THE RELATIONSHIP BETWEEN PSYCHOLOGICAL FACTORS AND POSTTRAUMATIC GROWTH AMONG HEAD AND NECK CANCER PATIENTS

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by

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LIST OF SYMBOLS

α	alpha
=	equal to
<	less than
>	more than
%	percentage
n	number

LIST OF ABBREVIATIONS

ACT	Acceptance and Commitment Therapy
BF	Benefit Finding
COPD	Chronic Obstructive Pulmonary Disease
DSM	Diagnostic and Statistical Manual of Mental Disorders
DSM-III	Diagnostic and Statistical Manual of Mental Disorders (DSM-3)
DSM-V	Diagnostic and Statistical Manual of Mental Disorders (DSM-5)
HADS	Hospital Anxiety and Depression Scale
HNC	Head and Neck Cancer
HS	Hope Scale
ICC	Intraclass Correlation Coefficient
ICD-10	International Statistical Classification of Diseases and Related Health Problems (ICD)
LOT	Life Orientation Test
LOT-R	Life Orientation Test-Revised
MMSE	Mini-Mental State Examination
PCL-5	PTSD Checklist for DSM-5
PTG	Posttraumatic Growth
PTGI-SF	Posttraumatic Growth Inventory-Short Form
PTSD	Posttraumatic Stress Disorder
SD	Standard Deviation
SE	Standard Error
SSSS	Sources of Social Support Scale

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HUBUNGAN DI ANTARA FAKTOR PSIKOLOGI DENGAN PERKEMBANGAN PASCA TRAUMA DALAM KALANGAN PESAKIT KANSER KEPALA DAN LEHER

ABSTRAK

Latarbelakang: Kanser kepala dan leher boleh mengakibatkan komplikasi psikologi secara berpanjangan, serta penjejasan sosial dan fungsi pesakit kanser yang mampu menjejaskan kesejahteraan dan kedapatan penyakit. Namun, terdapat bukti yang semakin meningkat menunjukkan bahawa perkembangan pasca trauma (PTG) memberi impak yang positif terhadap pesakit kanser, dimana PTG merupakan perubahan psikologi yang positif yang terbentuk hasil daripada trauma atau pengalaman yang amat tertekan akibat daripada kanser yang dihidapi. Walaupun PTG membawa kepada kepentingan, data berkenaan dengan hubungan diantara beberapa faktor psikososial penting (harapan, optimisme, strategi daya tindak dan persepsi sokongan pasangan), cabaran psikologi (kemurungan, keresahan dan stres pascatrauma) dengan PTG dalam kalangan pesakit kanser kepala dan leher merentasi masa masih berkurangan. Justeru, kajian ini bermatlamat untuk mengisi jurang penyelidikan dengan menilai perubahan tahap harapan, optimisme, cabaran psikologi (kemurungan, keresahan dan stres pascatrauma), strategi daya tindak, persepsi sokongan pasangan (faktor tidak bergantungan) dan PTG (faktor bergantungan) merentasi masa dan hubungkait diantara mereka dalam kalangan pesakit kanser kepala dan leher. *Metodologi:* Peserta kanser kepala dan leher menjawab soal selidik sosio-demografi dan ciri-ciri klinikal, Inventori Perkembangan Pasca Trauma-Borang Pendek, Skala Harapan, Ujian Orientasi Kehidupan-Pindaan, COPE Ringkas, Skala Sumber Sokongan Sosial, Skala Keresahan dan Depresi Hospital dan Senarai PTSD

bagi DSM-V dalam dua titik masa, iaitu penilaian garis dasar dan penilaian susulan (diantara lima hingga tujuh bulan dari penilaian garis dasar). *Kedapatan kajian:* Seramai 200 peserta kanser kepala dan leher mempamerkan tahap PTG, daya tindak sacara pendekatan, persepsi sokongan pasangan, harapan dan optimisme yang meningkat dari penilaian garis dasar ke penilaian susulan. Namun, tahap daya tindak secara mengelak susut dari penilaian garis dasar ke penilaian susulan. Model memintas secara rawak menunjukkan bahawa strategi daya tindak secara pendekatan (seperti perancangan dan penerimaan), tahap persepsi sokongan pasangan yang lebih tinggi dan tahap optimisme yang lebih tinggi menyumbang kepada tahap PTG yang meningkat merentasi masa. Sementara itu, strategi daya tindak secara mengelak adalah satu-satunya faktor yang berhubungkait dengan tahap PTG yang menurun merentasi masa. Tambahan, diantara ciri-ciri sosiodemografi dan klinikal, jantina adalah satu-satunya faktor yang berhubungkait dengan PTG secara signifikan merentasi masa (iaitu peserta lelaki mempunyai tahap PTG yang lebih rendah berbanding dengan peserta wanita). *Konklusi:* Intervensi psikososial yang akan meningkatkan strategi daya tindak secara pendekatan, sokongan pasangan dan optimisme serta mengurangkan strategi daya tindak secara mengelak sepatutnya disertakan sebagai sebahagian daripada rejimen rawatan pesakit kanser kepala dan leher untuk merangsang perkembangan PTG dan meningkatkan kesejahteraan pesakit.

