Stress Reactions in the Face of the “Good Cancer.” Correlates of Posttraumatic Growth in Thyroid Cancer

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy.

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Abstract

Thyroid cancer has been rapidly increasing in incidence. Little is known about the psychological impact of thyroid cancer beyond the impact on quality of life. Moreover, there is scant research on the potential positive outcomes following a diagnosis of thyroid cancer. This study investigated the experience of distress and posttraumatic growth (PTG) in thyroid cancer survivors. This study used a cross sectional design to survey 259 women with thyroid cancer across Canada and the United States. Age, time since diagnosis, recurrence, coping, social support, rumination, anxiety, depression, physical health-related quality of life, health locus of control, and health behaviour change were examined in relation to five dimensions of PTG. Hierarchical regression analysis was used to examine predictors of PTG. Moderation analysis was used to explore the impact of social support on coping and PTG. Findings from the regression analyses revealed that Positive Reappraisal style of coping was a significant predictor of factors relating to PTG including Relating to Others ($R^2$ change=.18), New Possibilities ($R^2$ change=.38), Personal Strength ($R^2$ change=.07), Spiritual Change ($R^2$ change=.28), Appreciation of Life ($R^2$ change=.15), and total PTG ($R^2$ change=.36). Social Support emerged as a moderator between Distancing as a style of coping and Relating to Others ($R^2$ change=.16). Participants reported significantly higher levels of distress and moderate degrees of PTG. Being
younger in age was predictive of Appreciation of Life, but did not account for a meaningful percentage of the variance in the regression model. Time since diagnosis and recurrence were not predictive of PTG for this sample. This is the first quantitative investigation of PTG in a thyroid cancer population, and highlights the fact that this sample of participants experienced significant levels of distress. This study confirms that Positive Reappraisal plays an important role in the experience of growth across all domains of PTG. Inconsistent results between each of these PTG domains with other psychosocial variables suggest evidence for further exploration of an alternate factor structure and caution when using a global score. Future research can focus on developing interventions aimed at reducing distress, reinforcing adaptive coping strategies, and promotion of the mechanisms of growth.
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# Table of Contents

Abstract ............................................................................................................................................. ii

Acknowledgements ............................................................................................................................... iv

List of Tables ......................................................................................................................................... vii

List of Figures ......................................................................................................................................... viii

Chapter 1: Introduction ....................................................................................................................... 1

Statement of the Problem: Prevalence, Incidence, and Impact of Thyroid Cancer ..................... 1

Chapter 2: Literature Review ............................................................................................................... 4

Psychological Impact of Cancer ........................................................................................................ 4

Posttraumatic Growth ......................................................................................................................... 11

A Model of Posttraumatic Growth ....................................................................................................... 15

The Role of Coping in Posttraumatic Growth ..................................................................................... 16

The Role of Support in Posttraumatic Growth .................................................................................... 19

Posttraumatic Growth and Cancer ...................................................................................................... 20

Psychological Impact of Thyroid Cancer ............................................................................................. 27

Need for the Current Study ................................................................................................................. 36

Hypotheses ........................................................................................................................................... 38

Chapter 3: Method ............................................................................................................................... 42

Participants .......................................................................................................................................... 42

Procedures ........................................................................................................................................... 45

Measures .............................................................................................................................................. 46

Data Analysis ...................................................................................................................................... 53

Chapter 4: Results ............................................................................................................................... 54

Analytic Strategy ................................................................................................................................. 54

Descriptive Statistics .......................................................................................................................... 55

Demographic Data .............................................................................................................................. 58

Thyroid Cancer Experiences ............................................................................................................... 58

Demographic Variables, Thyroid Cancer Experience, and PTG .................................................... 59

Predictors of PTG ............................................................................................................................... 65

Moderation .......................................................................................................................................... 72

Chapter 5: Discussion ......................................................................................................................... 82
PTG in Thyroid Cancer Survivors ................................................................. 82
Demographics and Thyroid Cancer Variables ........................................... 84
The Experience of Distress ........................................................................ 86
The Relationship Between Coping and PTG ........................................... 88
The Role of Social Support in PTG ............................................................. 90
Other Correlates and Predictors of PTG ..................................................... 91
Coping and PTG: Exploring Models for Moderation Using Social Support .... 95
Theoretical Contribution .......................................................................... 97
Strengths ..................................................................................................... 99
Limitations .................................................................................................. 99
Clinical Implications and Future Directions ............................................ 102
Conclusion ................................................................................................. 103
References ................................................................................................. 105
Appendix A: Recruitment Advertisement .................................................. 125
Appendix B: Recruitment Email .................................................................. 126
Appendix C: Counselling Resource Page .................................................. 128
Appendix D: Consent Form ........................................................................ 129
Appendix E: Demographics and Thyroid Cancer Questionnaire .............. 132
Appendix F: Posttraumatic Growth Inventory ........................................... 136
Appendix G: Depression Anxiety Stress Scale – 21 (DASS 21) ................. 137
Appendix H: Ways of Coping (Revised)* .................................................. 138
Appendix J: Multidimentional Health Locus of Control ............................. 141
Appendix K: Quality of Life Scale/Thyroid (QOL-Thyroid) ....................... 142
Appendix L: Rumination Responses Scale ................................................. 143
Appendix M: Medical Outcomes Survey Social Support Survey (MOS-SSS) ......................................................................................... 144
Appendix N: Descriptive Statistics for Scales (N=259) .............................. 145
Appendix O: Intercorrelations of the PTGI ............................................... 146
List of Tables

Table 1. Examples of Coping Strategies 17
Table 2. Demographics and Thyroid Cancer Variables 43
Table 3. Descriptive Statistics for PTGI (N=259) 56
Table 4. Intercorrelations for Demographic Variables and Posttraumatic Growth Factors 60
Table 5. Disease Recurrence and PTG 60
Table 6. Accessing Support Services and PTG 61
Table 7. Coping and PTG Correlations 62
Table 8. Depression, Anxiety, Rumination, and PTG Correlations 63
Table 9. Health Behaviour Changes, Thyroid Quality of Life (QOL) Physical Health, and PTG Correlations 64
Table 10. Health Locus of Control (HLOC) and PTG Correlations 64
Table 11. Social Support and PTG Correlations 65
Table 12. Predictors of PTG I: Relating to Others 66
Table 13. Predictors of PTG II: New Possibilities 67
Table 14. Predictors of PTG III: Personal Strength 68
Table 15. Predictors of PTG IV: Spiritual Change 69
Table 16. Predictors of PTG V: Appreciation of Life 70
Table 17. Predictors of Total PTG 71
Table 18. Summary of Significant Predictors of PTG 72
Table 19. Matrix of Suspected Moderating Effects of Social Support on the Relationship Between Coping and PTG 75
Table 20. Results of Examining the Moderating Effects of Social Support on the Relationship Between Coping and PTG 76
List of Figures

Figure 1. Scatter Plots of Suspected Moderating Effects of Social Support 73
Figure 2. Effects of Distancing Coping Style on Relating to Others as Moderated by Social Support 77
Figure 3. Effects of Escape Avoidance Coping Style on New Possibilities as Moderated by Social Support. 78
Figure 4. Effects of Confrontive Coping Style on Spiritual Change as Moderated by Social Support. 79
Figure 5. Effects of Distancing Coping Style on Appreciation of Life as Moderated by Social Support. 80
Figure 6. Effects of Distancing Coping Style on Total PTG as Moderated by Social Support 81
Chapter 1: Introduction

Statement of the Problem: Prevalence, Incidence, and Impact of Thyroid Cancer

The National Cancer Institute defines thyroid cancer as,

“Cancer that forms in the thyroid gland (an organ at the base of the throat that makes hormones that help control heart rate, blood pressure, body temperature, and weight). Four main types of thyroid cancer are papillary, follicular, medullary, and anaplastic thyroid cancer. (National Cancer Institute, 2011)

Thyroid cancer is considered a rare type of cancer, representing between 1% and 5% of all newly diagnosed cases in Canada (Canadian Cancer Society & Public Health Agency of Canada, 2015). Thyroid cancer is three to four times more likely to affect women than men and was reported by the Canadian Cancer Society as the most prevalent cancer in young females (aged 15-29) (Canadian Cancer Society & Public Health Agency of Canada, 2015). The incidence of thyroid cancer in Canada and the United States has been increasing. Rates in Canada rose by 7% in men and 10% in women between 1997 and 2006. Thyroid cancer incidence is the most rapidly increasing of all cancers in Canada, similarly in parts of the United States and Europe (Canadian Cancer Society & Public Health Agency of Canada, 2015). In the United States, the incidence of thyroid cancer has more than doubled since 1973 (Davies & Welch, 2006). It was estimated that in 2010, there would be 44,670 new cases diagnosed in the United States and 5,200 new cases in Canada (Canadian Cancer Society, Statistics Canada, Provincial/Territorial Registries, & Public Health Agency of Canada, 2010; National Cancer Institute, 2011). Despite its dramatic increase in incidence, there remains a dearth of studies investigating the psychological impact of thyroid cancer.
Thyroid cancer survival rates differ depending on the type of malignancy. Eighty per cent of thyroid cancer cases are classified as papillary type. The second most-common type is follicular (Edwards et al., 2002; S. H. Park, Suh, & Chi, 1988). Papillary and follicular types are commonly referred to as well-differentiated thyroid carcinoma (WDTC) and are associated with an excellent prognosis. Conversely, medullary and anaplastic thyroid cancers are rare and more aggressive, and are associated with a poor prognosis (National Cancer Institute, 2011). The five-year survival rates for WDTC have been reported to be between 90-99% (Hay, 2007; Hay, McConahey, & Goellner, 2002; Sanders & Cady, 1998; Schlumberger & Torlantano, 2000). WDTCs are generally considered easily treatable and slow growing (Sturgeon & Angelos, 2006). Standard treatment generally includes surgical removal of the thyroid gland (either partial or total), as well as removal of any affected lymph tissue (American Association of Clinical Endocrinologists, American College of Endocrinology, & American Association of Endocrine Surgeons, 2007; Cooper et al., 2006; Pacini, Castagna, Brilli, & Jost, 2008). Despite the overall good prognosis of WDTC, recurrence rates have been reported to vary between 3-68%, depending on a variety of factors (Tuttle et al., 2010). Regular and long-term follow-up is important among those with WDTC to detect recurrent disease.

The literature indicates that the treatment of WDTC is well tolerated and patients are advised to expect a ‘completely normal life’ (Schultz, Stava, & Vassilopoulou-Sellin, 2003). Dow, Ferrell and Anello (1997) have suggested that treated thyroid cancer patients are often considered to be ‘cured,’ and therefore are a frequently forgotten segment of the cancer survivor population, with thyroid cancer being labeled a benign experience from a medical perspective (Aschebrook-Kilfoy et al., 2015). However, given the high survival rate, moderate risk of recurrence, and necessary long-term surveillance, quality of life issues are an important concern.
Research on the psychosocial impact of thyroid cancer has primarily explored (health-related) quality of life (Almeida, Vartanian, & Kowalski, 2009; Giusti et al., 2005; Hoftijzer et al., 2008; Sawka et al., 2009; Tagay et al., 2006; Tan, Nan, Thumboo, Sundram, & Tan, 2007) and has found that thyroid cancer is associated with psychosocial distress (Bresner et al., 2015), reduced quality of life and persistent fatigue (Banach et al., 2013; Bresner et al., 2015; Huang, Lee, Chien, Liu, & Tai, 2004; Husson, Haak, Oranje, Mols, Reemst, & can de Poll-Franse, 2011; Lee et al., 2010; Misra et al., 2013; Tan et al., 2007; To et al., 2015).

For many people, any cancer diagnosis is likely to cause feelings of fear and worry, which can carry a detrimental psychological impact on those diagnosed. However, little is known about the psychological impact of thyroid cancer beyond quality of life domains. In particular, there is very little research to date on potential growth or positive changes that might accompany a diagnosis of thyroid cancer. Previous researchers have proposed that the experience of trauma and adversity, such as a cancer diagnosis, can result in the development of new ways of thinking about oneself and the world, leading to psychological growth (R. G. Tedeschi & L. G. Calhoun, 2004; R.G. Tedeschi, Park, & Calhoun, 1998). Multiple factors are known to contribute to psychological growth following adversity, including ways of coping with the event, cognitive processing, and social support. In order to address a gap in the literature, the goal of the present study is to explore the relationship between posttraumatic growth, demographic, psychosocial, and thyroid cancer-specific variables in thyroid cancer survivors. The following chapter will review the literature on the psychological impact of cancer, posttraumatic growth theory, correlates of posttraumatic growth as they relate to cancer survivors, and the psychological impact of thyroid cancer.
Chapter 2: Literature Review

Psychological Impact of Cancer

There has been extensive research on the psychological impact of cancer diagnosis and treatment. Cancer is the leading cause of death in Canada and accounted for 30% of all deaths in 2011 (Statistics Canada, 2012). It is estimated that 42% of women and 45% of men will develop cancer in their lifetime (Canadian Cancer Society & Public Health Agency of Canada, 2015). It is widely accepted that a cancer diagnosis may result in psychological distress. Clinicians and researchers are increasingly investigating psychiatric symptoms, disorders and co-morbidities in patients throughout their cancer experience (Aass, Fossa, Dahl, & Moe, 1997; Derogatis et al., 1983; Ibbotson, Maguire, Selby, Priestman, & Wallace, 1994). Numerous psychosocial correlates have been identified, including, fears of death, fear of the cancer and corresponding treatment, concerns of dependency and role functioning, disability, financial status, depression, anxiety, anger, changes in relationships, and physical complaints (W. S. Breitbart & Alici, 2009; W. S. Breitbart, Lederberg, & Rueda-Lara, 2009; Holland & Friedlander, 2006; Meyerowitz, 1980). Research indicates that 25 to 30% of newly diagnosed cancer patients experience significantly elevated levels of emotional distress (Zabora, BrintzenhofeSzoc, Curbow, Hooker, & Piantadosi, 2001). Patients are expected to adapt quickly to the perceived catastrophic news of a cancer diagnosis and make decisions around treatment while coping with their own distress (W. S. Breitbart & Alici, 2009; Petticrew, Bell, & Hunter, 2002).

Prevalence of psychological disorders during this time range in the literature; studies have reported 21% experiencing major depression or generalized anxiety disorder or both to as high as 48% (Burgess et al., 2005; Hill et al., 2011). Burgess and colleagues (2005) followed women with early breast cancer over five years and found nearly 50% had depression, anxiety or
both in the year after diagnosis followed by 25% in the second, third and fourth years and 15% in the fifth year. Previous psychological treatment, lack of an intimate confiding relationship, younger age and severely stressful non-cancer life experiences predicted longer term depression and anxiety (Burgess et al., 2005).

**Risk Factors for Development of Psychiatric Disorders in Cancer.** Numerous studies have investigated predictors of psychiatric disorders in the context of cancer, specifically risk factors for the development of anxiety and depression. Cancer patients may be at elevated risk of depression if they experience social isolation, recent losses, current pain and fatigue, and lower socioeconomic status (Aass et al., 1997; Nordin, Berglund, Glimelius, & Sjoden, 2001; Weisman, 1976). Personality type may also increase one’s vulnerability to developing depression in the context of cancer. Nordin et al. (2001) found that levels of anxiety and depression at the time of cancer diagnosis, more advanced disease and a lack of social and informal supports predicted anxiety and depression ‘caseness’ as determined by the Hospital Anxiety and Depression Scale (HAD), six months after a cancer diagnosis. The first year after diagnosis of breast cancer may be a critical time when patients are at greatest risk for depression, particularly for younger patients and those on adjuvant chemotherapy (Compas et al., 1999; Fann et al., 2008). In addition, hospitalization is a risk factor for psychiatric distress; previous researchers have found that the risk of psychiatric distress may be two times greater in hospitalized cancer patients compared to outpatient clinic counterparts (Aass et al., 1997). Female gender, impaired physical activity and impaired social role function may also increase one’s risk of anxiety (Aass et al., 1997). Psychological distress associated with the cancer experience will be described in the following sections.
Some research has aligned psychosocial functioning and emotional distress with the informational needs of cancer patients, particularly during cancer treatment, which may be a source of anxiety and worry. Lei and colleagues (2011) sought to identify the important informational needs of breast cancer patients in Malaysia during the first and fourth cycles of chemotherapy comparing these informational needs to those perceived by nursing staff. The Toronto Informational Needs Questionnaire-Breast Cancer (TINQ-BC) demonstrated a high level of informational needs amongst breast cancer patients at both the beginning and mid-course of chemotherapy; there were no significant differences in informational needs between treatment cycles (Lei et al., 2011). The most important information for breast cancer patients was about the disease itself including the potential spread of cancer, possibility of recurrence and success rates of treatment followed closely by physical care and psychosocial issues including communication with family or friends about cancer and where to seek help if experiencing challenges (Lei et al., 2011). Nurses had different views of what information may be important to breast cancer patients at both the first and fourth cycle of chemotherapy (Lei et al., 2011).

The authors concluded that communication between patients and their care providers is pivotal to assisting patients to understand expected treatment outcomes; communication may be an important mediator for symptoms of psychological distress and anxiety (Lei et al., 2011). Taha and colleagues (2011) recognized how one’s relationship with their oncologist may have implications for well-being during and after the course of treatment for cancer and influence symptoms of psychological distress and depression. Taha et al. (2011) sought to assess the relation between trust in physician and depressive symptoms amongst women undergoing treatment and those previously treated for breast cancer; they hypothesized that women still in treatment would have higher levels of depressive symptoms compared to women who completed
treatment and women in a non-cancer control group, and greater trust in the physician would result in lower depressive symptoms. Physician trust varied by stage of cancer; women in the non-cancer control group trusted physicians the least followed by women in treatment. Physician trust was highest amongst women who had completed breast cancer treatment; successful treatment outcomes resulted in physicians being viewed in a positive light by breast cancer survivors (Taha et al., 2011). Depression was greatest in women currently in treatment, however, trust in physicians was not related to depressive symptoms. The authors concluded that a cancer patient’s relationship with their oncologist is important to consider beyond treatment outcomes as it may have important implications for the patient’s overall psychological well-being, functioning and HRQoL (Taha et al., 2011).

**Depression.** The prevalence of depression in cancer patients varies widely and is influenced by the heterogeneity of the study sample including cancer site, age, gender, time since cancer diagnosis and choice of depression measure (Aass et al., 1997; Fann et al., 2008). Breitbart (1995) reviewed major psychiatric complications in cancer and found the incidence of depression in cancer patients ranged from 20% to 25% and increased with higher levels of disability, advanced illness and pain. The prevalence of major depressive disorder in cancer patients reported in the literature ranges from approximately 10% to 25%, which is two times higher than the prevalence in the general population (W. Breitbart, 1995; Pirl, 2004; Pirl, Temel, et al., 2008).

Previous studies suggest that 9% of women diagnosed with breast cancer experience major depression whereas 27% experience minor depression at the early stage of breast cancer (Kissane et al., 2004; Sharpley & Christie, 2007). Studies utilizing screening instruments to assess depression in breast cancer patients cite a higher and more variable range in prevalence
from 15% to 30% whereas studies employing structured clinical interviews to assess depression report prevalence between 5% and 15% (Fann et al., 2008). Hegel and colleagues (2006) sought to assess emotional distress and psychiatric disorders in newly diagnosed women with presurgical breast cancer. Ninety-six percent of the study population were white, non-Hispanic women. Almost half of study participants (47%) met the established criteria of self-report measures for psychiatric disorders. Prevalence of major depressive disorder was 11%, 60% of whom were moderately to severely depressed. Clinically significant emotional distress was observed in 41% of participants from worry (89%), fear (82%), nervousness (78%), sadness (61%) and depression (50%) (Hegel et al., 2006). Breast cancer patients may continue to experience symptoms of depression in the year following diagnosis and treatment. Hill et al. (2011) found that nearly two-thirds of women with major depression were experiencing recurrences of previous depression in the year following a breast cancer diagnosis (Hill et al., 2011).

The prevalence of major depressive disorder or clinically significant levels of depression in prostate cancer patients has been reported between 13% and 27%. Prevalence decreases from 10% to 16% in prostate cancer patients undergoing hormone therapy for their local, advanced disease (Korfage, Essink-Bot, Janssens, Schroder, & de Koning, 2006; Pirl, Greer, Goode, & Smith, 2008; Pirl, Siegel, Goode, & Smith, 2002). As high as 53% of prostate cancer patients may experience psychological distress at various stages of their cancer experience including worries about cancer recurrence or future diagnostic tests (Mehnert & Koch, 2007). Love and colleagues (2008) investigated rates of psychiatric morbidity in a longitudinal cohort of early and advanced stage prostate cancer patients with comparison to a cancer-free control group. Prevalence was low compared to other reported studies with 2.8% of early and 3.8% of advanced
prostate cancer patients meeting the DSM-IV criteria for major depression compared to 4.1% of the cancer-free, community control group via structured clinical interview (Love et al., 2008).

Elevated rates of depression have been observed in non-small cell lung cancer (NSCLC) patients, with reports ranging from 16% to 29% (Pirl, Temel, et al., 2008). In a study of newly-diagnosed patients with Stages III or IV non-small cell lung cancer, Pirl and colleagues (2008) found that 23.3% of participants met the criteria for depression, as measured by the Hospital Anxiety and Depression Scale.

**Anxiety.** Prevalence of anxiety in patients with cancer range from 1% to 58% (Derogatis, 1983; Kangas, Henry, & Bryant, 2002b; Kissane et al., 2004; Lynch, 1995). Similarly with depression, this wide variability is influenced by a number of factors including, cancer site, status and prognosis; medical complications such as associated pain, physical functioning and hospitalization; and social support (Kangas et al., 2002b; McDaniel, Musselman, Porter, Reed, & Nemeroff, 1995). For example, Pirl and colleagues (2008) investigated the prevalence of anxiety in newly-diagnosed patients with Stages III or IV non-small cell lung cancer. Using the Hospital Anxiety and Depression scale, 32.6% met the criteria for anxiety.

In a systematic review by Dale, Bilir, Han and Meltzer (2005), the prevalence of anxiety in short- and long-term prostate cancer survivors ranged from 10% to 36% (Dale, Bilir, Han, & Meltzer, 2005). In studies of prostate cancer patients who attended outpatient clinics following surgery or radiotherapy, a high prevalence of anxiety was reported at 13% and 15% of men (Namiki et al., 2007; Roth et al., 2006). Similarly, levels of anxiety in cervical cancer survivors are generally reported to be high, particularly upon initial diagnosis, possibly owing to the young age at which many women are diagnosed and often the need to undergo aggressive surgical procedures (Lutgendorf et al., 2002; Mantegna et al., 2013; Petersen & Quinlivan, 2002). A
recent prospective study evaluating emotional distress and QOL in 169 cervical cancer patients, reported severe levels of anxiety at the time of diagnosis in approximately 20-25% of survivors (Mantegna et al., 2013). Anxiety levels in patients were overall significantly improved three months following diagnosis. The authors also found that 10-15% of survivors continued to report elevated levels of anxiety two years later. The authors noted lower education levels and not living alone as factors that were associated with higher, persistent anxiety ratings (Mantegna et al., 2013). It was further suggested that survivors may have experienced increased anxiety as a result of a fear of not being able to sustain family and partner relationship responsibilities.

**Psychological Functioning, Health-Related Quality of Life, and Cancer.** A number of studies have examined the relationship between psychological functioning, psychological adjustment, health-related quality of life (HRQoL) and coping in the context of cancer diagnosis and treatment. In a longitudinal observational cohort study of early and advanced prostate cancer patients, Love and colleagues (2008) investigated psychosocial functioning as measured by the Short-Form 36 between patients at different stages of prostate cancer and cancer-free, community volunteers. Prostate cancer patients with more advanced disease had lower vitality, social functioning and mental health scores and higher somatization scores compared to men with early stage prostate cancer and men without prostate cancer (Love et al., 2008). The authors concluded that although psychiatric disorders such as anxiety and depression may not be higher in this patient group, psychosocial functioning is impaired in men with prostate cancer, particularly those with advanced disease (Love et al., 2008).

