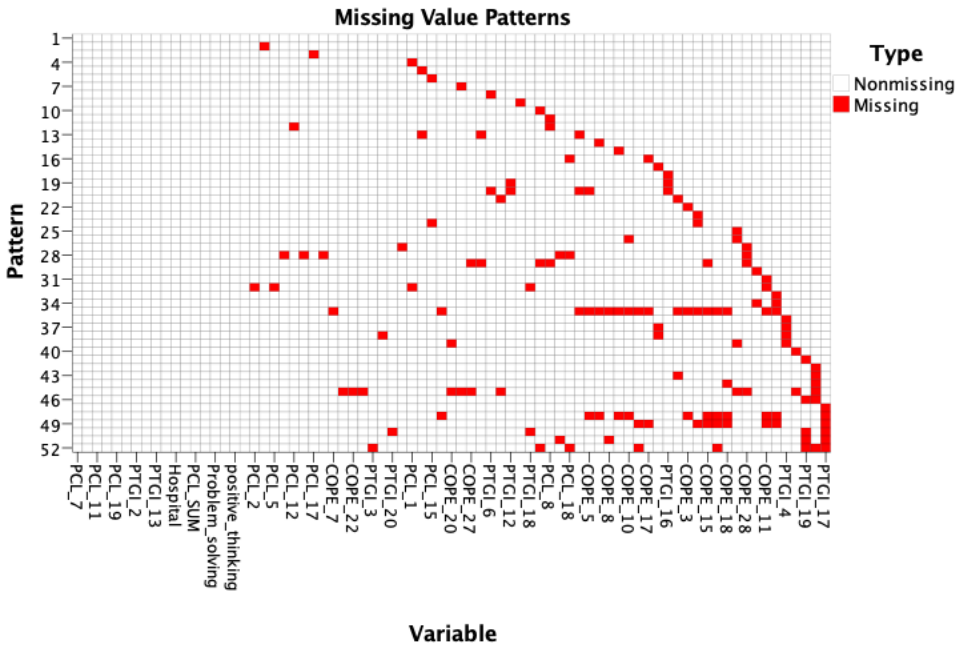

Figure 1. Scatterplot of Missing values pattern

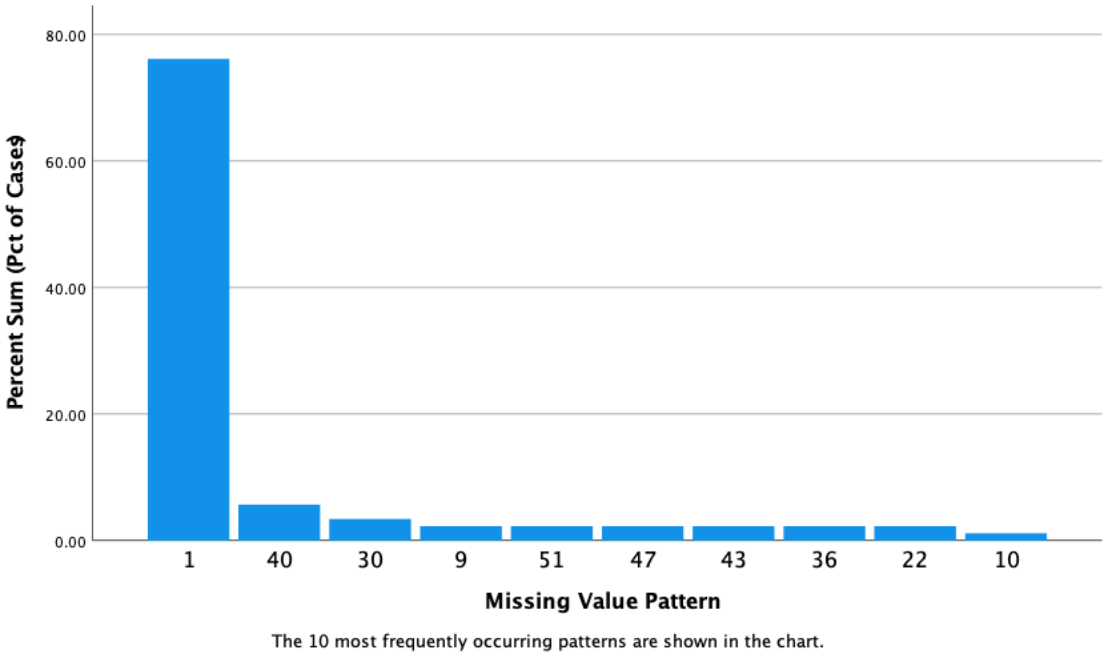

Figure 2: Chart of missing value patterns

Reliability Analysis

Internal reliability of the PTSD checklist -5 (PCL-5), Brief COPE, and Posttraumatic growth Inventory (PTGI) were investigated using Cronbach's Alpha. Results indicated that all scales were reliable. The PCL-5 had excellent reliability α.= .943, as well as the PTGI α.= .934. The Brief COPE had very good reliability α.= .882.

Table 1

Internal Reliability of Scales: Cronbach's Alpha

	Current Cronbach's Alpha	Previous Cronbach's Alpha (literature)
PCL-5	.943	0.77
PTGI	.934	.96
COPE	.882	0.70

A. Univariate and Multivariate Outliers

Items were computed to obtain mean scores on the scales, and univariate and multivariate analyses were conducted. Univariate outliers were identified by converting all non-categorical data into z-scores. Any z-score that exceeds ±3.29 was referred to as a univariate outlier. Results showed that the avoidance coping style had two univariate outliers (case #50 and case #51).