THE RELATIONSHIP BETWEEN PSYCHOLOGICAL FACTORS

AND POSTTRAUMATIC GROWTH AMONG

HEAD AND NECK CANCER PATIENTS

ABSTRACT

Background: Head and neck cancer may lead to long term psychological complications, social and functional impairment among cancer survivors, which may affect the well-being and illness outcome. Nevertheless, collective evidence is accumulating regarding the positive impact of posttraumatic growth (PTG) on cancer survivors. PTG is a positive psychological change that develops in response to the traumatic or highly stressful experience of living with cancer. Despite its importance, data is still lacking on how various important psychosocial factors (hope, optimism, coping strategies and perceived spousal support) and psychological challenges (depression, anxiety and posttraumatic stress) were related to PTG among head and neck cancer patients across time. Hence, this study aimed to fill the research gap by evaluating the changes in hope and optimism, psychological challenges (depression, anxiety and posttraumatic stress), coping strategies, perceived spousal support [independent variables] and PTG [dependent variable] across time and their association among a cohort of head and neck cancer patients. *Methods:* The head and neck cancer participants were administered the sociodemographic and clinical characteristic questionnaires, the Malay versions of the Hope Scale, Life Orientation Test-Revised, Brief COPE, Sources of Social Support Scale, Hospital Anxiety and Depression Scale, PTSD Checklist for DSM-5 and Posttraumatic Growth Inventory-Short Form over two timepoints, such as baseline assessment and follow up assessment (between five and seven months after baseline assessments). *Results:* A total of 200

participants exhibited significantly increased degree of PTG, approach coping, perceived spousal support, hope and optimism from baseline to follow up; while avoidant coping and psychological challenges (depression, anxiety and posttraumatic stress symptoms) significantly decrease from baseline to follow up. A random intercept model revealed that approach coping (such as planning and acceptance), a higher degree of perceived spousal support, and a greater degree of optimism significantly contributed to a higher degree of PTG across time. While avoidant coping (such as denial) was the only significant factor associated with a lower degree of PTG over time. In addition, among sociodemographic and clinical characteristics, only gender was significantly associated with PTG across time (in which male participants had a lower level of PTG than female participants). *Conclusion:* Psychosocial interventions which enhance approach coping, spousal support and optimism, as well as reducing avoidant coping, should be included as part of the treatment regimen of head and neck cancer patients in order to facilitate the development of PTG and improve the well-being of patients.

CHAPTER 1

INTRODUCTION

This chapters cover background of the study, the problem statement followed by research questions, research hypothesis, research objectives. Definition of terms and scope and limitation of the study as the conclusion of this chapter.

1.1   Background

Posttraumatic growth (PTG) is understood as a positive psychological change resulting from a struggle with trauma. Psychological factors are the aspects of personality that either restrict or facilitate the ways that a person think. Cancer experiences can have a positive and negative impact. Traumatic experience of cancer can be the source for PTG and at yet psychological factors play a main role in predicting PTG.

Cancer diagnosis is a stressful event that may lead to long term psychological challenges, social and functional impairment. Treatment of cancer is often multimodal and aggressive and leads to various side effects. Although cancer is no longer a fatal disease with a poor prognosis, it does change the lives of those diagnosed with it, as cancer is a chronic illness with a recurrent course. Head and neck cancer is a group of cancer diagnoses that affect various regions of the head and the neck, such as paranasal sinuses, pharynx, larynx, nasal cavity, oral cavity and lips, in which they are biologically similar. Overall, head and neck cancer affect 878,348 people worldwide annually, which made up 4.6% of total cancer incidence in 2020 (Sung, 2021). The commonest head and neck cancer in Malaysia is nasopharyngeal carcinoma which accounts for 4.0% of all cancer cases in the country (Ministry of Health Malaysia,

2018). Males are affected more frequently compared to females, with a ratio of 2:1 to 4:1.

One feature which differentiates head and neck cancer from other types of cancer is its association with facial disfigurement. Because of society emphasis on physical attractiveness, facial disfigurement, which arise due to head and neck cancer, raises the risk of the psychological vulnerability of head and neck cancer patients. For example, facial disfigurement may contribute to depression and lower quality of life among head and neck cancer patients (Dropkin, 1999; Long et al., 1996). A study in head and neck cancer patients demonstrated a higher degree of facial disfigurement was positively correlated with psychological distress (Hagedoorn and Molleman, 2006). Head and neck cancer patients are also prone to a high incidence of psychosocial issues, such as continued substance dependence and abuse, depression, suicide, interpersonal relationship conflict, social isolation, and damage to self-image (Smith et al., 2017).

Head and neck cancer patients are also vulnerable to various complications of the disease itself and the adverse effects of its treatment, such as mucositis, xerostomia, the problem with speech and swallowing, breathing complications, trismus, fatigue and pain (Sroussi, et al., 2017). Consequently, the daily functioning of patients is impaired, further contributing to the increasing prevalence of depression and further downfall of the degree of quality of life (Holtmaat et al., 2017; Sharp et al., 2018). Hence, head and neck cancer patients are prone to experience trauma as a result of the illness itself and/or due to the side effects of its treatment.