There is also increasing interest in understanding the survivorship phase of a cancer experience and the long-term needs and HRQoL of cancer survivors. A longitudinal cohort study in France investigated the relationship between HRQoL and cancer type two years after a cancer
diagnosis and found that cancer survivors may share a similar pattern of psychological morbidity two years after cancer diagnosis that is independent of their cancer type (Le Corroller-Soriano et al., 2011). Medical variables including the type of cancer and treatment received negatively impacted physical HRQoL, but were not significant for mental HRQoL scores; those with upper respiratory, lung and hematological cancers experienced the greatest impact on their physical HRQoL after two years of follow-up. Side effects resulting from cancer treatment negatively impacted both physical and mental HRQoL. Increased income and higher educational attainment were independent, positive predictors of higher physical and mental HRQoL (Le Corroller-Soriano et al., 2011).

As discussed above, many cancer survivors will experience significant symptoms of depression, anxiety and have ongoing HRQoL concerns. These are common concerns amongst cancer survivors, some more so at the time of diagnosis, during treatment, and in follow-up. Cancer research in-line with the field of Positive psychology, has also explored factors associated with individuals thriving, even under stressful circumstance such a life-threatening or chronic illness. Specifically, positive outcomes, or posttraumatic growth, experienced concurrently with distress, can result following a traumatic experiences such as a cancer diagnosis (R. G. Tedeschi & Calhoun, 1995; R. G. Tedeschi & L. G. Calhoun, 2004). A model of posttraumatic growth and related literature review will be described in the following section.

**Posttraumatic Growth**

Posttraumatic growth (PTG) has been described as a construct in the context of positive psychology (Linley, Joseph, Maltby, Harrinton, & Wood, 2009). The aim of positive psychology is to focus on strengths and more positive characteristics, balancing out mainstream psychology’s concern with negative correlates of the human experience, such as weaknesses,
deficits and psychopathology (Joseph & Linley, 2006; Seligman & Csikszentmihalyi, 2000).

Benefits, positive changes, or growth following adversity or trauma has been labeled differently in the literature: benefit-finding (Affleck & Tennen, 1996), adversarial growth (Linley & Joseph, 2004), stress-related growth (C.L. Park, Cohen, & Murch, 1996), transformational coping (Aldwin, 1994), and posttraumatic growth (R. G. Tedeschi & Calhoun, 1995), to name but a few (Joseph & Linley, 2006). Joseph and Linley (2006) provide a review of existing knowledge in the literature on growth, including the types of stressful or traumatic events researched. Tedeschi and Calhoun provide one of the most prominent models of growth, described as the functional-descriptive model (Joseph & Linley, 2006).

According to Tedeschi and Calhoun (2004), PTG is experienced as a process or outcome, as opposed to a way of coping. However, positive coping will inevitably lend itself to PTG. Growth may not happen immediately following a trauma and the development of PTG may occur years after the traumatic life event (Teixeira & Pereira, 2013). Tedeschi and Calhoun also acknowledge that encouraging people to think about how their experience has helped them to grow is enough to promote benefits (Stanton & Low, 2004).

Tedeschi and Calhoun (2004) state that,

“…the frightening and confusing aftermath of trauma, where fundamental assumptions are severely challenged, can be fertile ground for unexpected outcomes that can be observed in survivors: posttraumatic growth. The term posttraumatic growth refers to positive psychological change experienced as a result of the struggle with highly challenging life circumstances.” (p. 1) (R.G. Tedeschi & L.G. Calhoun, 2004)

They propose that survivors experience a re-evaluation of how they make sense of the world in response to a highly stressful event. They further posit that PTG coexists with the experience of
distress inherent in a traumatic event. Thus, PTG is an ongoing process that occurs as a result of cognitive processing (i.e., coming to terms with) of the impact of the traumatic event (R. G. Tedeschi & Calhoun, 1995; R.G. Tedeschi & L.G. Calhoun, 2004). In this framework, the struggle with the new reality following the trauma is critically important in the extent to which the individual experiences growth. This struggle produces cognitive rebuilding, which incorporates the traumatic event, new reality, and possibility of recurrent similarly distressing events. Tedeschi and Calhoun explain that this cognitive rebuilding is experienced as growth. In this model, growth is described in different terms than the construct of resilience, which can be defined as adaptation or resistance to distress following adversity (Bonanno, 2004). Here, PTG differs from resilience in that it does not only acknowledge one’s ability to overcome difficult life circumstances but PTG refers to a transformation of the self following the traumatic event (Sawyer, Ayers, & Field, 2010).

The authors present their model in the context of a number of assumptions or principles. Growth occurs when beliefs or assumptions are changed by a traumatic event (i.e., new assumptions or schemas are created). The authors note that certain assumptions are more resistant to being challenged, therefore reducing the likelihood that new schemas will be created. An example of a ‘resistant assumption’ are those of a religious nature. In this model, new assumptions must include some positive reappraisal and positive change in self, in order for growth to occur. The authors suggest that different traumatic events are likely to result in different levels or types of growth. For example, reappraisals will differ depending on whether the trauma was self-inflicted, caused by others or due to chance. Tedeschi and Calhoun (1995; 2004) propose that certain personality characteristics are more related to the possibility of growth than others, for example, optimism, hardiness, and self-efficacy. They further suggest that
growth occurs when the traumatic event carries significant meaning in the individual’s life. And finally, growth produces wisdom, or a deeper learning of self.

Tedeschi and Calhoun (1995) propose their PTG model as a “self-regulatory system of feedback loops” (p. 88). The individual’s personality characteristics play a significant role determining the initial response to the trauma. The trauma is appraised and subsequently hinders the individual’s habitual ways of functioning. Following initial shock induced by the traumatic event, the individual will experience significant psychological distress, that directly challenges the way they view the world (i.e., their cognitive schemas), and they realize that they are unable to halt this experience. In this context, psychological distress can include feelings of anxiety, specific fears, sadness, depression, guilt, anger and general irritability. The situation is evaluated as unmanageable, resulting in a “secondary response,” described as rumination. The authors suggest that rumination is an important strategy in working through traumatic events. As the person comes to terms with the stressful event, their rumination subsides. As such, the ruminative process is the individual’s attempt to cognitively engage with their new reality. During this phase, the model accounts for the input and support of others, which may contribute to the individual learning a new way to cope with their situation. Initial growth occurs when a schema revision has taken place, in part owing to the support of others, an acceptance of not being able to change certain aspects of the situation, setting more realistic goals, and the development of a new understanding. Further growth (or “wisdom”) takes place following additional cognitive processing. In this phase, rumination is more reflective and expansive in response to a greater perceived manageability of the situation, and consequently less emotional distress.
A Model of Posttraumatic Growth

Tedeschi and Calhoun’s (1995) model of PTG describes three primary areas in which growth manifests itself, and notes that an individual may not experience all or in the same ways as someone else. These areas of growth are changes in perception of self, changes in interpersonal relationships, and a change in one’s philosophy of life (R.G. Tedeschi et al., 1998).

The Five Domains of Posttraumatic Growth. In order to quantify PTG, Tedeschi and Calhoun (1996) created the Posttraumatic Growth Inventory (PTGI). The PTGI was originally a 34-item scale. Principal component analysis led to the elimination of 13 items, retaining 21 items. The authors found evidence for five domains of growth. They include, New Possibilities (e.g., ‘I am more likely to try to change things which need changing’), Relating to Others (e.g., ‘I learned a great deal about how wonderful people are’), Personal Strength (e.g., ‘A feeling of self-reliance’), Appreciation of Life (e.g., ‘Appreciating each day’), and Spiritual Change (e.g., ‘I have a stronger religious faith’). These factors have been confirmed by others in the literature, supporting the notion that the PTGI is a multidimensional measure (Taku, Cann, Calhoun, & Tedeschi, 2008).

A general feeling of increased personal strength has been shown to increase ones ability to survive difficult or traumatic life challenges. The identification and recognition that one possesses personal strength allows for a sense of resilience. Additionally, it has been found that the recognition of personal strength may encourage people to think about new possibilities for their lives (Tedeschi & Calhoun, 2004).

It is not uncommon for people to make drastic changes to their lives after having suffered a traumatic or life altering event. Tedeschi and Calhoun (2004) suggest that recognizing ones potential to take on a new life path or to engage in new activities is a common domain of PTG.
People make conscious choices to reengage in their lives in a different way, in line with their newfound growth and development.

Once a person has experienced a traumatic life challenge wanting to create more meaningful, and close relationships with those around them is common (Tedeschi & Calhoun, 2004). Relating to Others is the second most reported form of PTG. Not only has increased closeness to others been reported but an increased sense of empathy for others who are facing trauma or loss was also reported (Kissil, Niño, Jacobs, Davey, & Tubbs, 2010).

Another common element of PTG is an increased Appreciation of Life. Tedeschi and Calhoun (2004) reported that many people generally claim to have a newfound joy for life and an appreciation for those things that they may have at one time taken for granted. People diagnosed with cancer or HIV/AIDS are often times faced with the reality of their own mortality. Often times this experience will lead to reports of a shift in ones priorities and values, increasing their participation and appreciation in everyday life (Sawyer et al., 2010).

Finally, Spiritual Change or growth is often reported as part of PTG. An example of this can be seen with soldiers returning from war with newfound spiritual or existential beliefs. Others may have deepened their spiritual beliefs in order to overcome the trauma they faced at war (Currier, Lisman, Haris, Tait, & Erbes, 2013). Tedeschi and Calhoun (2004), suggest that when we are faced with terrible life challenges people will begin to engage in important existential questions, which are experienced as growth.

The Role of Coping in Posttraumatic Growth

Schaefer and Moos (1998) and Tedeschi and Calhoun (2004) have written extensively on the role of coping in the production of PTG. Coping is generally discussed in terms of two
categories; approach and avoidant styles. Table 1, taken from Solberg Nes and Segerstrom (2006), provides a summary of a variety of coping strategies often discussed in the literature.

Table 1

Examples of Coping Strategies (Solberg Nes & Segerstrom, 2006)

<table>
<thead>
<tr>
<th></th>
<th>Problem-Focused Coping</th>
<th>Emotion-Focused Coping</th>
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<tbody>
<tr>
<td><strong>Approach Coping</strong></td>
<td>Planning</td>
<td>Cognitive restructuring</td>
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<tr>
<td></td>
<td>Seeking instrumental support</td>
<td>Seeking emotional support</td>
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<tr>
<td></td>
<td>Task-oriented coping</td>
<td>Turning to religion</td>
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<td></td>
<td>Active coping</td>
<td>Acceptance</td>
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<tr>
<td></td>
<td>Confrontive coping</td>
<td>Positive reinterpretation</td>
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<tr>
<td><strong>Avoidance Coping</strong></td>
<td>Problem avoidance</td>
<td>Denial</td>
</tr>
<tr>
<td></td>
<td>Behavioral disengagement</td>
<td>Distancing</td>
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<tr>
<td></td>
<td></td>
<td>Mental disengagement</td>
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<tr>
<td></td>
<td></td>
<td>Wishful thinking</td>
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<td></td>
<td></td>
<td>Social withdrawal</td>
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Approach coping is described as a way of analyzing the traumatic experience in a local way, seeking social supports, reappraising the event in a positive light, and actively trying to solve the problem. Avoidance coping involves distancing from the problem or emotional experience, withdrawing from support networks, minimizing the problem, and believing that nothing can be done to change the problem or traumatic event (Moos & Schaefer, 1993; Schaefer & Moos, 1998; Solberg Nes & Segerstrom, 2006).
A recent review and meta-analysis of multiple types of cancer and PTG found that adaptive coping styles, such as positive reappraisal, Seeking Social Support and religious coping, were associated with greater PTG in survivors (Shand, Cowlishaw, Brooker, Burney, & Ricciardelli, 2015). Similarly, a review of PTG in oral cancer survivors found that positive active coping was consistently positively associated with PTG. Active coping strategies included positive reframing, religious coping, positive affectivity, and problem solving coping (Rajandram, Jenewein, McGrath, & Zwahlen, 2011). In line with PTG theory, the review authors discuss how trauma can shatter one’s assumptions about the world and themselves, hence, triggering a ruminative response. They further suggest that individuals who engage in adaptive or approach-oriented coping styles are able to experience rumination in a deliberate manner, towards developing a narrative around the search for meaning (Kangas, Henry, & Bryant, 2002a; Shand et al., 2015).

A recent review of psychosocial factors and PTG in breast cancer survivors found a robust association between coping and PTG (Kolokotroni, Anagnostopoulos, & Tsikkinis, 2014). Specifically, religious coping, active coping (e.g., planning), positive reframing, acceptance, problem focused coping and humor were found to be positively associated with the experience of growth. The ability to talk about one’s cancer experience was found to be associated with PTG, in that it reflected a level of engagement with more cognitive processing of cancer in attempt to restore core beliefs that were disrupted as a result of the diagnosis (Kolokotroni et al., 2014; R. G. Tedeschi, Park, & Calhoun, 2004). Numerous other studies have supported this notion (Prati & Pierrantonii, 2009; Schroevers, Kraaij, & Garnefski, 2011; Scrignaro, Barni, & Magrin, 2011; Silva, Crespo, & Canavarro, 2012).
The Role of Support in Posttraumatic Growth

Closely related to coping resources is the role of social support in the experience of PTG. Tedeschi and Calhoun (2004) suggest that a supportive social environment provides the opportunity for survivors to talk about the trauma of the diagnosis/treatment and seek out information. This in turn facilitates cognitive processing and construction of meaning, which plays a significant role in the production of PTG (Schroevers et al., 2011; R. G. Tedeschi et al., 2004). As mentioned in the previous section, approach-oriented coping facilitates the cognitive processing or rumination that leads an individual to consider new meaning in their life. Individuals who have strong social resources are more apt to rely on approach styles of coping (Moos & Schaefer, 1993). Supportive others can facilitate this new narrative by offering alternate perspectives that in turn can be integrated into schema change (R. G. Tedeschi & L. G. Calhoun, 2004).

Other factors can impact how much support individuals receive. Schaefer and Moos (1998) suggest that more severe events can often draw in more support. Additionally, individuals with pre-existing support networks are likely to receive more support. Shand et al. (2015) additionally found some support of the notion that social support may protect against posttraumatic stress symptoms, in addition to contribute to PTG. A number of studies have found support for the strong relationship between social support and PTG (Cormio, Romito, Giotta, & Mattioli, 2015; Kolokotroni et al., 2014; Prati & Pierrantoni, 2009; Scrignaro et al., 2011; Shand et al., 2015; Silva et al., 2012), and some suggest that social support plays a moderating role by strengthening coping strategies which then increases the likelihood of PTG. A study of breast cancer survivors found that social support was related to better adjustment, in part owing to the
women being able to share their concerns with their family, friends or spouse (Zemore & Shepel, 1989).

**Posttraumatic Growth and Cancer**

Positive changes following a cancer diagnosis and growth into survivorship have been documented in the psychology literature (Connerty & Knott, 2013; Helgeson, Reynolds, & Tomich, 2006; Mols et al., 2009; Knott et al., 2011). In particular, cancer survivors exhibit many qualities aligned with PTG citing positive relationship changes, personal strength, appreciation of life, spirituality and altered priorities following a cancer experience (Connerty & Knott, 2013; Cordova, Cunningham, Carlson, Andrykowski, 2001; Thornton, 2002; Sears et al., 2003; Mols et al., 2009). For many, a cancer experience becomes a psychosocial transition (Andrykowski et al., 1993, 1996; Cordova, Cunningham, Carlson, Andrykowski, 2001; Parkes, 1971) with the potential for growth and distress rather than a trauma with uniformly negative effects (Cordova, Cunningham, Carlson, Andrykowski, 2001).

Research has investigated PTG in the context of a cancer experience focusing on psychosocial factors (Connerty & Knott, 2013; Cordova, Cunningham, Carlson, Andrykowski, 2001; Helgeson, Reynolds, & Tomich, 2006; Sawyer, Ayers, & Field, 2010; Schmidt, Blank, Bellizzi & Park, 2011) and quality of life (Tomich & Helgeson, 2012).

Compared to age- and education-matched controls, Cordova and colleagues (2001) demonstrated a pattern of greater PTG in a group of breast cancer survivors (70 per group) in Kentucky. Controls were women with no cancer history. Study groups did not differ by symptoms of depression or self-reported well-being suggesting that the cancer survivors exhibited similar levels of distress to the cancer-free controls (Cordova, Cunningham, Carlson, Andrykowski, 2001). Cancer survivors demonstrated greater PTG, on domains Relating to
Others, appreciation for life, and Spiritual Change. PTG was unrelated to distress or well-being but was positively associated with perceived life-threat, prior talking about breast cancer, income and time since cancer diagnosis (Cordova, Cunningham, Carlson, Andrykowski, 2001).

Research has also investigated predictors and covariates of PTG in an attempt to better explain not only the mechanisms of PTG, but also characteristics of individuals who are more likely to experience PTG. Connerty and Knott (2013) used qualitative methods to investigate modifiable factors that may impact the development of PTG among cancer survivors who had been working as peer support leaders and/or cancer consumer advocates in Australia. The authors conducted group interviews with 15 cancer survivors (8 men, 7 women; varying types of cancer, predominantly prostate and breast) that asked participations to discuss experience around initial diagnosis, as well as positive and negative experiences or changes that resulted. The participants described examples of positive change in their relationships, perceptions of self and life in general and spirituality. Furthermore, a number of modifiable factors were found to facilitate PTG and regaining control over one’s life including social support (supportive and understanding relationships, practical supports), physical activity (preventive health behaviours and getting involved in complementary therapies) and finding information (Connerty & Knott, 2013). The notion that there are modifiable factors that can contribute to the experience of PTG has important practical implications in that these are concrete areas in which efforts can be focused when supporting cancer survivors.

Schmidt, Blank, Bellizzi and Park (2011) also investigated modifiable factors and their relationship with PTG in 54 adult cancer survivors in remission. Using hierarchical regression modeling, the authors investigated the relationship between attachment styles and PTG and potential mediation by social support and/or coping strategies. Secure attachment, active coping,
positive reframing and religion were all significantly correlated with PTG in univariate analyses, which is consistent with previous research (Bellizzi & Blank, 2006; Widows et al., 2005). Social support and insecure attachment were not related to PTG, which is contrary to previous research (Cordova, Cunningham, Carlson, Andrykowski, 2001). The authors concluded that limited use of support resources may be related to other barriers such as depression, and physical limitations, which may impede the development of PTG (Schmidt, Blank, Bellizzi, & Park, 2011). Furthermore, cancer survivors who exhibit secure attachment may be better positioned to cope with a diagnosis and manage survivorship following an experience with cancer as they are more likely to use active or positive coping strategies (Schmidt, Blank, Bellizzi, & Park, 2011).

Helgeson, Reynolds and Tomich (2006) sought to understand the relationship between PTG or benefit finding and psychological and physical health in a meta-analytic review of 77 studies. The relationship between benefit finding was analysed in health outcomes including depression, anxiety, positive well-being, global distress, intrusive-avoidant thoughts, quality of life and subjective physical health; PTG was considered in the context of a wide range of life events including sexual assault, natural disaster, bereavement, childhood abuse and cancer. PTG or benefit finding was significantly associated with better mental health outcomes including less depression and positive well-being; for the authors this highlighted positive outcomes that are possible when one experiences a traumatic experience such as cancer, rather than a mere lack of distress. The meta-analysis also examined moderators of the relationship between benefit finding and health outcomes demonstrating the importance of taking into account the stage at which someone is dealing with a traumatic life event when examining benefit finding. Time since trauma emerged as a significant moderator of a number of mental health outcomes including reduced depression (more time), positive affect (more time), global distress (recent event) and
reduced anxiety (less time) (Helgeson, Reynolds, & Tomich, 2006). Women were found to engage in the most benefit finding as they are more likely to express positive reappraisal and positive self-talk compared to men (Helgeson, Reynolds, & Tomich, 2006; Tamres, Janicki, & Helgeson, 2002). Study participants from racialized communities (minorities) and younger people were also more likely to engage in benefit finding (Helgeson, Reynolds, & Tomich, 2006).

Sawyer, Ayers and Field (2010) published an updated meta-analysis of the relationship between PTG and psychological and physical well-being in adults living with life-threatening illnesses, namely cancer and HIV/AIDS. Analysis of 38 studies (n=7927) revealed that PTG was associated with positive adaptive consequences including increased positive mental health, which was consistent with the meta-analytic findings of Helgeson and colleagues. Similarly, moderators of the relationship between PTG and psychological and physical well-being included age, ethnicity, time since the event and type of negative mental health outcome (Sawyer, Ayers, & Field, 2010).

Connery and Knott (2013) conducted group interviews with 15 cancer survivors who had completed treatment in Australia. Participants explored the numerous negatives of their experience, however several noted a number of areas where they experienced growth. Some of these areas in which participants reported growth were a change in world view, supportive relationships, the notion that doing creates meaning, in addition to other areas of positive change (e.g., no longer taking life for granted, self-awareness and understanding). The authors suggested that individuals participated in meaningful activities, for example making lifestyle changes such as exercise, which resulted in perceived growth. They further suggested that the adoption of a healthier lifestyle gave survivors a sense of personal control in a situation in which they
seemingly perceived to be in low control, which in turn promoted PTG (Connerty & Knott, 2013).

To a lesser degree, locus of control has been explored in relation to PTG and adjustment in cancer. Locus of control, as defined by Rotter (1966; 1990) is the extent to which an individual believes they have control over their life and related outcomes. Internal locus of control refers to the belief that the consequences of one’s actions are as a result of individual behaviors or characteristics. External locus of control refers to the belief that the consequences experienced are as a result of fate or luck, and generally unpredictable (Rotter, 1966, 1990). Health-related locus of control focuses on the extent to which an individual believes they have control over their health (internal), that it is up to chance (external), or influenced by doctors (powerful others) (Wallston, Wallston, & DeVellis, 1978).

The literature yields inconsistent reports of the relationship between internal (health) locus of control and adjustment or psychological wellbeing in cancer survivors (Bettencourt, Talley, Molix, Schlegel, & Westgate, 2008; Cummings & Swickert, 2010; Hodges & Winstanley, 2012; Pinquart & Frohlich, 2009; Sun & Stewart, 2000). Bettencourt and colleagues (2008) surveyed 224 women with breast cancer in rural and urban United States. They hypothesized that rural breast cancer survivors who endorsed powerful others and chance health locus of control would have greater psychosocial adjustment, and that internal locus of control would be related to adjustment in urban survivors. This was based on the notion that rural and urban cancer survivors have different values, a different way of life, and as such, may have differing predictors of psychological adjustment (Bettencourt et al., 2008; Cummings & Swickert, 2010). The authors found that internal locus of control was predictive of lower levels of depression and higher life satisfaction in breast cancer survivors in both urban and rural areas.
Further, they found that higher endorsement of powerful others health locus of control was predictive of higher levels of life satisfaction and lower levels of depression among breast cancer survivors living in rural areas (Bettencourt et al., 2008). The authors also noted that higher levels of powerful others health locus of control was predictive of higher symptoms of depression and lower life satisfaction, in breast cancer survivors living in urban areas. In urban areas, higher levels of chance health locus of control was related to higher levels of depression and lower life satisfaction. The authors suggested that tailoring clinical interventions to consider health locus of control may influence patient rapport and treatment effectiveness (Bettencourt et al., 2008).

A study by Pinquart and Frohlich (2009) followed 353 recently diagnosed cancer inpatients in a German hospital, interviewed prior to receiving chemotherapy and again nine months later. The authors measured a variety of personal resources, including self esteem, internal health-related locus of control, optimism, perceived social support, and purpose in life, and their effects on subjective wellbeing. Multivariate analysis revealed no association between internal health-related locus of control and subjective wellbeing. The authors suggested that perhaps individuals have less of an impact on the course of their illness, given the severity of some cancer diagnoses, thereby decreasing the potential benefits of an internal locus of control. They also noted lower correlational stability of the internal health-related locus of control measure (Pinquart & Frohlich, 2009).