Multivariate outliers were checked using Mahalanobis distance. The probability calculation of Chi square showed three significant multivariate outliers. Since none of these outliers were both univariate and multivariate outliers, they were retained in the data.

Influential outliers were determined using cook's distance with a criterion that any case > 1 is considered an influential case. For both PTS and PTG as dependent variables, no influential outliers were identified.

B. Demographics

The final sample size was 130 participants and included 25 nurses from Sahel hospital (19%), 39 nurses from Rosaires Hospital (30%), 17 nurses from Abou Jaoude Hospital (13.1%), 16 nurses from Haroun Hospital (12.3%), 17 nurses from Rizk Hospital (13.1%), and 16 nurses from Middle east Hospital (12.3%). On the question screening for proximity towards the port explosion, 39 participants reported that they were 600 meters away from the port explosion (30%), and 17 participants reported that they were 1.60 Km away from the port explosion (13%), followed by 41 participants who reported being 4.80 km from the port explosion (31.5%) (Table 1).

Table 2

Percentage and Frequency of participants' proximity to the explosion

Proximity(Km)	N	Percentage (%)
0.6	39	30
1.6	17	13.1
4.8	41	31.5
6	17	13.1
7.4	16	12.3

C. Descriptive Statistics

The mean of the items of each scale were computed as well as the average of all scores. For PTG, the overall mean was M=56.43 (and SD=22.83) which is higher than the midpoint. Scores on the problem-solving coping style had a mean of 9.73 (SD=3.10), which indicates that the sample scored higher than average. For PTS, the overall mean was M=34.50, SD= 18.13 which is slightly higher than the severity score cut-off (31-33) indicating that the sample exhibits moderate to high symptoms of PTS. For the avoidant coping style, the mean was M=17.28 (SD=4.74), which was slightly lower than the midpoint, indicating that participants were less prone to use an avoidant coping style. The mean of scores on the seeking social support coping style was slightly higher than the midpoint (M=17.92, SD=5.37). Finally, the mean of scores on the positive thinking coping style was M=13.48, SD=3.97 indicating that the sample scored slightly higher than average on this subscale of the Brief COPE. The descriptive Table below shows the rest of the results (Table 3)

Table 3

Descriptive Statistics of the Scales

	N	*M*	*SD*	*Minimum*	*Maximum*
PTGI	130	56.43	22.83	0	105
Problem Solving	130	9.73	3.10	3	16
Seeking Social Support	130	17.92	5.37	8	29
Avoidance	130	17.28	4.74	4	35
Positive Thinking	130	13.48	3.97	5	23
PTS	130	34.50	18.13	2	68

D. Normality

Since the sample size was large, the normality of the variables was tested by obtaining the z-scores of skewness and kurtosis. None of the scales showed z-skewness scores above or below 3.29 significance level. This indicated that the scales are normally distributed.

E. Homoscedasticity

The assumption of homoscedasticity was examined through generating a q-q plot. Inspection of the scatterplot of residuals indicated that the data points are equally distributed around the line. Therefore, the assumption of homoscedasticity was satisfied.

F. Multicollinearity

Multicollinearity refers to the large correlations between variables that can affect the regression analysis. Correlations above .80 are usually classified as problematic. Our examination of the zero-order correlation matrix suggested that none of the scales showed a large correlation. Furthermore, the coefficient analysis showed a VIF below 10 for all predictors suggesting that there were no issues with multicollinearity and the assumption was met.

G. Independence of Errors

The independence of errors was examined using the Durbin-Watson statistic to see if errors of the independent variables were independent of each other. In this study, the Durbin-Watson value was 1.85 ($1<x<2$) indicating that the assumption of independence of errors is met.

Regression Analysis

Our Main analysis was composed of two multiple regressions in which the first one PTG was entered as the outcome and the four coping styles: problem solving, positive thinking, avoidant, and seeking social support were entered as the predictors. The second regression included the same four coping styles as predictors of PTS.

PTG & Coping Styles

The model that included PTG as an outcome and the four coping styles: positive thinking, avoidant, problem-solving, and seeking social support as predictors was significant, $F(4,125)=18.995$, $p<.01$. The R squared value was $R^2=.615$. This indicated that the model accounted for 61.5% variance in PTG. Furthermore, the adjusted R square had a value of $R^2 =.358$, which indicates that only 35.8% of the variance is explained by the predictors in this model.

Assessment of the beta coefficients in our model suggested that seeking social support is the strongest significant positive predictor of PTG, β=.35, $p<.05$. In addition, problem solving coping style was the second strongest significant positive predictor, β=.27, $p<.05$. These findings indicated that those who scored high on the seeking social support and problem-solving coping style also showed higher levels of PTG. Moreover, positive thinking was not a significant predictor of PTG, β=.16, $p=.06$ as well as avoidant coping style. However, avoidance coping style was negatively associated with PTG. Therefore, not all our hypotheses were supported – only those regarding seeking social support and problem-solving coping styles were supported.

Table 4

Summary of Multiple Regression Analysis for the Four Coping Styles and PTG

	B	*SE (B)*	*β*	*t*	*Sig. (p)*
Avoidance	-.532	.403	-.110	-1.319	.190
Seeking Social Support	1.507	.385	.355	3.916	<.001
Problem Solving	1.996	.684	.272	2.918	.004
Positive Thinking	.955	.507	.166	1.883	.062

Note:

Adjusted R^2 = 0.358

PTS & Coping Style

The model that included PTS as an outcome and the four coping styles: positive thinking, avoidant, problem-solving, and seeking social support as predictors was significant, $F(4,125)=14.23$, $p<.01$. The R squared value was $R^2=.559$. This indicated that the model accounted for 55.9% variance in PTS. Furthermore, the adjusted R square had a value of $R^2 =.291$, which indicates that only 29.1% of the variance is explained by the predictors in this model.