1.2   Problem statement

Posttraumatic growth (PTG) is the positive psychological change, which develops as a consequence of trauma or highly stressful event experienced by the person. It has been reported to occur in traumatized head and neck cancer patients and has been shown to improve the quality of life of patients (Sharp, Redfearn, Timmons, Balfe, & Patterson, 2018). Other psychological factors reported to enhance psychological well-being and quality of life of head and neck cancer patients are hope, optimism, coping mechanism, and social support (particularly spousal support). However, data is lacking on the relationship between different type of positive psychological changes (hope, optimism and posttraumatic growth) among head and neck cancer patients. Moreover, data on how coping mechanisms and perceived spousal support are related to posttraumatic growth are also scarce among head and neck cancer patients.

Depression, anxiety and posttraumatic stress disorder are common psychological challenges among head and neck cancer patients. These psychological challenges may disrupt the psychological well-being and lower the quality of life of head and neck cancer patients. It is important to assess the degree to which these psychological challenges affect head and neck cancer patients. Moreover, it is pivotal to explore how common psychological challenges of head and neck cancer, such as depression, anxiety, and posttraumatic stress, are related to PTG in head and neck cancer patients after taking into consideration other psychological factors, as these data are lacking.

Hence, there is an increasing need to investigate these factors in cancer patients. However, the majority of PTG studies in cancer patients so far have focused

on breast cancer patients (Casellas-Grau et al., 2017). Only a few researchers have looked into the psychological factors that could be linked to PTG and it is more interesting to study in head and neck cancer patients. PTG is important and should be a positive psychology changes to focus on and enhancing wellbeing.

1.3 Research Questions

1. What are the levels of PTG, hope and optimism, psychological challenges (such as depression, anxiety, and posttraumatic stress), perceived spousal support, and coping strategies among a cohort of head and neck cancer patients across two timepoints?

2. What is the association between PTG, hope and optimism, psychological challenges (such as depression, anxiety, and posttraumatic stress), perceived spousal support, coping strategies, and PTG across two time point after controlling for socio-demographic and clinical characteristics among a cohort of head and neck cancer patients?

1.4 Research Hypotheses

1. PTG, hope and optimism, perceived spousal support, and approach coping strategies are expected to increase across two timepoints among head and neck cancer patients.

2. Psychological challenges (such as depression, anxiety, and posttraumatic stress) and avoidant coping strategies are expected to decrease across two timepoints among head and neck cancer patients.

3. PTG, hope and optimism, perceived spousal support and approach coping strategies predict higher degree of PTG across time, while avoidant coping strategies predicted lower degree of PTG across time.

1.5   Research objectives

1.5.1   General objective

To evaluate the relationship between hope and optimism, psychological challengers (such as depression, anxiety, and posttraumatic stress), perceived spousal supports, coping strategies and PTG among a cohort of head and neck cancer patients diagnosed with cancer within the first year of diagnosis.

1.5.2   Specific objectives:

1.   To assess the levels of PTG, hope and optimism, psychological challenges (such as depression, anxiety, and posttraumatic stress), perceived spousal support, and coping strategies among a cohort of head and neck cancer patients across two timepoints.

2.   To determine the relationship between PTG and other psychological factors (such as hope and optimism), psychological challenges (such as depression, anxiety, and posttraumatic stress), perceived spousal support, coping strategies, and PTG across time after controlling for socio-demographic and clinical characteristics among a cohort of head and neck cancer patients.

1.6   Definition of terms

Dependent variable (DV)	Operational definition
Posttraumatic growth	Positive psychological change which develops as a result of struggle with an extremely stressful experience or a traumatic event.

Independent variables (IV)	Operational definition
Hope	Hope is a dispositional trait and goal-directed motivational state which contributes to one's tendency to have a positive outlook in life.
Optimism	It is a tendency to perceive that good things will happen in life.
Anxiety	State of being uneasy, apprehensive or worried. Anxiety is a normal emotion, but anxiety disorder develops when significant and uncontrollable feelings of anxiety and fear ensue which significantly impaired the social, occupational, academic or personal functioning.
Depression	Mental condition that explains by ongoing feelings of sadness, despair, loss of energy, and difficulty dealing with normal daily life. Other signs of depression include hopelessness and feeling of worthlessness, loss of pleasure in activities adjustment in sleeping and eating patterns and suicidal. These syndrome causes significant impairment of the social, occupational, academic or personal functioning.
Post-traumatic stress disorders (PTSD)	Post-traumatic stress disorder (PTSD is a psychiatric disorder characterized by extreme distress and disruption in daily life which happens after exposure to a traumatic event.
Coping Strategies	A cognitive and behavioural process used to accept, control, and reduce the consequences of the impact of a stressful life experience. Coping strategies can divide into two main categories were approach coping and avoidance coping.

Perceived Social Spousal Supports	Spousal support is a perception or reality of being cared for and sufficiently supported by the spouse or partner.

