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UNIVERSITY OF GHANA, LEGON

DEPARTMENT OF PSYCHOLOGY

POSTTRAUMATIC GROWTH AMONG BREAST CANCER SURVIVORS IN GHANA

BY

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DECLARATION

I hereby declare that this thesis is the result of my own research work and that no part of it has been presented for another degree by anyone for any academic award in this university or elsewhere. All references used in the work have been fully acknowledged.

I bear sole responsibility for any shortcomings.

……………………… ………………… ………………………..

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I hereby declare that the preparation and presentation of this thesis was supervised in accordance with the guidelines on the supervision of thesis laid down by the University of Ghana.

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DEDICATION

This work is dedicated in memory of my late grandmother, Madam Juliana Oforiwaa Wiafe. May her soul continue to rest in perfect peace.

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ABSTRACT

Cancer of the breast is one of the most diagnosed cancers in women and causes most deaths in women globally. While the diagnosis of breast cancer is increasing globally, due to early diagnosis and improved treatment, many women also survive from the disease. The breast cancer experience has been known to be a series of ongoing trauma that can last for a very long time even to survivorship. While the rate of survival is increasing globally and locally, there is scarcity of knowledge about the changes that have occurred in the lives of these women who experienced breast cancer. The aim of this study is to assess Posttraumatic Growth (PTG) in breast cancer survivors in Ghana and to investigate the factors that relate and impact on PTG. This study employed the cross-sectional survey where 150 breast cancer survivors were conveniently selected to respond to some validated questionnaires. The study found that Age, Years of survival and Marital status had a positive association with Posttraumatic Growth. It was also found that there was no association between educational level, employment status, religion and disease/treatment factors and Posttraumatic growth. Regression analysis shows that Optimism, Coping, and Social Support have a direct effect on Posttraumatic Growth. Also, an indirect effect was found between Religiosity and Posttraumatic Growth. Another indirect effect was found between cognitive processing and Posttraumatic Growth. Findings from this study together with the implications have been discussed.

Keywords: Posttraumatic Growth, Breast Cancer, Breast Cancer Survivors, Optimism, Coping, Social Support, Cognitive Processing, Religiosity, Ghana, Positive Psychology.

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CHAPTER 1

INTRODUCTION

Background of the Study

Breast cancer (BC) is a life-threatening and a chronic disease that originates from an abnormal growth of cells in the beast tissue and has both physical and mental consequences for the patients (Ozkal & Arıkan, 2014). According to the World Cancer Report (2014) breast cancer is the most widely known type of cancer found in women and globally about 1.67 million women are affected (McGuire, 2016). Globacan (2012) reported that in 2010, over 1.3 million women died from breast cancer globally, 2,062 (21.0%) women in Ghana were diagnosed with the disease and 1,137 (16.5%) women died from breast cancer in Ghana. It is well known that early detection with a positive response to treatment reduces psychological trauma (Baako, 1999).

Different types of breast cancer have been identified by researchers. According to Sariego (2010), the most common among them include those that occur in the ducts: the invasive type and the noninvasive type which are "Invasive Ductal Carcinoma" and "Ductal Carcinoma In Situ" respectively. Invasive Ductal Carcinoma also have subtypes which include; "Medullary Carcinoma of the Breast", "Papillary Carcinoma of the Breast", "Mucinous Carcinoma of the Breast", "Cribriform Carcinoma of the Breast" and "Tubular Carcinoma of the Breast" (Sariego, 2010). Other breast cancer types are those that occur in the lobule the noninvasive type – "Lobular Carcinoma In Situ" and the invasive type – "Invasive Lobular Carcinoma". Also identified is the Molecular Subtypes of Breast Cancer: "Phyllodes Tumors of the Breast" and "Paget's Disease of the Nipple" (Sariego, 2010). In some cases, women may have "Recurrent and Metastatic Breast Cancer" (Sariego, 2010).

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The staging of breast cancer after diagnosis is done based on information that is obtained from clinical, radiological and pathological findings and assists in predicting how an individual will progress over time. Stage 0, I and II constitute early breast cancer whiles stages III and IV are referred to as advanced breast cancer, the lower the stage, the better the prognosis (Cancer Research UK, 2004). Early stage breast cancer (stage I & II) has relatively small tumor sizes which have not yet spread to other sites and have a good prognosis (Cancer Research UK, 2004). In contrast, advanced stage cancer (stage III & IV) tumor size is large and has metastasized to the lymph nodes and other locations with poor prognosis.

In Ghana, there is also an increase in BC which is mostly characterized by more advanced and aggressive forms of the cancer (Laryea, Awuah, Amoako, Osei-Bonsu, Dogbe et al., 2014; Ohene-Yeboah & Adjei, 2012). In one of the earliest studies in Ghana by Archampong (1977) on breast cancer, 75% of women with breast carcinoma presented with stage III and IV disease. Another study in Ghana on breast diseases at the surgical clinic of the Korle Bu teaching hospital indicated that among 300 women presenting with breast complaints, approximately 16% (47) had breast cancer, out of which 47% presented stage III and IV cancers (Asumanu, Vowotor, & Naaeder, 2000). A study in Ghana at the Korle Bu Teaching Hospital reported that 57.6% of patients presented with stage III-IV disease (Clegg-Lamptey & Hodasi, 2007). These results indicate that, patients in Ghana present at the late stage of their disease resulting in poor prognosis (Archampong, 1977; Asumanu et al., 2000; Clegg-Lamptey & Hodasi, 2007). These add to the findings by Abdulrahman and Rahman (2012) who found that Africans compared to Europeans present with advanced and invasive types of the disease and hence poor prognosis.

Some of the recent treatments that women diagnosed of breast cancer include chemotherapy, surgery, radiation therapy and hormonal therapy. Given at the same time or in

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succession depending on the disease severity, patients may receive a single treatment or a combination of therapies (NCI, 2006). Presently, according to the Global Cancer Statistics (2012), with improved treatment options and early diagnosis for breast cancer, survival rates are increasing and disclosure of survivor's experience after treatment is gaining importance (Torre, Bray, Siegel, Ferlay, Lortet-Tieulent, Jemal et al., 2015).

Findings from the NCI (2006) indicate that 5-year survival rates for early - stage breast cancers (stage I & II) are 96% -75% and that of breast cancers that have metastasized (stage III & IV cancers) is 20%. It is therefore not surprising that 47.9% has been reported as the cumulative 5-year overall survival of rate of breast cancer in Ghana and 91.94% and 15.09% for Stage I and Stage IV respectively (Mensah, Yarney, Nokoe, Opoku & Clegg-Lamptey, 2016).

In the psychosocial definition, survival is accepted as a process that begins with the time the patient is diagnosed and is defined in three stages (Mullan, 1985). According to Mullan (1985) the first stage of survival is the "Acute survival stage" which is the period beginning at the time the patient is diagnosed. The second stage is the "Extended survival stage" which is also the period beginning after termination of treatment when the patient enters the healing process and experience the fear of recurrence. The final stage is the Permanent survival stage which represents the period when a possible risk of recurrence is minimized (Mullan, 1985). In this current study, women who have gone through the second and third stage of survival proposed by Mullan (1985) are considered as breast cancer survivors.

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Breast Cancer and Trauma

Breast cancer like other Oncological illnesses epitomizes an ongoing trauma that can last for a very long time possibly for as long as the person lives (Aitken-Swan & Easson, 1959; Cordova, Giese-Davis, Golant, Kronenwetter, Chang & Spiegel, 2007). Even with developments in technology and medicine together with many preventive and medical treatment procedures, breast cancer to date is perceived as a disease which impacts many areas of the patient's life such as self-care, family life, sexuality and work life (Gumus, 2006; Ozkal & Arıkan, 2014). In most non-western cultures like cultures in Africa, breast is viewed as a representation of maternity, ferminity and motherhood (Baglama & Atak, 2015; Brinton, Figueroa, Awuah, Yarney, Wiafe et al., 2014). Along these lines, it can be demonstrated that breast cancer may threaten the women's ferminity, sexuality, maternal identity and their relationships with the environment such as self-esteem, self-confidence and body image (Brinton et al., 2014; Lantz & Booth, 1998). For people who experience breast cancer, the traumatic experience starts from the first day of detecting a lump, through diagnosis and treatment and continues through to survivorship (Cordova et al., 2007). One's life may be threatened by the disease together with its treatment and the experience may evoke feelings of helplessness and intense emotional reaction of fear due to an abrupt or unexpected diagnosis (Cordova et al., 2007; Sawyer, Ayers & Field, 2010; Stanton, Revenson & Tennen, 2007). Effects of treatment are not limited to only cancer cells; other healthy cells and tissues are damaged during treatment causing unpleasant side effects. The type and extent of the treatment mainly determines the side effects of cancer and it varies from each person (Merck Manual of Diagnosis and Therapy [MMDT], 2003). "Physical side effects of cancer treatments documented include pain, lymphedema, changes in body image, anemia, muscle ache, tiredness, skin reactions, loss of appetite, nausea, vomiting, diarrhea or constipation and risk of developing

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a secondary cancer. Other side effects are immune suppression leading to opportunistic infections, delayed blood clotting time, hair loss, tiredness, mouth sore, hot flashes, vaginal dryness, peripheral neuropathy, weight gain, insomnia and interrupted menstrual periods" (Eure, 2006; MMDT, 2003). Coupled with the possibility of losing the breast, anxiety about the disease due to the radical and stressful medical and surgical procedures may worsen the traumatic experience of these women (Cordova et al., 2007).

The experience of breast cancer like other extremely unpleasant life event can result in a range of behavioral, psychological and emotional outcomes (Ramos & Leal, 2013; Taku, Cann, Tedeschi, & Calhoun, 2009). Negative adjustment to circumstances concerning the cancer diagnosis and its treatment, such as symptoms of anxiety, depression and post-traumatic stress disorder may arise as a result of the trauma from breast cancer (Bostock, Sheikh, & Barton, 2009; Calhoun & Tedeschi, 2001; Linley, Joseph & Goodfellow, 2008; Taku et al., 2009). Patients must also deal with several negative experiences, including side effects of medical treatments such as "fatigue, pain, and hair loss; temporary and permanent changes in physical appearance; alterations in future life plans; and the threat of future disease recurrence" (Eure, 2006; MMDT, 2003). These negative experiences with breast cancer indicate that suffering from a life-threatening illness like breast cancer is a series of recounting threats and stressors but rather not an acute, extraordinary stressful experience (Cordova, 2008; Stanton et al., 2007). Other traumatic stressors parallel breast cancer in many ways. As a result, cancer has been included in the 5th edition of Diagnostic and Statistical Manual of Mental Disorders as one of the events that can trigger elicits cancer-related posttraumatic symptoms of depression, anxiety and posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2013). Kangas, Henry and Bryant (2002) in their review found that a range of 5% to 35% is the global PTSD rates found in breast cancer patients.

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Koutrouli, Anagnostopoulos, and Potamianos (2012) also found that the global PTSD rates in breast cancer patients and survivors vary from 2.4% and 19% globally. This indicates that the rate of having a negative psychological outcome after surviving from breast cancer is low.

Breast Cancer and Posttraumatic Growth

Some researchers believe that the negative impact of life-threatening and chronic diseases is not only seen as a loss or threat, but also create opportunities for positive changes and growth (Cordova et al., 2007; Fallah, Keshmir, Kashani, Azargalib &Akbari, 2012; Frazier & Kaler, 2006; Linley & Joseph, 2004). Studies on breast cancer survivors have confimed that, amidst the trauma, people experience positive changes as well (Kolokotroni, Anagnostopoulos & Tsikkinis, 2014). Tedeschi and Calhoun (1995) introduced the term "posttraumatic growth" (PTG) which they described as "the positive psychological change experienced as a result of the struggle with highly challenging life circumstances" (Tedeschi & Calhoun, 2004). Janoff-Bulman (2004) has indicated that during challenging life events like breast cancer, what the individual knows and beliefs about life and its existence are crashed and needs to be reconstructed to decrease psychological burden. According to Park (2010), to reduce the psychological distress associated with ones encounter with breast cancer and any other life threating situation, the patient will have to resolve the discrepancy between what he/she knows, believes and desire about the world (global meaning) against what he/she has experienced or perceived about breast cancer. This is achieved either through the process of assimilation (the very meaning of the stressor is changed) or through the process of accommodation (global beliefs and goals are altered) to improve the balance between the appraised meaning and global meaning of breast cancer (Park, 2013). Thus, PTG is therefore viewed as a potential consequence of the cognitive effort to redefine those

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beliefs and to reconstruct the assumptive world (Tedeschi & Calhoun, 2004; Janoff-Bulman, 1992, 2006). Globally, between 60-98% of people who experience breast cancer have been reported to experience some perceived growth due to a breast cancer diagnosis, treatment and survivorship (Parikh, De Ieso, Garvey, Thachil, Ramamoorthi, Penniment & Jayaraj, 2015; Kolokotroni et al., 2014; Sears, Stanton & Danoff-Burg, 2003; Stanton, Bower & Low, 2006; Weiss, 2002). According to Tedeschi and Calhoun (2004), in the process of rebuilding the assumptive world, individuals may reexamine many aspects of their lives and might recognize growth in five vital domains of their life including: "changes in priorities"; "an increased appreciation for life"; "a sense of increased personal strength"; "an essential relationship with others" and "existential/spiritual thrive" (Tedeschi & Calhoun, 2004).

Determinants of Posttraumatic Growth

Most theories and models of growth have come to the consensus that, growth from trauma starts through the individual's appraisal or meaning ascribed to the event or situation (Janoff-Bulman, 1992; 2006; Joseph & Linley, 2004; Park, 2010; Tedeschi & Calhoun, 1995; 2004). According to Linley and Joseph (2004), the development of PTG is mainly influenced by the perception one holds due to their subjective traumatic experience of the event. In the framework of illnesses like breast cancer, being diagnosed can cause disruption in important global views, including the kindness, fairness, one's ability to predict the world, sense of control and one's sense of immunity (Jim & Jacobsen, 2008). Additionally, serious illnesses like breast cancer almost inherently interrupt the individuals' strategies for the future and their goals for their current lives (Carver, 2005). The breast cancer survivor then begins to make sense of their new experiences and attempt to rebuild their previous assumptions by drawing from different and competing

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sources of knowledge available to them (Park, 2013). According to Park (2013) information exist that suggest that for situational meaning, knowledge is created with evidence from information individuals obtain from sources such as their healthcare providers, the anticipated impact of the illness on their future, appraisal of their ability to manage the illness, and generally, the sense of control they have over their lives (Leventhal, Weinman, Leventhal & Phillips, 2008; Weinstein & Quigley, 2006). Making meaning of the self, the future and the world based on information derived uniquely from the experience of cancer is what has been termed as cognitive processing of cancer. Spirituality/Religiosity has been identified as one of the variables that appear to be central of many individuals' "meaning systems" especially for those in Africa (Park, 2013). At diagnosis, the situational meaning they assign to their illness may be influenced by individuals' pre-illness spirituality. For instance, survivors may come to see God's purpose in their illness or try to reevaluate it as a chance for spiritual growth. They may also vigorously interrogate even the existence of God or whether their lives are determined by God (Cummings & Pargament, 2010). Park (2010) found that the effect between any of the meaning-making processes (situational cognitive processing and spirituality) and health outcomes are indirect and many different pathways are reported to influence these effects.

Based on the "functional-descriptive model of PTG" that was proposed by Tedeschi and Calhoun (2004), several factors including environmental characteristics like sociocultural influences, social support, level of distress from the trauma as well as individual characteristics like coping style and personality characteristics have been identified to influence the individual's confrontation with trauma (Calhoun & Tedeschi, 2006). Tedeschi and Calhoun (2004) pointed out that one of the variables that significantly influence the development of PTG is the Coping process. According to Lazarus and Folkman (1984), Coping is conceptualized as "cognitive and

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behavioral mechanisms that people use to deal with the distress caused by a demanding experience". Associated with cognitive processing, the type of coping style used in close succession to the trauma may determine the level of growth. In fact, both emotion-focused and problem-focused coping are noted for having a positive association with PTG (Linley & Joseph, 2004).