Assessment of the beta coefficients in our model suggests that only avoidant coping style seeking was a significant positive predictor of PTS, $\beta=.52$, $p<.05$. All other coping styles were non-significant predictors of PTS. Therefore, only one of our hypotheses were supported regarding avoidant coping style and PTS was supported.

Table 5

Summary of Multiple Regression Analysis for the Four Coping Styles and PTS

	B	*SE (B)*	*β*	*t*	*Sig. (p)*
Avoidance	1.999	.336	.523	5.942	<.001
Seeking Social Support	.023	.321	.007	.071	.943
Problem Solving	.718	.571	.123	1.257	.211

Positive Thinking	-.329	.423	-.072	-.778	.438

Note: Adjusted R^2 = 0.291

Moderational Analysis

To test the hypothesis that the proximity of each participant moderates the relationship between the significant predictors of PTS and PTG, interaction terms between each predictor (avoidant, social support, and problem-solving coping styles) and proximity from the port explosion were created and three linear regression analysis were conducted.

The first regression analysis examined the moderating effect of proximity on avoidant coping style which was the only significant predictor of PTS. As such, avoidant coping style, proximity, and the interaction term between them were added to the model that predicted PTS. Results showed that avoidant coping style was a significant predictor of PTS as consistent with previous results $F(3,126)=20.46$, $p<.001$, $\beta=.51$. However, the moderating effect of proximity on the relationship between avoidant coping style and PTS was not significant, $F(3,126)=20.46$, $p<.001$, $\beta=.09$, $p=.25$. Therefore, proximity did not act as a moderator in this model.

Table 6

Moderation analysis for avoidance and PTS

	Std. Error	*Beta*	*Sig(p).*
avoidance_strategy	.298	.517	<.001
Proximity	.902	.138	061
INT_avoidance	1.219	.090	.252

The second regression analysis examined the moderating effect of proximity on the relationship between seeking social support and PTG. As such, the variables seeking social support, proximity, and the interaction term between them were added to the model that predicted PTG. Results showed that proximity had a significant moderating effect on the relationship between seeking social support and PTG, $F(3,126)=31.92$, $p<.001$, $\beta=.175$, $p=.012$. Inspection of the scatterplots and interaction plots at each level of proximity showed that those who were furthest from the port explosion (7.4km) had higher marginal mean scores on the social support coping subscale while those closest to the port explosion (0.6km) had the lowest scores (figure below). This is in line with our hypothesis indicating that those who are further away from the port explosion have a stronger relationship between seeking social support and PTG than those who were closest to the port explosion.

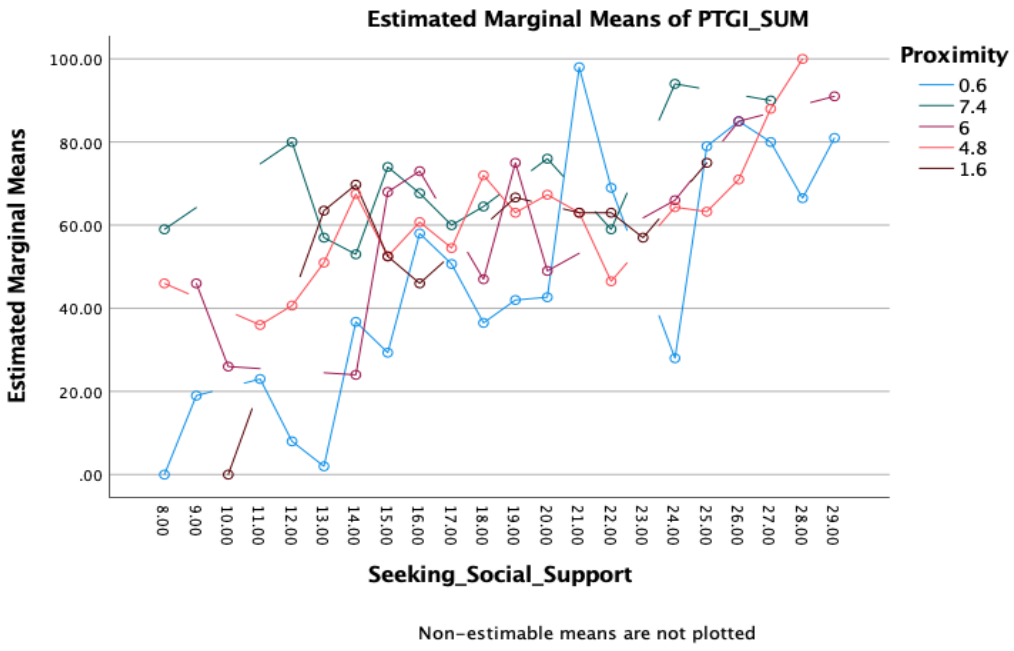

Table 7

Moderation analysis for seeking social support and PTG

	Std. Error	*Beta*	*Sig(p).*
Seeking_Social_Support	5.453	.537	<.001
Proximity	.291	-.328	<.001
INT_Social_Support	.006	.175	.012

The third regression analysis examined the moderating effect of proximity on the relationship between problem solving coping style and PTG. As such, the variables problem solving, proximity, and the interaction term between them were added to the model that predicted PTG. Results showed that proximity achieved a marginally significant moderating effect on the relationship between problem solving coping style and PTG, $F(3,126)=19.97$, $p<.001$, $\beta=-.237$, $p=.05$. Inspection of the scatterplots and interaction plots at each level of proximity showed that those who were furthest from the port explosion (7.4km) had slightly higher marginal mean scores on the problem-solving coping subscale while those closest to the port explosion (0.6km) had the lowest scores (figure below). This supported our hypothesis indicating that those who are further away from the port explosion have a stronger relationship between problem solving coping style and PTG, than those who were closest to the port explosion.