1.7   Scope and limitation of the study

The scope of this study covered the level PTG and psychological factors: psychological changes (hope and optimism), psychological challenges (depression, anxiety, and posttraumatic stress), coping strategies, and perceived spousal support across two timepoints among a cohort of head and neck cancer patients who were within one year of being diagnosed with cancer. This study also included how psychological changes (hope and optimism), psychological challenges (depression, anxiety, and posttraumatic stress), coping strategies and perceived spousal support were related to PTG across two timepoints. The limitation of this study was that it was only conducted across two timepoints, which was not sufficient to examine the trend of the psychological factors and PTG, and whether the psychological factors assessed have a causal inference on PTG. The delimitation of this study was that we did not include head and neck cancer patients with duration of diagnosis longer than one year as we would like to examine how PTG and other psychological factors varies during the initiate first year after being diagnosed with head and neck cancer.

CHAPTER 2

LITERATURE REVIEW

2.1   Posttraumatic Growth

Posttraumatic growth is the positive psychological changes that occur because of struggle with stressful life events or traumatic experiences. Posttraumatic growth has been widely documented in cancer patients (Tanyi et al., 2020). It is subdivided into five factors, i.e., new possibilities in life, a greater sense of personal strength, spiritual development, improved relationship with others and better appreciation of life (Calhoun and Tedeschi, 2006). Traumatic events alone are not sufficient to induce PTG in a cancer survivor. Instead, the individual cancer survivor must also reflect on their experiences and seek to find meaning in them such that PTG arises as a result of adaptation to the trauma of cancer diagnosis and its complications, and rebuilding one's sense of the world (Sumalla et al., 2009; Tedeschi and Calhoun, 2004). The components of PTG in cancer patients are explained as below:

2.1.1   New possibilities in life

Having cancer may change patient's priorities in life and set new objectives for themselves. They might begin to pursue new interests and set goals for the future. Cancer survivors may also attempt to achieve what they failed to do before being diagnosed with cancer, such as changing their lifestyle from one that is less than ideal to one that is healthier (Tedeschi and Calhoun, 2004).

2.1.2 A greater sense of personal strength

Cancer survivors may feel more confident in their ability to handle their condition and the side effects of cancer treatment. They may develop stronger inner strength. They consequently feel assured that they can overcome every obstacle in life with their newly discovered inner strength (Tedeschi and Calhoun, 2004)

2.1.3 Spiritual development

Cancer survivors are more sensitive towards spirituality and willing to explore the depth of their religious matters. They may experience increase spirituality and feel more connected to their religion (Tedeschi and Calhoun, 2004).

2.1.4 Improved relationship with others

Living with cancer might deepen the connections or relationships with family or friends or any close person. As per the view of Casellas-Grau *et al.* (2017), supporting each other is one of the most valuable and respectful decisions in such a traumatic stage in life. Head and neck cancer patients may develop higher degree of attachment with other patients who experienced similar life event.

2.1.5 Better appreciation of life

Cancer survivors may start to appreciate their lives more than they did previous prior to being diagnosed with cancer, and their priorities may shift. For instance, a cancer survivor may change their priorities in life and start to focus more on their

family or appreciate their life more than before after surviving from cancer (Tedeschi and Calhoun, 2004).

2.2 Theories Related to PTG

The mechanism of development of posttraumatic growth is explained in a few theories which enumerate on the process of transformation such as including the Janus face model, the organismic valuing theory of growth and affective-cognitive processing model of posttraumatic growth.

A 2-way model was hypothesized to conceptualize posttraumatic growth known as the "Janus-Face Model" which is divided into two components of posttraumatic growth such as the constructive and illusory component. The constructive component stated that posttraumatic growth developed from significant changes in identity, personal cognitive schemas and positive adjustment to trauma after successful coping with adverse circumstances (Zoellner and Maercker, 2006). Contrastingly, the illusory component is the distorted positive illusion component of posttraumatic growth that protects the subject from cognitive processing of the experience of loss and distress. It involves the defense mechanism of denial of having cancer or the negative impact of having cancer and from the adverse effects of its treatment. Hence, the illusory component is not real PTG perception, but it is helpful to maintain the psychological equilibrium and prevent changes in the assumptive world of the individual (Taylor et al., 2000).

The organismic valuing theory of growth explains that human is naturally being able to determine what is important to fulfil in life and they are inherently driven to progress in a positive path. As a result, when a traumatic event occurs, it triggers information processing to re-evaluate the assumption worldview about self, others and

the surrounding. There are two ways that the new trauma-related information is being processed. If assimilation occurred in which the trauma-related information is integrated into pre-existing worldview assumption, then the pre-existing assumptive worldview about self, others and the surrounding are maintained, the assumption will continue to exist and remain unshattered. However, if the pre-existing assumptive worldview are disconfirmed and being shattered, then it may progress in two ways, either positive or negative accommodation. Positive accommodation is where trauma-related information is incorporated into the existing worldview assumptions for construction of a new worldview assumptions (Joseph & Linley, Positive Adjustment to Threatening Events: An Organismic Valuing Theory of Growth Through Adversity., 2005). Therefore, rather than assimilation, positive accommodation will contribute to the growth of PTG. While negative accommodation will result in posttraumatic depreciation.