In the PTG model, Social support plays a major role. Not only does it provide reassurance, comfort and assistance and confidence, but an avenue for empathic listening is provided which offers a companion for cognitive and emotion processing and promotes emotional expression which is essential for coping with difficult life experiences. A supportive social environment plays an important role in the PTG process because it grants individuals with information and enables the cognitive processing and permits them to talk about the trauma (Tedeschi & Calhoun, 2004). Aiding in the successful adjustment for traumatic experiences, Social support becomes a predictor for PTG through its influences on the Coping process (Nolen-Hoeksema & Davis, 1999). New contacts and friendships, more compassionate behaviors and opportunity for closest relationships may be created through the positive changes that occur in many areas of the survivor's life due to the support they receive in the phase of difficult times (Prati & Pietrantoni, 2009).

Also, the functional descriptive model of PTG has included personality characteristics such as optimism (Tedeschi & Calhoun, 2004). It has been proposed that optimists emphasize the positive aspects of their situation, allowing them to take an active, problem-focused style of dealing with stressors (Tedeschi & Calhoun, 1995).

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Statement of Problem

There is a high prevalence rate of breast cancer globally (World Cancer Report, 2014). In Ghana, the diagnosis of breast cancer is also on the rise (Laryea et al, 2014; Ohene-Yeboah & Adjei, 2012). For women in sub-Saharan Africa, the mortality rate of breast cancer is high compared to women in other developed countries since breast cancer is characterized by late presentation, advanced and aggressive forms of the disease as well as negative attitudes such as late presentation and non-adherence to treatment (Opoku, Benwell & Yarney, 2012). However, due to advances in screening and educational programs which have led to early detection coupled with improved treatment, the global rate of survival is on the rise (Coleman et al., 2008). Today, the incidence of surviving cancer for more than 5 years globally is 2 in 3 adults diagnosed (Ries et al., 2006). Though breast cancer mortality in Africa is high compared to rates in other Western countries, Ghana's overall survival rate of breast cancer is reported as 47.91% (Mensah et al., 2016). This shows that at least a close to a half of women who experience breast cancer in Ghana is expected to survive the disease.

There exist a great number of women who experience the long-lasting costs of the breast cancer since the rate of survival for breast cancer patients is improving. Therefore, there is a rising concern to look at how these survivors are adjusting to life after cancer. However, the majority of the studies in Ghana on breast cancer have neglected the survivors as well as their posttraumatic experiences or how they are adjusting after cancer. Primarily, epidemiological trends (Boyle, 2012; Ohene-Yeboah & Adjei, 2012); awareness and its screening policies (Clegg-Lamptey & Hodasi, 2007; Opoku, Benwell & Yarney, 2007); genetic correlates and its prognosis of breast cancer types (Owiredu et al., 2009; Stark et al., 2010); ways of improving on medical treatments (Clegg-Lamptey, Dakubo & Attobra, 2009); well-being, help-seeking behaviors and quality of

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life of the patients (Clegg-Lamptey et al., 2009). There is limited knowledge about how these women adjust to life after their treatment within the Ghanaian setting. Hence the need to study how breast cancer survivors in Ghana are adjusting positively after cancer as well as the variables that are aiding them in this growth process.

Aims and Objectives

Aim

The aim of the study is to assess Posttraumatic Growth in breast cancer survivors in Ghana and the factors that relate and impact on Posttraumatic Growth.

Objectives

- To assess the prevalence of Posttraumatic Growth and its domains ("New Possibilities", "Spiritual Change", "Appreciation of Life", "Personal Strength" and "Relationship with Others") in BCS in Ghana.
- To assess the association of socio-demographic variables with Posttraumatic Growth To assess the association disease/treatment variables with Posttraumatic Growth
- To assess whether psychosocial variables (Optimism, Social Support, Coping, Cognitive Processing and Religiosity) predict Posttraumatic Growth

Relevance of the Study

The purpose of this study is to investigate posttraumatic growth among survivors of breast cancer in Ghana and to examine the factors that impact on this construct. By understanding the adaptation process after diagnosis and post-treatment, finding from this study could be of many benefits to professionals who work with cancer patients in clinical settings since they can focus

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on the possible positive consequences of cancer. In planning future rehabilitation programs for breast cancer patients, knowledge about PTG can be very helpful. With the understanding of the factors that may account for PTG in breast cancer survivors, healthcare providers and caregivers will know what to consider especially encouraging growth.

In addition, knowledge about PTG after breast cancer together with its associated factors can be very helpful for the education of health care professionals. Furthermore, this study will further add to the scientific literature on Posttraumatic Growth in Africa and Positive Psychology.

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CHAPTER 2

LITERATURE REVIEW

Theoretical Orientation

Shattered Assumption Theory (Janoff-Bulman, 1992; 2006)

Shattered assumption theory by Janoff-Bulman (1992; 2006) emphasizes assumptions about the world and how traumatic events can "shatter" such assumptions. According to Janoff-Bulman (2006), there are three fundamental assumptions individuals hold which are: "the world is benevolent; the world is meaningful, and the self is worthy". Such assumptions afford individuals with a sense of security and safety. According to Janoff-Bulman (2006), assumptions are broader and encompass schemas (which are narrower in scope and are largely influenced by daily interactions with the world) and can be challenged by significant life crises like serious illnesses such as Cancer (Janoff-Bulman, 2006). Janoff-Bulman (1992) proposes that before experiencing a traumatic or life changing event in this case breast cancer, the world is considered a safe and just place. One's sense of meaning in life including comprehensibility, meaningfulness of one's assumptive world and self-concept is called into question due the diagnosis and treatment of life-threating illnesses like breast cancer (Janoff-Bulman, 2006). It is assumed that following the diagnosis of cancer, instead of assuming the world is predictive and controllable, the world becomes dangerous, unsafe, and unpredictable; one's inner world becomes fragile and summons with uncertainty leading to feelings of vulnerability (Janoff-Bulman, 2006). Following treatment of cancer, subsequently, individuals attempt to rebuild their devastated assumptions and their shattered beliefs about the world and the reconstructed assumptions may be different than their pre-event assumptions about the world (Janoff-Bulman,

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2006). With processes such as coping and social support, Janoff-Bulman (1992) further hypothesized that individuals rebuild and reconstruct their assumptions to adjust to life after trauma and this brings about growth (Janoff-Bulman, 1992; 2006).

Organismic Valuing Theory (Joseph & Linley, 2005)

Their theory is emphasized within a positive psychology framework and assumes that individuals are inherently motivated to achieve growth (Joseph & Linley, 2005; 2008). Organismic Valuing Theory focuses on the integration between appraisal processes and personality/assumptive world. Organismic Valuing Theory assumes that individuals following traumatic events such as surviving cancer, the individual navigates through a series of appraisals, coping styles and emotional states to either assimilate or accommodate trauma-related information (Joseph & Linley, 2005; 2008). The theory further suggests that there are three means by which individuals process and cognitively interpret information. First, breast cancer survivor may use maladaptive coping strategies to maintain a presence in their current assumptive world. These individual returns to pre-levels of event functioning. He/she then develops strict defense mechanisms that may make them more vulnerable to future stressful or traumatic events (Joseph & Linley, 2005; 2008). Secondly, survivors who can accommodate trauma-related information, or change their worldviews, can either achieve positive or negative value direction. Those who positively accommodate may use adaptive coping strategies, by appraising and accepting the new trauma information. Positive accommodation may lead to PTG (e.g., increased personal strength, change in life perspective, improved interpersonal relationships with others). Experiences that are accommodated in a negative direction, by use of maladaptive coping strategies, lead to negative outcomes and increased psychopathology (Joseph & Linley, 2005; 2008). Finally, Organismic

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Valuing Theory also stresses that supportive others and social support are important in the aftermath of trauma. Specifically, the process of assimilation and accommodation are influenced by the individuals in one's environment. Joseph and Linley (2008) theorized outcomes to be contingent upon the degree in which individuals are open to changing their pre-existing schemas about life.

The Meaning Making Model (Park, 2010)

The Meaning Making Model distinguishes between "global and situational" meaning making (Park & Folkman, 1997). The general way an individual has been oriented and how he/she generally views many situations has been referred to as Global meaning, while situational meaning on the contrary refers to meaning one derives concerning a specific instance or situation in this case breast cancer. The Meaning Making Model suggests that the awareness of incompatibilities between people's global meaning they hold about the world and their appraised meaning of a situation due to discrepancy-based nature creates distress (Park, 2010), which in turn increases their efforts to decrease the subsequent distress or discomfort. Both emotion-focused and problem-focused coping strategies are some of the many ways these discrepancies can be decreased (Aldwin, 2007). Nevertheless, Park, Folkman, and Bostrom (2001) have stated that in situations which are not responsive to direct repair or problem-solving, such as serious illness and loss, meaning-making is often the most adaptive. Involved with meaning making is the survivors' search for a more favorable understanding of the situation and its implications as well as reexamining global beliefs and revising goals together with question or revise one's sense of purpose in life (Park, 2010; Wrosch, 2010). Predominantly if the adequate meaning is created or found, the outcome of a successful rebuilding process may lead to better adjustment, whereas the result of unproductive and protracted meaning-making efforts may be maladaptive

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rumination of the event (Segerstrom, Stanton, Alden, & Shortridge, 2003). Together with changes in global meaning, changes in the way one appraises a situation such as growth, revised identity and views of the world are results of the meaning made (Park, 2010). Park (2013) has indicated that the subsequent adjustment and coping survivors experience are predicted by the meanings that survivors assign to their illness.

The Transformational Model of Positive Change (Tedeschi & Calhoun, 1995)

The transformational model proposed by (Tedeschi & Calhoun, 1995) is one of the most complete and widely used models of growth. According to Tedeschi and Calhoun (1995, 2003), the outcome of excessive rumination (or cognitive processing) following the life-threating event is posttraumatic growth. Following such a life-threating event such as cancer diagnosis, the individual is presented with various challenges including the management of emotional distress and the person then goes through three stages in managing the excessive rumination. At the Initial stage, the survivors learn to manage intrusive and automatic thoughts which they experience over time until they engage in "deliberate rumination" (Tedeschi & Calhoun, 2008; Hefferon & Boniwell, 2011). Next, in attempt to reduce emotional distress, they engage in self-disclosure while dealing with these thoughts. Finally, they begin disengaging from previous goals which results to changed narrative and schemas (Tedeschi & Calhoun, 2008). According to Tedeschi and Calhoun (2008), in addition to wisdom or preparedness, the person can achieve posttraumatic growth once these processes have been completed.

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Model of Life Crisis and Personal Growth (Schaefer & Moos, 1992)

This model posits that in the aftermath of trauma both personal and environment factors impact life crises. All the components in their model are linked by feedback loops, which have the potential to influence one another. Their model considers such individual characteristics as socio-demographic, socioeconomic, prior crisis experience and health status and environmental factors include social support (e.g. family, friends, and co-workers). Factors related to the event, including the timing of the event, duration, severity and whether the event affects an individual or group of people are also relevant to this model (Schaefer & Moos, 1992). Schaefer and Moos (1992) proposed that after experiencing traumatic events like breast cancer, there are three primary outcomes can result from it: increases in social resources (e.g., better relationships with members of the family and friends), increases in personal resources (e.g., self-understanding, cognitive differentiation, empathy, assertiveness, altruism and maturity); and the development and increase of coping skills (e.g., ability to think through problems, regulate affect and seek help when needed) (Schaefer & Moos, 1992). The coping style appears to play an important role in experiencing PTG, as well as positive and negative health outcomes in general (Schaefer & Moos, 1992).

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Review of Related Studies

Prevalence of Posttraumatic Growth in Chronic Diseases

Studies on posttraumatic growth have been conducted on several populations in the health sector including people with chronic diseases such as diabetes and HIV ; other cancer populations such as survivors of stomach cancer, survivors of colorectal cancer , survivors of childhood cancers; survivors with mixed cancer diagnosis; breast cancer patients and Breast Cancer Survivors have noted that individuals experienced positive growth from their illness experience (Arpawong et al., 2013; Barthakur et al., 2016; Brix et al 2013; Danhauer et al., 2015; Danhauer et al., 2013; Dirik et al., 2016; Kolokotroni et al., 2014; Liu et al., 2014; McDonough et al., 2014; Mehrabi et al., 2015; Parikh et al., 2015; Ruini et al., 2013; Shand et al., 2015; Sim et al., 2015; Wang et al., 2014). However, different levels and domains of posttraumatic growth have been reported for different populations. For example, in a study by Romeo, Ghiggia, Tesio, Di Tella, Torta and Castelli (2017) with the aim of evaluating the level of PTG and its relationship with socio-demographic, clinical, and psychological variables in a sample of Italian BC survivor using a cross-sectional survey method, they found that a moderate positive psychological change after BC with the most changes in the “Appreciation of life” category and the least positive in “spiritual changes” were presented by the participants.

In another study with the purposed of investigating the correlates and prevalence of PTG as well as the relationship between health-related quality of life and PTG among Korean stomach cancer survivors, Sim et al., (2015) in a cross-sectional study found that majority of the participants reported experiencing moderate to high levels of PTG. The authors reported that the most common domain of growth reported were “Change of self-perception”, followed by “new possibilities”, “spiritual change” and “relating to others”.

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In a comparative study, Brix, Bidstrup, Christensen et al. (2013) also found that significantly higher PTG in the domains of "appreciation of life" and "relating to others" were experienced by women with breast cancer compared to BC-free women.

Schroevers and Teo (2008) investigated the prevalence of posttraumatic growth in Malaysian cancer patients using a cross-sectional survey. They found that "appreciation of life" was the most reported domain of posttraumatic growth reported by many patients in Malaysia.

In a qualitative study, Fallah, Keshmir, Kashani, Azargashb, and Akbari (2012) explored posttraumatic growth in Iranian breast cancer survivors. They found that overall posttraumatic growth occurred in the Iranian breast cancer survivors and these happened in three domains of their life which are "spiritual growth", "appreciation of life", and "increasing personal strength".

In another qualitative study, Mehrabi et al. (2015) investigated experiences of Iranian women Iranian women with breast cancer relating to PTG. Results show that "stability", appreciate of life", "effective interaction" and "spiritual prosperity" were the four prominent themes that came out of the participant's statements that demonstrated that the experiences of women with breast cancer in Iran induced psychological growth and maturity.

Using a mixed method, Barthakur et al. (2016) conducted a study which aimed to understand from an Indian perspective the occurrence of PTG in women who have survived breast cancer. Results indicate that in varying forms, PTG was evident through changes in "a better understanding of self", "perspective toward life", "and richer spiritual dimension of life" and "closer/warmer relationships with others."

Findings from these studies cannot be generalized to Ghanaian women who have also survived breast cancer because these studies did not include or consider African or Ghanaian population.

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Posttraumatic Growth among Breast Cancer Survivors in Ghana

In Ghana, there has been very limited studies that have focused on the psychosocial outcomes of breast cancer. For example, in a review of studies on breast cancer done in Ghana between 1956 and 2012 by Atobrah (2013) showed that 32.4% of cancer researches done in Ghana are done on breast cancer. In her review, she found that in Ghana, most of these researches have focused on the prevalence of breast cancer, the nature of the disease including the surgical material of the lump and the clinic-pathological features of the female breast, the biomedical treatments options, risks, presentation, diagnosis, and pattern and profiling of the disease. Very few studies had paid attention to the impact of psychosocial factors. Even these few studies that focused on psychosocial factors have been trying to answer the question about patients' non-compliance to treatment (late presentation and discontinuation of biomedical treatment) (Opoku, Benwell & Yarney, 2012). As a result, most of these studies have documented negative sequel of breast cancer such as fear, guilt, stigma, pain, financial challenges and much more. These psychosocial reactions are mostly influenced by their sociocultural norms, beliefs, and expectations of the breast cancer experience which then affects their health behavior (Atobrah, 2013). Studies in this reviewed work have totally failed to pay attention to the life after breast cancer and how patients who successfully go through the treatment are adjusting to their new life.

Bonsu, Azito, and Clegg-Lamptey (2014) used a qualitative exploratory method to explore the psychological and emotional experiences of women in Ghana who live with advanced breast cancer in the Kumasi metropolis. Findings from this study reveal that in addition to the negative psychological outcomes such as Sadness, Fear, Anxiety, pain, loss of hope in marriage parenting that women with breast cancer face, the women showed a strong desire to live which was mainly influenced by their high reliance on religiosity as a meaning-making process which helps them to come into a state of acceptance and subsequently have a strong will to live.