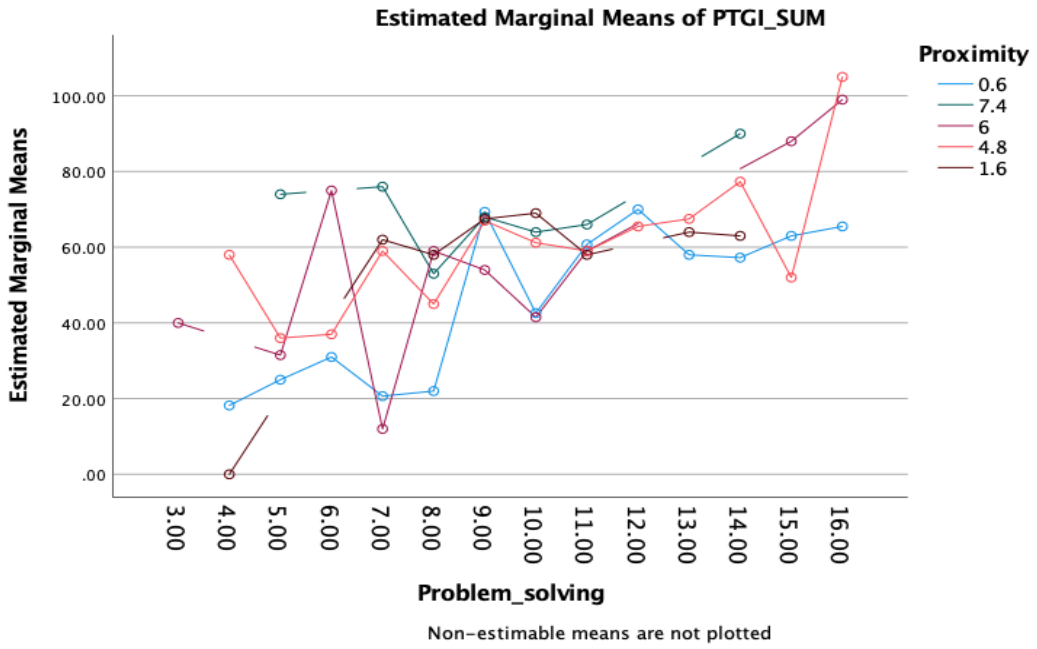

Table 8

Moderation analysis for problem solving and PTG

	Std. Error	*Beta*	*Sig(p).*
Problem_solving	.543	.528	<.001
Proximity	1.863	.020	.867
INT_Problem_solving	.265	-.237	.051

Chapter 5

Discussion

The aims of this study were to measure the role of four coping styles in predicting posttraumatic growth and posttraumatic stress in a sample of Lebanese nurses in light of the port explosion event. More specifically, we looked at the following four coping styles: problem solving, positive thinking, seeking social support, and avoidant and examined their predictive role on PTG and PTS separately. Moreover, we also examined the moderating effect of proximity on the significant predictors of PTG and PTS in this study.

Posttraumatic Growth and Posttraumatic Stress

Before discussing the investigated hypotheses of this study, it is important to analyze the data obtained on both dependent variables, mainly posttraumatic growth and posttraumatic stress, in light of previous studies. As we know, the sample of this study consisted of nurses who were present during the port explosion with the majority being of close proximity to the port explosion. Overall, respondents showed moderate reports of posttraumatic growth indicating that they have experienced minimal growth following the trauma. However, PTS scores were moderately high indicating that probable PTSD is present among this specific sample. Therefore, this particular result obtained in this study was interesting, but not unfamiliar to the literature. According to Cao et al. (2018) who conducted a study to assess the relationship between PTG and PTS on a sample of Chinese earthquake survivors 1 year after the incident, the relationship between PTG and PTS can vary depending on the heterogeneity of the sample at hand. This means that different levels of PTS (low, mild, high) can have a different effect on the levels of PTG (mild, moderate, high) as well. For example, in the study mentioned previously, the authors found that mild levels of posttraumatic symptoms showed high levels of PTG which could be

attributed to perceived but not actual PTG (Cao et al., 2018). Therefore, the higher levels of PTS in our sample could have had negative implications on the present PTG scores such that the presence of moderately high levels of PTS masked the actual PTG.