According to the affective-cognitive processing model of PTG, initially, the discrepancies between pre-existing assumptive worldview and the new trauma-related information resulting in the traumatic event shattered the pre-existing assumptive world about self, others and the surrounding. This triggers event cognition results in affective- cognitive processing which is characterised by either ruminative brooding or reflective pondering. If ruminative brooding follows, then assimilation occurred, and this leads to temporary restoration of the pre-assumptive worldview about self, others and the surrounding. But if cognitive conscious processing of the traumatic event resulting in reflective pondering, accommodation occurred whereby trauma-related information is incorporated into searching for meaning which eventually leads to construction of a new assumptive worldview and development of PTG (Joseph & Ragel, 2012).

2.3   The important of PTG in cancer patients.

From the theory of PTG we discovered that negative experience can lead to beneficial transformation. PTG develops when a person is trying to searching for meaning out of the traumatic life event. This occurred when the person pre-assumptive world was shattered by the traumatic experience and he is able to make meaning out of the trauma by incorporating or accommodate the new trauma-related information to rebuild the assumptive world after the traumatic event.

It is vital to study PTG in cancer patients because it is pivotal to examining and understanding the needs, experiences and outcomes of cancer patients as PTG improving outcomes of cancer patients which can help them handle their mental stability more effectively and promote quality of life. Many cancer survivors may experience positive transformation from their cancer experience, such as improved relationships, a stronger grasp of life, and an increase in positive self-perception ((Cordova, Cunningham , Carlson , & Andrykowsky, 2001).

 PTG is a transformational process and representing the positive psychological change that is beyond the degree before the occurrence of trauma. PTG is different from resilience. Resilience is the ability to restore psychological and physical functioning back to the degree before trauma, hence, resilience helps to maintain the functioning level of the person after trauma occurs. On the other hand, PTG allowed psychological functioning to increase beyond the level prior to occurrence of trauma and hence, it allowed positive transformation to occur in response to a traumatic event like having cancer.

PTG is also different from another positive psychological change called benefit finding (BF). Previous study of constructs of positive consequences of cancer have

distinguished between PTG and BF which are defined as separate phenomena (Sears, Stanton, & Danoff-Burg, 2003). PTG refers to benefits associated with changes in life perspective, interpersonal relationship, and self-perception. The changes result from the struggle of an extreme event like a cancer diagnosis and treatment and cannot be caused by minor stressors (Tedeschi and Calhoun, 1995; Sumalla et al, 2009). In contrast, BF is defined as the process in which the patient re-assigns positive value to the illness based on the benefits he or she identifies (Collins et al, 1990; Helgeson et al, 2006). While BF is hypothesized to start immediately after diagnosis, PTG refers to an active change in one's capacity to deal with adverse events and, thus, may develop even years after the cancer diagnosis (Calhoun and Tedeschi, 1998).

In addition, women who said they were very satisfied with their lives reported more posttraumatic progress than those who did not (Floortje, Vingerhoets, Coebergh, & de Poll-Franse, 2009). Not every cancer patient and not every stage of the illness trajectory experiences positive consequences of cancer. From the previous study of breast cancer survivors, women who reported having a high level of life satisfaction reported more posttraumatic growth than those who did not (Mols & et. al, 2009). In addition, women who stated that their satisfaction with life was high reported higher levels of posttraumatic growth in comparison to women who did not.

2.4 Factors Associated with Posttraumatic Growth in Head and Neck Cancer Patients

Various factors may be associated with PTG in cancer patients including demographic factors (female gender, young age, minority race, higher level of education and religiosity), clinical factors (such as tumor size, radiotherapy, endocrine treatment, and mastectomy) and psychology factors (including hope, optimism, and

social support, as well as positive coping strategies) (Fallah et al., 2012; Helgeson et al., 2006; Hullmann et al., 2014; Kinsinger et al., 2011; Yi et al., 2015; Zwahlen et al., 2010). In addition, psychological challenges including depression, anxiety and PTSD which trigger traumatic experience may also contributes to PTG. However, most of the studies on PTG in cancer patients involved breast cancer patients. Data on how demographic, clinical and psychological factors are predicted with PTG in head and neck cancer patients are lacking. It is important to look at the associating factors of PTG in head and neck cancer because this can facilitate the occurrence and PTG and improve wellbeing of patient.

Patient who has PTG may also have stress and negative feelings. Both growth and adversity can occur simultaneously. In actuality, the majority of those who experience PTG may also have experience psychological challenges, such as depression, anxiety and posttraumatic stress disorder. In the previous study of cancers patients, reported that higher level of posttraumatic stress symptoms and can be viewed as precursors for development of PTG.

A Malaysian study of head and neck cancer patients by Leong Abdullah et al. (2015) found that PTG at baseline assessment does not predict PTG at follow up assessment and concluded that most probably PTG is a coping process. Hence, this supports the presence of the illusory component of PTG, which is present at the early stage after the occurrence of trauma. However, only a few longitudinal studies of PTG have been conducted among head and neck cancer patients. It is even rarer to find a longitudinal study of PTG in head and neck cancer patients among the Asian population.

Cultural differences may contribute to differences in the occurrence of PTG in cancer patients and also influence the factors associated PTG (Cho and Park, 2013). Therefore, it is vital to study head and neck cancer in Asian cancer patients and how it varies over time as data is still lacking. To date, only two studies investigated PTG in Asian head and neck cancer patients. The first was a cross-sectional study in Hong Kong oral cavity cancer patients, demonstrating a mean PTGI score of 51.76 (Ho et al., 2011).