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Posttraumatic Growth among Breast Cancer Survivors in Ghana

In a recent study done by Boateng (in press) to assess the psychological distress and quality of life of women at various stages of breast cancer treatment journey in Ghana compared to their healthy controls, using both quantitative and qualitative method, she found that, generally the psychological distress is very high among breast cancer patients whereas their physical health, quality of life and psychological wellbeing were very poor compared to the control group. From the qualitative data, results indicate that in the midst of psychological distress mainly due to the breast cancer diagnosis and treatment those patients receive, women especially those in their later stage of the treatment reported to have hope and regain confidence that they will survive. Being religious about their cancer experience was identified as the main coping strategy which helps the women to deal with the distress from breast cancer and allows them to use other coping mechanisms.

Though these two studies have reported some positive trends in the life of breast cancer patients undergoing treatment in Ghana, no study was found that has documented how patients who have successfully gone through the treatment are adjusting to life positively.

Socio-demographic and Disease/Treatment Related Variables and Posttraumatic Growth

Some socio-demographic variables have been observed to be associated with PTG in some studies done. Age, education, socioeconomic and marital status (Sim et al., 2015; Shand et al., 2015; Yi et al., 2015; Wang et al., 2014; Kolokotroni et al., 2014; Brix et al., 2013; Jansen et al., 2011).

Some have also found weak correlations between demographic and PTG (Arpawong et al., 2013; Svetina et al., 2012). The time since diagnosis, the type of treatment and the stage of disease are some disease/treatment related factors that have been known by some researchers to have an

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association with PTG (Brix et al., 2013; Dirik et al., 2016; Jansen et al., 2011; Kolokotroni et al., 2014; Tomich & Helgeson, 2012). The weak relationship has also been found concerning disease/treatment-related characteristics and PTG (Arpawong et al, 2013; Sim et al., 2015; Svetina et al., 2012). For example, as far as the relationships between the PTGI scores and socio-demographic variables are concerned, Romeo et al (2017) found that there was a significant negative correlation between Age and the "New possibilities" subscale scores and "Appreciation of life" subscales scores of PTGI. It was also reported that Years of education was not correlated with PTGI scores. In addition, a significant differences in the PTGI levels between patients who had a partner (married, cohabiting) and those who did not (single or separated) was found. Specifically, women with a partner presented significantly higher scores on "recognition of new possibilities", "interpersonal relationships", and "a greater appreciation of life" than patients without a partner.

As for the clinical variables, Romeo et al. (2017) found that years since diagnosis significantly positively correlated with the "Personal strength" and "Appreciation of life" subscale scores. In addition, women with malignant breast cancer showed a significantly greater "appreciation of life" than women with benign cancer. Women who underwent Chemotherapy Therapy showed higher levels of PTG compared to women who underwent Hormone Therapy.

Rahmani et al. (2012) adopted descriptive-correlational design to examine the level together with the determinants of posttraumatic growth in cancer patients in Iran. Outcomes indicated that a significant association was observed between age, educational level and radiotherapy treatment history and experience of posttraumatic growth.

In a study to determine the level of PTG, Wang, Liu, Wang, Chen and Li (2014) used a descriptive research design to identify associated socio-demographic and clinical factors among

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breast cancer survivors in China. Results showed an average PTGI-SC score among Chinese breast cancer survivors. This is an indication that PTG is present in breast cancer survivors in China. It was found that educational level and household income have positive influence on PTG. PTG was highest for survivors who were retired, those who were working had moderate PTG, and PTG was lowest for women on sick leave. Also, Survivors with comorbid chronic diseases had lower PTG.

Sim et al. (2015) found that among Korean stomach cancer survivors, Age, Socioeconomic status and Religion were associated with PTG. Cormio et al. (2017) found that higher PTGI average score was observed for long-term disease-free cancer survivors in Italy who were more educated, employed and with longer time from diagnosis as well as those with no comorbidities. Brix et al. (2013) also found that Age was negatively associated with overall PTG and time since the surgery was positively related with overall PTG. They also found that the size of the tumor was associated positively with overall PTG and the domains of "personal strength", "appreciation of life" and "relating to others". Also, associated positively with overall PTG was the number of positive lymph nodes which impacted the domains of "spiritual change" and "relating to others". Compared to patients who had undergone lumpectomy, having undergone mastectomy was positively associated with overall PTG and with the domains of "personal strength" and "relating to others". Again, positively associated with the domain of "appreciation of life" was going through endocrine treatment. This implies that the development of PTG is influenced by the severity of disease.

Tanyi, Szluha, Nemes, Kovács, and Bugán (2015) used cross-sectional study to examine how cancer-related factors and sociodemographic predict PTG following a cancer diagnosis among breast or prostate cancer patients immediately before undergoing radiotherapy. Results show that

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younger age significantly predicted PTG total score and "New Possibilities" subscale score. Also, subjective severity of cancer was associated positively with the PTG total score and subscales scores on the "Appreciation of Life" and "New Possibilities" domains. The authors, therefore, concluded that sociodemographic and cancer-related variables may contribute significantly to growth.

Sim et al. (2015) found no relationship between disease-related variable and PTG among Korean stomach cancer survivors. Svetina and Nastran (2012) found a weak relationship between demographic and illness-related variables and PTG among breast cancer patients in Croatia. Lelorain et al. (2010) also found that demographic and medical variables poorly predict PTG.

Psychosocial factors and Posttraumatic Growth

Coping and Posttraumatic Growth

Pat-Horenczyk, Perry, Hamama-Raz, Ziv, Schramm-Yavin, and Stemmer (2015) conducted a case-control study on breast cancer survivors to investigate the impact a building-resilience intervention has on coping and posttraumatic growth (PTG). Results from this study show that, more than half of the participants reported increased PTG at 6 months. The participants in the intervention group reported increase in both positive coping and PTG which was significantly greater than what the control group reported. Additionally, as compared to those in the control group, participants in the intervention group reported higher proportion of PTG. Therefore, they concluded that interventions should not center on only building cancer survivor's PTG but along with building their coping skills. Reviews and studies by (Park et al., 2016; Dirik et al., 2016; Shand et al., 2015; Danhauer et al., 2015; Kolokotroni, et al., 2014; Brix et al 2013; Danhauer et al., 2013; Svetina et al., 2012; Koutrouli et al., 2012; Schmidt et al., 2012) showed a positive

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association between Coping and PTG. For instance, Schroevers and Teo (2008) in a cross-sectional study using the PTGI and Brief Cope found that among Malaysian cancer survivors, the coping strategies that were associated with more posttraumatic growth were humor, instrumental support and positive reframing.

In another cross-sectional study to assess the role of coping and goal reengagement on posttraumatic growth, Schroevers, Kraaij and Garnefski (2011) investigated how positive and negative changes are related and how they are associated with positive and negative affect. Findings from this study indicate that variables associated with more positive changes were the patient's use of approach coping (goal reengagement and positive reappraisal) whereas use of avoidant coping (self-distraction) was associated with more negative changes.

Oginska-Bulik and Kobylarczyk (2015) also performed a study in a group of paramedics with the purpose of investigating the mediating role of coping strategies for stress in the relationship between resilience and post-traumatic growth. Denial and Venting of negative emotions appeared as suppressors in the analyses of the relationship, while planning plays mediating role between resilience and post-traumatic growth. The authors concluded that in the process of post-traumatic growth, both problem-focused strategies and avoidance are important.

Büyükaşik-Çolak, Gündoğdu-Aktürk and Bozo (2012) performed a study to examine the relationship between posttraumatic growth and dispositional optimism and also assess whether coping strategies mediated this relationship in postoperative breast cancer patients. Results revealed that problem-focused coping fully mediated the relationship between dispositional posttraumatic growth and optimism, but emotion-focused coping could not mediate the relationship between optimism and PTG. Thus, postoperative breast cancer patients who were

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more likely to use problem-focused coping strategies and were optimistic led to the development of posttraumatic growth.

In another study, Turner-Sack et al. (2012) examined associations between coping strategies, posttraumatic growth and psychological distress in adolescent survivors of cancer. Results showed less use of avoidant coping strategies and younger age at diagnosis predicted higher levels of posttraumatic growth. Also, the use of more acceptance coping strategies and adolescents' beliefs that they were more likely to relapse predicted higher levels of posttraumatic growth.

Yeung et al. (2016) did a study which was aimed to apply the stress and coping model and the self-determination theory to further understand the psychological factors (including basic psychological needs satisfaction and coping variables) that promote PTG in a sample of 454 college students who are an ethnically diverse. Results show that after controlling for gender, the level of current distress due to the most traumatic event and the number of types of traumatic events the satisfaction of relatedness need, challenge appraisal, emotional expression, positive reframing and acceptance were associated with higher PTG.

Lelorain et al. (2010) estimated the prevalence and predictors of PTG after breast cancer and how it relates with psychological health among women who are disease-free 5-15 years after diagnosis. They found that, the variables: “active coping, dispositional positive affectivity and adaptative coping, religious coping, relational coping and to some extent denial coping” have an influence on PTG.

Optimism and Posttraumatic Growth

Optimism has been known to be positively related to PTG (Arpawong et al., 2013; Büyükaşik-Colak et al., 2012; Dirik et al., 2016; Kolokotroni et al., 2014; Koutrouli et al., 2012; Park et al.,

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2016; Shand et al., 2015; Yi et al., 2015). For example, Ho et al. (2011) conducted a cross-sectional study to investigate the association of Optimism, the positive Coping Strategies and Hope on PTG in oral cavity cancer patients in China, where they found that Optimism and Hope have significant positive correlation with PTG and accounted for 25% variance of Posttraumatic Growth. Married patients showed high levels of PTG when compared to unmarried patients.

Social Support and Posttraumatic Growth

Some reviews and studies have shown that, social support was positively related to PTG (Danhauer et al., 2015; Danhauer et al., 2013; Dirik et al., 2016; Kolokotroni et al., 2014; Koutrouli et al., 2012; McDonough et al., 2014; Park et al., 2016; Shand et al.,2015; Svetina et al., 2012; Yi et al., 2015). For example, Schroevers, Helgeson, Sanderman and Ranchor (2010), in a longitudinal study examined the relationship between emotional support after diagnosis of cancer and the experience of posttraumatic growth, at 8 years after diagnosis of cancer in a study which centered on three distinct types of emotional support: actually received support, dissatisfaction with emotional support received and perceived availability of support. Characterized by problem-solving comforting and reassuring, the findings suggest that getting support from friends and family in the period following diagnosis help cancer survivors to find positive meaning in the cancer experience (Schroevers et al, 2010).

In other to examine the role perceived social support play in enhancing PTG in cancer patients Tanriverd et al. (2012) used a cross-sectional study which involved 105 cancer patients. Relatively high levels of PTG and social support were reported by participants. Variables that were significantly positively associated with the development of PTG among cancer patients include total perceived social support, support from family, and friends.

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Posttraumatic Growth among Breast Cancer Survivors in Ghana

In a cross-sectional study performed Zhou et al. (2017) which aimed to increase our understanding the relationship between PTSD and PTG by examining simultaneously the role of social support and emotion regulation in PTSD and PTG among Ya'an earthquake survivors who were adolescents. Results indicate that Social support had a significant direct association with PTG and a positive indirect prediction on PTG through cognitive reappraisal.

Baglama and Atak (2015) conducted a cross-sectional survey to examine the relationship between locus of control, social support, dispositional hope and posttraumatic growth among breast cancer postoperative patients in North Cyprus. Results from this study showed a significant positive relationship between social support and posttraumatic growth.

Cormio et al. (2017) in a cross-sectional study assessed the existence of PTG in long-term disease-free cancer survivors in Italy. They also explore the association between the dimensions of PTG and demographic variables, clinical, various agents of perceived social support and psychological distress. In their findings, it was indicated that PTG was not found to be correlated with distress, nonetheless it correlated with perceived social support.

However, another study by Hill and Watkins (2017) which used a cross-sectional survey to examine the role of social support and rumination in psychological distress, psychological well-being and posttraumatic growth among women with ovarian cancer in USA found that social support did not predict PTG. However, Social support positively correlated with the “Relating to Others” domain of PTG.

Cognitive Processing and Posttraumatic Growth

Some studies have identified a positive relationship between cognitive processing and PTG (Bussell et al., 2010; Chan et al., 2011; Cohen & Numa, 2011; Gall et al., 2011; Kolokotroni et

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al., 2014). For example, Cohen and Numa (2011) performed a study to assess the relationship between PTG and emotional expressing, emotional and cognitive processing, and social support in volunteer and non-volunteer breast cancer survivors. Relatively, participants in both groups reported similar high levels of PTG. The study variables accounted for 31% of PTG variance, with cognitive and emotional processing being significant predictors.

Gangstad, Norman, and Barton (2009) examined whether PTG is associated with psychological distress and cognitive processing in stroke patients. They also explored whether the time since stroke moderate relationships between these variables. Findings indicate that four indicators of cognitive processing (i.e., positive cognitive restructuring, downward comparison, resolution, and denial) correlated positively with PTG and negatively with depression. therefore, they concluded that PTG is possible after stroke and cognitive processing plays an important role in this process for promoting such growth

Religiosity/ Spirituality and Posttraumatic growth

Religiosity or spirituality have been known to be positively related to PTG among non-western cultures such as India and China (Danhauer et al., 2013; Park et al., 2016; Shand et al., 2015). For example, Bellizzi et al. (2010) in a comparative study examined the relationship between religiosity, race and PTG. They also assessed the association between PTG and health-related quality of life in African American and White breast cancer survivors. Results revealed that higher levels of PTG were reported by African American breast cancer survivors compared to White women. Findings also show that the relationship between one's ethnicity and posttraumatic growth was mediated by religiosity. Again, Gesselman, et al. (2016) conducted a study which intended to assess how emotional distress, spirituality and PTG are associated for

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BCS and their partners. They found that greater levels of spirituality were associated with increases in PTG for BC survivors and their partners. They also found no association between BCS and partner spirituality and emotional distress. They therefore concluded that spirituality is associated with growth in BCS and their partners following diagnosis and treatment of breast cancer. Ai et al. (2013) used a cross-sectional survey method to explore the impact preoperative religious coping has on long-term postoperative personal growth as well as its potential mediators in this effect in patients undergoing cardiac surgery. Positive religious coping and a living status without a partner predicted PTG. Results further showed that social support, optimistic expectations, other religious factors and Medical indices were unrelated to PTG. they also found that, spiritual support mediates the role of positive religious coping and PTG. These results suggest that after surviving a life-altering operation, spirituality may play an important role in cardiac patients' PTG.

Other studies considering more than two psychosocial variables and Posttraumatic Growth

In a recent study which aimed to explore PTG level and how it's related to spirituality, social support and coping strategies among Polish rheumatoid arthritis patients, Rzeszutek et al. (2017) found that spirituality; coping strategies such as acceptance and return to religion and need for social support were significantly related to PTG levels among the participants.

Kim (2017) conducted a research aimed to test the variables of PTG based on an existing theoretical model of PTG in mothers of children with cancer. The variables of optimism, disruption of core beliefs, social support, and deliberate rumination accounted for 41.4% of the variance in the mothers' PTG. Social support and deliberate rumination are important factors directly affecting PTG.

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Posttraumatic Growth among Breast Cancer Survivors in Ghana

Park et al. (2016) did a study to identify the level of PTG and its correlates in patients with breast cancer in Korea. Findings show that a total score for the PTG was moderate in patients surviving breast cancer and this score was positively associated with having a religion, greater optimism, perceived social support, illness intrusiveness and cancer coping. Regression analysis showed that illness intrusiveness, cancer coping and optimism were statistically significant in patients' PTG.

A systematic review of studies by Casellas-Grau et al. (2016) show that being young, undergoing chemotherapy, and having social support were the sociodemographic, medical, and psychosocial characteristics associated with PTG. The findings further indicted that positive dispositional characteristics like optimism, socioeconomic status like level of education, the women's coping styles and the culture of the different samples were also associated with positive psychological functioning. In conclusion, they proposed that patient's perceived impact of breast cancer and their perceived support from significant others, can result in better functioning in women with breast cancer (Casellas-Grau, et al., 2016).

Koutrouli et al. (2016) through a cross-sectional study examined the levels of posttraumatic growth by exploring the relationships between medical, demographic, psychosocial variables and posttraumatic growth. The study also assessed the role social constraints plays in the relationship between automatic and deliberate cognitive processing of the trauma. The results showed that age at diagnosis and psychological distress was inversely associated with PTG while time since diagnosis was directly associated with PTG and indirectly associated with intrusions and psychological distress, through reflective rumination. Also, the relationship between intrusions and reflective rumination was moderated by Social constraints in the PTG process.