Additionally, perceived PTG could be associated with positive reinterpretations (Frazier et al., 2019). Given that PTS and PTG levels in this study were slightly higher than the midpoint of the scale, it is safe to say that the growth observed in this sample is not extremely high and the distress reported is mildly clinically significant. Additionally, in line with research on proximity and exposure to the trauma, those who have been directly exposed to the port explosion and were in close proximity might have reported higher levels of both PTS and PTG. The direct exposure and proximity reported to the central events of this study explained the moderately significant levels observed in our sample of nurses who were the frontliners of the Beirut blast aftermath in 2020. Therefore, a positive relationship was expected and justified among the moderately high levels obtained in this study. Supplementary studies have shown that the type of traumatic event can affect the relationship between PTS and PTG. This meant that the relationship between PTG and PTS could exhibit different patterns in traumas related to natural disasters than those related to domestic violence, for instance (Shakespeare-Finch & Lurie-Beck, 2014). However, given that our sample revolved around nurses who had to actively be involved in the explosion aftermath, the pattern obtained in this study between PTG, and PTS is justified.

Coping Styles, PTG, and PTS

According to Cao et al. (2018), the positive relationship between PTS and PTG can reflect different use of coping styles among individuals and how they manage their distress. This was consistent with our findings regarding the relationship between PTS and coping styles in our sample. Among the four coping styles, only avoidant coping style was found to be significant in

predicting PTS scores among Lebanese nurses. These findings supported our hypothesis (H5). This was also consistent with the literature on avoidant coping style and PTSS/PTSD where it has been found to be a very strong predictor of symptoms of posttraumatic stress and even PTSD. For example, in a study conducted by Machado et al. (2020), they found that daily use of avoidant coping style was associated with higher PTS severity. This is reflected by the marginally significant PTS scores in our sample. This suggested that the use of avoidant coping style in our nurses sample partially explained the obtained scores on PTS and it posed a question on the severity of these scores in light of such findings. The relationship between avoidant coping style and PTS was not found to be moderated by the proximity to the port explosion. While this finding is not in line with the literature on those who are closer to the port explosion are more likely to show higher scores of PTS as shown in the literature of this study, many other studies have specified that exposure plays a simultaneous role with proximity. This meant that the type of exposure (whether they were exposed directly or indirectly) could have played an important role in this moderation. In other words, those who were directly exposed to the traumatic event and were closer in proximity were more likely to show high scores of PTS or PTSD (May & Wisc, 2016).

Moreover, seeking social support and problem-solving coping styles were found to be significant predictors of PTG among our sample of Lebanese nurses. These findings were also supported by our hypotheses. In line with the literature, social support has been found to predict PTG consistently among several studies. For example, in a study conducted by Aflakseir et al. (2018) on a sample of women with breast cancer, results showed that social support was a significant predictor of PTG. Moreover, Tedeschi (1995)’s theory on coping styles and PTG suggested that social support enhanced PTG because it helped individuals disclose the traumatic

situations to others and receive positive feedback about it. This allowed them to reshape the traumatic event which was essentially a huge portion of trauma-focused therapy (Tedeschi, 1995). As such, social support is an important predictor. This is also similarly tied to problem solving coping style such that this strategy helps individuals use adaptive strategies (as opposed to maladaptive such as avoidance) to reduce the negative impact of their traumatic event (Giannone, 2017). The relationship between PTG and both coping styles was found to be moderated by proximity of participants to the port explosion. In other words, findings showed that those who were further away from the port explosion when it happened showed a stronger relationship between seeking social support, problem solving coping style and PTG scores. Generally, those who were further away showed higher use of social support and problem-solving coping styles and higher posttraumatic growth. As previously mentioned, the literature specified that proximity can increase symptoms of PTSD and PTS. Therefore, positive coping styles that have protective benefits such as seeking social support and problem solving, can promote higher PTG when people are further away from the traumatic events.

Clinical Implications

The findings of this study contributed to the wellbeing of nurses who are a particularly vulnerable population for developing PTSS (Fawaz & Itani, 2021). The highlighting of adaptive and maladaptive coping strategies through psychoeducation programs in continuing education (CE) of nurses could play a crucial role in the mitigation of the impact of traumatic events on nurses in Lebanese hospitals. CE programs done at hospitals and at the Order of nurses can benefit greatly from educating nurses on good practices in overcoming and growing from traumatic experiences.

On the clinical level, psychologists could build on the importance of seeking social support by organizing support groups for nurses who have endured traumatic events such as the 4th of August Blast where they can build a shared reality and receive social support from their peers, help each other in problem solving and positively reframing the impact of the traumas on their lives. Elaborating on the areas of PTG could inspire change of perspective in clients seeking help from a professional or in other words educating clients on PTG could be a form of the positive reframing coping strategy itself, such as explaining how trauma if faced through adaptive coping can lead to *personal and social growth*, in forming and cultivating relationships with others and experiencing *spiritual growth* by experiencing gratitude and optimism.

On a systemic level, hospital managements could be sensitized on good managerial practices in supporting staff who have been subject to traumatic events, and in motivating these systems to actively engage in supporting their nursing staff in the occurrence of a critical event.

Limitations of the Study

While this study has a number of contributions, it also has some limitations. First, this study adopted a cross sectional design which meant that no causal interpretations could be made. Moreover, the questionnaire was self-report which meant that recall bias could have influenced the results of the study. Second, the sample in this study constituted majorly of nurses who worked at hospitals in Beirut near the explosion which do not represent the Lebanese population; therefore, this study could not be generalized. Third, this study had many missing values which skewed the data making it hard to observe the true associations and predictive role of the four coping styles on PTG and PTS separately. Fourth, this study examined proximity on its own without exposure which are often used together in trauma studies as direct exposure has more empirical support for the relationship between proximity and PTS. In our study, we were

unaware if the nurses were directly or indirectly exposed to the port explosion of 2020. Lastly, although this study looked at the different types of people who were exposed to the explosion, it did not take into account the effect of multiple traumas on posttraumatic growth as evident by the history of Lebanese people who have suffered through multiple traumas across time which could have presented different results across PTG and PTS.