Meanwhile, the second was prospective study in Malaysian head and neck cancer patients, which demonstrated a decrease in the PTGI-SF score across time (Leong Abdullah et al., 2015). PTG exhibited by head and neck patients is relatively lower as compared to other types of cancer (Leong Abdullah et al., 2015). This may be due to physical complications of head and neck cancer and its treatment like facial disfigurement, xerostomia, difficulty with speech and swallowing and trismus, which are not seen in other types of cancer. In addition, head and neck cancer patients are also prone to several psychosocial issues, such as continued substance dependence and abuse, depression, suicide, interpersonal relationship conflict, social isolation, and damage to self-image (Smith et al., 2017). Thus, it is vital to study PTG in head and neck cancer where the pattern of development and trend of PTG across time may differ from other types of cancer, hence warranting different psychosocial interventions.

Association between Psychological Challenges (Depression, Anxiety, Posttraumatic Distress Symptoms), Hope and Optimism, Spousal Social Support, Coping Strategies, and Posttraumatic Growth in Head and Neck Cancer Patient

Head and neck cancer are associated with psychiatric sequelae such as depression and anxiety. Studies found that head and neck cancer have the highest documented rates of depression and anxiety. Head and neck cancer patients are also prone to posttraumatic stress disorder (Neilson et al., 2013; Wu et al., 2016). However, with the appropriate approach to coping, better social support (particularly spousal support), and the development of hope and optimism, these factors will enhance the psychological well-being of head and neck cancer patients.

2.5.1 Association between Psychological Challenges (Depression, Anxiety, Posttraumatic Distress Symptoms) and Posttraumatic Growth in Head and Neck Cancer Patient

Patients with head and neck cancer have been reported to be prevalent for depression and anxiety as a result of the risk of developing facial disfigurement (Dropkin, 1999; Long et al., 1996). As a result, it is not surprising that head and neck cancer is associated with psychiatric sequelae such as depression and anxiety. Some studies have found that head and neck cancer have the highest documented rates of depression and anxiety (Massie, 2004; Strauss, 1989). In a study of orofacial cancer patients by Humphris et al. (2003), they found that a significant number of patients experienced depression and anxiety three months post-treatment (possible case: anxiety= 37% and depression= 28%). Moreover, Kugaya et al. (2000) proved that head and neck cancer patients using a clinical interview with DSM III reported that 16.8% of patients have depression.

Depression and anxiety in head and neck cancer could contribute to the impaired quality of life of patients (Smith et al., 2003). In an article from Spiegel and Giese-Davis (2003), they found strong evidence that depression may predict cancer progression and mortality, where depression and cancer have a bidirectional relationship; both can exert a negative impact on each other. Study in cancer patients has also highlighted that high level of anxiety and depression adversely affects the coping and quality of life of patients (Karakoyun-Celik et al., 2010).

The prevalence of posttraumatic stress disorder was reported at 2.0% in a large-scale study of survivors with various cancer types or diagnoses (Esser et al., 2019). However, the prevalence of posttraumatic stress disorder is even higher in head and neck cancer survivors. Posttraumatic stress symptoms were reported in 33.4% of head and neck cancer survivors, and about 11.8% of survivors met diagnostic criteria for posttraumatic stress disorder (Moschopoulou et al., 2018). Posttraumatic stress symptoms not only occurred in head and neck cancer survivors but also occurred in their partners (Moschopoulou et al., 2018).

As psychological challenges such as depression, anxiety and posttraumatic stress symptoms are prevalent in head and neck cancer and these challenges may lead to various negative impact on cancer patients, it would be interesting to evaluate how these psychological challenges are related to PTG in head and neck cancer patients. The association between depression and anxiety with posttraumatic growth in head and neck cancer patients is still inconclusive. To date, only two studies investigated the relationship of posttraumatic growth with depression and anxiety in head and neck cancer. A Malaysian study by Leong Abdullah et al. (2015) demonstrated no significant association between severity of depression, anxiety and PTG among head and neck cancer patients. However, Holtmaat et al. (2017) demonstrated the absence

of anxiety disorder is associated with higher PTG in Dutch head and neck cancer patients but found no association between depression and PTG. The limitations of these two studies were small sample sizes, i.e., n= 50 (Leong Abdullah et al., 2015) and n = 74 (Holtmaat et al., 2017), respectively. Hence, a study with a larger sample size would be more desirable.

Cancer diagnosis and treatment can be a psychiatric or psychologically traumatic experience for patients. Cancer, on the other hand, can contribute to positive psychological changes, such as posttraumatic growth. According to Posluszny et al. (2015), a diagnosis and treatment of head and neck cancer significantly increase the level of PTSD because this is perceived as a traumatic experience for patients and interestingly, this may contribute to positive psychological changes, such as posttraumatic growth. However, studies investigating the relationship between posttraumatic stress symptoms and posttraumatic growth in cancer patients demonstrated a curvilinear relationship. Initially, posttraumatic stress symptoms contributed to an increase in posttraumatic growth. However, as the severity of posttraumatic stress symptoms continue to increase across time, it leads to depreciation of posttraumatic growth (Shand et al., 2015). Despite the importance of evaluating the severity of PTSD in cancer patients, data on how PTSD is related to PTG in head and neck cancer patients are scarce.