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Danhauer, Case, Tedeschi, Russell et al., (2013) used a longitudinal study to examined change in PTG over 2 years following breast cancer diagnosis. They also examined the role of multiple variables (sociodemographic, cancer-related, and psychosocial) associated with a change in PTG using Linear mixed effects models. Results indicate that mostly within the first few months following diagnosis, the total PTGI score had increased over time. Longer time since diagnosis, education level, and increases in social support greater baseline level of illness intrusiveness, spirituality, mental health and use of active-adaptive coping strategies were associated with greater PTGI in the longitudinal model.

Lelorain et al., (2012) explored how women who have survived cancer between 5- to 15-year integrate PTG in their overall cancer experience in a qualitative method (28 open interviews concerning changes). The analysis of results revealed women with high coping and social support and active cognitive processing reported statements which was specific to one thematic class of PTG.

Kolokotroni et al. (2014) reviewed quantitative studies concerning how PTG is associated with psychosocial factors in patients with breast cancer. They found that perceived the threat of the disease, Personality traits such as optimism and openness, cognitive processing of cancer like the use of deliberate rumination, social support, coping strategies such as problem-focused were identified to be related to PTG in women with breast cancer. Demographic characteristics such as age at cancer diagnosis were also found to play a key significant role in PTG.

Gaps and Rationale for the Study

Though several studies on PTG in Cancer survivors have been done among Breast Cancer patients and survivors and with different methods, varying and inconsistent results have been reported. Moreover, most studies on PTG in Cancer survivors have been conducted in western

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countries. Studies that explored posttraumatic experiences in breast cancer survivors within the Ghanaian context were extremely rare. It is well known fact that attitudes towards cancer differ between Western Cultures and African Cultures as well as their adjustment to the cancer and therefore factors that predict PTG in Ghanaians may also differ. Most studies on breast cancer in Ghana have focused primarily on the epidemiological trends (Boyle, 2012; Ohene-Yeboah & Adjei, 2012); awareness and its screening policies (Clegg-Lamptey & Hodasi, 2007; Opoku, Benwell & Yarney, 2007); genetic correlates of kinds of breast cancer and its prognosis (Owiredu et al., 2009; Stark et al., 2010); medical treatments and ways of improving on it (Clegg-Lamptey, Dakubo & Attobra, 2009); quality of life issues; well-being and help-seeking behaviors (Clegg-Lamptey et al., 2009). The majority of these studies on Breast Cancer in Ghana have neglected Survivors and more especially their positive experiences (Attobra, 2013).

Statement of Hypotheses

The present study seeks to test the following hypotheses.

Hypothesis 1: Demographic variables will be associated with Posttraumatic Growth

A. Age will be negatively associated with Posttraumatic Growth

B. Years of survival will be positively associated with Posttraumatic Growth

C. Women's marital status will be positively associated with their level of Posttraumatic Growth

Hypothesis 2: Disease/Treatment variables will be associated with Posttraumatic Growth

A. Type of Breast Cancer will be positively associated with Posttraumatic Growth

D. The Stage of Breast Cancer will be associated with Posttraumatic Growth

E. Type of treatment will be associated with Posttraumatic Growth

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Hypothesis 3: After controlling for demographic and disease/treatment factors, psychosocial variables will predict PTG.

i. Religiosity will predict Posttraumatic Growth

ii. Cognitive processing will predict Posttraumatic Growth

iii. Optimism will predict Posttraumatic Growth

iv. Social support will predict Posttraumatic Growth

v. Coping will predict Posttraumatic Growth

Conceptual Framework

The model below represents the relationships that were predicted for testing in this study. First of all, some demographic variable (Age, Years of survival, Marital status, type of breast cancer, Stage of breast cancer, Type of treatment) was perceived to have a positive association with PTG. Secondly, Psychosocial variables (Religiosity, Cognitive Processing, Optimism, Coping and Social support) were also expected to positively predict PTG.

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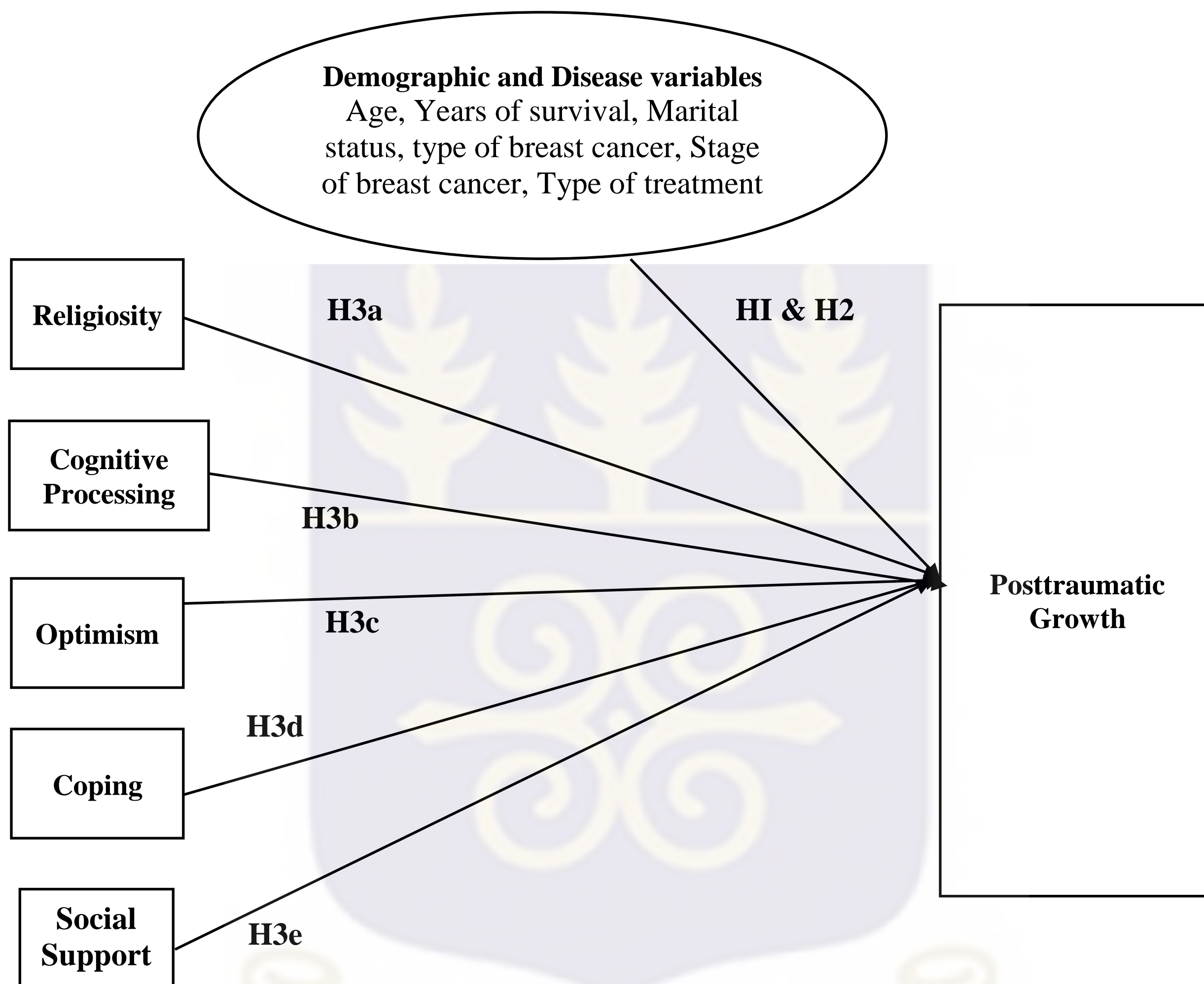

Figure 1 ***Conceptual Model Showing the Relationship between the Study Variables.***

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CHAPTER 3

METHODOLOGY

This chapter discusses the process of data collection in terms of the research setting/population, sample and sampling technique, the design, measures as well as the procedures involved in the data collection process. This section discusses the steps that were taken in gathering evidence to test the stated hypotheses.

Study Design

Since the study sought to obtain self-report information about breast cancer survivors' opinions concerning their post cancer experiences, the most appropriate design for this study is the cross-sectional survey. According to Rubin (2005), the cross-sectional survey is a type of research design that enables the researcher to collect a large amount of data across a wide range of people in a relatively short time using standardized questionnaires (Rubin, 2005). Cross-sectional surveys are used to gather information on a population at a single point in time. The advantages of using this method are that it is an efficient way of collecting information from a large number of respondents, less expensive, relatively easy to administer, permits anonymity and may result in more honest responses (Rubin, 2005).

Population

The population for this study was breast cancer survivors in Ghana (women who have been diagnosed and treated for breast cancer). Participants were selected from the OPDs of Peace and Love Hospital in both Accra and Kumasi. These settings were chosen because it is one of the private centers known for providing comprehensive breast cancer care. In addition, Peace and

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Love Hospital in Kumasi has a well-structured and organized support group for breast cancer survivors which is called Peace and Love Survivors Association (PALSA). PALSA was established in 2013 and it has a membership of more than 500 members. For convenience, participants were selected from members of this group who came for a check-up at Peace and Love Hospital the study. Participants who were included in this study met the following criteria:

- Must be 18 years and above
- Was diagnosed with breast cancer
- At least 6 months after chemotherapy courses and surgery have been done.
- Be willing to participate voluntarily

Exclusion Criteria

- Males
- women currently in active treatment (undergoing chemotherapy or surgery)

Sampling and Sample Size

The sample size for this study was a total of 105 breast cancer survivors who met the inclusion criteria. This sample size selection was based on the minimum sample size determination offered by Tabachnick and Fidell (2013; $N > 50 + 8m$ where m=number of variables) for regression analysis. Therefore, a study with 6 variables will need a minimum sample of 98 participants. Hence, a sample size of 105 was adequate for this study.

In selecting the actual sample for the study, different sampling techniques were used. Initially, the researcher adopted the purposive sampling technique to identify the participants who met the inclusion criteria. Purposive sampling technique helps in identifying the specific individuals that bare the most relevant data considering the topic of a study (Yin, 2011). Convenient sampling

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technique was used for selecting the participants for the study (i.e., survivors who were available at the OPD as at the time of data collection and consented to be part of the study).

Measures/Instruments

Sociodemographic and Disease/Treatment Characteristics

Self-report questionnaires were used to obtain Sociodemographic information such (e.g. age, marital status, level of education, years of survival) (see Appendix 1, section A). Disease and treatment information (e.g. disease type and severity, type of treatment etc.) were obtained from medical charts using a checklist (see Appendix 2).

Posttraumatic Growth Inventory (PTGI).

The Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) was used to assess Posttraumatic Growth. The PTGI is a 21-item self-report measure assessing five separate domains of posttraumatic growth: “New Possibilities” (5items, sample item: “I established a new path for my life”), “Relating to Others” (7items, sample item, “Putting effort into my relationships”), “Personal Strengths” (4items, sample item, “I discovered that I am stronger than I thought I was”), “Spiritual Change” (2items, sample item, “A better understanding of spiritual matters”), and “Appreciation of Life” (3items, sample item, “Appreciating each day”). Respondents were asked to indicate the degree to which they have experienced positive changes in their lives following the breast cancer diagnosis. The items were rated on a 6-point Likert-type scale ranging from 1 (*not at all*) to 6 (*a very great degree*), with higher scores indicating higher growth. A total PTGI was used as a measure of PTG. The highest score that one can obtain on PTGI is 126 and the least score one can obtain is 21. Scores from 21- 83 indicate low levels of growth, 84-104 indicate moderate levels of growth and scores from 105- 126 indicate higher

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levels of growth. Internal consistency reliability (Cronbach's alpha) ranged from .90 to .95 for the total scale (Brunet, McDonough, Hadd, Crocker & Sabiston, 2010; Tedeschi & Calhoun, 1996). Test–retest reliability for PTGI has been reported as r =.71 (Tedeschi & Calhoun, 1996) (see Appendix 1, Section B).

Cognitive Processing of Trauma Scale (CPOTS)

Cognitive processing was measured with Cognitive Processing of Trauma Scale (Williams et al., 2002). The Cognitive Processing of Trauma Scale (CPOTS) measures five aspects of cognitive processing: "Positive Cognitive Restructuring", "Downward Comparison", "Resolution", "Denial", and "Regrets" (Williams et al., 2002). The scale consists of the 17-item test in which statements are rated on a 7 point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scale was scored and a total score of the scale was used. Scores ranged from 17 to 119. A higher score indicates higher Cognitive Processing. The entire scale has a Cronbach's alpha of .80 to .85 (Williams et al., 2002) (see Appendix 1, Section C).

Life Orientation Test- Revised (LOT-R)

The Life Orientation Test-Revised (LOT-R) by Scheier, Carver, and Bridges (1994) was used as a self-report measure of Optimism. It is comprised 10 items measuring Optimism versus Pessimism: 3 items for Optimism, 3 items for Pessimism, and 4 filler items. Each item is rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Items 3, 7, and 9 are reverse scored. Items 2, 5, 6, and 8 are fillers and are not to be scored. Scoring is kept continuous. The total scores of the LOT range from 6 to 30 with higher scores indicating higher levels of Optimism. Internal consistency of the LOT has been reported to be acceptable with $\alpha = .85$ (Scheier et al., 1994) (see Appendix 1, Section D).

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Santa Clara Strength of Religious Faith Questionnaire

The Santa Clara Strength of Religious Faith Questionnaire assesses a person's strength and dedication to his/her spiritual conviction, irrespective of his/her religion (Plante & Boccaccini, 1997). It is suitable for individuals from diverse religious traditions since it is not restricted to a particular religion including no religious tradition. Respondents were asked to reply to 10 items regarding the extent to which they respect, depend and are dynamically drawn to their faith. The response format is a four-point Likert scale varying from 1 (Strongly Disagree) to 4 (Strongly Agree). Examples of items on the scale are: "I pray every day" and "My faith influences several of my choices." The scale has internal reliability (Cronbach Alpha = .94 - .97) (Plante & Boccaccini, 1997) (see Appendix 1, Section E).

The Brief COPE

The Brief COPE (Carver, 1997) was used to assess the participants' coping strategies. The Brief COPE is a 28-item self-report measure which is a measure of both maladaptive and adaptive coping skills. Participants rate their degree of use of these strategies on a 4-point scale ranging from 1 (not at all) to 4 (doing a lot). This tool has been developed to assess 14 different ways people respond to stress which is: "Self-distraction" (e.g. "taking mind off things"); "Active Coping" (e.g. "concentrating efforts on doing something"); "Denial"; "Substance Abuse" ("including prescriptive medications for mood disorders"); "use of Emotional Support"; "use of Instrumental Support" (e.g. "getting advice from others"); "Behavioral Disengagement" (e.g. "giving up"); "Venting"; "Positive Reframing" ; "Planning" (e.g. "coming up with a strategy"); "Humor"; "Acceptance"; "Religion"; and "Self-blame" (Carver, 1997). Every dimension has two items. A score that ranges from 28 to 56 means the least use of psychological coping; 57 to 84

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means the moderate use of psychological coping and 85 to 112 means greater use of psychological coping. The internal consistencies for the fourteen domains range between .54 and .90 (Carver, 1997) (see Appendix 1, Section F).

The Multidimensional Scale of Perceived Social Support [MDSPSS]

The Multidimensional Scale of Perceived Social Support [MDSPSS] (Zimet et al., 1988) was used to measure Social support. The MDSPSS measures perceived sufficiency of support from three different sources: family, friends, and significant other. The MDSPSS consists of 12 items with 7-point Likert-type scales ranging from "very strongly disagree" to "very strongly agree". Four items are dedicated to measuring perceived social support from a particular source and the MSPSS measures the adequacy of support from three sources: family (items 3, 4, 8, 11), friends (items 6, 7, 9, 12) and significant other (item 1, 2, 5, 10). The scale is self-administered and a score of 69 to 84 is indicative of high social support, 49 to 68 indicate moderate social support and 12 to 48 indicates low social support. Reliability coefficient alphas for the scale and the subscales range from .85 to .91 (see Appendix 1, Section G).

Pilot Study

Reliability Analysis of Scales

One of the assumptions considered in this study has to do with reliability of the measures used in data collection. Reliability of a measure is defined as the stability or consistency of the measure (Gravetter, 2006). According to Gravetter, (2006) when the same people are measured at the same or similar conditions, a reliable measure should produce the same or similar results. A pilot study was conducted prior to the main study to determine the reliability of the scales employed in the study. This pilot study was conducted by administering the scales to 20 breast

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cancer survivors receiving an out-patient care at the Peace and Love Hospital. In this study, the internal consistency (Cronbach's Alpha) was used to assess the reliability of the scales and subscale and results are presented in Table 1 below.