Future Considerations

This study provided preliminary results on the relationship between posttraumatic growth and its predictors (the four coping styles) after the Beirut port explosion in 2020. Future research should take into account the presence of multiple traumas especially in a high conflict area like Lebanon where citizens have been repeatedly exposed to multiple traumatic incidents. Exploring trauma and posttraumatic growth in Lebanon is important in light of the political, economic, and dire situation in general. Future research can help to better identify the factors that promote PTG and reduce which eventually can help employ intervention programs and help mental health professionals. It would be interesting to explore the impact of exposure alongside proximity. Moreover, more coping styles could be explored that are culturally adapted to Lebanon to achieve better empirical results. Finally, a mixed method research design that includes qualitative research should be considered for future research as it helps in constructing trauma narrative which could facilitate the interpretation of predictors and their usefulness.

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Appendix A

Participant information letter

Dear Ms./Mr.

I am Elie Sarkis, a student at Haigazian University from the Faculty of Social and Behavioral Sciences. I am currently carrying out a research study titled "The Relationship Between Coping Styles and Posttraumatic Stress and Growth Among Healthcare Professionals in Lebanon" advised by Dr. Hanine Hout.

You are being asked to take part in this study since COVID-19 and the dire situation in Lebanon has put tremendous pressure on health care workers.

Kindly read the below information to decide whether you would like to participate in this research study.

Purpose of the Research Project

This research study aims at investigating the predictive relationship between the different coping styles and PTSS and PTG, in a sample of Lebanese healthcare workers. The results of this study could help improve government healthcare policies and regulations related to mental health deterioration and burnout and support healthcare workers. This study will contribute towards the partial fulfillment of my academic study requirements at Haigazian University.

What will I be asked to do?

- If you choose to participate in this research study, you will be asked to fill in a questionnaire. Your participation will involve completing a survey that entails statements that you will have to rate based on agreement, and a demographic form for approximately 20 minutes.

Participation in this project is voluntary. You are free to withdraw anytime without having to give any reason for your withdrawal.

What are my rights?

- Participation in this study is completely voluntary, anonymous and confidential. Your name or any other identifying information will not be asked.
- Data you provide along with data from all participants in the present research will be stored in aggregate in a password protected folder on my computer. The data will be analysed and reported in aggregate. Only the principle investigators of this study will have access to the compiled data which will be stored for a period of 10 years post data. During this time, you have the right to inspect the data.
- You have the right to withdraw your consent or discontinue participation at any time for any reason. Your decision to refuse participation or withdraw will not involve any penalty or loss of

benefits to which you are entitled. Discontinuing participation in no way affects your relationship with Haigazian University.

- This research study has been reviewed and has received clearance from the Haigazian University ethics committee. If you have any further concerns about your rights as a research participant, please, do not hesitate to contact The SBS Ethics Committee at SBS.Ethics@haigazian.edu.lb

What are the risks and benefits of participation?

- Participation in this study may involve risk of fatigue and resurfacing of trauma.
- You will receive no direct benefits from participating in this research; however, your participation does help researchers better understand coping styles and how psychosocial interventions should be employed.
- This study might exacerbate painful memories and cause emotional distress. Some items in the tools may make you feel upset, therefore if you feel you need to talk to someone, please contact EMBRACE which is an organization that provides emotional support and psychological crisis intervention over the phone on 01 341 941 or on 1564 free of charge. EMBRACE also provides orientation to community-based resources close to where you live.
- If you are in therapy due to a traumatic event, please do discuss your possible involvement in this study with your psychotherapist before deciding whether you want to be involved.

Contact information

If you have any questions or concerns about the research, you may contact:

Dr. Hanine Hout
Thesis supervisor
961 1 349 230 extension 331
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Elie Sarkis, MA Student at Haigazian University
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Appendix B

Participant consent

The Relationship Between Coping Styles and Posttraumatic Stress and Growth Among Healthcare Professionals in Lebanon

Please read the following statements and place a check mark in the boxes adjacent to them.

- ☐ I have volunteered to participate in this research project conducted for purposes of study. My participation is voluntary and does not involve payment of any kind.
- ☐ I agree to participate in this research project conducted for purposes of study. My decision is voluntary and does not involve payment of any kind.
- ☐ I know that I can choose to withdraw from participation any time without any penalties or consequences whatsoever. I also hold the right to decline to respond to any question(s) that I may feel uncomfortable with.
- ☐ My participation involves answering an online questionnaire for approximately 20 minutes.
- ☐ I have been assured that the researcher will maintain my identity confidential.
- ☐ I have been assured that the information from this survey will be used for the purpose of academic study.
- ☐ I have received the assurance that this research study has been duly reviewed and approved by the Haigazian University ethics committee.
- ☐ I agree that the data gathered be kept in a secure location under the care of the study investigators for a period of 10 years.
- ☐ I have been assured that I can access my data (if identified) at any time.
- ☐ I have read, listened and fully understand the explanation given to me. All my questions have been satisfactorily answered.
- ☐ I, therefore, choose to voluntarily participate in this research study.

☐ I have received a copy of this consent form co-signed by the researcher.