Despite various studies which evaluated the relationship between psychological challenges and posttraumatic growth in cancer patients, most of the studies focus on breast cancer patients and are of cross-sectional design. There is an urgent need to conduct a study to investigate on how depression, anxiety and PTSD are related to PTG across time in head and neck cancer patients, which data are still lacking.

2.5.2 Association between Hope and Optimism and Posttraumatic Growth in Head and Neck Cancer Patient

Hope is a dispositional trait and a goal-directed motivational state which contributes to one's tendency to have a positive outlook in life. Hope consists of two components known as agency and pathway. Agency is a perceived motivational state that enables one to initiate or sustain strategies or ways to achieve the goal set in life. On the other hand, pathway is the perceived ability that enables one to generate strategies or ways to achieve the goal set in life. Hence, both agency and pathway are interdependent, where the degree of hope depends on the presence of both agency and pathway. The higher the degree of these components, the higher the degree of hope is (Snyder et al., 1991).

Hope has been reported to be associated with several outcomes in cancer patients. Hope is inversely correlated with a number of negative outcomes such as psychological distress, anxiety and depression (Han et al., 2013; Kim et al., 2011; Shimizu et al., 2012; Yang et al., 2014). On the contrary, hope is positively correlated with several positive outcomes among cancer patients, such as greater self-efficacy, higher spiritual well-being and quality of life, as well as a higher degree of positive psychology (such as resilience, optimism, psychosocial adjustment and posttraumatic growth) (Chang and Li, 2002; Ho et al., 2011; Hou et al., 2010; Jo and Son, 2004; Lin and Tsay, 2005; Ryu and Yi, 2013; Yang et al., 2014). Moreover, a higher degree of hope is also positively associated with greater social connectedness among cancer patients, whereby higher hope is related to higher nursing care satisfaction, improved relationships with friends and neighbours, and higher quality of social relationship (Jo and Son, 2004; Ryu and Yi, 2013). A study of PTG among Malaysian cancer patients (patients with mixed cancer diagnoses) has also documented that hope is the most

significant factor associated with PTG compared with other positive psychological changes such as optimism and religious coping (Leong Abdullah et al., 2019).

On the other hand, optimism is a stable and consistent belief that good outcomes will happen in life rather than bad ones. Hence, unlike hope which is a goal-directed motivational state, optimism is a different construct. Two studies of PTG in cancer patients have reported that optimism and hope are indeed two different constructs (Ho et al., 2011; Leong Abdullah et al., 2019).

Nevertheless, similar to hope, optimism is associated with several positive outcomes in cancer patients. A higher degree of optimism is positively associated with psychological well-being, a higher degree of hope and posttraumatic growth (Horney et al., 2011; Miller et al., 1996; Petersen et al., 2008). For example, optimism acts as a cognitive strategy that facilitates cognitive reappraisal of the trauma of living with cancer. Hence, it enhances the search for meaning from the traumatic event and increases the probability of developing PTG (Yi et al., 2015). Contrastingly, optimism is inversely associated with psychological complications of cancer, such as psychological distress and depression (Horney et al., 2011). In the context of head and neck cancer patients, optimism predicts better one-year survival of head and neck cancer patients independent of confounding demographic and clinical factors (Allison et al., 2003). On the contrary, when the level of optimism in head and neck cancer patients is low, it predicted higher level of depression (Horney et al., 2011).

In the context of head and neck cancer patients, Ho et al. (2011) conducted a cross-sectional study that investigated the relationship between hope, optimism and posttraumatic growth. The study reported that only the pathway domain of hope was associated with posttraumatic growth, but not the agency domain of hope and

optimism (Ho et al., 2011). Nevertheless, this study was limited by a small sample size (n = 50) and its cross-sectional design. Hence, a study on how hope and optimism are related to posttraumatic growth across time among a larger cohort of head and neck cancer patients is warranted to confirm the findings reported by (Ho et al., 2011).

2.5.3 Association between Perceived Social Support and Posttraumatic Growth in Head and Neck Cancer Patient

Social support is a perception or reality of being cared for by others, being sufficiently supported by others, and being considered part of a social network. Social support could be classified into four components such as emotional support, instrumental support, informational support and companionship support. Emotional support concerns whether one has received sufficient love, trust, concern, affection, acceptance, encouragement and care from others. Hence, it is related to the nurturance and warmth one receives from their social network. Companionship support enables one to experience a sense of belonging from the support one receives from their social network. For example, spousal support is a form of companionship support. Informational support is a concern with sufficient support received in terms of information, guidance, instruction and advice in solving one's problems in life from the person's source of social support. Finally, instrumental support is adequate if one is provided with sufficient financial assistance, goods and service from one's social network (Williams, 2005). Good social support, especially spousal support, may contribute to positive psychological outcomes among cancer patients. Good social support has been reported to reduce psychological distress and psychopathology while enhancing psychological adjustment, which reduces morbidity and mortality among cancer patients. Consequently, a high degree of perceived social support also enhances the quality of life of cancer patients (Applebaum et al., 2014).