Table 1: *Internal Consistencies of the Scales*

SCALE	Cronbach Alpha (α)
Posttraumatic Growth Inventory (PTGI)	**.90**
Subscales of PTGI	
Appreciation of Life	**.71**
Spiritual Change	**.52**
Personal Strength	**.79**
New Possibilities	**.57**
Relating to Others	**.75**
Cognitive Processing of Trauma Scale (CPOTS)	**.74**
Subscales of CPOTS	
Denial	**.50**
Positive Cognitive Reconstruction	**.84**
Resolution	**.62**
Regret	**.55**
Downward Comparison	**.66**
Life Orientation Test-Revised (LOT-R)	**.89**
Santa Clara Strength of Religiosity Questionnaire	**.91**
Brief COPE	**.98**
Subscales of Brief COPE	
Self-Distraction	**.95**
Active Coping	**.92**
Denial	**.89**
Substance Use	**.80**
Emotional Support	**.84**
Instrumental Support	**.87**
Behavior Disengagement	**.84**
Venting	**.77**
Positive Reframing	**.74**
Planning	**.75**
Humor	**.72**
Acceptance	**.88**
Religion	**.85**
Self-Blame	**.74**
Multidimensional Scale of Perceived Social Support (MSPSS)	**.87**

N= 20

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From Table 1 above, the overall Posttraumatic Growth Inventory (PTGI) has a Cronbach alpha value of .90 and the Cronbach alphas of the subscales range from .52 to.79. Apart from Spiritual Change and New Possibility subdomain of the PTGI which yielded relatively lower Cronbach alphas (.52 and .57 respectively), all the other scales were higher.

The overall Cognitive Processing of Trauma Scale (CPOTS) has a Cronbach alpha value of .74 and the Cronbach alpha of its subscales range from .50 to .84. Most of the subscales yielded high Cronbach alphas except for Denial and Regret subscales which yielded lower Cronbach alphas (.50 and .55 respectively).

The overall Life Orientation Test has a Cronbach alpha value of .89. The Santa Clara Strength of Religiosity Questionnaire has a Cronbach alpha value of .91.

The overall Brief Cope has a Cronbach alpha value of .98 and the Cronbach alpha of the subscales range from .72 to .95. The overall Multidimensional Scale of Perceived Social Support has a Cronbach alpha value of .87. These alphas are appropriate as described by Nunnally (1978). This indicated that most of the instruments in the study were reliable to be used. Therefore, no revision was made to the items on the scales.

Procedure

Ethical clearance was obtained from the Ethics Committee for Humanities (ECH), University of Ghana, Legon. After the approval was granted by ECH, an introductory letter was acquired from the Department of Psychology of the University of Ghana. The letter of introduction from the Department of Psychology, a copy of Research Proposal and the Ethical clearance certificates were sent to the management of Peace and Love Hospital for permission to conduct the study in the facility. After the permission was granted at Peace and Love Hospitals, a date was fixed for

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the commencement of the data collection. Two research assistants were recruited for the data collection and were given training on the administration of the questionnaires. The out- patient's departments of the hospitals were used for the data collection.

On the days of the data collection, the researchers were introduced to the patients waiting to see their doctors. The participants who meet the inclusion criteria were identified and the researcher and the two assistants engaged the patients individually. Details of the study were thoroughly explained in writing and orally by either the researcher or the research assistants to the participants and those who were willing to partake were giving an informed consent form to either sign or thumbprint. After obtaining consent from the participants, the questionnaires were given to the participants to fill. The respondents who could read and write were administered the questionnaires in a pen-and-paper form. Those who could not read and write were interviewed by following the questions on the questionnaires. During the data collection, those who could not finish were given the chance to go and their questionnaires were not included in the analysis. The data collection lasted for 4 weeks. The completed questionnaires were then sorted out for analysis.

Ethical Consideration

Research using human participants requires high ethical standards. Hence an ethical clearance was sought from the Ethical Committee for Humanities of the University of Ghana. The nature and purpose of the study were well explained to participants who were approached for the study and those who agreed to participate were given the informed consent form to sign before taking part in the study.

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Again, they were made aware of the voluntary nature of the study, their right to withdraw at any point in time without explanation or penalty and were also assured of privacy and confidentiality. After the study, the researcher also addressed any other concerns that participants had about the study in the form of debriefing.

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CHAPTER 4

RESULTS

This chapter presents the results of the analyses of the data by summarizing the key findings in appropriate tables. The SPSS version 22 was used in analyzing the data and series of statistical tests were used including descriptive statistics to summarize the data. The main inferential statistical tests that were used to analyze each hypothesis are discussed with reasons. The discussion of the tests is followed by detailed presentations of Tables with their interpretations. The key findings are summarized below.

Preliminary Analysis

Descriptive Statistics of the Variables

The characteristics of the respondents in the study are summarized in Table 2 below:

Table 2: Demographic Characteristics of the Participants in the Study

			N = 150	%
Variable	Minimum	Maximum	M	SD
Age	28	78	52.93	10.39
Years of Survival	6 months	14 years	5.01	3.30
Marital Status				
Single			8	7.6
Married			46	43.8
Divorced			29	27.6
Widow			22	21.0
Educational Level				
No School			16	15.2
Primary/JHS			42	40.0
Secondary/Vocational			18	17.1
Tertiary			29	27.6

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Continuation of Table 2: ***Demographic Characteristics of the Participants in the study***

Variable	N = 150	%
Employment Status		
Not employed	31	29.5
Employed Full-time	21	20.0
Employed Part-Time	3	2.9
Self-Employed	50	47.6
Religion		
Christianity	90	85.7
Islam	13	12.4
No Religion	2	1.9
Type of Breast Cancer		
Unknown	6	5.7
Ductal Carcinoma In Situ	12	11.4
Invasive Ductal Carcinoma	75	71.4
Mucinous Carcinoma of the Breast	5	4.8
Invasive Lobular Carcinoma	3	2.9
Recurrent & Metastatic Breast Cancer	4	3.8
Stage of Breast Cancer		
Unknown	9	8.6
Stage I	25	23.8
Stage II	40	38.1
Stage III	27	25.7
Stage IV	4	3.8
Type of Surgery		
Lumpectomy	26	24.8
Mastectomy	79	75.2
Chemotherapy		
Yes	105	100.0
Radiotherapy		
No	29	27.6
Yes	76	72.4
Hormone Therapy		
No	6	5.7
Yes	99	94.3

Summarized descriptive results are presented in Table 2. The respondents' age ranges from 28 to 78 years (M= 52.93, SD = 10.39). The Years of survival of the respondents range from 6 months to 14 years (M = 5.0, SD = 3.30). In terms of their marital status, 46 (43.8%) of the women were

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married. For the level of education, 42 (40%) of the participants were primary/JHS leavers. 50 (47.6%) were self-employed and 90 (85.7%) of the participants were Christians.

For the Disease/Treatment factors, 75 (71.4%) of participants were diagnosed with Invasive Ductal Carcinoma and 40 (38.1%) of the respondents were diagnosed with Stage II breast cancer. For the type of surgery done, 79 respondents underwent Mastectomy. All the respondents had gone through Chemotherapy and 72.4% had gone through Radiotherapy while 94.3% of them were undergoing Hormone Therapy.

Validation of Scales

All the scales measuring the study variables were validated in order to ensure that, they could actually measure what they are supposed to measure. The Exploratory Factor Analysis (EFA) was done with the aim of verifying whether the foreign measures are able measure the same constructs in the African setting. With this methodology, the individual items on the scales were analyzed in relation to the subthemes to establish the amount of variance that each component of the scale is able to account for in the overall variations. The EFA helped to ascertain whether the items of the corresponding scales would yield factor loadings that could be considered to be part of a single construct (Field, 2009).

Exploratory Factor Analysis of the Posttraumatic Growth Inventory

An EFA was performed on the PTGI items using Principal Components Analysis with Varimax rotation. Principal components analysis was used because the primary purpose was to identify and compute composite scores for the PTGI. The factorability of the 21 PTGI items which measures Posttraumatic Growth was examined. All the 21 items correlated with at least one other

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item (at least .3), which suggests reasons for factorability. The Bartlett's test of sphericity was significant ($\chi 2$ (210) = 1383.647, $p < .001$). The Kaiser-Meyer-Olkin measure of sampling adequacy was .847 which was above the commonly recommended value of .6 and the communalities were all above .3, additionally confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable with all 21items.

Only the first four components yielded eigenvalues greater than 1.0. Initial eigenvalues indicated that the first four factors explained 41.70%, 10.19%, 8.11% and 5.48% of the variance respectively. Solutions for first, second, third and fourth factors were each examined using varimax of the factor loading matrix. In each of the four components, more than 3 items loaded eigenvalues above .30. The four-factor solution, which explained 65.48% of the variance were maintained. Results are presented in Appendix 3.

Exploratory Factor Analysis of the Cognitive Processing of Trauma Scale

An EFA was performed on the CPOTS items using Principal Components Analysis with Varimax rotation. Principal components analysis was used because the primary purpose was to identify and compute composite scores for the CPOTS which was used as a measure for Cognitive Processing. The factorability of the 17 CPOTS items which measures was examined. All the 17 items correlated with at least one other item (at least .3) which suggests reasons for factorability. The Bartlett's test of sphericity was significant ($\chi 2$ (136) = 630.474, $p < .001$). The Kaiser-Meyer-Olkin measure of sampling adequacy was .79, above the commonly recommended value of .60 and the communalities were all above .30 further confirming that each item shared

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some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable for all 17 items.

Only the first four components yielded eigenvalues greater than 1.0. Initial eigenvalues indicated that the first four factors explained 30.37%, 11.43%, 8.53% and 8.17% of the variance respectively. Solutions for first, second, third and fourth factors were each examined using varimax of the factor loading matrix. In each of the four components, more than 3 items loaded eigenvalues above .30. The four-factor solution, which explained 58.50% of the variance were maintained. Results are presented in Appendix 4.

Exploratory Factor Analysis of the Life Orientation Test - Revised

An EFA was performed on the LOT-R items using Principal Components Analysis with Varimax rotation. Principal components analysis was used because the primary purpose was to identify and compute composite scores for the Life Orientation Test-Revised (LOT-R) which was used as a measure of Optimism. The factorability of the 10 LOT-R items was examined. All the 10 items correlated with at least one other item (at least .3) which suggests reasons for factorability. The Bartlett's test of sphericity was significant ($\chi 2$ (45) = 265.096, $p < .001$). The Kaiser-Meyer-Olkin measure of sampling adequacy was .71, above the commonly recommended value of .60 and the communalities were all above .30, further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable for all 10 items.

Only the first three components yielded eigenvalues greater than 1.0. Initial eigenvalues indicated that the first four factors explained 33.76%, 13.56% and 13.42% of the variance respectively. Solutions for first, second and third factors were each examined using varimax of the factor loading matrix. In each of the three components, more than 3 items loaded eigenvalues

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above .30. The three-factor solution, which explained 60.74% of the variance were maintained. See appendix 5 for results.

EFA of the Santa Clara Strength of Religious Faith Questionnaire

An EFA was performed on the Santa Clara Strength of Religious Faith Questionnaire items using Principal Components Analysis with Varimax rotation. Principal components analysis was used because the primary purpose was to identify and compute composite scores for the Santa Clara Strength of Religious Faith Questionnaire (SCSRFQ) which was used as a measure for Religiosity. The factorability of the 10 SCSRFQ items was examined. All the 10 items correlated with at least one other item (at least .3) which suggests reasons for factorability. The Bartlett's test of sphericity was significant ($\chi 2$ (45) = 366.203, $p < .001$). The Kaiser-Meyer-Olkin measure of sampling adequacy was .81, above the commonly recommended value of .60 and the communalities were all above .30, further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable for all 10 items.

Only the first two components yielded eigenvalues greater than 1.0. Initial eigenvalues indicated that the first two factors explained 40.12% and 14.77% of the variance respectively. Solutions for first and second factors were each examined using varimax of the factor loading matrix. In each of the two components, more than 3 items loaded eigenvalues above .30. The two-factor solution, which explained 54.89% of the variance were maintained. Results are presented in Appendix 6.

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Exploratory Factor Analysis of the Brief Cope

An EFA was performed on the Brief Cope items using Principal Components Analysis with Varimax rotation. Principal components analysis was used because the primary purpose was to identify and compute composite scores for the Brief Cope which was used as a measure of Coping. The factorability of the 28 Brief Cope items was examined. All the 28 items correlated with at least one other item (at least .3) which suggests reasons for factorability. The Bartlett's test of sphericity was significant ($\chi 2$ (378) = 1821.771, $p < .001$). The Kaiser-Meyer-Olkin measure of sampling adequacy was .73, above the commonly recommended value of .60 and the Communalities were all above .30, further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable for all 28 items.

Only the first eight components yielded eigenvalues greater than 1.0. Initial eigenvalues indicated that the first eight factors explained 28.37%, 13.84%,6.38%, 5.46%,5.31%,4.71%, 4% and 3.81% of the variance respectively. Solutions for all the eight factors were each examined using varimax of the factor loading matrix. In the first seven components, more than 3 items loaded eigenvalues above .30. Only two items in the eighth component yielded eigenvalues greater than .30. Therefore, items in the first seven-factor solution, which explained 68.072% of the variance were maintained. Results are presented in Appendix 7.

Exploratory Factor Analysis of the Multidimensional Scale of Perceived Social Support

An EFA was performed on the Multidimensional Scale of Perceived Social Support items using Principal Components Analysis with Varimax rotation. Principal components analysis was used

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because the primary purpose was to identify and compute composite scores for the Multidimensional Scale of Perceived Social Support [MDSPSS] which was used as a measure for Social Support. The factorability of the 12 MDSPSS items which measures Social Support was examined. All the 12 items correlated with at least one other item (at least .3) which suggests reasons for factorability. The Bartlett's test of sphericity was significant ($\chi 2$ (66) = 366.203, $p < .001$). The Kaiser-Meyer-Olkin measure of sampling adequacy was .897, above the commonly recommended value of .60 and the communalities were all above .30, further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable for all 12 items.

Only the first two components yielded eigenvalues greater than 1.0. Initial eigenvalues indicated that the first two factors explained 61.37% and 16.445% of the variance respectively. Solutions for first and second factors were each examined using varimax of the factor loading matrix. In each of the two components, more than 3 items loaded eigenvalues above .30. The two-factor solution, which explained 54.89% of the variance were maintained. Results are presented in Appendix 8.

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Descriptive Statistics of Variables and Test of Normality

Table 3: Descriptive Statistics of the Predictors

	Minimum	Maximum	M	SD	Skewness	Kurtosis
Cognitive Processing	71.00	109.0	89.95	7.65	.24	.29
Religiosity	31.00	40.00	37.91	2.42	-1.21	.70
Posttraumatic Growth	66.00	124.00	104.07	14.59	-.78	-.26
Optimism	22.00	30.00	27.93	2.15	-.90	-.18
Coping	47.00	95.00	79.50	9.88	-1.64	2.50
Social Support	18.00	84.00	57.21	16.85	-.66	-.63

N=105, S.E of Skewness=.236

Descriptive statistics are presented in Table 3. For the variable Cognitive Processing, the scores obtained by respondents ranges from 71 to 109 (M =89.95, SD =7.65). For the variable Religiosity, the scores obtained by respondents range from 31 to 40 (M = 37.90, SD =2.42). For the variable PTG, the scores obtained by respondents range from 66 to 124 (M = 104.07, SD = 14.59. The scores obtained by the respondents on the variable Optimism were between 22 and 30 (M = 27.93, SD = 2.15). On the variable Coping, the scores obtained by respondents range from 47 and 95 (M = 79.50, SD = 9.90). For the variable Social Support, the scores obtained by the respondents were between 18 and 84 (M = 4.77, SD = 1.40). The skewness and kurtosis for all the variables fall into the accepted range of skewness (−1.96, +1.96) and kurtosis (-2, +2) (Tabachnick & Fidell, 2013; George & Mallery, 2010). This indicates that the distributions of all variables were approximately univariately normal.

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Intercorrelations among Predictor and Criterion Variables

To assess for linearity between the variables to be used in the regression model, correlation was performed using the Pearson Product-moment Correlations to access the relationship among variables. The Table 4 below represents the correlation matrix.