Participant consent		Investigator	
Date:	_____	Date:	April 2022
Name:	_____	Name:	Elie Sarkis
Signature:	_____	Signature:	

Appendix C

Posttraumatic Stress Disorder (PTSD) Checklist-5*

PCL-5

Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

Not at all, A little bit, Moderately, Quite a bit, Extremely

0, 1, 2, 3, 4

1. Repeated, disturbing, and unwanted memories of the stressful experience?

2. Repeated, disturbing dreams of the stressful experience?

3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?

4. Feeling very upset when something reminded you of the stressful experience?

5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?

6. Avoiding memories, thoughts, or feelings related to the stressful experience?

7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?

8. Trouble remembering important parts of the stressful experience?

9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?

10. Blaming yourself or someone else for the stressful experience or what happened after it?

11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?

12. Loss of interest in activities that you used to enjoy?

13. Feeling distant or cut off from other people?

14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?

15. Irritable behavior, angry outbursts, or acting aggressively?
16. Taking too many risks or doing things that could cause you harm?
17. Being “superalert” or watchful or on guard?
18. Feeling jumpy or easily startled?
19. Having difficulty concentrating?
20. Trouble falling or staying asleep?

قائمة اضطارب ما بعد الصدمة – 5

فيما يلي لائحة بالمشكلات والأعراض المتواترة إثر اجتياز مرحلة انضغاط ,توتر حياتي. اقرأ(ي) بتمعّن كلاً من المشكلات المدوّنة أدناه ثم ضع(ي) دائرة حول الرقم الموجود على يسار الصفحة لتحديد درجة الاضطراب الذي أثارته كلٌّ من هذه المشكلات عندك، خلال الشهر السابق. الحدث الضاغط الذي عشته كان:

بتاتا 0

قليلا1

متوسط2

أكثر من متوسط 3

كثيرا جدّا 4

في الشهر المنصرم، كم بلغ شعورك بالضيق من:

1. ذكريات متكرّرة، مزعجة وغير مرغوب فيها للتجربة المرير ة التي مررت بها؟

2. أحلا م متكررة ومزعجة للتجربة المريرة التي مررت بها؟

3. الشعور أو التصرف المفاجئ كما لو كانت التجربة المريرة تحدث مرّة أخرى (كما لو كنت قد عدت بالزمن فعلًا وتعيشها من جديد)؟

4. الشعور بالاستياء الشديد عندما يذكّ رك شيء ما بالتجربة المريرة؟

5. المعاناة من رد فعل بدنى قوي عندما يذكّ رك شيء ما بالتجربة المريرة (على سبيل المثال، زيادة ضربات القلب، صعوبة في التنفس أوالتعرّق) ؟

6. تجنب الذكريات أو الأفكار أو المشاعر المتعلقة بالتجربة المريرة؟

7. تجنب الأشياء الخارجية التي تذكرك بالتجربة المريرة(على سبيل المثال، الأشخاص، الأماكن، المحادثات، الأنشطة، الأشياء أوالمواقف) ؟

8. مشاكل تذكر أجزأء هامة من التجربة المريرة؟

9. وجود معتقدات سلبية قوية عنك أو عن أشخاص أخرين أو العالم (على سبيل المثال، تراودك أفكار مثل: "أنا سيء"، "هناك شيء خاطئ في"، "لا يمكن الوثوق بأحد"، "العالم خطر جداً")؟

10. إلقاء اللوم على نفسك أو على شخص آخر فيما يخص حدوث التجارب المرير ة أو تبعاتها؟

11. وجود مشاعر سلبية قوية مثل الخوف أو الرعب أو الغضب أو الشعور بالذنب أو العار؟

12. فقدان الاهتما م بالأنشطة التي كنت تستمتع بها؟

13. الشعور بالبعد أو العزلة عن الأشخاص الآخرين؟

14. . صعوبة الإحساس بالمشاعر الإيجابية ((على سبيل المثال، عدم التمكن من الشعور بالسعادة أو مشاعر حب تجاه المقربين إليك)

15. سرعة الغضب أو المرور بنوبات الغضب أو التصرف بعدوانية؟

16. الخوض في الكثير من المخاطر أو الأشياء التي قد تسبب لك الضرر؟

17. البقاء في حالة تأهّب قصوى أو احت ا رس أو حذر شديدين؟

18. الشعور بسرعة الاهتياج أو الاستفزاز بسهولة؟

19. صعوبة في التركيز؟

20. مشاكل في الرغبة في النو م أو في البقاء نائماً؟

Appendix D

Brief Coping Orientation to Problems Experienced (COPE) Scale

Instructions: The following questions ask how you have sought to cope with a hardship in your life. Read the statements and indicate how much you have been using each coping style when faced with the death of you patient.

Rating scale from 1- 4 (1 = I haven't been doing this at all; 2 = A little bit; 3 = A medium amount; 4 = I've been doing this a lot)

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real."
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.