Research on the relationship between locus of control and PTG is skant, none looking exclusively at cancer populations. A Danish study surveyed 320 high school students who had witnessed a stabbing at their school. They found no relationship between locus of control and PTG (Iversen, Christiansen, & Elklit, 2011). Similarly, a study of 221 college students were surveyed to determine the effects of internal versus external locus of control on PTG (Cummings
& Swickert, 2010). Participants were asked to write down a traumatic experience that had occurred in the last six months and answer questions regarding the event, in addition to questionnaires on locus of control and PTG. PTG was measured using the Perceived Benefits Scale (PBS) (McMillen & Fisher, 1998). No relationship was found between locus of control and total PTG, however the PBS subscale Enhanced Self-Efficacy was correlated with external locus of control (Cummings & Swickert, 2010). While there is some evidence of a relationship between locus of control and adjustment, there are few studies that directly assess the impact of health locus of control on PTG, and fewer that explore this phenomenon with cancer survivors. Given the lack of research in this area, this study further explored the relationship between health locus of control and PTG.

A recent study by Pat-Horenczyk et al. (2016) examined PTG trajectories among 198 breast cancer patients who were post-cancer treatment, over a two-year period. Using latent transition analysis, the authors identified four distinct adaption profiles: distressed, resistant, struggling, and constructive growth. The distressed profile was characterized by a high probability of negative coping strategies, depression, and PTSD. The resistant profile was characterized by low levels of distress and depression, as well as low levels of PTG and coping (negative or positive), and appeared to describe trauma resilient individuals. The struggling profile was characterized by both higher negative and positive coping, higher levels of depression, a higher probability of endorsing PTSD, as well as high levels of growth. Finally, the constructive growth profile was characterized by higher levels of positive coping, high growth, with lower levels of depression and PTSD, and lower negative coping (Pat-Horenczyk et al., 2016). Medical variables and demographics did not predict any of the four profiles. The authors found that increased flexibility was predictive of the struggling and constructive PTG profiles,
and additionally decreased the probability of distress (Pat-Horenczyk et al., 2016). When looking at profile stability, the authors reported that the number of breast cancer patients with a struggling PTG profile decreased over time, and was associated with a high likelihood of transitioning to a resistant or constructive profile. Women who were classified as constructive PTG at baseline, had a higher likelihood of transitioning to a struggling profile six months later. This study highlights the importance of distinguishing the difference between the degree of PTG from the quality of PTG, and how this might change over time (Pat-Horenczyk et al., 2016).

By investigating PTG and psychological and physical outcomes, the research cited above has elucidated important relationships and associations of PTG in the context of cancer diagnosis and survivorship, as well as gaps in knowledge and research in the field of PTG. Much of the research has focused on breast and prostate cancer survivors warranting further exploration in other cancer diagnoses and experiences. Thyroid cancer has rarely been explored in the PTG literature and as such is the focus of the present study. Important relationships, such as coping, social support, physical activity, and others, with respect to PTG will be further explored beyond the context of breast and prostate cancer.

**Psychological Impact of Thyroid Cancer**

As previously stated, thyroid cancer is increasing in incidence, has a high survival rate, and is increasingly being diagnosed in younger persons. A recent study suggests that by 2019, the number of people diagnosed with thyroid cancer in the United States will double, making it the third most common cancer in women of all ages, and likely the second most common cancer in women under the age of 45 years (Grogan et al., 2013). The authors further suggest that if these trends continue, thyroid cancer survivors could represent up to 10% of all cancer survivors in the United States in the near future. Given that the population of thyroid cancer survivors is
growing, more research is needed to understand the psychological impact of a thyroid cancer diagnosis and its subsequent treatment. Although there are limited studies in this area, the next section will focus on a review of the literature to date on the psychological impact of thyroid cancer.

**Thyroid cancer as the “good” cancer.** Lack of support for thyroid cancer patients has been met with a perceived lack of validation for the illness (Easley, Miedema, & Robinson, 2013; Manuel, 2010; Misra et al., 2013; Sawka et al., 2009). Many types of cancer are treated with chemotherapy, resulting in a physical representation of cancer in the form of hair loss. Chemotherapy is not a typical course of treatment in most well-differentiated thyroid cancers, although it is used in more severe cases. It has been found that as the course of treatment for thyroid cancer is generally different than that for other types of cancer, validation or recognition from others has been lacking (Manuel, 2010). A recent study by Easley and colleagues (2013) explored this perceived lack of support in young thyroid cancer survivors. Data from 12 young adult thyroid cancer survivors, 1 to 5 years post-treatment, was analyzed as a part of a larger study of 55 patients. Telephone interviews conducted with patients revealed two prominent themes; the psychological impact of having the “good” cancer, and experiences of isolation. One hundred percent of participants reported that their diagnosis was communicated to them as the “good” cancer, in an attempt to emphasize a positive prognosis and survival rate. Participants reported that this resulted in the diagnosis being downplayed and their experience dismissed. They felt that they were perceived as not needing support and consequently felt unworthy of accessing supports. The authors also found an overall theme of isolation amongst thyroid cancer survivors. Isolation was described as being from other cancer patients and support services,
owing to not “looking sick”, isolation during RAI treatment, and isolation from their peers without cancer (Easley et al., 2013).

A qualitative investigation by Sawka and colleagues (2009) explored thyroid cancer survivors’ experiences of diagnosis and post-surgical radioactive iodine treatment. Three focus groups were conducted with five to six participants in each, with a total of sixteen participants in all. Participants were asked to discuss their experience of counselling, decision-making, and treatment related to radioactive iodine. Participants were also free to discuss other aspects related to their thyroid cancer experience. A primary theme that emerged centred around the experience of diagnosis being life-changing and one that was connected to feelings of fear and uncertainty about the future. Study participants understood the low mortality rates associated with thyroid cancer, however they described being told they had the “good cancer,” and experienced this to be dismissive of the importance of the diagnosis. In turn, participants stressed the need for support from their healthcare team, family and friends throughout diagnosis and treatment(s) (Sawka et al., 2009).

**Quality of Life and Adjustment.** The psychological impact of thyroid cancer has primarily been explored through quality of life (QOL) outcomes. QOL measures look at the extent to which a patient’s physical, mental or emotional, and social well-being have been affected by their illness or treatment (Tan et al., 2007). Studies have shown patients have impaired long term QOL, despite being “cured” of the disease (no thyroid tissue detected). For example, a Singapore based study of 144 patients with well-differentiated thyroid cancer, found that thyroid cancer patients had significantly lower QOL on all domains of the SF-36, compared to general population norms. The authors also found that morbidity and treatment of thyroid cancer lead to a decrease in the physical functioning domain of QOL in survivors over 50 years
of age. Thyroid cancer survivors with lower levels of education were also found to have lower QOL (Tan et al., 2007). Another recent study evaluated QOL in 121 thyroid cancer survivors and compared data to a large community population with a similar age and gender distribution (Singer et al., 2012). The authors found that thyroid cancer patients reported significantly more problems, that is, poorer QOL, than found in the community sample and that QOL was generally unrelated to disease stage (Singer et al., 2012). Interesting, thyroid cancer studies have showed similar QOL results to breast cancer patients and worse than melanoma and colorectal cancer patients (Shults, Beck, Stave & Vasilopouliou-Sellen, 2003).

A recent systematic review of health-related QOL of thyroid cancer survivors reported that survivors experience severe and long-term impairments in health-related QOL following surgery and subsequent treatment (Husson, Haak, Oranje, Mols, Reemst, & van de Poll-Franse, 2011). The review noted conflicted reports in the literature. The authors explained that high-quality studies with long-term thyroid cancer survivors found lower health-related QOL when compared with a healthy population or other reference groups. Conversely, poorer-quality studies reported no difference in health-related QOL between thyroid cancer survivors and the normal population. The authors further noted that, at the time, there was a lack of a valid, thyroid-specific instrument to assess health-related QOL.

Optimism can be understood as a personality construct, with some people naturally having a more optimistic explanatory style. The research has been extensive on the relationship between dispositional optimism and mental and physical health factors. Studies have shown that optimism relates to better QOL, both mental and physical, and improved psychological functioning in patients with thyroid, head, and neck cancers, and more so for thyroid cancer survivors (Kung et al., 2006). Longer remission periods have also been associated with higher
QOL scores (Hendrieke, 2008). It is worth noting that the study by Kung and colleagues (2006) demonstrated that optimism is more related to mental QOL than of physical QOL, suggesting that optimism can have a significant effect on the psychological impact of thyroid cancer (Kung et al., 2006).

**Other Psychosocial Factors associated with Thyroid Cancer.** Anxiety has been found to be a common symptom among cancer survivors and is considered to be a strong predictor of lower QOL. Levels of anxiety have been found to be more prevalent than depressive symptomology in thyroid cancer patients. Additionally, higher than normal rates of anxiety have been found in the thyroid cancer population when compared to other cancer populations (Tagay, Herpertz, Langkafel, Erim, Bockisch, Senf, & Gorges, 2006; Harrington, McGerk, Llewellyn, 2008). A study looking at the impact of being diagnosed with thyroid cancer found that anxiety was most closely related to questions about the trajectory of the disease and treatment-related side effects (Sawka et al., 2009). In a study looking at psychological adjustment in thyroid cancer, self-report data was collected from 154 thyroid cancer patients and the results showed that over one-third of the sample reported clinically significant levels of anxiety (Costa & Packenham, 2012). There are a number of possible explanations as to why anxiety may be high in thyroid cancer survivors. One possible explanation is that some individuals may be treated with high doses of thyroid hormone to suppress their TSH, resulting in symptoms of thyroid hormone excess, which may mimic that of anxiety, such as heart palpitations, irritability, and insomnia. Another plausible explanation is that thyroid cancer survivors are often told not to worry, owing to the high survival rate. As such, thyroid cancer survivors may not receive the suggestion of or access to supports that could help them process any cancer-related anxiety resulting from their diagnosis or related treatments.
A large, recent quantitative study surveyed 941 Canadian thyroid cancer survivors using a self-report, self-administered questionnaire (Bresner et al., 2015). The authors found that the high degree of cancer-related worry in thyroid cancer survivors was comparable to previous studies of other types of cancers. Disease status and younger age were found to be the strongest predictors of cancer-related worry. Shorter time since diagnosis, partnered marital status, and having children were also independently associated with cancer-related worry. The authors also reported that survivors had heightened worry about death, despite the reported high survival rate for most thyroid cancer survivors. Perhaps this is related to the relatively young age at which many thyroid cancer survivors are diagnosed. Given that a common perception of thyroid cancer is that of “the good cancer,” it is possible that survivors are not being referred to supports that could help them process anxiety resulting from the diagnosis. Indeed, two recent surveys of thyroid cancer survivors indicated that their care could have been improved through introduction to a psychological or support group (Goldfarb & Casillas, 2014). These findings support the notion that thyroid cancer survivors’ level of anxiety and/or distress may be reduced through more access to support services.

A number of studies have found that certain personal characteristics among thyroid cancer patients have shown to be helpful in reducing symptoms of anxiety. Costa and Packenham (2012) found that higher levels of self-acceptance and spiritual well-being were related to less or lowered anxiety among thyroid cancer survivors. Tagay et al. (2006) found that anxiety and general mental health scores were significantly lower in a subgroup of patients that had been diagnosed with thyroid cancer within a year of the study. Increased time from diagnosis may also be related to increased adjustment, such as one’s purpose in life, spiritual well-being, self-acceptance, benefit finding, and wisdom, among others (Costa & Packenham, 2012). In sum,
the literature consistently reports that thyroid cancer survivors report high levels of anxiety, frequently reported in younger patients, and often focused on the trajectory of their disease. Research exploring protective factors against distress and the promotion of psychological adjustment is scant. This study aims at helping to fill this gap.

A common theme for thyroid cancer patients has been a perceived lack of support and access to information. Outcome measures have shown that education and time since diagnosis allow patients the chance to better understand their disease and to build coping and adjustment outcomes (Tan et al., 2007). In a dissertation on the experience of young women with thyroid cancer (Manuel, 2010) many of the young women identified a lack of appropriate information and support available (Manuel, 2010). In a cross-sectional study based in New York City hospitals (Roberts, Lepore, & Urken, 2008), many patients reported that they did not feel as though they had received enough information about side effects, reoccurrence, and current information about thyroid cancer. Further, 92% of patients reported not attending thyroid cancer support groups, but 44% said they would have attended if one were made available to them. Additionally, 74% of patients stated that they did not use self-help materials; with 69% being interested if the materials had been available. Other concerns were related to thyroid cancer-specific and age-appropriate supports (Roberts et al., 2008). Perhaps the lack of information provided or available to thyroid cancer survivors is reflective of the notion that thyroid cancer is the “good cancer,” i.e., survivors expected to have a high chance of survival do not have the same informational needs as with other types of cancer with higher disease severity and poorer outcomes.

When faced with a potentially life threatening disease, an important source of comfort for the patient is often their healthcare provider. In many studies of thyroid cancer, patients
identified a lack of physician support (Applewhite et al., 2016; Aschebrook-Kilfoy et al., 2015). As documented in the literature, lack of information may be detrimental to a client’s mental and emotional health. As discussed above, Roberts and colleagues (2010) reported that thyroid cancer patients reported not having received enough information on side effects, disease recurrence, and current information about the disease. Additionally, patients complained that they did not receive adequate guidance from their health care team regarding where to find emotional support, and did not feel supported (Roberts et al. 2010). However the literature is somewhat mixed, perhaps owing to sample characteristics. A recent qualitative study found that most thyroid cancer patients interviewed reported feeling supported by and having confidence in their healthcare team (Misra et al., 2013). Patients also reported that specific information regarding recurrence rates of thyroid cancer was lacking. Conversely, they found the informational and support needs were not adequately met by existing thyroid cancer and generic cancer support organizations, most specifically related to the lack of available in-person support groups.

The literature shows that recurrence rates of differentiated thyroid cancers is between 3-68% (Tuttle, 2010), depending on the initial stage of disease. Approximately 20% of those people who require additional operations due to recurrence of the disease have also reported a third occurrence of the disease, suggesting that once a patient has had one recurrence the likelihood of additional recurrences increases (Yim, 2011). It has been suggested that disease recurrence can be more psychologically distressing than the initial cancer diagnosis (Burnet, 2000; Vivvar, 2010). Sawka and colleagues (2013), looked at patients thyroid cancer survivors’ experiences post surgery using a qualitative design. There were 16 participants in the study, 75% female, and all but one of the participants had RAI treatment post-surgery. Many of the
participants reported similar psychological experiences following surgery. Initial reactions to recurrence were shock, fear of death, and the uncertainty for the future. Reports of lingering worry and heightened awareness for future recurrences were also identified. Additionally, many patients reported not feeling legitimized in their treatment related side effects, leaving them feeling frustrated and unheard. These distressing feelings seemed to dissipate when patients had trust in their physician and when they felt they could freely communicate with their health care team. An important consideration for the psychological well being of thyroid cancer patients is that they feel included in treatment decisions and additionally important is that they feel heard and understood by their health care team. “Thus, in spite of the potentially surgically treatable nature of local-regional cancer recurrence, the acute psychosocial impact and support needs of affected individuals should not be overlooked” (p.50, Misra et al., 2013). These findings suggest that thyroid cancer survivors experience significant feelings of distress related to their cancer experience, despite being diagnosed with a cancer that has a generally good prognosis.

**Benefit Finding and Posttraumatic Growth.** To date, only two studies have addressed benefit finding or posttraumatic growth within a thyroid cancer population. Costa and Pakenham (2012) explored benefit finding and adjustment, as represented by higher order cognitive and motivational states and health behaviour changes. Additionally, they collected data on patient benefit finding and health behaviour changes from the partners of thyroid cancer patients. One hundred and fifty-four thyroid cancer survivors were surveyed in addition to thirty-two partners, from a major hospital in Brisbane, Australia. Benefit finding was measured using the Stress Related Growth Scale (SRGS-R), which assesses positive and negative changes in response to a stressful situation (Armeli, Gunthert, & Cohen, 2001; Costa & Pakenham, 2012). The Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) was also used to confirm
the convergent validity of the SRGS-R. Benefit finding was found to be associated with greater positive affect, increased health behaviour change, and better outcomes with respect to higher order cognitive and motivational states of adjustment. Benefit finding was found to be correlated with greater positive affect, wisdom, spiritual wellbeing, and lifestyle changes. The study further suggested that benefit finding in thyroid cancer survivors related to health behaviour changes, that are in turn corroborated by their partners, is also strongly correlated with adjustment outcomes that are existentially-oriented.

Misra and colleagues (2013) conducted 15 semi-structured interviews, in Toronto, with thyroid cancer survivors who had experienced recurrence and treatment of local-regional disease. The interviews focused on initial reactions to recurrence, coping mechanisms, psychosocial impact, sources of medical information, sources of support, and unmet needs. They found that recurrence was related with significant psychological distress and worry associated with the risk for future recurrence. Additionally, the authors described that patients reported changes in outlook and lifestyle, consistent with themes of posttraumatic growth, following disease recurrence. Some patients reported experiencing enhancement of family relationships, heightened appreciation for life, increased self-confidence, and motivation towards healthy lifestyle changes (Misra et al., 2013). The lack of research on benefit finding and PTG in thyroid cancer survivors calls for further investigation. Review of the literature has identified gaps that this study hopes to fill. The following section explores the need for the present study, direction of research, and study hypotheses.

**Need for the Current Study**

As discussed in the previous sections, the incidence rate of thyroid cancer is increasing faster than the incidence rate of any other major cancer. It is the most common cancer diagnosed
in young females, aged 15 to 29, and the second most common cancer, following breast cancer, diagnosed in adults aged 30 to 49 (Canadian Cancer Society & Public Health Agency of Canada, 2015). There is also a growing body of literature that points to the possibility of over-diagnosis and subsequent over-treatment in individuals, particularly women, with small thyroid cancer nodules, (Davies & Welch, 2014). Thyroid cancer survivors have been described as the neglected segment of cancer survivors, owing to the stable low mortality rates, leading thyroid cancer survivors feeling dismissed, or frustrated when their experience of distress is not acknowledged. The use of the term the “good cancer” further perpetuates the sentiment of dismissal for those diagnosed with thyroid cancer.

Relative to the volume of literature focused on other types of cancer, there is a dearth of research on the psychological impact of thyroid cancer. As previously mentioned, the majority of thyroid cancers, more specifically, well-differentiated thyroid cancer, are characterized by relatively low incidence rate and high survival rate. However, despite the high survival rate, quality of life of thyroid cancer survivors is reportedly lower than the normal population, similar to breast cancer survivors, and worse than melanoma and colorectal cancer survivors (Husson, Haak, Oranje, Mols, Reemst, & can de Poll-Franse, 2011). Posttraumatic growth in thyroid cancer survivors has not been explored quantitatively, to date. Psychosocial research with thyroid cancer survivors is not as extensive as with other cancer populations, possibly owing to the good prognosis of well-differentiated thyroid cancers. Most of the psychosocial literature has focused on quality of life, in part owing to long-term side effects reported by thyroid cancer survivors. While the incidence of thyroid cancer has been reported as increasing (Davies & Welch, 2014), thyroid cancer makes up a small percentage of overall new cancer cases (Canadian Cancer
Society & Public Health Agency of Canada, 2015). It is possible that these are some of the reasons why PTG has not been extensively explored in this population.

The purpose of the present study is to understand the relationship between symptoms of PTG, and demographic, psychosocial, and thyroid cancer-specific variables. Based on previous findings identifying critical variables for understanding adjustment following a cancer diagnosis, the current study will investigate how depression, anxiety, rumination, social support, quality of life, locus of control, coping, demographic variables, medical variables, are related to and predict PTG among thyroid cancer survivors. PTG theory, as presented by Schaeffer and Moos (1998), has suggested that social support may influence coping, and act as a precursor to PTG among those with a cancer diagnosis. Thus, the moderating effects of social support will also be explored. The hypotheses for the current study are detailed below.

**Hypotheses**

1. The following hypotheses focus on demographic characteristics. These will be analyzed using correlational methods. It is expected that:
   
   a. Younger age will be positively correlated with posttraumatic growth (M.J. Cordova et al., 2007).
   
   b. Participants with children will report more posttraumatic growth. Individuals with dependent children (i.e., under the age of 18 years) will be analyzed separately. This is based on the supposition that thyroid cancer survivors with young children may interpret the diagnosis as more traumatic given the potential negative impact on their ability to meet the demands of being a parent, and further, the potential negative psychological impact their illness may have on their children. It has been suggested that experience of more psychological distress can produce more
growth (Schaefer & Moos, 1998; R. G. Tedeschi & L. G. Calhoun, 2004). It is also possible that survivors with children may be more motivated to find new meaning in their lives for the sake of their children.

c. Longer time since diagnosis or first surgery will be positively correlated with posttraumatic growth. This has been well-established in the literature (Helgeson, Renolds, & Tomich, 2006; R.G. Tedeschi & L.G. Calhoun, 2004).

d. Disease recurrence will be associated with greater posttraumatic growth (Tomich & Helgeson, 2012; Urcuyo, Boyers, Carver, & Antoni, 2005)

2. The following hypotheses focus on additional correlates of posttraumatic growth. These will be analyzed using correlational methods.

a. Active coping styles (i.e., Confrontive, Seeking Social Support, Planful Problem Solving, and Positive Reappraisal) will be positively correlated with posttraumatic growth (Sears, Stanton, & Danoff-Burg, 2003).

b. Positive changes in health behaviour (decreased smoking, drinking, illicit drug use, and increased exercise, improved diet and sleep, and improved stress management) will be positively correlated with posttraumatic growth (Costa & Pakenham, 2012).

c. Internalized locus of control will be positively correlated with posttraumatic growth.

d. It is expected that greater quality of life will be positively correlated with posttraumatic growth, however the literature is mixed in this area (Tomich & Helgeson, 2012).
e. It is well established that increased rumination is positively correlated with posttraumatic growth (R. G. Tedeschi & Calhoun, 1995; R.G. Tedeschi & L.G. Calhoun, 2004; R.G. Tedeschi et al., 1998). The present study expects to confirm this finding.

f. Greater levels of social support will be correlated with posttraumatic growth. Tedeschi and Calhoun’s (2004) theory of posttraumatic growth suggests that social support is a strong correlate of PTG.

3. The following hypotheses relate to expected predictors of posttraumatic growth. These will be evaluated using multiple regression analyses.

a. Age, greater time since diagnosis, and recurrence are expected to be predictors of PTG, based on previous findings (Helgeson et al., 2006; Tomich & Helgeson, 2012).

b. Previous research has found social support to be a strong predictor of posttraumatic growth (R.G. Tedeschi & L.G. Calhoun, 2004). The present study expects to confirm this finding with thyroid cancer survivors.

c. Coping, specifically more active coping styles (i.e., Confrontive, Seeking Social Support, Planful Problem Solving, and Positive Reappraisal) are expected to predict posttraumatic growth (M. J. Cordova, Cunningham, Carlson, & Andrykowski, 2001; Kolokotroni et al., 2014)

d. According to Tedeschi and Calhoun (2004), rumination is an essential component of posttraumatic growth. As such, it is expected that rumination will be predictive of posttraumatic growth in this study population.

e. Internal locus of control is expected to predict posttraumatic growth.
f. Quality of Life, Depression, and Anxiety, are not expected to be predictors when entered into regression analyses, based on previous findings (Helgeson et al., 2006). While health behaviour change has been shown to be strongly related to PTG (Costa & Pakenham, 2012), it is not expected to be as strong as a predictor, relative to social support, coping, rumination and locus of control.

4. Exploratory analysis will be conducted on the potential moderating effects of social support on the relationships between psychosocial variables and PTG. Social support has been found to be strongly related to posttraumatic growth (Kolokotroni et al., 2014; Prati & Pierrantoni, 2009; Shand et al., 2015). Other authors have suggested that social support is a precursor to growth, and may have an influence on coping (Schaefer & Moos, 1998). As such, it is expected that social support may strengthen or moderate the relationship between coping and posttraumatic growth.