Table 4: Correlation Matrix representing the relationship between the variables

		1	2	3	4	5	6	7	8
1	Age								
2	Years of Survival	.17*							
3	Optimism	-.04	-.22*						
4	Cognitive Processing	-.11	-.06	.20*					
5	Religiosity	.03	-.20*	.53**	.21*				
6	Coping	.06	-.21*	.47**	.55**	.47**			
7	Social Support	-.03	-.03	.49**	.29**	.36**	.56**		
8	Posttraumatic Growth	.20*	.20*	.53**	.22*	.34**	.48**	.53**	

*** p<0.001; ** p< 0.01; * p< 0.05

Table 4 above shows the results for exploring the relationship between the variables using Pearson Product-moment Correlation coefficient. Of the potential covariates, there was a weak significant positive relationship between Age (r=.20); Years of survival (r= .20) and PTG (p<.05) and PTG. Of the hypothesized predictors of change in PTG, there was a weak positive relationship between Cognitive Processing and PTG (r=.22, p<.05). There was also a significant moderate relationship between Religiosity and PTG (r=.34, p<.01) and between Coping and PTG (r= .48, p<.01). There was also a strong significant positive relationship between optimism and posttraumatic growth (r=.53, p<.01) and between social support and posttraumatic growth (r=.53, p<.01). This correlation coefficient was adequate for a regression analysis since it is below the .7

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threshold which is too high and hence considered to be violating the assumption of multicollinearity (Field, 2009).

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Testing Hypotheses

Objective One

Prevalence of Posttraumatic Growth among Breast Cancer Survivors in Ghana

To assess the prevalence of overall PTG and its domains, the proportions were estimated. PTG has five domains (Spiritual Change, Appreciation of Life, Personal Strength, New Possibilities and Relationships with others) and each was measured on three levels or categories (Low, Moderate, and High). The Table 5 below is a summary of the findings.

Table 5: Distribution of the prevalence of Posttraumatic growth experienced by the participants

		n = 105	%	[95% Conf. Interval]
Posttraumatic Growth	Low	13	12.4	7.3–20.3
	Moderate	32	30.5	22.3 – 40.1
	High	60	57.1	47.4 – 66.4
Spiritual Change	Low	3	2.9	0.9 – 8.6
	Moderate	15	14.3	8.7 – 22.5
	High	87	82.9	74.3 – 89.0
Appreciation of Life	Low	5	4.8	2.0 – 11.1
	Moderate	26	24.8	17.3 – 34.1
	High	74	70.5	60.9 – 78.5
Personal Strength	Low	7	6.7	3.2 – 13.5
	Moderate	29	27.6	19.8 – 37.1
	High	69	65.7	60.1 – 74.3
New Possibilities	Low	26	24.8	17.3 – 34.1
	Moderate	43	41.0	31.8 – 50.7
	High	36	34.3	25.7 – 44.0
Relationships with others	Low	14	13.3	8.0 – 21.4
	Moderate	22	21.0	14.1 – 30.0
	High	69	65.7	56.0 – 74.3

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Posttraumatic Growth among Breast Cancer Survivors in Ghana

From the Table 5, 57% of the women experienced high levels of overall PTG [95% CI = 47.4 – 66.4] and 30.5% of the women also experienced moderate levels of PTG [95% CI = 22.3 – 40.1]. This means that more than half of the participants experienced high PTG. Put together, 87.5% of the participants experienced moderate to high levels of PTG.

In the domains of PTG, 83% of the participants reported high scores in the Spiritual Change domain of PTG [95% CI = 74.3 – 89.0]. Again, 71% of the participants reported high scores in the Appreciation of Life domain of PTG [95% CI = 60.9 – 78.5].in addition, 66% of the participants reported high scores in Personal Strength [95% CI = 60.1 – 74.3]. Also, 66% of the participants reported high scores in Improved relationship [95% CI = 56.0 – 74.3] and finally, 34% of the participants reported high scores in New Possibilities [95% CI = 25.7 – 44.0]. This shows that, the domain to experience the highest level of PTG was "Spiritual Change", followed by "Appreciation of life", then "Personal Strength" and "Relating with others". The domain to receive the least growth was "New possibilities".

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Objective Two and Three

Association of Demographic and Disease/ Treatment Factors and Posttraumatic Growth

Hypothesis 1: Demographic variables will be associated with Posttraumatic Growth

Hypothesis 1a: Age will be negatively associated with Posttraumatic Growth

Hypothesis 1b: Years of survival will be positively associated with Posttraumatic Growth

Hypothesis 1c: Women's marital status will be positively associated with their level of Posttraumatic Growth

Hypothesis 2: Disease/Treatment variables will be associated with Posttraumatic Growth

Hypothesis 2a: Type of Breast Cancer will be positively associated with Posttraumatic Growth

Hypothesis 2b: The Stage of Breast Cancer will be positively associated with Posttraumatic Growth

Hypothesis 2c: Type of treatment will be positively associated with Posttraumatic Growth

To examine which Demographic and Disease/Treatment variables are associated with PTG, series of Pearson Chi-square tests were performed. All the demographic and Disease/Treatment variables were categorical and PTG was also in 3 categories (Low, Moderate, and High). Chi-Square tests are used to test the association of two categorical variables. Table 6 below shows the results from the Chi-square tests.

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Table 6: Chi-Square test assessing Association of Demographic and Disease/Treatment variables with Posttraumatic Growth

Variable		Posttraumatic Growth, n (%)			$\chi 2$
		Low	Moderate	High	P-Value
Demographic Variables					
Age	Below 50 Years	10(62.5)	16(50.0)	15(26.3)	9.192**
	Above 50 Years	6 (37.5)	16(50.0)	42(73.7)	
Years of Survival	< 5 years	10(62.5)	25(78.1)	22(38.6)	13.417***
	≥ 5 Years	6 (37.5)	7 (21.9)	35(61.4)	
Marital Status	Single	4 (25.0)	1 (3.1)	3 (5.3)	31.865***
	Married	0 (0.0)	11(34.4)	35(61.4)	
	Divorced	10(62.5)	10(31.3)	9 (15.8)	
	Widow	2(12.5)	10(31.3)	10(17.5)	
Educational Level	No School	1 (6.3)	4 (12.5)	11(19.3)	9.422
	Primary/JHS	5 (31.3)	17 53.1)	19(33.3)	
	Secondary/Vocational	6(37.5)	3(9.4)	9(15.8)	
	Tertiary	4 (25.0)	8 (25.0)	18(31.6)	
Employment Status	Not employed	5 (31.3)	9 (28.1)	17(29.8)	7.839
	Employed Full-time	3 (18.8)	5 (15.6)	13(22.8)	
	Employed Part-Time	2 (12.5)	0 (0.0)	1(1.8)	
	Self-Employed	6 (37.5)	18(56.3)	26(45.6)	
Religion	Christianity	15(93.8)	25(78.1)	50(87.7)	5.462
	Islam	1 (6.3)	7 (21.9)	5 (8.8)	
	No Religion	0 (0.0)	0 (0.0)	2 (3.5)	
Disease and Treatment Variables					
Type of Breast Cancer	Unknown	2 (12.5)	0 (0.0)	4 (7.0)	17.878
	Ductal Carcinoma In Situ	4 (25.0)	1 (3.1)	7 (12.3)	
	Invasive Ductal Carcinoma	8 (50.0)	24(75.0)	43(75.4)	
	Mucinous Carcinoma of the breast	1 (6.3)	4 (12.5)	0 (0.0)	
	Invasive Lobular Carcinoma	1(6.3)	1(3.1)	1(1.8)	
	Recurrent & Metastatic Breast Cancer	0(0.0)	2 (6.3)	2 (3.5)	
Stage of Breast Cancer	Unknown	2 (12.5)	1(3.1)	6 (10.5)	7.655
	Stage I	6(37.5)	8 (25.0)	11(19.3)	
	Stage II	5 (31.3)	14(43.8)	21(36.8)	
	Stage III	3 (18.8)	9 (28.1)	15(26.3)	
	Stage IV	0(0.0)	0(0.0)	4 (7.0)	
Type of Surgery	Lumpectomy	6 (37.5)	5 (15.6)	15(26.3)	2.901
	Mastectomy	10(62.5)	27(84.4)	42(73.7)	
Radiotherapy	No	6 (37.5)	10(31.3)	13(22.8)	1.653
	Yes	10(62.5)	22(68.8)	44(77.2)	

*** $p<0.001$; ** $p<0.01$; * $p<0.05$

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From the Table 6 above, there was a significant positive association age ($\chi 2$ (2) = 9.192, p <.01) and PTG. This indicates that, older women are more likely to experience PTG relative to younger women. Therefore, the hypothesis that Age will have a negative association with PTG was not supported.

There was also a significant positive association between Years of Survival ($\chi 2$ (2) = 13.417, p <.001) and PTG. This means that, the longer a woman survives from breast cancer, the higher the chances of her developing PTG. This supports the hypothesis that Years of Survival will have a positive association with PTG.

In addition, there was a significant Positive association between marital status ($\chi 2$ (2) = 31.865, p <.001) and PTG. This also shows that married women are more likely to experience PTG relative to women who are not married. Therefore, the hypothesis that Women's marital status will be positively associated with their level of PTG was supported.

Type of Breast Cancer ($\chi 2$ (10) = 17.878, p>.05), Stage of Breast Cancer ($\chi 2$ (8) = 7.655, p>.05), Type of Surgery ($\chi 2$ (2) = 2.901, p>.05) and Radiotherapy ($\chi 2$ (2) = 1.653, p>.05) were not associate with PTG. Therefore, the hypotheses that Type of Breast Cancer will be positively associated with PTG, Stage of Breast Cancer will be associated with PTG and Type of treatment will be associated with PTG were not supported.

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Objective Four

Predicting Posttraumatic Growth with Psychosocial Variables

Hypothesis 3: After controlling for demographic and disease/treatment factors, psychosocial variables will predict Posttraumatic Growth

Hypothesis 3a: Religiosity will predict Posttraumatic Growth

Hypothesis 3b: Cognitive processing will predict Posttraumatic Growth

Hypothesis 3c: Optimism will predict Posttraumatic Growth

Hypothesis 3d: Social support will predict Posttraumatic Growth

Hypothesis 3e: Coping will predict Posttraumatic Growth

A 2-step Hierarchical Multiple Regression was performed to test the hypothesis that psychosocial factors (Optimism, Coping, Cognitive Processing, Social Support, and Religiosity) will predict PTG after controlling for the demographic and the clinical variables (Age and Years of survival). Normality and linearity, the basic assumptions that need to be satisfied before running a regression analysis were all adequate. Results are presented in Table 7 below.

Table 7: Summary of Hierarchical Regression Analysis for Variables Predicting Posttraumatic Growth among Breast Cancer Survivors.

Model	**Predictor**	B	Std. Error	***β***	t	Sig.
Step 1	Age	.240	.136	.171	1.761	.081
	Years of Survival	.743	.429	.168	1.730	.087
Step 2	Age	.208	.103	.148	2.022	.046
	Year of Survival	1.386	.333	.313	4.166	.000
	Optimism	2.603	.617	.383	4.220	.000
	Cognitive Processing	-.049	.164	-.026	-.301	.764
	Religiosity	-.022	.523	-.004	-.042	.966
	Coping	.367	.159	.248	2.300	.024
	Social Support	2.350	.938	.226	2.506	.014

For Step 1, $R^2 = .067$ *, F= 3.651; step 2,* $R^2 = .524$*,* $\Delta R^2 = .457$*, F= 18.649,* $\Delta F = 15.266$

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Demographic variables (Age and years of survival) are entered at Step 1 and psychosocial variables (Optimism, Cognitive Processing, Religiosity, Coping and Social Support) were added at Step 2. Age, and Years of survival when entered at Step 1, explained 6.7% of the variance in PTG (R^2 =.067, F (2,102) = 3.651, p<.01). Psychosocial variables entered in step 2 explained an additional 45.7% of the variance in PTG after controlling for Age and Years of survival (ΔR^2 =.457, ΔF (5, 97) = 18.649, p <.001). The total variance explained by the model was 52.4%, (R^2 =.524, F (7, 97) = 15.266, p<.001).

The result in the Table 7 above indicate that, Optimism (B= 2.6) was a significant predictor of PTG (β= .383, p< .001). This indicates that as Optimism increase by one unit, PTG also increases by 2.6 units. Also, as Optimism increase by one standard deviation (*SD*=2.15), PTG increases by 0.38 standard deviations. The standard deviation of PTG is 14.59 and so this constitutes a change of 37.934 (2.6 x 14.59) of PTG. Therefore, for every 2.15 increase in terms of Optimism felt by the women, there is a corresponding increase of 37.934 in terms of PTG. This means that Optimism as a psychosocial factor leads to an increased level of PTG. Therefore, the hypothesis that Optimism will predict PTG was supported.

Also, Coping (B=.37) significantly predict PTG (β=.248, p<.05). This indicates that as coping increase by one unit, PTG also increases by .37 units. Also, as Coping increase by one standard deviation (*SD*=9.88), PTG increases by 0.25 standard deviations. The standard deviation of PTG is 14.59 and so this constitutes a change of 5.40 (.37 x 14.59) of PTG. Therefore, for every 9.88 increase in coping felt by the women, there is a corresponding increase of 5.40 in terms of PTG. This means that Coping as a psychosocial factor leads to an increased level of PTG. Therefore, the hypothesis that Coping will predict PTG was supported.

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Social Support (B= 2.35) was a significant predictor of PTG (β=.23, $p<.01$). This indicates that as Social Support increase by one unit, PTG also increases by 2.35 units. Also, as Social Support increase by one standard deviation (*SD*=1.40), PTG increases by 0.23 standard deviations. The standard deviation of PTG is 14.59 and so this constitutes a change of 34.29 (2.35 x 14.59) of PTG. Therefore, for every 1.40 increase in Social Support received by the women, there is a corresponding increase of 34.29 in terms of PTG. This means that Social Support as a psychosocial factor leads to an increased level of PTG. Therefore, the hypothesis that Social Support will predict PTG was supported.

In the Table 7, the result showed that Cognitive Processing and Religiosity could not predict PTG with beta scores of -.045 and -.02 respectively. Therefore, the results do not support the hypothesis that Cognitive Processing will predict PTG. Also, results do not support the hypothesis that Religiosity will predict PTG. This indicates that survivors who were optimistic, use more coping strategies and receive social support are more likely to experience PTG relative to survivors' cognitive processing or religiosity level.

Mediation Analysis

A series of regression analyses were run to test the mediating role Optimism, Coping and Social Support plays on the Cognitive Processing, Religiosity and PTG relationship. Specifically, the Sobel's test of significance was determined by the method proposed by Preacher and Hayes (2004). Baron and Kenny's (1986) suggestion for testing mediation analysis was used to test for mediation role of psychosocial variables (Optimism, Coping and Social support) on the Religiosity, Cognitive Processing and PTG relationship. For a variable to play a mediating role according to Baron and Kenny (1986), first of all, variations in the predictor variable (X) should significantly account for variation in the mediating variable (M). Secondly, changes in the

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mediating variable should significantly account for a variance in the criterion (Y). Thirdly, when the relationship between the predictor and the mediator and that of the mediator and criterion are controlled, an earlier significant association between the predictor and criterion should no longer be significant. In other words, for Baron et al (1986), there should always be a relationship between the independent and dependent variable before a third variable which renders this relationship insignificant will be said to be a mediator.

However, Bollen (1989) argued that the nonexistence of relationship between a predictor and a criterion does not refute causality. He is noted to have said that establishing relationship is neither a necessary nor an adequate prerequisite for causality. Recent researchers interested in mediation analysis have taken on this perspective (Hayes, 2009).

Optimism mediates the relationship between Cognitive Processing and Posttraumatic Growth.

Table 8: Mediation Analysis of Optimism on Cognitive Processing – Posttraumatic Growth relationship

Model				
Predictor	**Criterion**	**B**	**S. E.**	***β***
Model 1	**Optimism**			
Age		.004	.020	.020
Years of Survival		-.136	.063	-.209*
Cognitive Processing		.054	.027	.191*
Model 2	**Posttraumatic Growth**			
Age		.259	.108	.184*
Years of Survival		1.320	.348	.298***
Cognitive Processing		.266	.148	.140
Optimism		3.882	.538	.571***

*Sobel's test for significant mediation displayed Z= 1.93, ***P<.001, **P<.01, *p<.05*

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From Table 7 above, it was observed that Cognitive Processing which is the independent variable could not predict PTG when the personal variables were controlled. However, based on the argument by Bollen (1989) and Hayes (2009; 2013) it is possible to test for mediation (M) even if the predictor (X) and the criterion (Y) aren't associated. For this study, there was a significant relationship between the predictor and the criterion (see Table 4).