Social support confers a bidirectional relationship with other positive psychological changes among cancer patients. Cancer survivors with a high degree of optimism tend to exhibit stronger social support as they have lesser emotional demands, which would then project a less stressful social environment for social interaction to occur and, in turn, facilitate the formation of social networks (Trunzo and Pinto, 2003). Stronger social support also enables frequent emotional sharing of traumatic experiences and stressful life events between cancer patients and their source of social support. This facilitates cognitive reappraisal of the traumatic event of living with cancer and, in turn, allow the search of meaning out of the trauma and development of PTG (Shand et al., 2015; Tedeschi and Calhoun, 2004). Studies of PTG in Malaysian cancer patients (patients with mixed cancer diagnoses) indicated perceived spousal support as one of the significant predictors of PTG, and higher instrumental support is one component of social support associated with PTG (Leong Abdullah et al., 2019; Shand et al., 2015; Tedeschi and Calhoun, 2004). Again, no studies have been conducted before to assess how perceived spousal support is related to posttraumatic growth across time in head and neck cancer patients, despite the various positive outcome in cancer patients contributed by social support.

2.5.4 Association between Coping Strategies and Posttraumatic Growth in Head and Neck Cancer Patient

Coping is a cognitive and behavioral process utilized to tolerate, manage and reduce a stressful life event. One classification of coping categorized coping strategies broadly into approach and avoidance coping (Higuchi and Echigo, 2016; Rajandram et al., 2011). Studies of PTG in cancer patients revealed that approach coping, such as positive reappraisal and acceptance as well as religious coping, were associated with a greater degree of PTG (Casellas-Grau et al., 2017; Shand et al., 2015). Nevertheless,

these studies were limited by the small sample size and cross-sectional design of the study.

To the best of our knowledge to date, no study focuses on the relationship between coping strategies and PTG among head and neck cancer patients across time. However, in the context of a closely related positive psychology (benefit findings), two studies reported that approach coping strategies (such as active coping, emotional support and positive reappraisal) were predictive of PTG among head and neck cancer patients (Harrington et al., 2008; Llewellyn et al., 2011). Notwithstanding these findings, benefit findings (BF) and PTG are two distinct positive psychology. BF is a positive psychological change in the form of perceived benefit in response to an adverse life event. Still, PTG is a more pervasive cognitive change that occurred after shattering the cognitive assumption about self, others, and the surrounding world due to struggling with a traumatic event (Shand et al., 2015). In fact, a study by Andrykowski et al. (2017) comparing BF and PTG between rural and urban cancer patients reported that rural cancer patients had higher PTG than non-rural patients. Still, there was no difference in the degree of BF between rural and urban patients. These findings pinpointed that both BF and PTG are indeed different constructs. Hence, there is a significant need to conduct a study to investigate how coping strategies utilize by cancer patients are related to posttraumatic growth among head and neck cancer across time to fill the research gaps.

2.5.5 Association between Socio-Demographic, Clinical Characteristics and Posttraumatic Growth in Head and Neck Cancer Patient

To date, there are no national statistics specifically for head and neck cancer that clearly indicate the demographic and clinical characteristics of the patients. Hence,

the overview of the sociodemographic and clinical characteristics of the Malaysian head and neck cancer population are based on previous studies of the sociodemographic and clinical characteristics of head and neck cancer in the country. The proportion of male patients ranged from 62.8% to 65.0% (Ahmad et al., 2021; Ludin et al., 2018; Wong et al., 2015). While the mean age of the head and neck cancer participants in recent Malaysian studies fall within the range of 55.0 to 61.6 years old (Ahmad et al., 2021; Ludin et al., 2018; Raman et al., 2021; Wong et al., 2015). In the context of racial distribution, two studies which done a study in east coast Malaysia, indicated the majority of the participants were Malays (68.8% to 77.5%), followed by Chinese (17.5% to 20.9%) (Ahmad et al., 2021; Ludin et al., 2018); while another two studies reported that larger proportions of head and neck cancer patients were Indians (35.4% to 47.7%), followed by Chinese (33.3% to 45.4%) (Raman et al., 2021; Wong et al., 2015). Regarding monthly income, the worldwide data also indicated that most of the head and neck cancer survivors were in the low socioeconomic class (Salehiniya et al., 2018). In term of education status, other Malaysian studies on head and neck cancer patients revealed that those who attained up to at least secondary education level ranged from 41.9% to 60.0% (Ludin et al., 2018; Raman et al., 2021).

Clinical characteristics of Malaysian head and neck cancer pinpointed that the majority of the participants were in stage 4 of cancer (range = 43.8% to 46.5%), followed by stage 3 (23.8% to 31.9%), and then stage 2 (12.6% to 23.1%) (Ahmad et al., 2021; Wong et al., 2015). The national head and neck cancer data reported that nasopharyngeal carcinoma is the commonest site of head and neck cancer in Malaysia, followed by oral cancer (International Agency for Research in Cancer, 2021). Participants treated with chemotherapy alone or the combination of chemotherapy with other treatment modalities constituted about 23.1% to 49.3% of the total participants