This study was designed to investigate the experience of and psychosocial factors related to the development of PTG in thyroid cancer survivors. Demographic and thyroid cancer related variables were examined in relation to PTG. Coping strategies, rumination, QOL, locus of control, social support, and health behaviour changes were also investigated for their contribution to PTG. Psychosocial predictors of PTG were examined as well as the potential mediating or moderating role of social support.
Chapter 3: Method

Participants

A total of 477 individuals accessed the survey online for this study. The final sample was selected based on participants’ consent and eligibility. Entrance criteria for participation in the study required that participants had received a thyroid cancer diagnosis, were over 16 years of age, and resided in Canada or the United States. A total of eight individuals were excluded because consent was not obtained. One individual responded “no,” and eight individuals did not respond when asked for consent. A total of eight individuals were excluded because they resided outside of Canada and the United States, and were therefore not eligible to participate in the study. A total of 188 individuals were further excluded from the final sample owing to extensive missing data. A total of 263 individuals provided consent, completed the survey in entirety, and met eligibility criteria. The majority of respondents identified as female (98.5%). Given the high proportion of female respondents and the higher prevalence of thyroid cancer among women, making this a population of particular interest for this research, the sample was limited to women and 14 of the completed surveys were excluded from the final sample (13 males and 1 female-to-male transgendered individual). The final sample was comprised of 259 women who were between the ages of 20 and 73 (M age = 43.1, SD = 11.2). Descriptive statistics for demographic information are summarized in Table 1. A total of 60% of participants were from the United States and 40% were from Canada. Respondents were predominantly Caucasian (88.4%), with 4.2% identifying as Hispanic, 1.9% as First Nations, 0.8% as South Asian, and 3.9% as “Other.” Married (67.2%) or living with their partner (9.7%).

Approximately half of participants (46.7%) were employed full time. A smaller proportion of participants were employed part time (10.8%), or identified themselves as
homemakers (10.4%). Fifteen individuals (5.8%) were on illness leave from work and 17 individuals (6.6%) were unemployed at the time of completing the survey. The study sample was overall highly educated, with the majority of individuals having completed some college or university (65.3%) or graduate, medical or law school (25.1%).

Table 2

Demographics and Thyroid Cancer Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
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<td>43.11 (11.20)</td>
<td></td>
</tr>
<tr>
<td>Country of Residence</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>155</td>
<td>59.8</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>104</td>
<td>40.2</td>
<td></td>
</tr>
<tr>
<td>Rural vs Urban</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>189</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
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<td>26.3</td>
<td></td>
</tr>
<tr>
<td>Other</td>
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<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>97.3</td>
<td></td>
</tr>
<tr>
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<td>2.3</td>
<td></td>
</tr>
<tr>
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<td></td>
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<tr>
<td>Common-law or living with partner</td>
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<td>9.7</td>
<td></td>
</tr>
<tr>
<td>Single/never married</td>
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<td>9.7</td>
<td></td>
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<tr>
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</tr>
<tr>
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<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Separated</td>
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</tr>
<tr>
<td>Ethnicity</td>
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<tr>
<td>Hispanic</td>
<td>11</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>First Nations</td>
<td>5</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>South Asian</td>
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Table 2 (continued)

<table>
<thead>
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<th>Variable</th>
<th>N</th>
<th>%</th>
<th>Mean (SD)</th>
</tr>
</thead>
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<td>Ethnicity (continued)</td>
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<td>East Asian</td>
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<td></td>
</tr>
<tr>
<td>Middle Eastern</td>
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<tr>
<td>Identifies with a Religion (Y/N)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>176</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>83</td>
<td>32</td>
<td></td>
</tr>
<tr>
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<td>46.7</td>
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</tr>
<tr>
<td>Employed Part-time</td>
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<td>10.8</td>
<td></td>
</tr>
<tr>
<td>Homemaker</td>
<td>27</td>
<td>10.4</td>
<td></td>
</tr>
<tr>
<td>Self-employed</td>
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<td>7.7</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>17</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>Retired</td>
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<td>6.2</td>
<td></td>
</tr>
<tr>
<td>On illness leave</td>
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<td>5.8</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>12</td>
<td>4.6</td>
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</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Education Recoded</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>College and Undergraduate</td>
<td>169</td>
<td>65.3</td>
<td></td>
</tr>
<tr>
<td>Graduate, Medical or Law school</td>
<td>65</td>
<td>25.1</td>
<td></td>
</tr>
<tr>
<td>High school or less</td>
<td>25</td>
<td>9.7</td>
<td></td>
</tr>
<tr>
<td>Number of Children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>98</td>
<td>37.8</td>
<td></td>
</tr>
<tr>
<td>No children</td>
<td>61</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td>1 child</td>
<td>42</td>
<td>16.2</td>
<td></td>
</tr>
<tr>
<td>3 children</td>
<td>39</td>
<td>15.1</td>
<td></td>
</tr>
<tr>
<td>4 children</td>
<td>15</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>5 children</td>
<td>4</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Number of Children Under 18yrs</td>
<td>259</td>
<td>0.88</td>
<td>(1.06)</td>
</tr>
<tr>
<td>Time Since First Surgery (months)</td>
<td>246</td>
<td>62.55</td>
<td>(64.27)</td>
</tr>
<tr>
<td>TC Recurrence (N=235)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>163</td>
<td>62.9</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>63</td>
<td>24.3</td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td>9</td>
<td>3.5</td>
<td></td>
</tr>
</tbody>
</table>
Procedures

Participants were recruited following approval from the University of Toronto’s Social Sciences, Humanities and Education Research Ethics Board. Given the relatively low incidence of thyroid cancer, study participants were recruited through a number of avenues in order to achieve a large enough sample size for statistical power. The study questionnaire was available online, therefore recruitment efforts were entirely focused online. Advertisements were posted through Thyroid Cancer Canada (TCC). TCC is a national charitable support organization with a website, Facebook page, and an online patient support forum that has a membership of 1334, and is regularly accessed by 400 individuals. The study was also advertised on the Young Adult Cancer Canada (YACC) website and Facebook page. Additionally, study advertisements were posted on a variety of Facebook online support forums, including, Thyroid Cancer, Thyroid Cancer Sisters, Thyroid Cancer Support Group, Thyroid Cancer Survivors, and Thyroid Cancer 411, most of which have a large membership of individuals residing in the United States. The study advertisement consisted of a one-page document (Appendix A) with a short description about the study and contained a link to the online consent and questionnaire package. Information emails (Appendix B) were sent to those organizations/groups that required initial email contact or more details than the one-page study advertisement contained. The study survey was hosted on FluidSurveys, a Canadian online survey engine. Identifying information was not collected for the purposes of this study. The final online study page provided participants with instructions on how to erase browser history to further protect their confidentiality. Additionally, a counselling resource page was provided to all participants (Appendix C).
Measures

Interested participants were asked to read and agree to a study consent form online (see Appendix D). Once consent was obtained, participants were forwarded to the online study questionnaires (see Appendices E through M). Each study measure is described below.

**Demographics.** The Demographics Questionnaire (Appendix E) gathered participant background information, such as age, gender, marital status, number of dependent children, ethnocultural background, religion, employment status, income and education. Medical items specific to thyroid cancer were also included, such as, time since diagnosis (or first surgery), types of surgery, type of thyroid cancer, time since last treatment, types of treatment received, and recurrence.

**Posttraumatic Growth.** The Posttraumatic Growth Inventory (PTGI; see Appendix F), developed by Tedeschi and Calhoun (1996), is a 21-item, self-report questionnaire used to quantify PTG. The PTGI yields a total score as well as scores on five dimensions. The five factors are labeled as, *New Possibilities* (e.g., “I am more likely to try to change things which need changing”), *Relating to Others* (e.g., “I learned a great deal about how wonderful people are”), *Personal Strength* (e.g., “A feeling of self-reliance”), *Appreciation of Life* (e.g., “Appreciating each day”), and *Spiritual Change* (e.g., “I have a stronger religious faith”). A 6-point likert scale is used to rate items, ranging from 0 (“I did not experience this change as a result of my crisis”) to 5 (“I experienced this change to a great degree as a result of my thyroid cancer experience”). Possible total scores range from 0 to 105. Good internal consistency was reported for Total PTG with an $\alpha = .90$ and internal consistency of the five factors was as follows: Relating to Others $\alpha = .85$, New Possibilities $\alpha = .84$, Personal Strength $\alpha = .72$, Spiritual Change $\alpha = .85$, and Appreciation of Life $\alpha = .67$ (Tedeschi and Calhoun, 1996).
Reliability of all PTGI factors in this sample revealed good to excellent reliability: Relating to Others $\alpha = .872$, New Possibilities $\alpha = .849$, Personal Strength $\alpha = .796$, Spiritual Change $\alpha = .832$, and Appreciation of Life $\alpha = .803$. Reliability for PTGI total score was also excellent $\alpha = .941$. Test-retest reliability with a 2-month interval was reported as $r = .71$. While the PTGI has not yet been used with thyroid cancer survivors as an outcome measure, it has been used with multiple other cancer populations (M. J. Cordova et al., 2001; Scrignaro et al., 2011; Silva et al., 2012; Soo & Sherman, 2015). Studies measuring PTG as an outcome frequently use the total score when reporting results. As such, this study used each of the subscales in addition to the total score to explore unique patterns between each of the five factors and add to the literature.

**Mood.** The Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report instrument measuring symptoms of depression, hyperarousal, and tension (see Appendix G). It is a shortened version of the original 42-item DASS. The scale has been shown to be a highly discriminating measure of anxiety and depression (e.g., Antony et al., 1998; Clara, Cox, & Enns, 2001; Henry & Crawford, 2005), and yields three subscale scores, including, Depression, Anxiety, and Stress. The Depression scale includes 7 items that assess dysphoric mood, low self-esteem, and anhedonia. The Anxiety scale is comprised of 7 items that measure physiological arousal and fear. Lastly, the Stress scale consists of 7 items relating to a tendency to overreact to stressful events, irritability, and tension. Items are rated on a 4-point Likert scale ($0 =$ did not apply to me at all to $3 =$ applied to me very much, or most of the time). Good internal consistency reliability have been reported for the DASS-21, specifically, Depression $\alpha = .85$, Anxiety $\alpha = .81$, and Stress $\alpha = .88$. Internal consistency in this sample was as follows: Depression $\alpha = .93$, Anxiety $\alpha = .83$, and Stress $\alpha = .86$. Concurrent validity has been
reported to be between moderate and high \((r = .40\) to \(.65)\) with similar measures of anxiety and depression (Antony et al., 1998; Brown et al., 1997; Crawford and Henry; 2003).

**Coping.** The Ways of Coping Questionnaire (WOC; Folkman & Lazarus, 1988) is a 66-item, self-report scale measuring coping strategies across eight scales (see Appendix H). Participants were asked to rate the frequency that they use 66 different coping strategies, as they relate to their thyroid cancer experience, on a 4-point Likert scale \((1 = \text{not used}, \ 2 = \text{used somewhat}, \ 3 = \text{used quite a bit}, \ 4 = \text{used a great deal})\). The coping scales in the WOC are as follows: Confrontive coping (6 items; e.g., “I did something that I didn’t think would work, but at least I was doing something”), Distancing (6 items; e.g., “I went along with fate; sometimes I just have bad luck”), Self-Controlling (7 items; e.g., “I tried not to burn my bridges, but leave things open somewhat”), Seeking Social Support (6 items; e.g., “I talked to someone to find out more about the situation”), Accepting Responsibility (4 items; e.g., “I criticized or lectured myself”), Escape-Avoidance (8 items, e.g., I hoped for a miracle), Planful Problem Solving (6 items, e.g., I just concentrated on what I had to do next – the next step), and Positive Reappraisal (7 items, e.g., “I was inspired to do something creative about the problem”). The remaining 16 scale items were fill items.

Internal reliability for each of the eight scales was reported as follows: Confrontive \(\alpha = .70\), Distancing \(\alpha = .61\), Self-Controlling \(\alpha = .70\), Seeking Social Support \(\alpha = .76\), Accepting Responsibility \(\alpha = .66\), Escape-Avoidance \(\alpha = .72\), Planful Problem Solving \(\alpha = .68\), and Positive Reappraisal \(\alpha = .79\) (Folkman, Lazarus, Dunkel-Schetter et al, 1986). Internal consistency is this sample was as follows, Confrontive \(\alpha = .76\), Distancing \(\alpha = .76\), Self Controlling \(\alpha = .67\), Seeking Social Support \(\alpha = .75\), Escape Avoidance \(\alpha = .83\), Accepting Responsibility \(\alpha = .56\), Planful Problem Solving \(\alpha = .76\), and Positive Reappraisal \(\alpha = .75\).
**Health Behaviour Change.** Health behaviour changes was assessed using a similar method as Costa and Pakenham (2012) in their investigation into benefit finding in thyroid cancer survivors (see Appendix I). A recent study on cancer survivors also used a similar measure of health behaviour changes (C. L. Park, Edmondson, Fenster, & Blank, 2008). A brief measure was adapted for the purposes of this study to assess health behaviour change in seven common areas: smoking, alcohol, illicit drug use, exercise, diet, sleep, and stress management. Selection of these health behaviour changes is based on those commonly assessed in cancer literature (Denmark-Wahneried, Aziz, Rowland, & Pinto, 2005), with the addition of illicit drug use. Participants were asked to rate changes on a 7-point scale (1 = much worse now to 7 = much better now). Costa and Pakenham (2012) found a two factor structure between the behaviours, separated into “lifestyle behaviours” and “substance use.”

**Locus of Control.** Locus of control was measured using the Multidimensional Health Locus of Control Scale (MHLC; see Appendix J) (Wallston et al., 1978). The MHLC is an 18-item scale developed to assess health-related locus of control across 3 factors, internal locus of control (“if I get sick, it is my own behavior which determines how soon I get well again”), chance (“my health is largely a matter of good fortune”), and powerful others (“health professionals control my health”). Each subscale contains 6 items and is scored using a 6-point Likert scale (1 = strongly disagree to 6 = strongly agree). Higher scores indicate greater emphasis placed on that type of locus of control (internal, chance, or powerful others). Internal consistency for this measure was reported as $\alpha = .70$ for Internal, $\alpha = .49$ for Chance, and $\alpha = .58$ for Powerful Others (Winefield, 1982). Internal consistency in this sample was as follows, Internal $\alpha = .68$, Chance $\alpha = .68$, and Powerful Others $\alpha = .70$. 
**Quality of Life.** Quality of Life was measured using the City of Hope Quality of Life (Thyroid Version; QOL-TV) (Ferrell, Hassey-Dow, & Grant, 1995). The QOL-TV is a 30-item measure that assesses quality of life, specific to thyroid cancer patients (see Appendix K). This measure was developed as a part of a larger study on pain and cancer, and adapted for use in a thyroid cancer population. Participants were asked to rate a number of symptoms in terms of how problematic they have been during their illness and treatment, on a 10-point scale (0 = no problem to 10 = severe problem). Questions are broken down into four categories: physical well being (e.g., problems with fatigue and swelling/fluid retention), psychological well being (e.g., “How difficult is it for you to cope with your disease and treatment?” and “How satisfying is your life?”), social concerns (e.g., “Is your continuing health care interfering with your personal relationships?” and “How much financial burden have you incurred as a result of your illness and treatment?”), and spiritual well being (e.g., “How much has your spiritual life changed as a result of cancer diagnosis?”). Subscales are scored by summing the items and creating a mean score. A number of items are reverse-scored (1, 3, 10-23, and 27). Test-retest reliability was good with \( r = .89 \) for the entire scale, and \( r \) values ranging from .81 to .90 for the subscales. Good internal consistency was reported with \( \alpha = .93 \). Subscale alphas ranged from \( \alpha = .71 \) for spiritual well being, \( \alpha = .77 \) for physical well being, \( \alpha = .81 \) for social concerns, and \( \alpha = .89 \) for psychological well being (Ferrell et al., 1995).

**Rumination.** The Ruminative Responses Scale (RRS; Treynor, Gonzalez, & Nolen-Hoeksema, 2003) was administered to participants to evaluate rumination specific to their thyroid cancer experience (see Appendix L). The RRS is a 22-item scale developed to assess ruminative response styles. This scale was chosen over other measures, as it has been widely used in the literature to assess ruminative coping (Schoofs, Hermans, & Raes, 2010). Total
scores are derived by adding the scores of the 22 items. The authors have acknowledged that many of the items in the RRS overlap with symptoms of depression, as measured by the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). As such, they recommend using the following items to more accurately measure reflective and brooding rumination: items 5, 7, 10, 11, 12, 13, 15, 16, 20 and 21.

Examples of these remaining items include, “Think ‘What am I doing to deserve this?’”, “Think ‘Why do I always react this way?’”, and “Go some place alone and think about your feelings.” Participants were asked to rate each item on a four-point Likert scale, ranging from 1 (“almost never”) to 4 (“almost always”). Multiple scores can be generated from the RRS. The authors have recommend using the RRS as a continuous measure, selecting “high” or “low” ruminators using percentile cut-offs (e.g., scores in the top 33% to be labeled as “high” ruminators, scores in the bottom 33% to be labeled as “low” ruminators) (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). The authors also noted that the modified version of the RRS, with depressive items removed, contains two factors of rumination, “reflective” and “brooding.” Many studies can be found in the literature using the unmodified 22-item version of the RRS, noting up to three separate factors, including brooding, reflective and depression-related items (Johnson, McKenzie, & McMurrich, 2008; Roelofs, Muris, Huibers, Peeters, & Arntz, 2006; Schoofs et al., 2010). The modified RRS has shown adequate internal consistency for brooding rumination ($\alpha = .77$) and reflective rumination ($\alpha = .72$) (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). These factors, or subscales, have adequate test-retest reliability, brooding has $r = .62$, and reflection has $r = .60$ (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). For the purpose of this study, multiple scores of the RRS were considered when investigating the hypotheses. Internal consistency for the RRS total score in this sample was $\alpha = .96$. 
Social Support. The Medical Outcomes Study Social Support Survey (MOS-SSS; C.D. Sherbourne & A.L. Stewart, 1991) was administered to participants to evaluate overall and specific dimensions of social support (see Appendix M). The MOS-SSS is a 19-item, self-report scale designed to measure perceived availability of support across four dimensions, including, Emotional-Informational, Affectionate, Tangible, and Positive Social Interaction. The MOS-SSS was developed out of the Medical Outcomes Study, a two-year longitudinal study assessing process and outcomes of care for patients with chronic conditions (C.D. Sherbourne & A.L. Stewart, 1991). The measure is focused on perceived availability of support (if needed), based on the work of Cohen and Willis (1985). The authors’ note that an individual not currently receiving support at a given time is not necessarily unsupported, just as someone who appears to have access to support may not have the perception that they are in fact supported. Participants are asked to rate the availability of companionship, assistance and other types of support on a 5-point Likert scale (1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = most of the time, 5 = all of the time). Examples of items from each of the measure’s four dimensions include, “someone you can count on to listen to you when you need to talk” (Emotional/Informational support), “someone to help you if you were confined to bed” (Tangible support), “someone who shows you love and affection” (Affectionate support), and “someone to have a good time with” (Positive Social Interaction). Higher scores indicate higher perceived availability of social support. Reliability for the MOS-SSS total score and four subscales range from $r = .91$ to $.97$, and are stable over time (12 months). A coefficient alpha of 0.96 was obtained in the present sample. Internal consistency alphas for the subscales were as follows; Emotional/Informational $\alpha = .93$, Tangible $\alpha = .95$, Affectionate $\alpha = .96$, and Positive Social Interaction $\alpha = .97$. The authors report multitrait scaling analysis that supports four dimensions of functional support and
an overall social support index. Good construct validity is reported (C. D. Sherbourne & A. L. Stewart, 1991).

**Data Analysis**

Several steps were followed to analyze the study data. All analyses were performed using SPSS v.23. Descriptive statistics were examined to determine the distribution of scores for each study variable. The five factors of PTG and the total PTG score, as measured by the PTGI, were used as the outcome variables for all of the analyses. To ensure robustness of the results to potential violation of any assumptions, inferential analyses were performed using bootstrapping. Bootstrapping is a resampling technique that produces robust statistical estimates when assumptions of statistical analyses are violated. One thousand samples were used in each bootstrapped analysis.
Chapter 4: Results

The study results are presented in the following order: descriptive statistics for study measures, followed by inferential statistics exploring each of the study hypotheses.

Analytic Strategy

Hypotheses 1a through 1d, were addressed using a combination of correlation analyses of all demographic variables and thyroid cancer variables with each of the five factors of PTG, as measured by the PTGI. The relationship between recurrence (or non-recurrence) and PTG was measured using a t-test.

Hypotheses 2a through 2f were addressed using correlation analyses to examine the relationship between each of the following variables and PTG scores: depression, anxiety, rumination, coping (Confrontive, Distancing, Self-Control, Seeking Social Support, Accepting Responsibility, escape-avoidance, Planful Problem Solving, and Positive Reappraisal), quality of life, health behaviour change (exercise, diet, sleep, and stress management), social support (overall total score, emotional/informational, tangible, affectionate, positive social interactions), and health locus of control (internal, chance, and powerful others).

Hypotheses 3a through 3f were addressed using linear regression analysis to examine the predictive contribution of those study variables found to be significantly correlated with each of the five factors of PTG as well as total PTG, as described above. The following variables were entered into regression analyses: age, time since surgery, thyroid cancer recurrence, number of children, coping (Confrontive, Seeking Social Support, Accepting Responsibility, Planful Problem Solving, Positive Reappraisal), anxiety, health behaviour change (exercise, diet, sleep, stress management), health locus of control (internal, chance, powerful others), social support (total support), and quality of life – physical health.
Hypothesis 4 was addressed using exploratory analyses to determine whether social support moderated the relationship between coping and PTG. Moderation or effect modification of the relationship between coping and PTG, was explored by including the interaction effect between the suspected moderator and predictor into the regression model. The first step taken was to identify potential suspected moderated effects. This step was performed by running scatter plots of the relationships between coping styles and each factor of PTG for subsamples of different levels of social support, and subsequently investigating which plots have visibly different crossing regression lines for the series defined by the values of moderator.

**Descriptive Statistics**

Descriptive statistics were examined for all scale variables to determine distribution of normality. These results are presented in Appendix N. The mean, median, standard deviation, skewness, kurtosis and range for PTGI are represented in Table 3. As can be seen from this table, most variables in this dataset have a range of all possible values and are normally distributed. Although few variables seem to be skewed, given the sufficiently large sample size, multiple regression analyses that address main research questions in this study can be conducted with confidence as long as the multivariate normality assumption is met. Assumptive diagnostics were conducted for each regression analysis (normality of residuals, linearity and homoscedasticity). These assumptions were met for all analyses indicating that mild departure from normality for some variables included in the analyses did not affect the overall results.
Table 3.

Descriptive Statistics for PTGI (N=259)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Subscale</th>
<th>M</th>
<th>Mdn</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
<th>Range Obtained</th>
<th>Range Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTGI</td>
<td>I. Relating to Others</td>
<td>18.94</td>
<td>20.00</td>
<td>8.62</td>
<td>-.29</td>
<td>-.69</td>
<td>0-35</td>
<td>0-35</td>
</tr>
<tr>
<td></td>
<td>II. New Possibilities</td>
<td>12.09</td>
<td>13.00</td>
<td>6.46</td>
<td>-.21</td>
<td>-.78</td>
<td>0-25</td>
<td>0-25</td>
</tr>
<tr>
<td></td>
<td>III. Personal Strength</td>
<td>11.58</td>
<td>12.00</td>
<td>4.82</td>
<td>-.43</td>
<td>-.26</td>
<td>0-20</td>
<td>0-20</td>
</tr>
<tr>
<td></td>
<td>IV. Spiritual Change</td>
<td>4.57</td>
<td>5.00</td>
<td>3.43</td>
<td>.06</td>
<td>-1.27</td>
<td>0-10</td>
<td>0-10</td>
</tr>
<tr>
<td></td>
<td>V. Appreciation of Life</td>
<td>10.53</td>
<td>11.00</td>
<td>3.75</td>
<td>-.93</td>
<td>.34</td>
<td>0-15</td>
<td>0-15</td>
</tr>
<tr>
<td></td>
<td>Total Score</td>
<td>58.84</td>
<td>62.00</td>
<td>23.08</td>
<td>-.41</td>
<td>-.44</td>
<td>0-104</td>
<td>0-104</td>
</tr>
</tbody>
</table>

The PTGI measured psychological growth in individuals in response to their experience of having thyroid cancer. The factor scores for the PTGI were generally normally distributed for this sample. Scores for factors IV and V were somewhat skewed. The mean total score on the PTGI was 58.84 (SD = 23.08) and when averaged across items was 2.53, corresponding to a “small” to “moderate” degree of positive change following thyroid cancer. Subscales Relating to Others (M = 2.71, SD = 1.23), New Possibilities (M = 2.42, SD = 1.29), and Spiritual Change (M = 2.29, SD = 1.72) had similar means when averaged across items. Mean scores for Personal Strength (M = 3.18, SD = 1.24) and Appreciation of Life (M = 3.51, SD = 1.25) were higher, in the “moderate” to “great” range for degree of change. Intercorrelations of the PTGI can be found in Appendix O.