As presented in Table 8 above, in the first model, Optimism (the mediator) was regressed on Cognitive Processing (the predictor) while controlling for Age and Years of survival which were the personal variables that had a significant effect on PTG. All other personal variables were not considered because they could not account for a significant variance in the criterion. Results indicated that there was a significant relationship between Cognitive Processing and Optimism (β = .191, $\rho < .05$).

A positive significant relationship was found to exist between Optimism and PTG (*see Table 7*). For the second model, PTG was regressed on both Cognitive Processing and Optimism. It resulted that, while Cognitive Processing could not predict PTG (β = .140*,* ρ >.05), Optimism significantly predicted PTG (β = .571*,* ρ < .001) which suggests the presence of a mediating effect. Finally, using the method proposed by Preacher and Hayes (2004), Sobel's test for mediating effect was conducted. Results indicated that the mediator (Optimism) did not significantly explain the influence of Cognitive Processing on PTG ($Z = 1.93$, p >.05).

The above result suggests the presence of a full mediating effect of Optimism on the relationship between Cognitive Processing and PTG.

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Coping mediates the relationship between Cognitive Processing and Posttraumatic Growth.

Table 9: Mediation Analysis of Coping on Cognitive Processing – Posttraumatic Growth relationship

Model Predictor	Criterion	B	S. E.	β
Model 1	**Coping**			
Age		.150	.077	.157
Years of Survival		-.617	.242	-.206*
Cognitive Processing		.716	.104	.554**
Model 2	**Posttraumatic Growth**			
Age		.148	.118	.105
Years of Survival		1.316	.377	.297**
Cognitive Processing		-.133	.189	-.070
Coping		.849	.150	.575***

*Sobel's test for significant mediation displayed Z= 4.37, ***P<.001, **P<.01, *p<.05*

With reference to Table 7 above, it was observed that Cognitive Processing which is the independent variable could not predict PTG when the personal variables were controlled. However, based on the argument by Bollen (1989) and Hayes (2009; 2013) it is possible to test for mediation (M) even if the predictor (X) and the criterion (Y) aren't associated. For this study, there was a significant relationship between the predictor and the criterion (see Table 4).

As presented in Table 9 above, in the first model, Coping (the mediator) was regressed on Cognitive Processing (the predictor) whiles controlling for Age and Years of survival which were the personal variables that had a significant effect on PTG. All other personal variables were not considered because they could not account for a significant variance in the criterion. Results indicated that there was a significant relationship between Cognitive Processing and Coping (β = .554, ρ *<.01*).

A positive significant relationship was found to exist between Coping and PTG (*see Table 7*).

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For the second model, PTG was regressed on both Cognitive Processing and Coping. It resulted that, while Cognitive Processing could not predict PTG (β = -.070, ρ >.05), Coping significantly predicted PTG (β = .575, ρ < .001) which suggests the presence of a mediating effect. Finally, using the method proposed by Preacher and Hayes (2004), Sobel's test for mediating effect was conducted. Results indicated that the mediator (Coping) significantly explained the influence of Cognitive Processing on PTG (*Z= 4.37*, p <.001).

The above result suggests the presence of a full mediating effect of Coping on the relationship between Cognitive Processing and PTG.

Social Support mediates the relationship between Cognitive Processing and Posttraumatic Growth.

Table 10: Mediation Analysis of Social Support on Cognitive Processing – Posttraumatic Growth relationship

Model				
Predictor	**Criterion**	**B**	**S. E.**	***β***
Model 1	**Social Support**			
Age		.001	.013	.006
Years of Survival		-.007	.041	-.017
Cognitive Processing		.052	.018	.285**
Model 2	**Posttraumatic Growth**			
Age		.271	.114	.193*
Years of Survival		.829	.358	.187*
Cognitive Processing		.197	.159	.103
Social Support		5.293	.864	.509***

Sobel's test for significant mediation displayed Z=2.61, *** p<0.001; **. p< 0.01,*. p< 0.05

With reference to Table 7 above, it was observed that Cognitive Processing which is the independent variable could not predict PTG when the personal variables were controlled.

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However, based on the argument by Bollen (1989) and Hayes (2009; 2013) it is possible to test for mediation (M) even if the predictor (X) and the criterion (Y) aren't associated. For this study, there was a significant relationship between the predictor and the criterion (see Table 4).

As presented in Table 10 above, in the first model, Social Support (the mediator) was regressed on Cognitive Processing (the predictor) while controlling for Age and Years of survival which were the personal variables that had a significant effect on PTG. All other personal variables were not considered because they could not account for a significant variance in the criterion. Results indicated that there was a significant relationship between Cognitive Processing and Social Support ($\beta = .285$, $\rho < .01$).

A positive significant relationship was found to exist between Social Support and PTG (*see Table 7*).

For the second model, PTG was regressed on both Cognitive Processing and Social Support. It resulted that, while Cognitive Processing could not predict PTG ($\beta = .103$, $\rho > .05$), Social Support significantly predicted PTG ($\beta = .509$, $\rho < .001$) which suggests the presence of a mediating effect. Finally, using the method proposed by Preacher and Hayes (2004), Sobel's test for mediating effect was conducted. Results indicated that the mediator (Social Support) significantly explained the influence of Cognitive Processing on PTG ($Z = 2.61$, $p < .01$).

The above result suggests the presence of a full mediating effect of Social Support on the relationship between Cognitive Processing and PTG.

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Optimism mediates the relationship between Religiosity and Posttraumatic Growth.

Table 11: Mediation Analysis of Optimism on Religiosity – Posttraumatic Growth relationship

Model				
Predictor	**Criterion**	**B**	**S. E.**	***β***
Model 1	**Optimism**			
Age		-.006	.018	-.030
Years of Survival		-.074	.056	-.113
Religiosity		.448	.076	.506***
Model 2	**Posttraumatic Growth**			
Age		.230	.109	.164*
Years of Survival		1.363	.353	.308***
Religiosity		.623	.546	.103
Optimism		3.712	.618	.546***

*Sobel's test for significant mediation displayed Z=4.21, **P<.01, *p<.05*

With reference to Table 7 above, it was observed that Religiosity which is the independent variable could not predict PTG when the personal variables were controlled. However, based on the argument by Bollen (1989) and Hayes (2009; 2013) it is possible to test for mediation (M) even if the predictor (X) and the criterion (Y) aren't associated. For this study, there was a significant relationship between the predictor and the criterion (see Table 4).

As presented in Table 11 above, in the first model, Optimism (the mediator) was regressed on Religiosity (the predictor) while controlling for Age and Years of survival which were the personal variables that had a significant effect on PTG. All other personal variables were not considered because they could not account for a significant variance in the criterion. Results indicated that there was a significant relationship between Religiosity and Optimism (β = .506, $\rho < .001$).

A positive significant relationship was found to exist between Optimism and PTG (*see Table 7*).

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For the second model, PTG was regressed on both Religiosity and Optimism. It resulted that, while Religiosity could not predict PTG (β = .103*,* ρ >.05), Optimism significantly predicted PTG (β = .546*,* ρ < .001) which suggests the presence of a mediating effect. Finally, using the method proposed by Preacher and Hayes (2004), Sobel's test for mediating effect was conducted. Results indicated that the mediator (Optimism) significantly explained the influence of Religiosity on PTG (*Z= 4.21*, p <.001).

The above result suggests the presence of a full mediating effect of Optimism on the relationship between Religiosity and PTG.

Coping mediates the relationship between Religiosity and Posttraumatic Growth.

Table 12: Mediation Analysis of Coping on Religiosity – Posttraumatic Growth relationship

Model Predictor	Criterion	B	S. E.	β
Model 1	**Coping**			
Age		.071	.084	.075
Years of Survival		-.417	.269	-.139
Religiosity		1.811	.360	.444***
Model 2	**Posttraumatic Growth**			
Age		.160	.114	.114
Years of Survival		1.369	.371	.309***
Religiosity		1.072	.550	.178
Coping		.671	.136	.454***

*Sobel's test for significant mediation displayed Z=3.52, **P<.01, *p<.05*

With reference to Table 7 above, it was observed that Religiosity which is the independent variable could not predict PTG when the personal variables were controlled. However, based on the argument by Bollen (1989) and Hayes (2009; 2013) it is possible to test for mediation (M)

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even if the predictor (X) and the criterion (Y) aren't associated. For this study, there was a significant relationship between the predictor and the criterion (see Table 4).

As presented in Table 12 above, in the first model, Coping (the mediator) was regressed on Religiosity (the predictor) while controlling for Age and Years of survival which were the personal variables that had a significant effect on PTG. All other personal variables were not considered because they could not account for a significant variance in the criterion. Results indicated that there was a significant relationship between Religiosity and Coping (β = .444, $\rho < .001$).

A positive significant relationship was found to exist between Coping and PTG (*see Table 7*).

For the second model, PTG was regressed on both Religiosity and Coping. It resulted that, while Religiosity could not predict PTG (β =.178, ρ >.05), Coping significantly predicted PTG (β = .454, $\rho < .001$) which suggests the presence of a mediating effect. Finally, using the method proposed by Preacher and Hayes (2004), Sobel's test for mediating effect was conducted. Results indicated that the mediator (Coping) significantly explained the influence of Religiosity on PTG ($Z = 3.52$, $p < .001$).

The above result suggests the presence of a full mediating effect of Coping on the relationship between Religiosity and PTG.

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Social Support mediates the relationship between Religiosity and Posttraumatic Growth.

Table 13: Mediation Analysis of Social Support on Religiosity – Posttraumatic Growth relationship

Model Predictor	Criterion	B	S. E.	β
Model 1	**Social Support**			
Age		-.006	.013	-.046
Years of Survival		.020	.041	.048
Religiosity		.217	.055	.375***
Model 2	**Posttraumatic Growth**			
Age		.237	.111	.169*
Years of Survival		.991	.358	.224*
Religiosity		1.238	.516	.206*
Social Support		4.828	.872	.465***

*Sobel's test for significant mediation displayed Z=3.21, **P<.01, *p<.05*

With reference to Table 13 above, it was observed that Religiosity which is the independent variable could not predict PTG when the personal variables were controlled. However, based on the argument by Bollen (1989) and Hayes (2009; 2013) it is possible to test for mediation (M) even if the predictor (X) and the criterion (Y) aren't associated. For this study, there was a significant relationship between the predictor and the criterion (see Table 4).

As presented in Table 13 above, in the first model, Social Support (the mediator) was regressed on Religiosity (the predictor) while controlling for Age and Years of survival which were the personal variables that had a significant effect on PTG. All other personal variables were not considered because they could not account for a significant variance in the criterion. Results indicated that there was a significant relationship between Religiosity and Coping (β = .375, $\rho < .001$).

A positive significant relationship was found to exist between Coping and PTG (*see Table 7*).

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For the second model, PTG was regressed on both Religiosity and Social Support. It resulted that, Religiosity could predict PTG (β = .206, ρ <.05) while Social Support also significantly predicted PTG (β = .465, ρ < .001) which suggests the presence of a partial mediating effect. Finally, using the method proposed by Preacher and Hayes (2004), Sobel's test for mediating effect was conducted. Results indicated that the mediator (Social Support) significantly explained the influence of Religiosity on PTG ($Z= 3.21$, p <.01).

The above result suggests the presence of a partial mediating effect of Social Support on the relationship between Religiosity and PTG.

Summary of Findings

The results presented in the tables above indicate that breast cancer survivors in Ghana reported moderate to high levels of PTG. The women in this study showed significant high growth in Spiritual Growth, Appreciation of Life, Improved relationship with others and Personal Strength. Least change was observed in New Possibilities. It was also found that Age was associated with PTG. In addition, Marital status was associated with PTG and Years of survival was associated with PTG. No Disease/Treatment factors were found to be associated with PTG. Again, it was found that, Optimism predicts PTG. Also, Coping predicted PTG and Social Support also predicted PTG. Further analysis showed that Optimism fully mediated the relationship between Religiosity and PTG. A full mediation was also found for Coping on the relationship between Religiosity and Posttraumatic Growth. It was also found that Coping fully mediates the relationship between Cognitive processing and PTG. Social Support fully mediated the relationship between Cognitive Processing and PTG. It was found that Optimism fully mediated the relationship between Cognitive Processing and PTG. Finally, it was found that Social Support partially mediates the relationship between Religiosity and PTG.

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Observed Model

The diagram below represents the observed model from the data analysis based on the study hypotheses that were developed from the study objectives. It was found that Optimism, Coping and Social Support have a significant direct relationship with PTG. However, Religiosity and Cognitive Processing had an indirect relationship with PTG. Also, Optimism, Coping and Social Support fully mediated the relationship between Cognitive Processing and PTG. Again, Optimism and Coping had a full mediating effect on the relationship between Religiosity and PTG and a partial mediation effect of Social Support was found on the relationship between Religiosity and PTG. The model below therefore holds that, Optimism, Coping and Social Support are mediators for the relationship between Cognitive Processing and Religiosity on PTG.

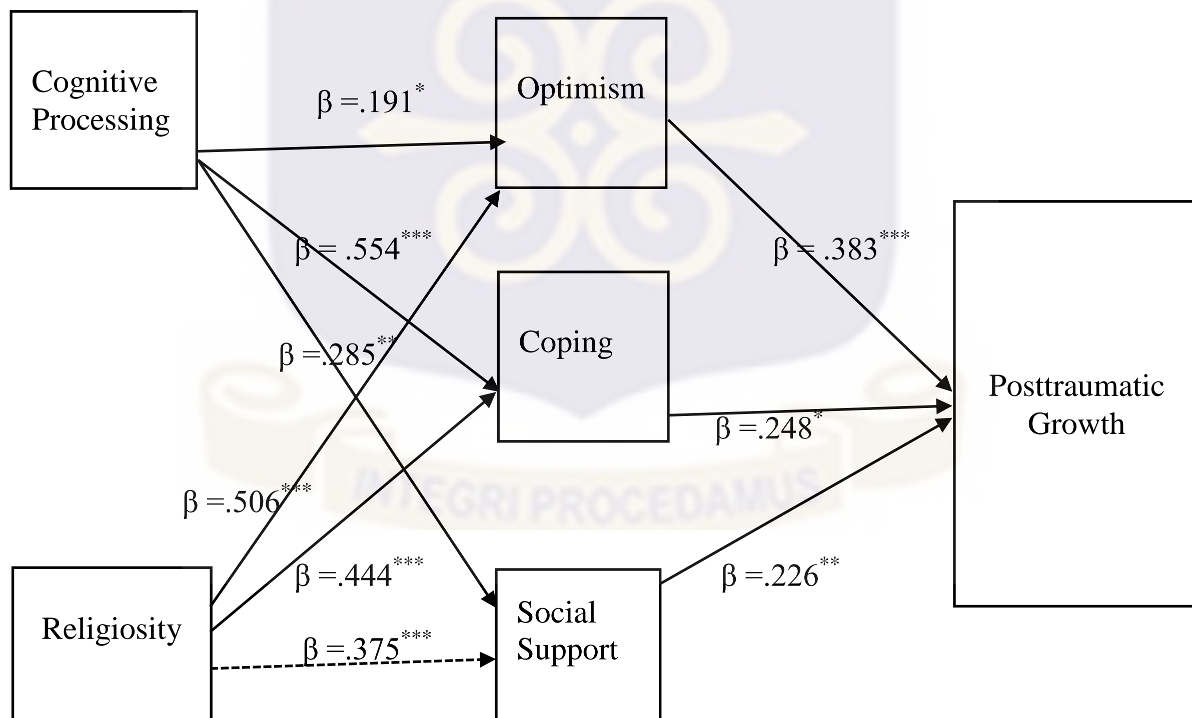

Figure 2: ***Observed Model: Optimism, Coping and Social support mediates the relationship between Cognitive Processing and Religiosity on Posttraumatic Growth.***

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CHAPTER 5

DISCUSSION

The aim of the study is to assess Posttraumatic Growth in breast cancer survivors in Ghana and to investigate the factors that relate and impact on PTG. There is paucity of data on the posttraumatic experiences of breast cancer survivors within the Ghanaian setting; this will set the baseline for other future studies.