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

مقياس التكيف

الرجاء الإجابة على الأسئلة التالية مشيراً إلى أي مدى توافق أو لا توافق على كل عبارة. ضع إشارة مقابل التكرار المناسب لك:

أنا لم أفعل ذلك على الإطلاق 1

لقد فعلت هذا قليلا 2

لقد كنت أفعل هذا بشكل متوسط 3

لقد فعلت هذا كثيرا 4

1. **تحولت إلى العمل أو الأنشطة الأخرى لتصفية ذهني**
2. **ر كزت جهودي على القيام بشيء حيال الوضع الذي انا فيها**
3. **كنت أقول لنفسي "هذا ليس حقيقيا"**
4. **استخدمت الكحول أو المخدرات لاشعر على نحو أفضل**
5. **حصلت على الدعم العاطفي من الآخرين**
6. **تخليت عن محاولة التعامل مع الموقف**
7. **اتخذت اجراءات في محاولة لجعل الوضع يبدو أفضل**
8. **كنت ارفض أن اصدق أنه ما حدث قد حدث فعلا**
9. **قلت أشياء حتى اتخلص او اهرب من من المشاعر غير السارة المتعلقة بالحدث**
10. **حصلت على المساعدة والمشورة من أشخاص آخرين**
11. **استخدمت الكحول أو المخدرات لتساعدني في الخروج من ذلك الموقف**
12. **حاولت أن أرى الموقف في صورة مختلفة، لجعله يبدو أكثر إيجابية**
13. **انتقدت نفسي**
14. **حاولت الخروج باستراتيجية حول ما يجب القيام به**
15. **حصلت على الراحة والتفهم من شخص ما**
16. **تخليت عن محاولة التأقلم مع الموقف**
17. **بحثت عن شيء جيد في ما يحدث**
18. **صنعت و قلت النكات حول هذا الموضوع**
19. **فعلت أ شياء لاقلل من التفكير في الموقف ، مثل الذهاب إلى السينما ، ومشاهدة التلفزيون والقراءة وأحلام اليقظة ,النوم، أو التسوق**
20. **قبلت بواقع الحقيقة أنه حدث**

21. **عبرت عن مشاعري السلبية**
22. **حاولت أن أجد الراحة في ديني و معتقداتي الروحية**
23. **حاولت الحصول على مشورة أو مساعدة من الآخرين حول ما يجب القيام به**
24. **تعلمت كيفية العيش معه**
25. **فكرت مليا في الخطوات التي يجب اتخاذها**
26. **لومت نفسي عن الأشياء التي حدثت**
27. **صليت أو لجأت الى التأمل**
28. **سخرت من هذا الموقف**

Appendix E

PTGI – Posttraumatic Growth Inventory

Indicate for each of the statements below the degree to which this change occurred in your life asa result of the crisis/disaster, using the following scale.

0 = I did not experience this change as a result of my crisis

1 = I experienced this change to a very small degree as a result of my crisis

2 = I experienced this change to a small degree as a result of my crisis

3 = I experienced this change to a moderate degree as a result of my crisis

4 = I experienced this change to a great degree as a result of my crisis

5 = I experienced this change to a very great degree as a result of my crisis

Possible Areas of Growth and Change

1. I changed my priorities about what is important in life
2. I have a greater appreciation for the value of my own life
3. I developed new interests
4. I have a greater feeling of self-reliance
5. I have a better understanding of spiritual matters
6. I more clearly see that I can count on people in times of trouble
7. I established a new path for my life
8. I have a greater sense of closeness with others
9. I am more willing to express my emotions
10. I know better that I can handle difficulties
11. I am able to do better things with my life
12. I am better able to accept the way things work out
13. I can better appreciate each da
14. New opportunities are available which wouldn't have beenotherwise
15. I have more compassion for others
16. I put more effort into my relationships

17. I am more likely to try to change things which need changing
18. I have a stronger religious faith
19. I discovered that I'm stronger than I thought I was
20. I learned a great deal about how wonderful people are
21. I better accept needing others

مقياس النمو ما بعد الصدمة

الرجاء وضع الرقم المناسب الذي يحدد شدة التغيير الذي حدث لك بسبب الصدمات التي كنت قد مررت بها , وذلك حسب مقياس الشدة الآتي:

لم اواجهة اي تغيير كنتيجة لازمتي =0

واجهت هذا التغيير الى درجة ضغيرة جدا كنتيجة لازمتي =1

واجهت هذا التغيير الى درجة ضغيرة كنتيجة لازمتي =2

واجهت هذا التغيير الى درجة متوسطة كنتيجة لازمتي =3

واجهت هذا التغيير إلى درجة شديدة كنتيجة لازمتي =4

واجهت هذا التغيير إلى درجة شديدة جدا كنتيجة لازمتي=5

علامات النمو ما بعد الصدمة

1. غيرت اولوياتي حول ماهو مهم في الحياة
2. ازداد تقديري لنفسي
3. كونت اهتمامات جديدة
4. ازداد شعوري بالاعتماد على النفس
5. اصبح لدى فهم افضل للأمور الروحية
6. أصبحت اكثر قدرة على الاعتماد على الناس في وقت الشد
7. شققت طرق جديدة لحياتي
8. أصبحت اشعر اني اكثر ارتباطا بالآخرين
9. أصبحت اشد استعدادا للتعبير عن انفعالاتي
10. زادت قدرتي في مواجهة الصعوبات
11. أصبحت اكثر قدرة علي إنجاز أعمال جيدة في حياتي
12. أصبحت اكثر قدرة على تقبل الواقع
13. ازداد تقديري لحياتي يوم بعد يوم
14. أصبحت هناك فرص جديدة متاحة , لم تكن متاحة من قبل
15. أصبحت اكثر إحساسا بالآخرين
16. ازدادت جهودي لتكوين علاقات مع الآخرين
17. أصبحت اكثر استعدادا لتغير الأوضاع التي تحتاج إلى تغيير
18. قوي إيماني الديني
19. اكتشفت انني اشد قوة مما كنت اتصور
20. أهم درس تعلمته هو" أن الناس رائعين"
21. ازداد تقبلي لمبدا احتياجي للآخرين

Appendix F

Demographic Sheet

1. Specify your age: _____
2. Gender

☐ Female

☐ Male

☐ Other