The Depression subscale of the DASS-21 had a mean score of 7.27 (SD = 5.47) indicating a “moderate” level of depressive symptomology, with 39% of respondents scoring within the normal range (0-9). Scores on the anxiety subscale were, on average, 7.44 (SD = 4.90)
indicating a “moderate” to “severe” level of anxiety symptomology, and 24% of respondents scored within the normal range (0-7). The mean for the Stress scale was 9.85 (SD = 5.10) indicating a “mild” to “moderate” level of stress, with 37.5% of respondents scoring in the normal range (0-14).

All eight of the WOC subscale scores when averaged across items were between 1 and 2, corresponding to these categories of coping being “used somewhat” and “used quite a bit” (escape avoidance $M = 1.60$, $SD = 0.50$; Planful Problem Solving $M = 1.56$, $SD = 0.44$; Distancing $M = 1.54$, $SD = 0.44$; Self Controlling $M = 1.54$, $SD = 0.40$; Positive Reappraisal $M = 1.51$, $SD = 0.46$; Seeking Social Support, $M = 1.44$, $SD = 0.43$; Accepting Responsibility $M = 1.36$, $SD = 0.41$; and Confrontive $M = 1.25$, $SD = 0.35$).

Health locus of control was measured using the MHLOC. More individuals endorsed an internal locus of control related to their health, with a mean of 23.80 ($SD = 4.87$). Means for chance and powerful others were similar, $M = 18.86$ ($SD = 5.43$) and $M = 18.41$ ($SD = 5.67$), respectively. The RRS mean was 48.80 ($SD = 16.27$) and when averaged across items was between 2 and 3 ($M = 2.22$), corresponding to “sometimes” or “often” when asked about ruminative thinking patterns. A single item assessing thyroid-related physical quality of life (TQOL-P) from the City of Hope Quality of Life scale was used for the purposes of the following analyses. The TQOL-P mean score was 5.91 ($SD = 2.05$).

With respect to social support, the mean total score on the MOS-SSS was 67.34 ($SD = 18.31$) and when averaged across items was between 3 and 4 ($M = 3.54$), corresponding to receiving or having access to support “some of the time” or “most of the time.” Three of the four subscales had similar mean scores when averaged across items (emotional/informational $M = 3.29$, tangible $M = 3.49$, positive social interaction $M = 3.77$). Affectionate support had a slightly
higher mean score when averaged across items of 4.04, corresponding to receiving social support “most of the time.”

Health behaviour changes were measured on a scale from 1 to 7, ranging from “much worse” to “much better.” Exercise ($M = 3.58, SD = 1.92$), sleep ($M = 3.19, SD = 1.83$), and stress management ($M = 3.49, SD = 1.61$) had mean scores ranging between 3 and 4, corresponding to “slightly worse” and “no change.” Diet had a mean score of 4.28 ($SD = 1.71$) indicating “no change.” Responses on items regarding changes in substance use were inconsistent, suggesting that participants were confused by how the measure was structured. For example, many participants rated their behaviour change with respect to illicit drug use as “1” or “much worse now.” It is highly unlikely that the study population accessed are high users of illicit drugs. As such, questions pertaining to smoking, alcohol and illicit drug use behaviour change were omitted from analyses.

**Demographic Data**

A final sample of 259 female participants were retained for analyses. Additional details on how the final sample was selected as well as descriptive statistics can be found in the Methods Chapter.

**Thyroid Cancer Experiences**

The mean time since diagnosis was approximately 5 years (62.6 months), however responses ranged from 1 month to 38 years from time of diagnosis. The majority of individuals reported having had surgery to treat thyroid cancer (98.5%), and 78.4% had received radioactive iodine (RAI) treatment. Only 24.3% of participants (63 of 235 that responded) reported having a recurrence of thyroid cancer. A small number of individuals (11.2%) reported having been diagnosed with another type cancer. When asked if they were aware of the term “good cancer”
when referring to thyroid cancer, 95.8% responded yes, they knew of or were told about the term “good cancer.”

When asked about accessing supports to cope with their thyroid cancer experience, 25.1% of participants had accessed counselling with a mental health professional; 34.7% had mood symptoms treated with prescription medication; 42.9% had attended a thyroid cancer support group; 6.6% had attended a general cancer support group; 5% had attended a cancer-related workshop or retreat; 18.9% reported having received some other type of support; and 25% of participants reported that they had no received any of the supports listed.

**Demographic Variables, Thyroid Cancer Experience, and PTG**

A series of bivariate correlations were conducted to evaluate associations between demographic, thyroid cancer variables and PTG. Age, number of children, number of children under the age of 18 years, and time since diagnosis were correlated with each of the five factors of PTG. Table 4 is a representation of these findings. Gender and ethnicity were not evaluated given the near-homogeneity of the sample. Personal Strength and Appreciation of Life, were correlated with younger age. Spiritual Change was positively correlated with total number of children. Only Personal Strength was found to be positively correlated with time since diagnosis. New Possibilities was positively correlated with recurrence of thyroid cancer. Total PTG was not significantly correlated with any demographic or thyroid cancer variables. Other demographic variables were explored, including marital status and education, but were not significantly related to PTG.
Table 4.

*Intercorrelations for Demographic Variables and Posttraumatic Growth Factors*

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.10</td>
<td>-.07</td>
<td>-.13*</td>
<td>.02</td>
<td>-.15*</td>
<td>.12</td>
</tr>
<tr>
<td>Number of children</td>
<td>.02</td>
<td>.01</td>
<td>.01</td>
<td>.21**</td>
<td>.02</td>
<td>.05</td>
</tr>
<tr>
<td>Number of children under 18yrs</td>
<td>.06</td>
<td>-.01</td>
<td>.04</td>
<td>.09</td>
<td>.08</td>
<td>.06</td>
</tr>
<tr>
<td>Time since diagnosis</td>
<td>-.02</td>
<td>.12</td>
<td>.13*</td>
<td>.09</td>
<td>-.00</td>
<td>.06</td>
</tr>
</tbody>
</table>

*p<.05, **p< 0.01

Note: I = Relating to Others, II = New Possibilities, III = Personal Strength, IV = Spiritual Change, V = Appreciation of Life

The relationship between disease recurrence and the five factors of PTG was assessed using a t-test. Results are summarized in Table 5, below.

Table 5.

*Disease Recurrence and PTG*

<table>
<thead>
<tr>
<th>PTG</th>
<th>Recurrence</th>
<th>No Recurrence</th>
<th>t(224)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Relating to Others</td>
<td>20.83</td>
<td>8.67</td>
<td>18.44</td>
<td>8.89</td>
</tr>
<tr>
<td>New Possibilities</td>
<td>13.63</td>
<td>6.58</td>
<td>11.58</td>
<td>6.64</td>
</tr>
<tr>
<td>Personal Strength</td>
<td>12.43</td>
<td>5.31</td>
<td>11.36</td>
<td>4.73</td>
</tr>
<tr>
<td>Spiritual Change</td>
<td>5.13</td>
<td>3.15</td>
<td>4.31</td>
<td>3.51</td>
</tr>
<tr>
<td>Appreciation of Life</td>
<td>11.00</td>
<td>3.70</td>
<td>10.33</td>
<td>3.89</td>
</tr>
<tr>
<td>Total PTG</td>
<td>63.86</td>
<td>24.34</td>
<td>57.32</td>
<td>23.32</td>
</tr>
</tbody>
</table>

The relationship between accessing supports to cope with thyroid cancer and PTG was evaluated using a t-test. Accessing supports was recoded into a binomial variable with 74.9% of
individuals endorsing that they accessed some form of support and 25.1% of individuals endorsing that they did not access any supports to help cope with their thyroid cancer experience. Accessing supports was not significantly associated with any factor of PTG or total PTG. Results are summarized in Table 6, below.

Table 6.

<table>
<thead>
<tr>
<th></th>
<th>Accessed Support</th>
<th>Did Not Access Support</th>
<th>t(257)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relating to Others</td>
<td>19.12</td>
<td>18.39</td>
<td>.60</td>
<td>.551</td>
</tr>
<tr>
<td>New Possibilities</td>
<td>12.47</td>
<td>10.97</td>
<td>1.62</td>
<td>.105</td>
</tr>
<tr>
<td>Personal Strength</td>
<td>11.87</td>
<td>10.74</td>
<td>1.64</td>
<td>.103</td>
</tr>
<tr>
<td>Spiritual Change</td>
<td>4.71</td>
<td>4.17</td>
<td>1.09</td>
<td>.276</td>
</tr>
<tr>
<td>Appreciation of Life</td>
<td>10.54</td>
<td>10.48</td>
<td>.12</td>
<td>.905</td>
</tr>
<tr>
<td>Total PTG</td>
<td>59.82</td>
<td>55.91</td>
<td>1.19</td>
<td>.237</td>
</tr>
</tbody>
</table>

Psychosocial variables and PTG

Correlation analyses were conducted to determine whether a relationship existed between depression, anxiety, stress, rumination, coping strategies, quality of life, social support, health locus of control, thyroid quality of life (physical health) and posttraumatic growth. The correlations between each variable and posttraumatic growth are presented in Table 7. Active coping styles were positively and significantly associated with PTG. Specifically, Planful Problem Solving and Positive Reappraisal were correlated with all five factors of PTG and total PTG. Confrontive and Seeking Social Support were correlated with New Possibilities, Personal Strength, and total PTG. Accepting Responsibility was positively correlated with factor New
Possibilities. With regard to other coping styles, Distancing was positively and significantly correlated with Personal Strength, Spiritual Change, and total PTG.

Table 7.

*Coping and PTG Correlations*

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOC 1: Confrontive</td>
<td>.08</td>
<td>.21**</td>
<td>.16*</td>
<td>.00</td>
<td>.08</td>
<td>.13*</td>
</tr>
<tr>
<td>WOC 2: Distancing</td>
<td>.10</td>
<td>.08</td>
<td>.17**</td>
<td>.13*</td>
<td>.11</td>
<td>.13*</td>
</tr>
<tr>
<td>WOC 3: Self Control</td>
<td>.05</td>
<td>.10</td>
<td>.07</td>
<td>.04</td>
<td>.04</td>
<td>.07</td>
</tr>
<tr>
<td>WOC 4: Seeking Social Support</td>
<td>.11</td>
<td>.21**</td>
<td>.17**</td>
<td>.11</td>
<td>.09</td>
<td>.016*</td>
</tr>
<tr>
<td>WOC 5: Escape Avoidance</td>
<td>-.02</td>
<td>.10</td>
<td>.09</td>
<td>.07</td>
<td>.02</td>
<td>.05</td>
</tr>
<tr>
<td>WOC 6: Accepting Responsibility</td>
<td>.04</td>
<td>.13*</td>
<td>.08</td>
<td>.11</td>
<td>.02</td>
<td>.08</td>
</tr>
<tr>
<td>WOC 7: Planful Problem Solving</td>
<td>.19**</td>
<td>.33**</td>
<td>.23**</td>
<td>.20**</td>
<td>.17**</td>
<td>.27**</td>
</tr>
<tr>
<td>WOC 8: Positive Reappraisal</td>
<td>.42**</td>
<td>.51**</td>
<td>.44**</td>
<td>.51**</td>
<td>.40**</td>
<td>.53**</td>
</tr>
</tbody>
</table>

*p<.05, **p< 0.01

Note: WOC = Ways of Coping, I = Relating to Others, II = New Possibilities, III = Personal Strength, IV = Spiritual Change, V = Appreciation of Life

Consistent with the literature (M. J. Cordova et al., 2001), Depression was not correlated with PTG. Anxiety was found to be positively correlated with Spiritual Change, but not other factors of PTG. Rumination, as measured by the Ruminative Responses Scale (RRS), was not correlated with any factor of PTG, nor the PTG total score. The RRS, primarily measures rumination as it manifests in depression. The RRS total scores was used for the purposes of these analyses. Results are displayed in Table 8.
Table 8.

*Depression, Anxiety, Rumination, and PTG Correlations*

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>-.12</td>
<td>-.05</td>
<td>-.07</td>
<td>.04</td>
<td>-.11</td>
<td>-.09</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.07</td>
<td>.07</td>
<td>.09</td>
<td>.17**</td>
<td>.09</td>
<td>.10</td>
</tr>
<tr>
<td>Rumination</td>
<td>-.00</td>
<td>.06</td>
<td>.03</td>
<td>.08</td>
<td>.02</td>
<td>.64</td>
</tr>
</tbody>
</table>

**p< 0.01

Note: I = Relating to Others, II = New Possibilities, III = Personal Strength, IV = Spiritual Change, V = Appreciation of Life

Individuals who reported making positive changes in health behaviours (exercise, diet, etc.) also reported greater posttraumatic growth. Positive or greater change in exercise was correlated with Relating to Others, New Possibilities, Personal Strength, Appreciation of Life and total PTG. Improved diet was positively correlated with Relating to Others, New Possibilities, Personal Strength, and total PTG. Improved sleep was positively correlated with Relating to Others, and stress management was positively correlated with Relating to Others, New Possibilities, and total PTG. Results are displayed in Table 9. Thyroid Physical Quality of Life was found to be modestly positively correlated to two factors of PTG, New Possibilities (r=.18, p=.001) and Personal Strength (r=.17, p=.001), as well as total PTG (r=.13, p=.05).
Table 9.

Health Behaviour Changes, Thyroid Quality of Life Physical Health, and PTG Correlations

<table>
<thead>
<tr>
<th>PTG</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise</td>
<td>.24**</td>
<td>.30**</td>
<td>.23**</td>
<td>.14*</td>
<td>.12</td>
<td>.25**</td>
</tr>
<tr>
<td>Diet</td>
<td>.15*</td>
<td>.18**</td>
<td>.14*</td>
<td>.10</td>
<td>.04</td>
<td>.16*</td>
</tr>
<tr>
<td>Sleep</td>
<td>.16*</td>
<td>.11</td>
<td>.09</td>
<td>.07</td>
<td>.02</td>
<td>.12</td>
</tr>
<tr>
<td>Stress management</td>
<td>.20**</td>
<td>.18**</td>
<td>.12</td>
<td>.08</td>
<td>.06</td>
<td>.18**</td>
</tr>
<tr>
<td>Thyroid QOL Physical Health</td>
<td>.11</td>
<td>.18**</td>
<td>.17**</td>
<td>.06</td>
<td>.00</td>
<td>.13*</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01

Note: I = Relating to Others, II = New Possibilities, III = Personal Strength, IV = Spiritual Change, V = Appreciation of Life, QOL = Quality of Life

Health Locus of Control was evaluated in the context of PTG. Internal health locus of control and powerful others (health care professionals, family, friends) were positively correlated with all factors of PTG, as well as the total score. Conversely, chance was negatively correlated with factor I Appreciation of Life. The results are displayed in Table 10.

Table 10.

Health Locus of Control and PTG Correlations

<table>
<thead>
<tr>
<th>PTG</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal HLOC</td>
<td>.16**</td>
<td>.20**</td>
<td>.20**</td>
<td>.17**</td>
<td>.21**</td>
<td>.22**</td>
</tr>
<tr>
<td>Chance HLOC</td>
<td>-.09</td>
<td>-.04</td>
<td>-.04</td>
<td>-.04</td>
<td>-.13*</td>
<td>-.10</td>
</tr>
<tr>
<td>Powerful Others HLOC</td>
<td>.27**</td>
<td>.20**</td>
<td>.21**</td>
<td>.20**</td>
<td>.17**</td>
<td>.25**</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01

Note: I = Relating to Others, II = New Possibilities, III = Personal Strength, IV = Spiritual Change, V = Appreciation of Life, HLOC = Health Locus of Control
Overall, social support was found to be correlated with PTG. Total social support was evaluated as well as the following four dimensions: emotional/informational support, tangible support, affectionate support, and positive social interaction. PTG Spiritual Change was not correlated with any measure of social support. The total score on the Social Support Scale was positively correlated with the remaining four factors of PTG (Relating to Others, New Possibilities, Personal Strength, Appreciation of Life) as well as total PTG. Similar results were found for three of the subscales, tangible support, affectionate support, and positive social interaction. Emotional/informational support was only positively correlated with three factors of PTG (Relating to Others, New Possibilities, Personal Strength) and total PTG. Results are displayed in Table 11.

Table 11

Social Support and PTG Correlations

<table>
<thead>
<tr>
<th></th>
<th>PTG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Social Support Total Score</td>
<td>.37**</td>
</tr>
<tr>
<td>Emotional Informational Support</td>
<td>.34**</td>
</tr>
<tr>
<td>Tangible Support</td>
<td>.33**</td>
</tr>
<tr>
<td>Affectionate Support</td>
<td>.28**</td>
</tr>
<tr>
<td>Positive Social Interaction</td>
<td>.32**</td>
</tr>
</tbody>
</table>

Note: I = Relating to Others, II = New Possibilities, III = Personal Strength, IV = Spiritual Change, V = Appreciation of Life

Predictors of PTG

Variables were selected and evaluated as potential predictors of PTG based on the strength of correlations, described in the previous section. Five factors of PTG as well as Total
PTG were used for analyses and separate models were tested for each of the five factors and the total PTG scores.

A hierarchical regression analysis was conducted to examine the contributions of the variables found to be correlated with PTG factor I Relating to Others. The model variables were entered in one block as independent variables using the enter method and a .05 criteria for variable entry. Results from this analysis yielded three predictors of PTG factor I, namely, Positive Reappraisal, Health locus of control – Powerful others, and total social support. Collectively, the factors entered into this model explained approximately 32% of the variance in predicting PTG factor I. Results are displayed in Table 12, below.

Table 12

*Predictors of PTG I: Relating to Others*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>p</th>
<th>R Square Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td>.179**</td>
</tr>
<tr>
<td>Planful Problem Solving</td>
<td>-.09</td>
<td>.22</td>
<td>.646</td>
<td></td>
</tr>
<tr>
<td>Positive Reappraisal</td>
<td>.89</td>
<td>.16</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Health Behaviour Change</td>
<td></td>
<td></td>
<td></td>
<td>.032</td>
</tr>
<tr>
<td>Exercise</td>
<td>.55</td>
<td>.33</td>
<td>.101</td>
<td></td>
</tr>
<tr>
<td>Diet</td>
<td>-.60</td>
<td>.36</td>
<td>.100</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>.17</td>
<td>.32</td>
<td>.588</td>
<td></td>
</tr>
<tr>
<td>Stress management</td>
<td>.13</td>
<td>.39</td>
<td>.741</td>
<td></td>
</tr>
<tr>
<td>Health Locus of Control</td>
<td></td>
<td></td>
<td></td>
<td>.036**</td>
</tr>
<tr>
<td>Internal</td>
<td>.04</td>
<td>.10</td>
<td>.687</td>
<td></td>
</tr>
<tr>
<td>Powerful Others</td>
<td>.28</td>
<td>.08</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Total Social Support</td>
<td>.14</td>
<td>.03</td>
<td>.001</td>
<td>.072**</td>
</tr>
</tbody>
</table>

*p< 0.05, **p< 0.01

A hierarchical regression analysis was conducted to examine the contributions of the variables found to be correlated with PTG factor II New Possibilities. Analysis was conducted in
a similar fashion as described above. Results from this analysis yielded five predictors of PTG factor II, namely, Positive Reappraisal, exercise, thyroid QOL – physical health, HLOC – powerful others, and total social support. Collectively, the factors entered into this model explained approximately 51% of the variance in predicting PTG factor II. Results are displayed in Table 13, below.

Table 13.

*Predictors of PTG II: New Possibilities*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>p</th>
<th>R Square Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrence</td>
<td>-.47</td>
<td>.97</td>
<td>.629</td>
<td>.001</td>
</tr>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td>.380**</td>
</tr>
<tr>
<td>Confrontive</td>
<td>.24</td>
<td>.22</td>
<td>.240</td>
<td></td>
</tr>
<tr>
<td>Seeking Social Support</td>
<td>-.13</td>
<td>.21</td>
<td>.538</td>
<td></td>
</tr>
<tr>
<td>Accepting Responsibility</td>
<td>.17</td>
<td>.00</td>
<td>.604</td>
<td></td>
</tr>
<tr>
<td>Planful Problem Solving</td>
<td>-.08</td>
<td>.22</td>
<td>.702</td>
<td></td>
</tr>
<tr>
<td>Positive Reappraisal</td>
<td>.94</td>
<td>.18</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Health Behaviour Change</td>
<td></td>
<td></td>
<td></td>
<td>.046*</td>
</tr>
<tr>
<td>Exercise</td>
<td>1.00</td>
<td>.31</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Diet</td>
<td>-.17</td>
<td>.37</td>
<td>.633</td>
<td></td>
</tr>
<tr>
<td>Stress management</td>
<td>-.05</td>
<td>.37</td>
<td>.913</td>
<td></td>
</tr>
<tr>
<td>Thyroid Quality of Life – Physical Health</td>
<td>-.07</td>
<td>.02</td>
<td>.007</td>
<td>.038**</td>
</tr>
<tr>
<td>Health Locus of Control</td>
<td></td>
<td></td>
<td></td>
<td>.028</td>
</tr>
<tr>
<td>Internal</td>
<td>.02</td>
<td>.12</td>
<td>.891</td>
<td></td>
</tr>
<tr>
<td>Powerful Others</td>
<td>.19</td>
<td>.09</td>
<td>.030</td>
<td></td>
</tr>
<tr>
<td>Total Social Support</td>
<td>.05</td>
<td>.03</td>
<td>.043</td>
<td>.017</td>
</tr>
</tbody>
</table>

* *p < 0.05, **p < 0.01

A hierarchical regression analysis was conducted to examine the contributions of the variables found to be correlated with PTG factor III Personal Strength. Analysis was conducted in a similar fashion as described above. Results from this analysis yielded four predictors of PTG
factor III, namely, Positive Reappraisal, exercise, Thyroid QOL – physical health, and total social support. Collectively, the factors entered into this model explained approximately 26% of the variance in predicting PTG factor III. Results are displayed below in Table 14.

Table 14.

**Predictors of PTG III: Personal Strength**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>p</th>
<th>R Square Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.03</td>
<td>.04</td>
<td>.459</td>
<td>.002</td>
</tr>
<tr>
<td>Time since surgery</td>
<td>.00</td>
<td>.01</td>
<td>.499</td>
<td>.014</td>
</tr>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td>.073**</td>
</tr>
<tr>
<td>Confrontive</td>
<td>.19</td>
<td>.20</td>
<td>.331</td>
<td></td>
</tr>
<tr>
<td>Distancing</td>
<td>-.01</td>
<td>.00</td>
<td>.957</td>
<td></td>
</tr>
<tr>
<td>Seeking Social Support</td>
<td>-.10</td>
<td>.217</td>
<td>.641</td>
<td></td>
</tr>
<tr>
<td>Planful Problem Solving</td>
<td>-.22</td>
<td>.25</td>
<td>.404</td>
<td></td>
</tr>
<tr>
<td>Positive Reappraisal</td>
<td>.56</td>
<td>.15</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Health Behaviour Change</td>
<td></td>
<td></td>
<td></td>
<td>.016</td>
</tr>
<tr>
<td>Exercise</td>
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<td>.00</td>
<td>.024</td>
<td></td>
</tr>
<tr>
<td>Diet</td>
<td>-.00</td>
<td>.328</td>
<td>.988</td>
<td></td>
</tr>
<tr>
<td>Thyroid Quality of Life – Physical Health</td>
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<td>.02</td>
<td>.024</td>
<td>.021</td>
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<tr>
<td>Health Locus of Control</td>
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<td>.026</td>
</tr>
<tr>
<td>Internal</td>
<td>.05</td>
<td>.10</td>
<td>.610</td>
<td></td>
</tr>
<tr>
<td>Powerful Others</td>
<td>.12</td>
<td>.07</td>
<td>.117</td>
<td></td>
</tr>
<tr>
<td>Total Social Support</td>
<td>.04</td>
<td>.02</td>
<td>.045</td>
<td>.023</td>
</tr>
</tbody>
</table>

*p< 0.05, **p< 0.01

A hierarchical regression analysis was conducted to examine the contributions of the variables found to be correlated with PTG factor IV Spiritual Change. Analysis was conducted in a similar fashion as described above. Results from this analysis yielded four predictors of PTG factor IV, namely, number of children, Positive Reappraisal, exercise anxiety, Planful Problem Solving and internal HLOC were near-significant predictors, with p values of .074 and .068,
respectively. Collectively, the factors entered into this model explained approximately 36% of
the variance in predicting PTG factor IV. Results are displayed below in Table 15.

Table 15.

*Predictors of PTG IV: Spiritual Change*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>p</th>
<th>R Square Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Children</td>
<td>.70</td>
<td>.14</td>
<td>.001</td>
<td>.046**</td>
</tr>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td>.282**</td>
</tr>
<tr>
<td>Distancing</td>
<td>-.06</td>
<td>.08</td>
<td>.446</td>
<td></td>
</tr>
<tr>
<td>Planful Problem Solving</td>
<td>-.15</td>
<td>.09</td>
<td>.074</td>
<td></td>
</tr>
<tr>
<td>Positive Reappraisal</td>
<td>.57</td>
<td>.07</td>
<td>.001</td>
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<td>Anxiety</td>
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<td>.008</td>
</tr>
<tr>
<td>Exercise</td>
<td>.15</td>
<td>.10</td>
<td>.043</td>
<td></td>
</tr>
<tr>
<td>Health Locus of Control</td>
<td></td>
<td></td>
<td></td>
<td>.012</td>
</tr>
<tr>
<td>Internal</td>
<td>.07</td>
<td>.04</td>
<td>.068</td>
<td></td>
</tr>
<tr>
<td>Powerful Others</td>
<td>.03</td>
<td>.04</td>
<td>.370</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01

A hierarchical regression analysis was conducted to examine the contributions of the
variables found to be correlated with PTG factor V Appreciation of Life. Analysis was
conducted in a similar fashion as described above. Results from this analysis yielded three
predictors of PTG factor V, namely, age, Positive Reappraisal, HLOC - Chance. Collectively, the
factors entered into this model explained approximately 22% of the variance in predicting PTG
factor V. Results are detailed below in Table 16.
A hierarchical regression analysis was conducted to examine the contributions of the variables found to be correlated with Total PTG. Analysis was conducted in a similar fashion as described above. Results from this analysis yielded four predictors of Total PTG, namely, Positive Reappraisal, HLOC – Powerful others, Thyroid QOL – physical health, and total social support. Collectively, the factors entered into this model explained approximately 48% of the variance in predicting Total PTG. Results are displayed below in Table 17.
Table 17.

*Predictors of Total PTG*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>p</th>
<th>R Square Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.235</td>
<td>.135</td>
<td>.081</td>
<td>.000</td>
</tr>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td>.359**</td>
</tr>
<tr>
<td>Confrontive</td>
<td>.389</td>
<td>.79</td>
<td>.614</td>
<td></td>
</tr>
<tr>
<td>Distancing</td>
<td>-.77</td>
<td>.72</td>
<td>.302</td>
<td></td>
</tr>
<tr>
<td>Seeking Social Support</td>
<td>-1.22</td>
<td>.74</td>
<td>.116</td>
<td></td>
</tr>
<tr>
<td>Planful Problem Solving</td>
<td>-.04</td>
<td>.88</td>
<td>.961</td>
<td></td>
</tr>
<tr>
<td>Positive Reappraisal</td>
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<td><strong>.001</strong></td>
<td></td>
</tr>
<tr>
<td>Health Behaviour Change</td>
<td></td>
<td></td>
<td></td>
<td>.014</td>
</tr>
<tr>
<td>Exercise</td>
<td>1.82</td>
<td>1.13</td>
<td>.108</td>
<td></td>
</tr>
<tr>
<td>Diet</td>
<td>-.13</td>
<td>1.17</td>
<td>.911</td>
<td></td>
</tr>
<tr>
<td>Stress Management</td>
<td>-.89</td>
<td>1.09</td>
<td>.426</td>
<td></td>
</tr>
<tr>
<td>Health Locus of Control</td>
<td></td>
<td></td>
<td></td>
<td>.050**</td>
</tr>
<tr>
<td>Internal</td>
<td>.08</td>
<td>.38</td>
<td>.830</td>
<td></td>
</tr>
<tr>
<td>Powerful Others</td>
<td>.93</td>
<td>.26</td>
<td><strong>.002</strong></td>
<td></td>
</tr>
<tr>
<td>Thyroid Quality of Life – Physical Health</td>
<td>-.21</td>
<td>.07</td>
<td><strong>.006</strong></td>
<td>.025*</td>
</tr>
<tr>
<td>Total Social Support</td>
<td>.24</td>
<td>.08</td>
<td><strong>.002</strong></td>
<td>.031**</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01
A summary of significant regression models is described in Table 18, below.

Table 18.

*Summary of Significant Predictors of PTG*

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coping – Positive Reappraisal</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total Social Support</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>HLOC Powerful Others</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>HLOC Chance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>HBC Exercise</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Quality of Life</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Number of Children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Note: HLOC = Health locus of control, HBC = Health behaviour change, I = Relating to Others, II = New Possibilities, III = Personal Strength, IV = Spiritual Change, V = Appreciation of Life

**Moderation**

Moderation or effect modification of the relationship between coping and PTG, was explored by including the interaction effect between the suspected moderator and predictor into the regression model. The first step taken was to identify potential suspected moderated effects. Since exploring the moderation hypothesis for all combinations of PTG factors and coping styles would involve running 48 analyses, which would have resulted in greatly inflated type I error, a more conservative approach was chosen.
Specifically, this step was performed by examining scatter plots of the relationships between coping styles and each factor of PTG, and subsequently investigating which plots have visibly different crossing regression lines for the series defined by the values of moderator. The moderation hypothesis was then tested with regression analysis with interaction only for those combinations of variables. The plot is presented below in Figure 1.

Figure 1. Scatter Plots of Suspected Moderating Effects of Social Support

When investigating presence of moderation, variables are often centred prior to running analyses and constructing the interaction terms. Centering is carried out to accomplish two goals:
to reduce multicollinearity between the main effects and their product, and to improve interpretability of the regression coefficients when the variables representing the main effects do not have a meaningful zero (Dalal & Zickar, 2012). Since the variables in the current moderation analyses could have meaningful zeros, representing total absence of social support or absence of utility of certain coping styles, the second reason for centering was not considered.

Multicollinearity between variables investigated for moderation effects was investigated and found to be essential. According to Dalal and Zickar (2012), centering does not reduce essential collinearity between main effects and their products. Both centred and uncentred main effects were conducted for these moderation analyses and produced the same results. The collinearity statistics (tolerance and VIF) were exactly the same for analyses with uncentred and centred predictive variables. Therefore, only results with uncentred variables have been presented. A summary is presented in Table 19.
Table 19

*Matrix of Suspected Moderating Effects of Social Support on the Relationship Between Coping and PTG*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Confrontive</th>
<th>Distancing</th>
<th>Self Control</th>
<th>Seeking SS</th>
<th>Escape/Avoid</th>
<th>Accept Resp.</th>
<th>Planful Prob Solv</th>
<th>Positive Reap</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTG I</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PTG II</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PTG III</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTG IV</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTG V</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total PTG</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: X represents assumed moderating effects based on scatter plot review. Significant moderating effects are shown in bold.; Seeking SS = Seeking Social Support, Escape/Avoid = Escape Avoidance, Accept. Resp. = Accepting Responsibility, Planful Prob Solv = Planful Problem Solving, Positive Reap = Positive Reappraisal

Only the results of analyses with significant moderating effects are presented in Table 20, below. Individual scatter plots were further analyzed for more detail. These results are described below in Figures 2 to 5.
Table 20.

Results of Regression Models of the Moderating Effects of Social Support on the Relationship
Between Coping and PTG

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Predictor</th>
<th>B</th>
<th>SE(B)</th>
<th>β</th>
<th>p</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTG I</td>
<td>Social Support</td>
<td>-.02</td>
<td>.10</td>
<td>-.03</td>
<td>.881</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distancing</td>
<td>-1.02</td>
<td>.70</td>
<td>-.31</td>
<td>.148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SS x Distancing</td>
<td>.02</td>
<td>.01</td>
<td>.59</td>
<td>.044</td>
<td>.16</td>
</tr>
<tr>
<td>PTG II</td>
<td>Social Support</td>
<td>-.06</td>
<td>.07</td>
<td>-.16</td>
<td>.404</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Escape Avoidance</td>
<td>-.44</td>
<td>.34</td>
<td>-.27</td>
<td>.195</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SS x Escape Avoidance</td>
<td>.01</td>
<td>.01</td>
<td>.53</td>
<td>.030</td>
<td>.08</td>
</tr>
<tr>
<td>PTG IV</td>
<td>Social Support</td>
<td>-.06</td>
<td>.04</td>
<td>-.33</td>
<td>.097</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Confrontive</td>
<td>-.58</td>
<td>.30</td>
<td>-.36</td>
<td>.054</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SS x Confrontive</td>
<td>.01</td>
<td>.01</td>
<td>.53</td>
<td>.038</td>
<td>.02</td>
</tr>
<tr>
<td>PTG V</td>
<td>Social Support</td>
<td>-.06</td>
<td>.05</td>
<td>-.27</td>
<td>.218</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distancing</td>
<td>-.48</td>
<td>.33</td>
<td>-.34</td>
<td>.143</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SS x Distancing</td>
<td>.01</td>
<td>.01</td>
<td>.63</td>
<td>.044</td>
<td>.05</td>
</tr>
<tr>
<td>Total PTG</td>
<td>Social Support</td>
<td>-.20</td>
<td>.27</td>
<td>-.16</td>
<td>.467</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distancing</td>
<td>-2.70</td>
<td>1.94</td>
<td>-.31</td>
<td>.166</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SS x Distancing</td>
<td>.06</td>
<td>.03</td>
<td>.63</td>
<td>.038</td>
<td>.12</td>
</tr>
</tbody>
</table>

Social Support was found to moderate the relationship between a Distancing style of coping and PTG I: Relating to Others. No relationship was found between a Distancing style of coping and PTG I. For individuals with low levels of social support (bottom 25% of sample), a Distancing style of coping is not related to PTG I. However, individuals with high levels of social support (top 25% of sample) who also rely on Distancing as a coping style, are more likely to report higher PTG I scores. Figure 2 details a graphic representation of these results.
Social Support was found to moderate the relationship between an escape-avoidance style of coping and PTG II: New Possibilities. For individuals with low levels of social support (bottom 25% of sample), an escape-avoidance style of coping is not related to PTG II. However, individuals with high levels of social support (top 25% of sample) who also rely on escape-avoidance as a coping style, are more likely to report higher PTG II scores. Figure 3 details a graphic representation of these results.
Figure 3. Effects of Escape Avoidance Coping Style on New Possibilities as Moderated by Social Support.

Social Support was found to moderate the relationship between a Confrontive style of coping and PTG IV: Spiritual Change. For individuals with low levels of social support (bottom 25% of sample), a Confrontive style of coping is not related to PTG IV. However, individuals with high levels of social support (top 25% of sample) who also rely on a Confrontive coping style, are more likely to report higher PTG IV scores. Figure 4 details a graphic representation of these results.
Figure 4. Effects of Confrontive Coping Style on Spiritual Change as Moderated by Social Support.

Social Support was found to moderate the relationship between a Distancing style of coping and PTG V: Appreciation of Life. For individuals with low levels of social support (bottom 25% of sample), Distancing style of coping is not related to PTG V. However, individuals with high levels of social support (top 25% of sample) who also rely on Distancing as a coping style, are more likely to report higher PTG V scores. Figure 5 details a graphic representation of these results.
Figure 5. Effects of Distancing Coping Style on Appreciation of Life as Moderated by Social Support.

Social Support was found to moderate the relationship between a Distancing style of coping and Total PTG. For individuals with low levels of social support (bottom 25% of sample), Distancing style of coping is not related to Total PTG. However, individuals with high levels of social support (top 25% of sample) who also rely on Distancing as a coping style, are more likely to report higher Total PTG scores. Figure 6 details a graphic representation of these results.
Figure 6. Effects of Distancing Coping Style on Total PTG as Moderated by Social Support.
Chapter 5: Discussion

This study investigated the experience of posttraumatic growth (PTG) for women who had received a diagnosis of thyroid cancer. Thyroid cancer survivors have been described as the neglected segment of cancer survivors, owing to their stable low mortality rates, with thyroid cancer often referred to as the “good cancer.” Relative to the volume of literature focused on other types of cancer, there is a dearth of research on the psychological impact of thyroid cancer. The present study examined the experience of PTG in thyroid cancer survivors, in relation to demographic variables, thyroid cancer variables, coping, social support, and other psychosocial variables. To the investigators’ knowledge, this is the first study that quantitatively investigated PTG in thyroid cancer survivors. Levels of PTG for the study sample were compared to that of survivors of other types of cancer reported in the literature. Using a cognitive-processing model (Tedeschi & Calhoun, 1995; 2004), predictors of PTG are discussed in relation to each of the research questions and are interpreted in comparison with previous research. Moderating effects of social support between PTG and psychosocial correlates are also explored. In follow-up, contributions of study results to the understanding of PTG theory is discussed. Finally, study limitations and theoretical and clinical implications are discussed, in addition to directions for future research.

PTG in Thyroid Cancer Survivors

Reports of PTG levels in cancer survivors vary in the literature. The level of PTG, both overall total and subscales, for this study sample was substantially lower compared to some breast cancer survivor studies (Cordova et al., 2001; Silva et al., 2012) and three recent studies involving multiple types of cancer (Love & Sabiston, 2011; Morris & Shakespeare-Finch, 2011; Scrignaro et al., 2011). PTG levels for thyroid cancer survivors in this study were similar to
those reported in a study of breast cancer survivors within 12 months of receiving a diagnosis (Sears, Stanton & Danoff-Burg, 2003). In this study sample, the greatest amount of growth was reported in Appreciation of Life and Personal Strength, with scores ranging between a moderate to great degree of change as a result of individuals’ thyroid cancer experience. Small to moderate degree of change were reported in Relating to Others, New Possibilities, Spiritual Change, and total PTG. Studies looking at older, long-term cancer survivors (Cormio et al., 2015) and individuals with chronic disease (Purc-Stephenson, 2014) generally reported lower levels of PTG. In this study sample, the highest mean ratings of PTG were on dimensions of Appreciation of Life (M=3.51) and Personal Strength (3.18), with mean ratings ranging between a moderate to great degree of change as a result of individuals’ thyroid cancer experience. Lowest ratings were endorsed on Spiritual Change, with mean scores falling between a small to moderate degree of change.

There are several possible reasons why PTG scores in the current study were lower relative to PTG scores in other samples of cancer survivors. A recent Australian study suggested that PTG for breast cancer survivors may be higher compared to rates of PTG in chronic disease populations, owing to more public awareness of breast cancer and associated support received during treatment and post-diagnosis (Purc-Stephenson, 2014). A large, recent North American-wide study has highlighted that thyroid cancer survivors feel they have a lack of support from their families and physicians, and are given the impression that they have the “good kind of cancer” (Applewhite et al., 2016; Aschebrook-Kilfoy et al., 2015). The authors suggest that this approach may be unintentionally deleterious. It is possible that a bi-product of not receiving the same kind of recognition of the impact of their cancer and support from family members and healthcare providers, as compared to breast or other cancers, inhibits the ability to process the
diagnosis in a new and positive way. An individual’s ability to talk about their traumatic event has been demonstrated to contribute to PTG (Kolokotroni et al., 2014; Schaefer & Moos, 1998). One study found emotional expression to be one of the strongest predictors of PTG (Manne et al., 2004). Tedeschi and Calhoun (2004) suggest that the degree to which individuals engage in narrative or self-disclosure about their perspective of their traumatic experience, as well as how others respond to these discussions, may play a role in PTG. If thyroid cancer survivors feel their experience is trivialized, it may discourage them from seeking support to discuss their thoughts and feelings related to their cancer experience. The relationship between social support and PTG will be discussed in more depth later in this chapter.

Another possible reason as to why PTG was lower for thyroid cancer survivors compared to some other types of cancer survivors, is that the thyroid cancer experience may not have been perceived by survivors as a serious trauma, or as traumatic an experience, in the same way as with other cancer diagnoses. As such, if a thyroid cancer diagnosis does not cause significant distress, it may not challenge the individual’s outlook on life and who they are, resulting is less PTG. This study did not explore posttraumatic stress or measure the trauma impact of thyroid cancer, however this is a recommended direction for future research. Alternatively, it is possible that individuals surveyed in this study simply experienced adjustment as opposed to growth, following diagnosis and treatment of thyroid cancer. This explanation seems less plausible, however, given the high ratings of distress in the sample.

**Demographics and Thyroid Cancer Variables**

Study results supported the hypothesis that younger age is associated with greater PTG. Consistent with some studies of breast and other cancer survivors (Cordova et al., 2001; Kolokotroni et al., 2014; Shand et al., 2015), younger age was positively associated with PTG,
on dimensions of Personal Strength and Appreciation of Life, although this association was weak. Other studies found no significant relationship between age and PTG (Scrignaro et al., 2011; Sears, Stanton, Danoff-Burg, 2003; Tomich & Helgeson, 2004; Weiss, 2004). An explanation as to why younger age has been reported to be associated with PTG is that, for younger people, a cancer diagnosis may cause more distress owing to fundamental beliefs about youth and health being challenged. This, in turn, may provide more opportunity to activate mechanisms of PTG (Kolokotroni et al., 2014; Tedeschi & Calhoun, 2004). Regression analyses found age to only be predictive of PTG dimension Appreciation of Life. However, this only accounted for 2% of the variance in the model. Given that many thyroid cancer survivors are diagnosed at a young age, there may be an opportunity to develop targeted interventions and psychoeducation with this population in order to increase the opportunity for growth. It would be important to further explore the connection between younger age and PTG in future research with a longitudinal design.

Study results supported the hypothesis that having children would be associated with increased growth. Specifically, Spiritual Change was weakly positively associated with being a parent. When entered into the regression model, having children proved to be predictive of Spiritual Change, accounting for 5% of the variance in the model. Individuals with children who are faced with a cancer diagnosis may be uniquely faced with existential questions around the impact of the diagnosis on their life expectancy and ability to care for their children. While it is well known that the five-year survival expectancy for thyroid cancer survivors is over 98%, studies have indicated that thyroid cancer survivors experience increased cancer-related worry and heightened worry about death (Bresner et al., 2015). Perhaps these increased worries related to being a parent provides the seed for existential questioning that leads to Spiritual Change. As
previously mentioned, this is the first quantitative exploration of PTG in thyroid cancer survivors. As such, even small magnitude relationships may serve as hypothesis-generating for future, more in-depth research.

The relationship between time since diagnosis and PTG has been mixed in the literature (Kolokotroni et al., 2014). This study found support for the hypothesis that there would be a relationship between time since diagnosis and PTG, however, only the Personal Strength dimension of PTG was weakly positively associated with increased time since diagnosis. A moderate relationship was found between thyroid cancer recurrence and the New Possibilities dimension of PTG, however not with total PTG or the four other dimensions. It is plausible that individuals who have experienced a recurrence are in a unique position to find a new path or direction owing to having undergone a second (or more) round of diagnosis and treatment for thyroid cancer. Individuals may find that what helped them cope with their initial diagnosis, does not adequately help them during the recurrence, thus creating new options or a new philosophy for processing the recurrent cancer.

While bivariate analyses of sociodemographic variables found significant relationships between PTG and younger age, number of children, time since diagnosis, and recurrence, multivariate analyses only found support for younger age as a predictor of Appreciation of Life. Perhaps prospective investigation would help elaborate on these relationships.

The Experience of Distress

According to Tedeschi and Calhoun’s theory (1995; 2004), PTG can occur in the presence of distress. As expected, depression was not significantly related to PTG. Anxiety was positively associated with the Spiritual Change dimension of PTG, however this was only a weak association. In general, this study sample endorsed greater symptoms of depression and anxiety,
substantially higher than the general adult population (Crawford et al., 2009) as well as breast and other cancer survivors (Przezdziecki et al., 2013; Sharp, Carsin, & Timmons, 2013; Soo & Sherman, 2015). In contrast, a much smaller proportion of thyroid cancer survivors in this study were in the normal range for depression, and less than 25% were in the normal range for anxiety. A number of factors could account for the high levels of distress in the current sample. Firstly, recruitment was predominantly advertised on webpages of online support groups. It is possible that many individuals seeking support through these groups are doing so owing to their current level of distress. It is also possible that thyroid cancer survivors may experience increased anxiety and depression, in part, owing to a perceived lack of support from families and their health care team. The present study found that the vast majority of survivors (95%) had knowledge of the term “good cancer” as it applied to a thyroid cancer diagnosis. This suggests that the majority of survivors were experiencing significant distress levels, despite having knowledge of the treatability and low risk of death with most thyroid cancers. A large North American study (N=1174) has reported that thyroid cancer survivors experience several adverse physical, social, psychological, and spiritual challenges that persist for many years following initial treatment (Applewhite et al., 2016; Aschebrook-Kilfoy et al., 2015). It is possible that the experience of not being taken seriously (Applewhite et al., 2016) and feeling unsupported may in part contribute to symptoms of anxiety and depression. A third explanation for why symptoms of depression and anxiety are elevated in the study sample, is that these symptoms in and of themselves can be reflective of abnormal thyroid hormone measurements. The present study did not collect thyroid biomarker information and is therefore unable to confirm the potential impact of such.
Shand et al (2015) suggest that the relationship between psychosocial factors and PTG may be curvilinear. Specifically, they suggest that while high levels of distress may contribute to PTG, it is possible that too much distress may in fact inhibit growth. This was worth consideration given the significantly high levels of distress in this study population, however no evidence for curvilinear relationships was found.

Rumination is noted as a key component of the PTG model proposed by Tedeschi and Calhoun (1995; 2004). There is some evidence to support that rumination plays a role in the development of PTG in breast cancer survivors (Chan, Ho, Tedeschi, & Leung, 2011; Lelorain, Tessier, Florin, & Bonnaud-Antignac, 2012; Soo & Sherman, 2015). This study failed to find support for the hypothesis that a relationship exists between rumination and PTG in thyroid cancer survivors. This may in part be owing to the way in which rumination was measured. The Ruminative Responses Scale (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) appears to be overly representative of a brooding type of rumination. Reflective or instrumental rumination is more related to PTG than the brooding type (Soo & Sherman, 2015). It is possible that the study sample experienced reflective or instrumental rumination, however the rumination measure selected for this study did not effectively measure it.

**The Relationship Between Coping and PTG**

Coping has been demonstrated to be an important component of the growth process following a trauma. Coping serves to aid the cognitive processing required to disengage from certain basic assumptions, while at the same time building new meaning, schemas and goals (Tedeschi & Calhoun, 2004). Consistent with other studies of cancer survivors (Cordova et al., 2001; Kolokotroni et al., 2014; Prati & Pierrantoni, 2009; Scignaro et al., 2011; Sears, Stanton, & Danoff-Burg, 2003; Shand et al., 2015; Silva et al., 2012), support was found for the
hypothesis that approach or active styles of coping are positively associated with PTG. Planful Problem Solving and Positive Reappraisal were consistently positively associated with all dimensions of PTG as well as total PTG. Correlations for Planful Problem Solving were weak to moderate, however associations between Positive Reappraisal style of coping and PTG were moderate to strong. Seeking Social Support and Confrontive styles of coping were associated with two dimensions of PTG, New Possibilities and Personal Strength, as well as total PTG, although correlations were weak. Results are in line with Tedeschi and Calhoun’s model of PTG (1995; 2004), in that the assumption is that PTG requires more than just the experience of a stressful or traumatic event. Rather, it requires the individual to engage with the challenges of a new reality following a traumatic experience. Approach-oriented or problem solving coping strategies are one way in which cancer survivors can process the distress that accompanies a diagnosis and subsequent treatment (Schaefer & Moos, 1998; Tedeschi & Calhoun, 2004). When all coping styles were entered into a hierarchical regression model, only Positive Reappraisal remained a significant predictor of PTG for all dimensions as well as total PTG. Coping accounted for between 7 and 38% of the variance across all dimensions of PTG. Positive Reappraisal coping accounted for one third of the variance for New Possibilities, Spiritual Change, and total PTG, and between 15% and 18% of the variance for Appreciation of Life and Relating to Others, respectively. One possible explanation for the stronger relationship between Positive Reappraisal and New Possibilities and Spiritual Change is that these domains of PTG involve creating a new outlook or explanation of their experience and possible future. Perhaps positive reappraisal as a process is more integral in the production of PTG in these areas, as opposed to those that are more focused on resiliency, increased connectedness with others and appreciation of life.
Positive Reappraisal has been shown to be a strong predictor of PTG in the literature (Helgeson, Reynolds, & Tomich, 2006; Prati & Pierrantoni, 2009; Schaefer & Moos, 1998; Sears, Stanton & Danoff-Burg, 2003). One explanation of why Positive Reappraisal may lead to growth is that an individual’s efforts to interpret traumatic events in a positive light can lead to a ‘self-fulfilling prophecy’ of positive changes, or growth (Prati & Pierrantoni, 2009). As such, it appears that Positive Reappraisal not only increases the likelihood of PTG, but that it may be a required component of the growth process.

The Role of Social Support in PTG

Perceived social support is well known to be linked to many health and well-being benefits in cancer survivors (Cohen, 2004; Marlow, Cartmill, Cieplucha, & Lowrie, 2003). Social support may lessen the negative effects of receiving a cancer diagnosis and related treatments, as well as contribute to a sense of social integration and attachment. This, in turn, is likely to decrease feelings of isolation, strengthen relationships, and help cancer survivors experience positive psychological adaptation or growth (Holland & Holahan, 2003; Love & Sabiston, 2011). Overall, thyroid cancer survivors in this study reported less social support than breast cancer survivors (Soo & Sherman, 2015). Ratings on each of the four dimensions of social support and total score ranged from having access to support “some of the time” to “most of the time,” with lowest ratings on emotional/informational support and highest ratings on affectionate support. Nearly all dimensions of social support and total social support were positively associated with total PTG and four of five dimensions of PTG. As one would expect, social support was most strongly associated with PTG Relating to Others, with correlation coefficients in the moderate range. All types of social support were not significantly associated with Spiritual Change, suggesting that this dimension of PTG involves more individual processing on larger
existential questions, less impacted by availability of others to talk to about their cancer experience.

Predictive analyses revealed significant relationships between total social support, total PTG and three dimensions of PTG, including Relating to Others, New Possibilities, and Personal Strength. However, Social Support was not a main contributor to the variance in the model (<1% to 7%). As discussed at the beginning of this chapter, supportive individuals can help cancer survivors craft narratives about the changes that have occurred as a result of their cancer diagnosis. These narratives can in turn affect the individual’s willingness to incorporate new perspectives or schemas (Tedeschi & Calhoun, 2004). One explanation for the low predictive strength of social support could be that thyroid cancer survivors have less opportunity to discuss their cancer experience with others, owing to the lack of support or acceptance that thyroid cancer is indeed a traumatic event for some (Applewhite et al., 2016; Aschebrook-Kilfoy et al., 2015). While there are a number of online support group services for thyroid cancer survivors, there are limited in-person supports specific to thyroid cancer survivors in the United States and no in-person support groups in Canada. Perhaps, if thyroid cancer survivors had more opportunity to discuss their experience in more supportive networks, as well as amongst family and healthcare practitioners who do not trivialize their diagnosis, support received may have more impact on growth.

Other Correlates and Predictors of PTG

**Health Locus of Control.** The relationship between Health Locus of Control and PTG was explored in this study, with expectation that an Internal Health Locus of Control would be associated with increased PTG. Little is known about the relationship, if any, between Locus of Control and PTG. It was hypothesized that individuals who had a greater sense of control over
their health and well-being would be more likely to take an active role in making sense of their thyroid cancer experience, develop new perspectives, ultimately contributing to growth. Generally, individuals in the study sample endorsed Internal Health Locus of Control more than Chance or Powerful Others. Internal and Powerful Others were positively associated with all dimensions of PTG as well as total PTG, although the strength of these associates was weak. Chance was negatively associated with Appreciation of Life, although, a weak correlation. When entered into the regression model, contrary to the study hypotheses, Internal Health Locus of Control was not associated with PTG. Rather, Powerful Others was predictive of PTG dimensions Relating to Others (2% of the variance), New Possibilities (5% of the variance), and total PTG (5% of the variance). Chance was predictive of PTG Appreciation of Life, accounting for 4% of the variance in the model. These results suggest that having a sense of internalized control over one’s health experience is not important in the process of growth following a thyroid cancer diagnosis. To the contrary, belief in one’s medical care (powerful others) or the notion that one’s health status is impacted by chance events is predictive of growth. One explanation for the lack of predictive value of Internal Health Locus of Control may be that these individuals could be more likely to have thoughts of self-blame around their cancer experience. This could in turn lead to a more negative evaluation of their experience, hampering positive growth. Placing importance on powerful others or chance events may free individuals from feeling responsibility related to their cancer diagnosis. It is unclear exactly what role locus of control plays in the pathways to PTG, however this is an area for future research.

**Thyroid-Related Physical Quality of Life.** Thyroid-Related Physical Quality of Life (TPQOL) was measured as a global rating from “poor” to “excellent.” Contrary to study predictions, TPQOL was positively associated with total PTG, as well as Personal Strength and
New Possibilities, although these relationships were weak. Results were similar when TPQOL was entered into the regression model, however the contribution to overall variance was small with respect to Personal Strength and New Possibilities. These results are consistent with a recent review of correlates of PTG in cancer patients, where seven studies reported on the relationship between physical QOL and PTG (Shand et al., 2015). The lack of significant relationship between physical QOL and PTG can be explained by the notion that the experience of positive outcomes can occur while experiencing distress, and that adjustment is not dependent on alleviating suffering (Shand et al., 2015). A recent longitudinal study on adjustment of breast cancer survivors reported findings that suggest that positive changes occurring as a result of a cancer experience, specifically, positive changes in personal resources and skills, may be associated with reduced psychological distress and increased QOL later in life (Silva et al., 2012). The authors further suggest that PTG may function as a coping strategy, and as such be an important pathway to adjustment and QOL for cancer survivors. As previously discussed, Positive Reappraisal style of coping was moderately to strongly correlated ($r = .40$ to $.53$) with all dimensions of PTG, suggesting that the process of cognitively reappraising a traumatic experience, such as thyroid cancer, plays a significant role in PTG. The present study did not explore physical QOL as an outcome, however this is an important area for further exploration, particularly given that QOL is consistently reported to be similar or lower for thyroid cancer survivors when compared to other cancer survivors (Aschebrook-Kilfoy et al., 2015; To et al., 2015). In addition to targeting interventions toward improving physical health outcomes associated QOL in thyroid cancer survivors, awareness and promotion of PTG may be an additional pathway to improving the lives of thyroid cancer survivors.
**Health Behaviour Change.** This study also explored the relationship between health behaviours changes (HBC), in terms of exercise, diet, sleep, and stress management, and PTG. Generally, positive relationships were found between dimensions of PTG and HBC, however these associations were weak. Results indicated that positive change in exercise was positively associated with total PTG and nearly all dimensions, with the exception of Appreciation of Life. Positive change in diet was associated with Relating to Others, New Possibilities, Personal Strength, and total PTG. Positive change in stress management was positively associated with Relating to Others, Personal Strength and total PTG. Positive change in sleep was associated only with Relating to Others dimension of PTG. When entered in to the regression model, only exercise remained significantly predictive of PTG on dimensions of New Possibilities, Personal Strength and Spiritual Change. However, these results did not significantly contribute to the overall variance (1 to 5%). As with Thyroid-Related Physical Quality of Life, HBC was not explored as an outcome within the scope of the present study. These initial exploratory analyses show support for further research on health behaviour changes in thyroid cancer survivors. A recent study suggested that physical activity following a cancer diagnosis may interact with psychosocial correlates of PTG (such as social support), increasing the experience of PTG (Love & Sabiston, 2011). They found evidence of the moderating role of exercise on the relationship between social support and PTG in young adult cancer survivors. They further suggested that exercise increased social interaction and social networks, which in turn increased positive growth. It is possible that the association between HBC and PTG in this study sample was not strong owing to the fact that a large to majority percentage of the sample reported no behaviour change to negative behaviour change in the areas of exercise, sleep, and stress management.
Perhaps future research could explore HBC in thyroid cancer survivors in more depth, and its relationship to QOL and PTG.

**Coping and PTG: Exploring Models for Moderation Using Social Support**

The purpose of this study was to explore psychosocial correlates of PTG within thyroid cancer survivors. Social support is known to be a key variable in the process of PTG (Cordova et al., 2001; Kolokotroni et al., 2014; Morris & Shakespeare-Finch, 2011; Serignaro et al., 2011; Shand et al., 2015; Tedeschi & Calhoun, 2004). Schaefer and Moos (1998) proposed that social support acts as a precursor to PTG by influencing coping behaviours, contributing to or enabling successful adaptation following a traumatic event (Prati & Pierrantoni, 2009). Schaefer and Moos (1998) suggest that individuals who have experienced more distress, often receive more support, resulting in more growth. The authors further suggested that support may act as a precursor to growth, and also influence coping. As such, exploratory analysis was conducted looking at the role of social support as a potential moderator of the relationship between different styles of coping and PTG. A moderator is a variable that affects the strength and/or the direction of the relationship between an independent variable and a dependent variable.

Analyses revealed that Social Support moderated the relationship between certain coping strategies and PTG. The most significant of these findings indicated that Social Support aided in producing more growth on the dimension of Relating to Others, when a Distancing coping style was used. A similar relationship was found with Appreciation of Life and Total PTG, although it only accounted for a small percentage of the variance. Those with high levels of Social Support who also rely on a Distancing coping style had greater PTG than those who had lower levels of support with a Distancing style of coping. Social Support also appeared to moderate the relationship between an Escape Avoidance style of coping and PTG New Possibilities. More
specifically, individuals who had high levels of Social Support and used an Escape Avoidant coping style experienced more growth than those who had lower levels of Social Support.

Similarly, Social Support moderated the relationship between a Confrontive style of coping and PTG Spiritual Change. That is, individuals with high levels of Social Support and a Confrontive coping style experienced more growth than those with lower levels of Social Support who utilized Confrontive coping. Moreover, the absence of Social Support for individuals who relied strongly on a Confrontive coping style had a detrimental affect on Spiritual Change. Similarly, the absence of Social Support for individuals who relied strongly on a Distancing coping style had a detrimental effect on Appreciation of Life. These accounted for only a small percentage of variance, thus these results are best interpreted as exploratory and hypothesis-generating for future research.

In general, the results from moderation analyses are aligned with existing research that has suggested that social support can influence coping styles, which in turn impacts the experience of PTG (Schaefer & Moos, 1998). Numerous studies have noted that approach-oriented and problem solving based coping styles are associated with increased positive growth (Cordova et al., 2001; Rajandram et al., 2011; Schroevers et al., 2011; Silva et al., 2012; Tedeschi & Calhoun, 2004). This study’s results suggest that social support may help make-up for a lack of approach-oriented and problem-solving coping strategies, increasing the probability that a thyroid cancer survivor will experience growth, when they maybe otherwise would not. In the case of moderating a Confrontive style of coping with PTG, it is possible that an individual’s support network can help soften the sometimes more aggressive and hostile coping style, offering alternate views and emotional support with respect to their thyroid cancer experience. Interventions could be designed to identify and educate survivors on their coping style and target
those individuals who could benefit from extra support, connecting them with appropriate services. This could be of particular utility for those individuals who have Confrontive or Distancing styles of coping, as a lack of social support may in fact inhibit growth potential.

**Theoretical Contribution**

The results of the present study contribute to the theoretical model of posttraumatic growth in several ways. Thyroid cancer survivors in this study, while viewed as being diagnosed with a “good cancer,” demonstrated that they experienced multiple factors of PTG following their diagnosis. While the role of rumination was not determined, thyroid cancer survivors surveyed endorsed that they were experiencing a high degree of distress (be it depression, anxiety, stress, or brooding rumination), and that PTG can co-occur under these circumstances. This finding confirms Tedeschi and Calhoun’s theory that both negative and positive changes can coexist following a traumatic experience, such as a cancer diagnosis and subsequent treatment.

Cognitive-processing is an essential component of the PTG theory proposed by Tedeschi and Calhoun. This processing leads to the individual taking stock of the dramatic life changes and challenges they have been faced with, resulting in the creation of a new outlook on life and sense of self. Approach-oriented coping strategies, particularly Positive Reappraisal, and social support enable and support cognitive-processing by increasing opportunities for the survivor to talk about their experience, contributing to the creation of new schemas related to their diagnosis of thyroid cancer, resulting in positive growth.

Pat-Horenczyk and colleagues (2016) recently presented four possible profiles or trajectories of PTG, including, distressed, resistant, struggling and constructive. Similar to the struggling PTG profile, thyroid cancer survivors in the present study reported both approach and
avoidant coping strategies, along with moderate PTG and high levels of distress. Pat-Horenczyk and colleagues (2016) further proposed that cancer survivors with a struggling PTG profile may move towards a more constructive experience of PTG over time, with an associated decrease in distress levels. Although longitudinal research is needed to better understand trajectories of PTG among thyroid cancer survivors, it may be the case that identifying thyroid cancer survivors who fit the struggling profile may be beneficial as means of helping them reduce their experience of distress, and providing them with strategies to solidify positive transitions towards constructive growth.

This study found some evidence for social support as a moderator. Social support was found to magnify the experience of growth, specifically with coping styles that are not approach-oriented in nature. As postulated by Schaeffer and Moos (1998), social support is not only influential in the development of PTG, but it can also influence coping behaviour and foster successful adaptation and possibly growth. Social Support was found to increase the experience of Spiritual Change and Appreciation of Life in individuals who utilized Confrontive and Distancing coping styles. In the absence of social support, or individuals with low levels of support, these coping strategies were found to be detrimental to the experience of growth. The model in which social support accounted for the greatest amount of variance (16%) was between Distancing coping style and Relating to Others. Perhaps a strong presence of supportive family or friends can help individuals compensate for reliance on a distancing style of coping, which in turn contributes an increased closeness with others and sense of empathy.

Lastly, one possible explanation for lack of consistent strong relationships with some of the psychosocial factors, such as Social Support, and PTG could be as a result of a different factor structure of the PTGI than the five subscales proposed by Tedeschi and Calhoun (1996).
Intercorrelations of the PTGI revealed that the total score was highly correlated with Relating to Others, New Possibilities, and Personal Strength subscales. This suggests that perhaps the Spiritual Change and Appreciation of Life dimensions are more unique aspects of PTG, whereas Relating to Others, New Possibilities, and Personal Strength are measuring similar constructs. While not a focus of the present study, this suggests that future research may look at a different factor structure of the PTGI.

**Strengths**

This study has a number of strengths. This is the first quantitative assessment of PTG in thyroid cancer survivors. Thyroid cancer survivors have a unique experience when compared to other types of cancers, resulting in similar or lower quality of life than more severe cancers, and a high degree of worry (Applewhite et al., 2016; Aschebrook-Kilfoy et al., 2015; Bresner et al., 2015). As such, this warranted investigation of the experience of PTG in thyroid cancer survivors. The sample size was robust, with a large number of thyroid cancer survivors who volunteered their time to participate in a lengthy study. Research with thyroid cancer survivors is limited in general, perhaps owing to the high survival rate and perceived lack of severity of most well-differentiated thyroid cancer cases. This study helps to bring voice to an understudied population. Finally, existing studies with thyroid cancer survivors generally focus on the deficits and pathologies as a result of having thyroid cancer, such as lower QOL, fatigue and worry. This study instead focuses on what helps thyroid cancer survivors do well and attain positive growth as a result of their experience.

**Limitations**

There are limitations in the design of this study. Firstly, the study was a retrospective cohort design relying on survivors’ memories of past events, which impacts their ability to recall
accurately. For example, individuals who have experienced adjustment following their cancer diagnosis, and are no longer in significant distress, may under-report how impactful their experience was at the time. Additionally, questions around causality cannot be answered owing to the cross-sectional nature of the design. Future research should follow thyroid cancer survivors in a prospective manner. Study results are not generalizable to all thyroid cancer survivors, owing to the study sample only consisting of women. Future studies should target recruitment to including more men for a more accurate picture of PTG across both genders.

Previous research has indicated that women report more PTG than men (Schaefer & Moos, 1998; R. G. Tedeschi et al., 2004). Research exploring predictors of PTG with men may elucidate why this experience is different. Perhaps women are more likely to engage social networks to talk about their cancer experience than their male counterparts. Given the results of this study that highlight the importance of social support, particularly as it relates to Distancing and Confrontive coping styles, it would be interesting to explore if there is a difference in coping between male and female thyroid cancer survivors and how social support differs in impact. Results not necessarily generalizable to non-English speaking survivors outside of North America.

This study did not limit the length of time since diagnosis in the recruitment process. As such, there was a large range of when survivors had been first diagnosed with thyroid cancer, ranging from 1 month to 38 years. This could certainly have impacted results given that the experiences of someone within the first year of being diagnosed and someone 30 years post-diagnosis are likely to be quite different. The differences in length of time since diagnosis may account for the lower PTG scores in this sample.

Recruitment for this study was advertised exclusively through thyroid cancer-specific or generic cancer support groups. This invites a selection bias as individuals connected to support
groups may either have disproportionately high social support or may have more negative experiences with their diagnosis and treatment that lead them to seek out the support organization or webpage. However, a recent study failed to find a relationship between membership in a cancer-related support group and PTG (Soo & Sherman, 2015), indicating that support group membership alone is not associated with PTG. Participants were surveyed online in questionnaire format. The questionnaire itself was quite lengthy, taking an average of 1 hour to complete. This may have resulted in a high number of drop-outs. This study had a large number of incomplete datasets (n=188). While it is unknown how many were unique cases, this likely represents a number of individuals who started the survey but failed to complete it owing to the length of time it took to complete. The confidential online format made it impossible for individuals to return to the survey at a later time to revisit their responses and complete the study.

This study did not investigate previous traumas that thyroid cancer survivors may have had. Previous experience with trauma can contribute to the likelihood of experiencing PTG (Tedeschi & Calhoun, 1995; 2004). Given that participants’ trauma history was not known, it was impossible to account for the impact of this variable. Thyroid biomarker information was not collected as a party of this study. It is possible that thyroid hormone deficiency or excess could results in symptoms that mirror the experience of depression and anxiety. This could have contributed to the high levels of distress reported by participants, however it is impossible to confirm to what degree.

The measure included in this study to assess coping styles, The Ways of Coping – Revised (Folkman & Lazarus, 1988), while frequently used in the literature, has mixed reliability amongst its subscales. Perhaps using another coping scale, one targeted to use within a cancer population, would yield different or more robust results. Finally, the measure of rumination
chosen for this study had a strong emphasis on brooding type of rumination, which has been shown to not be related to PTG. This may account for the failure to find a relationship between rumination and PTG in thyroid cancer survivors in this study. A measure that evaluated more reflective rumination thought patterns would have been a better fit for this study.

**Clinical Implications and Future Directions**

Results from the present study can help inform psychosocial interventions for women who have received a thyroid cancer diagnosis. While presenting thyroid cancer as the “good cancer” may ultimately become a part of a survivor’s way to cognitively reappraise being diagnosed with cancer, it does not appear to be enough to prevent high levels of psychological distress, as found in this sample. Perhaps this label prevents survivors from being referred to support services, such as counselling, or feeling entitled to ask for a referral. Social support was found to be predictive of PTG and may be lacking for women with thyroid cancer. A combination of social support and a Positive Reappraisal coping style to help individuals develop new schemas helped survivors to experience positive growth. Perhaps healthcare support workers can shift their approach away from down-playing the diagnosis as “the good cancer,” and instead offer an empathic ear, providing survivors with an opportunity to talk about their experience, promoting cognitive processing. Healthcare providers should consider offering thyroid cancer survivors access or a referral to a psychologist or other counselling services, such as cognitive or mindfulness-based programs. These can offer additional support to the cancer survivor, in turn fostering cognitive processing necessary for PTG, promote cognitive reappraisal and a novel perspective of their thyroid cancer experience. These programs can also help individuals learn problem-focused coping strategies which are known to promote growth.
With respect to measurement of health-related QOL, this study used the City of Hope Quality of Life – Thyroid Version (Ferrell et al., 1995). A very recent systematic review of measurements of thyroid-specific health-related QOL recommended the ThyPRO as the preferred instrument for assessing thyroid disease-related symptoms. The authors indicated that the ThyPro had the highest number of positive ratings in overall level of psychometric ratings (Wong, Lang, & Lam, 2016). Future research should consider using this measure to assess QOL in thyroid cancer survivors.

As touched on previously, future research should focus on prospective investigation so to be able to comment on causality. Exploring additional pathways to PTG, such as optimism and other personality factors, may further elaborate on the overall of positive growth in thyroid cancer survivors.

Conclusion

Thyroid cancer survivors have been an understudied and overlooked group in cancer literature. Thyroid cancer survivors are growing in numbers, in part, owing to diagnosis at a young age, and a very high survival rate. A recent study suggested that by the year 2019, the number of thyroid cancer survivors will double, becoming the third most common cancer in women of all ages the United States, and could in fact represent 10% of all cancer survivors in the near future (Grogan et al., 2013). It is now well-known that thyroid cancer survivors have similar to lower quality of life compared to other more severe cancers, and experience significant cancer-related worry (Applewhite et al., 2016; Aschebrook-Kilfoy et al., 2015; Bresner et al., 2015; Sawka et al., 2009). Given the high level of psychological distress in this group and the similar to lower levels of PTG compared to other cancers, there appears to be an opportunity to intervene with thyroid cancer survivors to help support them in developing a new outlook on
their experience that could lead to positive growth. If PTG is indeed a precursor to quality of life (Silva et al., 2012), supporting thyroid cancer survivors through empathic reflection that encourages novel cognitive processing around their diagnosis, rather than simply dismissing it as benign, could have far-reaching benefit.
References


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doi:10.1037/0003-066X.59.1.20


122


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Appendix A: Recruitment Advertisement

Are you a Thyroid Cancer Survivor?

Help us know more about the experiences of thyroid cancer survivors living in Canada and the United States. What helps thyroid cancer survivors experience personal psychological growth beyond diagnosis and treatment? How does thyroid cancer affect mental health and quality of life?

For the purposes of this study, a thyroid cancer survivor is someone who has been diagnosed with thyroid cancer.

To participate, you must:

- Have received a diagnosis for thyroid cancer
- Be living in Canada or the United States
- Be at least 16 years of age
- Be fluent in written English

This study is voluntary and confidential.

The survey will take approximately 45-60 minutes to complete. Your participation is completely anonymous.

If you are interested in participating, please go to the link below to learn more about the study

LINK

Please contact me if you have any questions.

Sarah Lyons
Ph.D. Candidate
OISE – University of Toronto
sj.lyons@mail.utoronto.ca
Appendix B: Recruitment Email

Stress Reactions in the Face of the “Good Cancer”.
Correlates of Posttraumatic Growth in Thyroid Cancer Survivors

Hello,

My name is Sarah Lyons. I am a graduate student in the department of Counselling Psychology at the Ontario Institute for Studies in Education (OISE), University of Toronto. I am conducting a study as part of my doctoral studies in counselling psychology.

Through my study, I would like to find out more about the experiences of thyroid cancer survivors following diagnosis and treatment, including related mental health issues, coping styles, quality of life, and factors that help survivors experience personal psychological growth. It is my hope that the findings of this study will help us understand more about the experiences of thyroid cancer survivors and bring voice to the thyroid cancer community. For the purposes of this study, a thyroid cancer survivor is someone who has been diagnosed with thyroid cancer.

It is important to note that this research is being supervised by my academic supervisor, Dr. J. Roy Gillis at OISE, University of Toronto. My doctoral committee consists of two additional members. Dr. Abby Goldstein and Dr. Anna Sawka. Dr. Anna Sawka has extensive experience in thyroid cancer research and is also an Endocrinologist at Toronto General Hospital, specializing in the treatment of thyroid cancer.

A person is eligible to participate in this study if she or he:

- Has received a diagnosis of thyroid cancer
- Lives in Canada or the United States
- Is at least 16 years of age
- Speaks English

I estimate that participants will take approximately 45 to 60 minutes to complete the research materials. They will be asked to fill out the consent form, outlining detailed information about their participation, and some other questionnaires. The questionnaires gather demographic information, ask questions about their thyroid cancer experience (including some medical questions), their coping style, access to supports, experience of emotional distress, impact on quality of life, and experience of posttraumatic growth (personal psychological growth following a traumatic experience). Participants will also be asked to elaborate on their experience of thyroid cancer in narrative form, as well as comment on the notion that thyroid cancer is the “good cancer.” Participants will receive a list of counselling resources they may access if any questions raise personal issues that they would like to discuss with a counselor or peer support person.

Participation in this study is completely voluntary and participants may change their minds at any time to discontinue the survey. The survey will be available online at this link: [insert link]

I would like to invite your organization to contribute to this study in any of the following ways:

- By emailing the study information with a link to the online survey to potential participants or by posting the study information on online support forums that thyroid cancer patients are able to access
- By including the study flyer or information about the study in an upcoming newsletter
- By referring potential participants to the research. Please let your colleagues, friends, and family members know about the research and encourage them to participate.

Participation in this study is completely anonymous and confidential. I do not want or require access to personal emails or contact information of potential participants. Instead, my contact information can be passed on to thyroid cancer survivors who may be interested in participating in the research study.
I am happy to answer any questions you may have about the research study and address any concerns that may arise. Please feel free to contact me at any time by phone or by email. It is my hope that we can collaborate together on this important research and make a substantial contribution to thyroid cancer research.

Sarah Lyons  
Ph.D. Candidate  
OISE – University of Toronto  

sj.lyons@mail.utoronto.ca
Appendix C: Counselling Resource Page

If this survey has raised any personal issues that you would like to discuss with a mental health professional or peer support person, here is a list of national counselling resources. If you have difficulty connecting with resources in your area, you can contact me by email at sj.lyons@mail.utoronto.ca for assistance in finding a resource.

1. Canadian Psychological Association (provincial organizations with a referral service)
   http://www.cpa.ca/public/findingapsychologist/

2 Canadian Mental Health Association (local, provincial branches)
   http://www.cmha.ca

3. Canadian Cancer Society, Peer Support (telephone and in-person)
   http://www.cancer.ca/en/support-and-services/support-services/talk-to-someone-who-has-been-there/?region=pe
   1-888-939-3333
   info@cis.cancer.a

4. Thyroid Cancer Canada, Support Services
   http://www.thyroidcancercanada.org/tcc-support.php
   416-487-8267
   info@thyroidcancercanada.org

5. Canadian Mental Health Helpline
   1-866-531-2600

6. American Psychological Association, Psychologist Locator
   http://locator.apa.org
   1-800-374-2723

7. Mental Health America, Find An Affiliate
   http://www.mentalhealthamerica.net/find-affiliate
   1-800-969-6642

8. ThyCa: Thyroid Cancer Survivors’ Association, Inc. (local support groups, online support community, person-to-person network)
   http://www.thyca.org/sg/

9. American Cancer Society (online support, patient navigator program)
   http://www.cancer.org/treatment/supportprogramsservices/index
   1-800-227-2345

10. (American) National Suicide Prevention Lifeline
    1-200-273-8255
Appendix D: Consent Form

Stress Reactions in the Face of the “Good Cancer”.  
Correlates of Posttraumatic Growth in Thyroid Cancer Survivors

Sarah Lyons, M.A.  
Ph.D. Student, Counselling Psychology  
OISE, University of Toronto

J. Roy Gillis, Ph.D.  
Academic Supervisor, Associate Professor  
OISE, University of Toronto

Abby Goldstein, Ph.D., C.Psych.  
Assistant Professor  
OISE, University of Toronto

Anna Sawka, M.D., Ph.D.  
Clinician Investigator, Endocrinologist  
University Health Network, University of Toronto

Introduction
The purpose of this informed consent is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide you with sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

The researcher of this study is currently enrolled in the Ph.D. program at the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT). This research partially fulfills the requirements for the researcher’s Doctoral program and the results from this project may be used for professional publication. This letter is to help you understand the nature of the research so that you can decide if you want to participate. Participation is completely voluntary, and participants will be free to withdraw at any time. Your withdrawal will not affect the research in any way. Should you have any concerns about the research, you may at any time contact Dr. Roy Gillis (supervisor) at (416) 978-0679 or roy.gillis@utoronto.ca, or the researcher, Sarah Lyons at sj.lyons@mail.utoronto.ca. You will receive an update of the research after it is finished, if you request one.

Ethical Concerns: Should the supervisor or researcher not be able to address your concerns about this study, please contact the University of Toronto Ethics Review office at: (416) 946-3273 or ethics.review@utoronto.ca

Purpose
Through this study, I would like to find out more about the experiences of thyroid cancer survivors following diagnosis and treatment, related mental health issues, coping styles, quality of life, and factors that help survivors experience personal psychological growth. It is my hope that the findings of this study will help us understand more about the experiences of thyroid cancer survivors and bring voice to the thyroid cancer community. For the purposes of this study, a thyroid cancer survivor is someone who has been diagnosed with thyroid cancer.

How do I participate?
You will be asked to answer a series of questionnaires that will take approximately 45-60 minutes to complete. The survey is entirely online and uses a confidential and secure web-based survey tool.

The questionnaires gather basic information about you (for example, your age and education), as well as ask questions about your thyroid cancer experience (including some medical questions), your style of coping with stress, access to supports, your experience of emotional distress, the impact thyroid cancer has had on your quality of life,
and if you have experienced personal psychological growth since your diagnosis. You will also be asked to describe your experience of thyroid cancer in an open-ended question format.

You are eligible to participate in this study if you:
- Have received a diagnosis for thyroid cancer
- Live in Canada or the United States
- Are at least 16 years of age
- Speak English

Do I have to participate?
Your participation in this research is completely voluntary. The information you provide will remain confidential and no one will know that you participated in this study, as you will be completing the survey anonymously. You are free to withdraw from this study at any time with no consequence. I will not be collecting personal identifiable information or IP addresses of those who access the survey.

Once you submit your responses online, it will not be possible to retrieve or delete them as there will be no way of identifying your individual survey. This strategy guarantees that your answers will remain anonymous and confidential.

Right to withdraw
You may withdraw from the study at any time by exiting the browser.

Are there any risks or benefits to participating?
The data collected from this research study may or may not benefit you in the immediate. By participating you will be helping us to know more about the experiences of thyroid cancer survivors living in Canada following diagnosis and treatment, related mental health issues, coping styles, quality of life, and factors that help survivors experience personal growth.

There are no anticipated risks associated with this study. Some of the questions may lead you to think about negative emotions or experiences. In the case that any questions raise personal issues that you would like to discuss with a counsellor, a “Counselling Resource Sheet” can be found at the bottom of this consent as well as on the final page of the survey. The resource page contains a list of national counselling and peer support resources. If you would like information on a resource specific to your area, these resources will be able to provide you with a referral, or you can contact me by email for assistance in finding a resource.

Compensation
There is no compensation offered to you for your participation in this study.

Storage and Retention of Participant Data
Data will be kept on secure, encrypted USB port and locked in a filing cabinet with access only by project staff. Data will be kept for seven years following study completion, and then will be destroyed.

Anonymity and Confidentiality
The data collected in this study are strictly confidential. You will not be asked to put your name anywhere on the survey. Only research personnel affiliated with this project will have access to the data. No identifying information will be used when we publish or present the results of this study. Furthermore, it is advised that you take this survey in a space that you will have at least 60 minutes of uninterrupted time, due to the sensitive nature of the questions. You will, however, be able to stop and come back to the survey at a later time. You may wish to erase your browser history following completion as well and instructions for doing so will be provided to you at the conclusion of the survey. The last screen of the survey will provide a link, which will take you out of the survey into a new webpage giving you the opportunity to enter your email should you be interested in receiving an emailed report of this study’s findings. This is optional and email addresses will be kept separate from collected data.

Publication and Presentation of Results
Results may be presented at conferences or published in journals. Your name will not be associated with the research in any way.
I, (the participant) have read the above form and understand the conditions of my participation. My participation in this study is voluntary, and if for any reason, at any time, I wish to leave the study I may do so without having to give an explanation. Furthermore, I am also aware that the data gathered in this study are confidential and anonymous. My e-mail address, should I decide to provide it, will not be associated with any of my data.

Please print this screen at this point if you want a copy of this page for your own records.

By clicking on the “I consent” button, this indicates that you have agreed to participate in this study and do not have any unresolved questions about your participation in the research.
Appendix E: Demographics and Thyroid Cancer Questionnaire

Please tell us the following things about yourself. There are no right or wrong answers, and all responses will be kept confidential and anonymous.

1. What country do you live in?
   a. Canada
      i. Specify province
   b. United States
      i. Specify state
   c. Other (excluded from study)

2. Please specify whether you currently live in a rural area or an urban area
   a. Rural (country)
   b. Urban (city or town)
   c. Other (please specify)

3. What is your age (in years)?

We recognize that there are a variety of sexual orientations and gender identities. In order to better understand your situation, we would like to ask the following questions:

4. How would you identify your gender identity?
   a. Female
   b. Male
   c. Transsexual
   d. Transgendered
   e. Genderqueer
   f. Two-spirit
   g. FTM (female-to-male)
   h. MTG (male-to-female)
   i. Intersex

5. How would you identify your sexual orientation?
   a. Straight/Heterosexual
   b. Lesbian
   c. Gay
   d. WSW (woman who has sex with women)
   e. Bisexual
   f. MSM (man who has sex with men)
   g. Queer
   h. Transensual (person attracted to transsexual or transgendered people)
i. Polysexual
j. Two-spirit
k. Questioning
l. Asexual
m. Autosexual
n. Unsure
o. Other (please specify)
p. Prefer not to answer

6. What is your marital status?
   a. Married
   b. Common-law or living with partner
   c. In a committed relationship
   d. Single/never married
   e. Divorced
   f. Separated
   g. Other

7. How many children do you have?
   a. If you have children, how many are under the age of 18?

8. What is the ethno-cultural group that you most identify with? (e.g., South Asian, Eastern European, etc.)

9. Do you identify with a religion? Yes/No
   a. If Yes, please describe:

10. Please indicate the highest level of education you have completed to date.
    a. Some primary school
    b. Primary school
    c. Some high school
    d. High school diploma
    e. Some college
    f. College diploma or certificate
    g. Some university
    h. University undergraduate degree (3 or 4 year)
    i. Some graduate, medical, or law school
    j. Completion of graduate, medical or law school
    k. Other (please specify)

11. Please select which answer best represents your current employment status
    a. Unemployed
    b. Student
    c. Homemaker
    d. Retired
    e. On illness leave
f. Employed Part-time
g. Employed Full-time
h. Self-employed
i. Other (please specify)

12. Please state your average annual household income.

**Thyroid Cancer Questionnaire**

1. What type(s) of treatment have you undergone for thyroid cancer? Check all that apply.
   a. Surgery
   b. Radioactive iodine (RAI) treatment
   c. Alternative treatment (please specify)
   d. Other (please specify)
   e. Don’t know

2. Have you had surgery for treatment of thyroid cancer? Y/N
   a. If yes, what year did you have your first thyroid surgery for treatment of thyroid cancer? (mm/yy)

3. Has your thyroid cancer ever come back (after initial treatment) and required additional therapy (such as surgery, radioactive iodine, radiation treatment, chemotherapy, alcohol injection of lymph nodes, or other)?
   a. Yes
   b. No
   c. Don’t know

4. Have you been diagnosed with other types of cancer? Y/N
   a. If Yes, please specify.

5. Have you ever come across information suggesting that thyroid cancer is a “good cancer”? Y/N
   a. If yes, please describe your reactions to this.
      For example, Was this information helpful? Did this prompt you to think, feel or act differently? Did this influence your decision-making?

6. What significant changes (if any) have you undergone as a result of your overall experience with thyroid cancer? Please describe below.
7. What type(s) of supports have you received, related to your thyroid cancer experience? Please check all that apply.
   a. Counselling from a mental health professional (such as a psychiatrist, psychologist, social worker, counsellor, or therapist)
   b. Prescription medication for mood (such as antidepressant or anxiety medication)
   c. Thyroid cancer support group
   d. General cancer support group
   e. Cancer-related workshops or retreats (e.g., Healing Journey, programs through Wellspring, etc.)
   f. Other (please specify)
   g. None of the above
Appendix F: Posttraumatic Growth Inventory

Directions: Using the scale below, please indicate the degree to which the change reflected in each of the following statements is true in your life as a result of your thyroid cancer experience.

0 = I did not experience this change as a result of my thyroid cancer experience.
1 = I experienced this change to a very small degree as a result of my thyroid cancer experience.
2 = I experienced this change to a small degree as a result of my thyroid cancer experience.
3 = I experienced this change to a moderate degree as a result of my thyroid cancer experience.
4 = I experienced this change to a great degree as a result of my thyroid cancer experience.
5 = I experienced this change to a very great degree as a result of my thyroid cancer experience.

1. I changed my priorities about what is important in life. 0 1 2 3 4 5
2. I have a greater appreciation for the value of my own life. 0 1 2 3 4 5
3. I developed new interests. 0 1 2 3 4 5
4. I have a greater feeling of self-reliance. 0 1 2 3 4 5
5. I have a better understanding of spiritual matters. 0 1 2 3 4 5
6. I more clearly see that I can count on people in times of trouble. 0 1 2 3 4 5
7. I established a new path for my life. 0 1 2 3 4 5
8. I have a greater sense of closeness with others. 0 1 2 3 4 5
9. I am more willing to express my emotions. 0 1 2 3 4 5
10. I know better that I can handle difficulties. 0 1 2 3 4 5
11. I am able to do better things with my life. 0 1 2 3 4 5
12. I am better able to accept the way things work out. 0 1 2 3 4 5
13. I can better appreciate each day. 0 1 2 3 4 5
14. New opportunities are available which wouldn’t have been otherwise. 0 1 2 3 4 5
15. I have more compassion for others. 0 1 2 3 4 5
16. I put more effort into my relationships. 0 1 2 3 4 5
17. I am more likely to try to change things which need changing. 0 1 2 3 4 5
18. I have a stronger religious faith. 0 1 2 3 4 5
19. I discovered that I’m stronger than I thought I was. 0 1 2 3 4 5
20. I learned a great deal about how wonderful people are. 0 1 2 3 4 5
21. I better accept needing others. 0 1 2 3 4 5
Appendix G: Depression Anxiety Stress Scale – 21 (DASS 21)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:
0 = Did not apply to me at all - NEVER
1 = Applied to me to some degree, or some of the time - SOMETIMES
2 = Applied to me to a considerable degree, or a good part of time - OFTEN
3 = Applied to me very much, or most of the time - ALMOST ALWAYS

<table>
<thead>
<tr>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found it hard to wind down</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>2. I was aware of dryness of my mouth</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>3. I couldn’t seem to experience any positive feeling at all</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>4. I experienced breathing difficulty (eg., excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>5. I found it difficult to work up the initiative to do things</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>6. I tended to over-react to situations</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>7. I experienced trembling (eg., in the hands)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>8. I felt that I was using a lot of nervous energy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>9. I was worried about situations in which I might panic and make a fool of myself</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>10. I felt that I had nothing to look forward to</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>11. I found myself getting agitated</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>12. I found it difficult to relax</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>13. I felt down-hearted and blue</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>14. I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>15. I felt I was close to panic</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>16. I was unable to become enthusiastic about anything</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>17. I felt I wasn’t worth much as a person</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>18. I felt that I was rather touchy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>19. I was aware of the action of my heart in the absence of physical exertion (eg., sense of heart rate increase, heart missing a beat)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>20. I felt scared without any good reason</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>21. I felt that life was meaningless</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>
Appendix H: Ways of Coping (Revised)*

Please read each item below and think about how you generally have coped with stressful encounters that you have experienced. Using the following rating scale, to what extent did you generally use the strategies listed below.

<table>
<thead>
<tr>
<th>Not Used</th>
<th>Used Somewhat</th>
<th>Used Quite A Bit</th>
<th>Used A great deal</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

1. Just concentrated on what I had to do next – the next step.
2. I tried to analyze the problem in order to understand it better.
3. Turned to work or substitute activity to take my mind off things.
4. I felt that time would make a difference – the only thing to do was to wait.
5. Bargained or compromised to get something positive from the situation.
6. I did something which I didn’t think would work, but at least I was doing something.
7. Tried to get the person responsible to change his or her mind.
8. Talked to someone to find out more about the situation.
9. Criticized or lectured myself.
10. Tried not to burn my bridges, but leave things open somewhat.
11. Hoped a miracle would happen.
12. Went along with fate; sometimes I just have bad luck.
13. Went on as if nothing had happened.
14. I tried to keep my feelings to myself.
15. Looked for the silver lining, so to speak; tried to look on the bright side of things.
16. Slept more than usual.
17. I expressed anger to the person(s) who caused the problem.
18. Accepted sympathy and understanding from someone.
19. I told myself things that helped me to feel better.
20. I was inspired to do something creative.
21. Tried to forget the whole thing.
22. I got professional help.
23. Changed or grew as a person in a good way.
24. I waited to see what would happen before doing anything.
25. I apologized or did something to make up.
26. I made a plan of action and followed it.
27. I accepted the next best thing to what I wanted.
28. I let my feelings out somehow.
29. Realized I brought the problem on myself.
30. I came out of the experience better than when I went in.
31. Talked to someone who could do something concrete about the problem.
32. Got away from it for a while; tried to rest or take a vacation.
33. Tried to make myself feel better by eating, drinking, smoking, using drugs or meds.
34. Took a big chance or did something very risky.
35. I tried not to act too hastily or follow my first hunch.
36. Found new faith.
37. Maintained my pride and kept a stiff upper lip.
38. Rediscovered what is important in life.
39. Changed something so things would turn out all right.
40. Avoided being with people in general.
41. Didn’t let it get to me; refused to think too much about it.
42. I asked a relative or friend I respected for advice.
43. Kept others from knowing how bad things were.
44. Made light of the situation; refused to get too serious about it.
45. Talked to someone about how I was feeling.
46. Stood my ground and fought for what I wanted.
47. Took it out on other people.
48. Drew on my past experiences; I was in a similar situation before.
49. I knew what had to be done, so I doubled my efforts to make things work.
50. Refused to believe that it had happened.
51. I made a promise to myself that things would be different next time.
52. Came up with a couple of different solutions to the problem.
53. Accepted it, since nothing could be done.
54. I tried to keep my feelings from interfering with other things too much.
55. Wished that I could change what had happened or how I felt.
56. I changed something about myself.
57. I daydreamed or imagined a better time or place than the one I was in.
58. Wished that the situation would go away or somehow be over with.
59. Had fantasies or wishes about how things might turn out.
60. I prayed.
61. I prepared myself for the worst.
62. I went over in my mind what I would say or do.
63. I thought about how a person I admire would handle this situation and used that as a model.
64. I tried to see things from the other person’s point of view.
65. I reminded myself how much worse things could be.
66. I jogged or exercised.
Appendix I: Health Behaviour Changes

We are interested in health behaviour changes that you may have experienced since being diagnosed with thyroid cancer. Please rate the degree of change you have experienced in the following areas:

<table>
<thead>
<tr>
<th>Much worse now</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Much better now</th>
</tr>
</thead>
</table>

a. Exercise  
b. Diet  
c. Sleep  
d. Stress Management  
e. Smoking  
f. Alcohol intake  
g. Illicit drug use (e.g., illegal drugs or misuse of prescription drugs)
Appendix J: Multidimensional Health Locus of Control

Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer EVERY ITEM and that you select ONLY ONE number per item. This is a measure of your personal beliefs; there are no right or wrong answers.

1 = Strongly disagree
2 = Moderately disagree
3 = Slightly disagree
4 = Slightly agree
5 = Moderately agree
6 = Strongly agree

1. If I get sick, it is my own behaviour which determines how soon I get well again.
2. No matter what I do, if I am going to get sick, I will get sick.
3. Having regular contact with my physician is the best way for me to avoid illness.
4. Most things that affect my health happen to me by accident.
5. Whenever I don’t feel well, I should consult a medically trained professional.
6. I am in control of my health.
7. My family has a lot to do with my becoming sick or staying healthy.
8. When I get sick, I am to blame.
9. Luck plays a big part in determining how soon I will recover from an illness.
10. Health professionals control my health.
11. My good health is largely a matter of good fortune.
12. The main thing which affects my health is what I myself do.
13. If I take care of myself, I can avoid illness.
14. Whenever I recover from an illness, it’s usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.
15. No matter what I do, I’m likely to get sick.
16. If it’s meant to be, I will stay healthy.
17. If I take the right actions, I can stay healthy.
18. Regarding my health, I can only do what my doctor tells me to do.
Appendix K: Quality of Life Scale/Thyroid (QOL-Thyroid)

We are interested in knowing how your experience of having thyroid cancer affects your Quality of Life. Please answer all of the following questions based on how you have been feeling during the previous week.

Physical Well Being:

1. To what extent have the following been a problem during your illness and treatment?

   0  1  2  3  4  5  6  7  8  9  10
   no problem severe problem

   a. Fatigue
e. Appetite changes
c. Aches or pain
d. Sleep changes
e. Constipation
f. Menstrual changes or fertility
g. Weight gain
h. Tolerance to cold or heat
i. Dry skin or hair changes
j. Voice changes
k. Motor skill/coordination
l. Swelling/fluid retention

2. Rate your overall physical health:

   0  1  2  3  4  5  6  7  8  9  10
   extremely poor excellent
Appendix L: Rumination Responses Scale

People think and do many different things when they are coping with a traumatic experience. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you reflect on your thyroid cancer experience. Please indicate what you generally do, not what you think you should do.

1 = almost never
2 = sometimes
3 = often
4 = almost always

1. think about how alone you feel
2. think “I won’t be able to do my job if I don’t snap out of this”
3. think about your feelings of fatigue and achiness
4. think about how hard it is to concentrate
5. think “What am I doing to deserve this?”
6. think about how passive and unmotivated you feel.
7. analyze recent events to try to understand why you are depressed
8. think about how you don’t seem to feel anything anymore
9. think “Why can’t I get going?”
10. think “Why do I always react this way?”
11. go away by yourself and think about why you feel this way
12. write down what you are thinking about and analyze it
13. think about a recent situation, wishing it had gone better
14. think “I won’t be able to concentrate if I keep feeling this way.”
15. think “Why do I have problems other people don’t have?”
16. think “Why can’t I handle things better?”
17. think about how sad you feel.
18. think about all your shortcomings, failings, faults, mistakes
19. think about how you don’t feel up to doing anything
20. analyze your personality to try to understand why you are depressed
21. go someplace alone to think about your feelings
22. think about how angry you are with yourself
Appendix M: Medical Outcomes Survey Social Support Survey (MOS-SSS)

People sometimes look to others for companionship, assistance, or other types of support. How often are each of the following kinds of support available to you if you need it?  
**Circle ONE number on each line.**

<table>
<thead>
<tr>
<th>Emotional/informational support</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone you can count on to listen to you when you need to talk</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to give you information to help you understand a situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to give you good advice about a crisis</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to confide in or talk to about yourself or your problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone whose advice you really want</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to share your most private worries and fears with</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to turn to for suggestions about how to deal with a personal problem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone who understands your problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tangible support</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone to help you if you were confined to bed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to take you to the doctor if you needed it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to prepare your meals if you were unable to do it yourself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to help with daily chores if you were sick</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Affectionate support</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone who shows you love and affection</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to love you and make you feel wanted</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone who hugs you</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive social interaction</th>
<th>None of the time</th>
<th>A little of the time</th>
<th>Some of the time</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone to have a good time with</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to get together with for relaxation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Someone to do something enjoyable with</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*Additional item:* Someone to do things with to help you get your mind off things

144
### Appendix N: Descriptive Statistics for Scales (N=259)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Subscale</th>
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Appendix O: Intercorrelations of the PTGI

PTGI Intercorrelations

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