The objectives were first to assess the prevalence of PTG and to assess the prevalence of the domains of the PTGI (spiritual growth, appreciation of life, personal strength, new possibilities and relationship with others) in BCS in Ghana. Secondly, the study sought to examine the association of socio-demographic and disease/treatment variables with PTG. Finally, the study further examined how psychosocial variables (Optimism, Coping, Social support, Religiosity and cognitive processing) predict PTG.

Prevalence of Posttraumatic Growth in Ghanaian Breast Cancer Survivors

Results show that about eighty eight percent (88%) of the women reported moderate to high levels of Posttraumatic Growth. Results from this study support previous findings by other researchers who found that PTG is evident at varying degrees in breast cancer survivors (Barthakur et al., 2016; Cheng et al., 2016; Danhauer et al., 2015; Kolokotroni et al., 2014; Liu et al., 2014; Mehrabi et al., 2015; McDonough et al., 2014; Parikh et al., 2015; Park et al., 2016; Romeo et al., 2017; Shand et al., 2015; Wang et al., 2014). Findings from this study is higher than findings by Sim et al (2015) who found that 53.3% of the participants experienced moderate to high levels of PTG among Korean stomach cancer survivors and also higher than what was reported by Jansen et al. (2011) among colorectal cancer survivors (46.0%). This means that

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positive posttraumatic experience is not limited to cancer survivors in other part of the world but also it is largely evident in breast cancer survivors in Ghana too. According to Tedesch and Calhoun (2004), PTG may be attained if the event is sufficiently distressing to change the individual's assumption about self, the world, and the future. The high mortality rate and the stigma associated with breast cancer in Ghana makes its experience more traumatic hence leading to this recorded high PTG rate after surviving it. This confirms that breast cancer is indeed a traumatic experience, especially within the Ghanaian context. As found by Bonsu et al. (2014), women who are almost through with their treatment of breast cancer begin to show positive trends such as the desire to live and regaining hope and confidence in life, this study shows that these positive trends progress through to survivorship and affect other areas of their lives.

Results by an individual subscale of PTG show that breast cancer survivors in Ghana reported higher growth in Spiritual Growth, Appreciation of Life, Improved relationship with others and Personal Strength. Least change was observed in New Possibilities. Findings are consistent with previous studies (Barthakur et al., 2016; Brix et al., 2013; Mehrabi et al., 2015; Moore et al., 2017; Romeo et al.,2017; Sim et al., 2015). Since breast cancer on the average affects older people, growth in the domain of new possibilities may be less prevalent. High levels of Spiritual Growth maybe as a result of the strong sociocultural beliefs most Ghanaians hold about illness. Some people believe that suffering from a disease like breast cancer is a curse or punishment from God or the Spirits so therefore surviving from the disease might mean a repaired relationship between themselves and their object of worship. Given the chance to live again after encountering such a life threatening disease may indicate that whoever they worship has forgiven them any offense and has given them another chance to make things right. They may be

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therefore grateful and appreciate this new life better and may be extra careful with how they live their lives now. Due to the collective nature of Africans and Ghanaians particularly, the kind of support the women received from their relatives and friends as well as other support groups such as their church or fellowships while they were going through the treatment might have improved their interpersonal relationship. Based on the support received, the women might value and the benefits of having close relationship and therefore, they may spend some time building and strengthening these interpersonal relationships. They may also strengthen their relationship with others as an indication of how much they appreciate the help they offered them when they were undergoing treatment.

Demographic Variables and Posttraumatic Growth in Ghanaian Breast Cancer Survivors

Regarding the association of the sociodemographic variables, three variables (age, marital status and years of survival) are positively associated with PTG. This means that survivors who were older, married and had survived for longer reported significantly higher PTG. Age was positively associated with PTG. This finding contradicts what has been reported by previous studies (Brix et al., 2013; Jansen et al., 2011; Romeo et al., 2017; Sim et al., 2015). The reason may be that younger woman who are diagnosed and treated for breast cancer may have other problems associated with sexuality, body image, loss of job, finding a partner etc. to contend with. This study confirms analysis by Atobrah (2012) who found that young patients diagnosed with cancer or other chronic diseases experience prolonged periods of denial because of fear. This in effect can prolong their grief process (Kubler-Ross, 1969) and delay their posttraumatic growth. This finding also supports findings by Boateng (in press) who showed that young cancer patients experience more psychological distress than older counterparts and older women have a higher

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quality of life than younger ones in among breast cancer patients in Ghana. This confirms that younger women who experience breast cancer in Ghana have poor psychological outcomes compared to older women. Also, Marital status is positively associated with PTG. Those who are married reported higher PTG than those who were not married. Findings confirm other findings by previous researchers (Brix et al., 2013; Jansen et al., 2011; Kolokotroni et al., 2014; Romeo et al., 2017; Shand et al., 2015; Wang et al., 2014; Yi et al., 2015). This may be due to the fact that married women may get some sort of support (social, emotional and financial) from their husbands. Years of survival was also found to be associated with PTG. Women who have survived for more than five (5) years showed higher PTG than women who have survived below five (5) years. This finding supports findings from previous studies (Brix et al., 2013; Dirik et al., 2016; Jansen et al., 2011; Kolokotroni et al., 2014; Tomich & Helgeson, 2012). This may be because women who survive for long may become more confident about the future. In addition, since the development of PTG is time oriented, the more years one survives, the higher their PTG.

Disease/Treatment Variables and Posttraumatic Growth in Ghanaian Breast Cancer Survivors

No disease and treatment variable was found to be associated with posttraumatic growth. Though the type and severity of the cancer diagnosis as well as the treatments have been known to be a traumatic one, surprisingly, results from this study found no association between these factors and the positive changes women survivors of breast cancer in Ghana experience as reported in other studies in other countries (Dirik et al., 2016; Kolokotroni et al., 2014; Brix et al., 2013; Tomich & Helgeson, 2012; Jansen et al., 2011). The findings violate the assertion that the

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severity of the disease influences PTG. It contradicts findings from Romeo et al. (2017) who found that having malignant breast cancer and undergoing Chemotherapy Therapy relate to some extent to PTG among Italian BC survivors. Also, findings from this study contradict that of Brix et al. (2013) who found that among breast cancer survivors, Tumor size, the number of positive lymph nodes, having undergone mastectomy versus lumpectomy and Endocrine treatment were positively related to PTG. It however supports finds by other researchers (Sim et al., 2015; Arpawong et al, 2013; Svetina et al., 2012) who found no association between disease characteristics and PTG. For example, the study supports findings by Sim et al. (2015) who found that no disease-related variable related to PTG among stomach cancer survivors. Several reasons may have accounted for this outcome. First, due to the myth and stigma associated with the diagnosis of breast cancer within the Ghanaian setting, being diagnosed with breast cancer may be enough to trigger some traumatic symptoms such as fear, feeling worried and grief. Hence the specific nature of the disease, as well as its treatment, may not necessarily be associated with growth. Often after people have successfully gone through the treatment, they may show growth mainly because they have been able to overcome the stigma associated with breast cancer. In addition to the reason stated above, another possible explanation as to why disease and treatment variables may not be related to PTG was the fact that in most developing countries like Ghana, patient's knowledge about their health condition as well as their treatment is very low (de-Graft Aikins, 2005). In most cases, medical professionals do not communicate the details of their condition as well as details of their treatment to the patients. So, most patients may finish the treatment without knowing the specific type of breast cancer they were diagnosed of, the stage of cancer and even the chemotherapy course they were taking. In this study, the severity of the disease and treatment were assessed directly from the patient's folder and not

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from how the patient perceives it. However, a number of studies have demonstrated that perceived stressfulness has an association with PTG. So, an assessment of their subjective experiences and perception of the stressfulness of the treatment would have brought more understanding on how their disease and treatment factors affect their PTG.

Psychosocial Variables and Posttraumatic Growth in Ghanaian Breast Cancer Survivors

In terms of the role of the psychosocial factors in predicting growth, this study found that optimism predicts PTG. Some studies have also found that optimism influence the PTG process (Arpawong et al., 2013; Dirik et al., 2016; Kolokotroni et al., 2014; Park et al., 2016; Shand et al., 2015; Yi et al., 2015). This may be to the fact that optimistic people often show some positive qualities such as the expression of positive feelings, a positive understanding of threatening situations, the use of adaptive coping and seeking for social support and that may facilitate the perception of positive changes following trauma (Prati & Pietrantoni, 2009).

Also, results from this study indicate that Coping is a significant predictor of PTG. In line with prior research (Brix et al., 2013; Büyükaşik-Colak et al., 2012; Danhauer et al., 2015; Dirik et al., 2016; Park et al., 2016; Kolokotroni, et al., 2014; Oginska-Bulik & Kobylarczyk, 2015; Shand et al., 2015), individuals who employed active coping, planning, positive reframing, and acceptance techniques in dealing with their diagnosis of cancer reported greater PTG. This demonstrates that coping foster PTG in cancer survivors. In fact, according to Schaefer and Moos (1992 PTG is positively influenced by both problem and emotion -focused coping. Popularly, a coping style characterized by denial, repression and emotion suppression is associated with worse health outcomes (Linley & Joseph, 2004). Results are in accordance with the functional descriptive transformational model of positive change (Tedeschi & Calhoun, 1995;

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2004) and model of life crisis and personal growth (Schaefer & Moos, 1992) which suggests that coping is an important predictor of PTG.

In addition, this study shows that Social support predicts PTG. This finding is consistent with some results of the studies in the literature (Danhauer et al., 2015; Dirik et al., 2016; Hasson-Ohayon et al., 2016; Kolokotroni et al., 2014; McDonough et al., 2014; Park et al., 2016; Shand et al., 2015; Yi et al., 2015). As found by Prati and Pietrantoni (2009) in their meta - analysis emphasized that social support is an important contributor to the development of PTG in breast cancer survivors. Bozo et al. (2009) also showed that breast cancer survivors with high social support are more likely to develop PTG. Then again, the perception of positive changes in several domains of the survivor's life may create the opportunity for closest relationships, more compassionate behaviors, and new contacts and friendships, which turn social support into an outcome (Prati & Pietrantoni, 2009).

This study also found an indirect effect between Religiosity and PTG. This indirect effect is mediated by optimism and coping. This indirect relationship has not been found by any of the reviewed literatures (Ai et al., 2013; Casellas-Grau et al., 2017; Danhauer et al., 2013; Gesselman et al., 2016; Park et al., 2016; Rzeszutek et al., 2017; Shand et al., 2015). According to Park (2013), spirituality is a global source of knowledge that people rely on in meaning making and that will not necessarily predict good health outcome unless it goes through different pathways. In the case of breast cancer survivors in Ghana, the pathway between spirituality and PTG may include optimism and coping. Making religious or spiritual meaning to the cancer event may increase the person's sense of hope in a higher power or about life which may lead to developing PTG. In addition, making religious connotation to the cancer experience can lead to

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one using more coping skills such as religious coping and positive reframing which has been found to be greatly linked to the development of PTG.

There was also an indirect effect between Cognitive processing and PTG. This indirect effect is mediated by optimism, coping and social support. This result contradicts previous findings (Kolokotroni et al., 2014; Chan et al., 2011; Cohen & Numa, 2011; Gall et al., 2011; Bussell et al., 2010) who found that cognitive processing predicts PTG directly. Processing information that was acquired from the traumatic experience (breast cancer) has been identified as a situational source of meaning making and it may not per say predict health outcomes unless it goes through different pathways (Park, 2013). In this study, the use of optimism, coping and social support has been identified as the pathway that mediates the effect of cognitive processing of breast cancer and PTG. The ability to assimilate the new experience with the old information the women have about breast cancer can increase their level of optimism and hope about their self, their life and the world at large and this can lead to PTG. Also, a successful appraisal of the new information experienced by the women as a result of breast cancer may lead to the use of more coping strategies like acceptance, positive reframing, humor, planning etc. which may also facilitate them developing PTG. In addition, social support has been found to be a significant contextual factor that facilitates the cognitive processing of breast cancer and offer an alternative perspective about the condition which may lead to PTG (Kolokotroni et al., 2014).

To explain the final model, Religiosity/Spirituality is operationalized as a person’s strong urges to rely on and use resources in his or her religion to make meaning and representation and for that matter use religious themes as a process to rebuild his or her views about the world after an encounter with a cancer event. In other words, religiosity is viewed in this study as a sense of meaning making to challenging events in one’s life which are mainly based on one’s religious

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beliefs. In contrast, cognitive processing is operationalized as an individual's ability to critically and analytically appraise a cancer event based on the information he/she has come to know through experiencing breast cancer; especially, information received from health professionals and other sources. Religiosity/Spirituality and Cognitive processing of the cancer are two sources of knowledge that have been identified by the meaning making model as global and situational meaning respectively (Park, 2013). As proposed by Janoff-Bulman (1992; 2006) in the Shattered assumption theory, after one encounters a breast cancer, his/her global view about is called into question. This causes what is termed as a cognitive dissonance (Festinger, 1957) which refers to the feelings of discomfort that result from holding two conflicting beliefs about a situation. In attempts to resolve this dissonance, according to the Organismic Valuing Theory (Joseph & Linley,2005; 2008), the individual engages in processes to accommodate and assimilate the new information they have acquired through their experience with breast cancer about life (situational meaning of breast cancer) to their already existing schemas (global meaning of breast cancer) (Park, 2013). Spirituality has been reported as one of the global source of knowledge that most people in most African societies use in making sense of their illnesses experiences (de-Graft Akins et al., 2012). Park (2013) also identified spirituality as a global source of meaning people make in the adverse situation. Situational sources of knowledge are obtained mainly based on information they obtain from sources such as their healthcare providers their appraisals of their ability to manage the illness and its anticipated impact on their future and their general sense of control over their lives (Park, 2013). The effects these sources have on health outcomes have been thought to be exerted through many different pathways. The model from this study supports the theory by Tedeschi and Calhoun (1995) which suggested that several psychosocial variables such as personality characteristics like optimism; coping and social support influence the

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appraisal process through a complex relationship between these variables. This model is consistent with Schaefer and Moos' (1992) coping theory which suggested that individual characteristics, Environmental factors, and socioeconomic factors affect the appraisal processes and lead to health outcomes through a feedback loop that is linked with each other and have the potential to influence one another.

Limitations of this study

Several limitations to this study must be noted. First, the study included self-report data only and no observational or interview data so the responses might be socially desirable ones. Similarly, although regression analysis typically permits the inference of causality, this is not a controlled, experimentally manipulated study, and results must, therefore, be interpreted in this light.

The findings from this study should be interpreted with care. Findings from this study reflect the views of a section of breast cancer survivors seeking care in a private hospital in Accra and Kumasi in Ghana and not the entire Ghanaian breast cancer survivors thus potentially limiting the generalizability of these results.

Due in part to the small sample size and in part to a lack of theoretical basis, potential moderators of the relations explored in this study were not tested.

Finally, in the model, the study did not examine the different types of cognitive processing as well different types of coping strategies and how they affect PTG. In addition, this study did not also take into account the subdomains of posttraumatic growth in the model.

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Conclusion and Implications for Further Research

Based on the findings from this study, it can be concluded that PTG is evident breast cancer survivors in Ghana and it happens in many domains in their lives. This is more evident in people who are Optimistic, use social support and have more coping skills. People who process their illness experience from religious perspective show PTG through being Optimistic and using more coping skills. On the other hand, people who process their illness experience from information unique to their illness experience show PTG through being Optimistic, using more coping skills and making use of social support. This confirms that positive cancer experience is greatly affected by both internal (optimism and coping abilities) as well as external (social support) factors. This is important information that clinicians taking care of breast cancer patients and survivors should take into consideration when planning both short-term and long-term intervention for rehabilitation. These findings are also essential for example in providing psychoeducation to the public. Findings from this study add additional information that can be included in training of healthcare professionals who will be caring for breast cancer patients.

Future researchers should consider using other methods such as qualitative or mixed-methods to bring a clear understanding of the construct of Posttraumatic Growth within the Ghanaian context. Also, other psychosocial and cultural variables should be examined by future research. Since PTG is time bound, it is recommended that a longitudinal study should be employed by future researchers for a better understanding of the growth process. Future studies can explore other cancer and breast cancer populations to help throw more light on the construct of Posttraumatic Growth. Other studies can compare both the positive and negative outcomes of experiencing breast cancer to help give a holistic understanding of the posttraumatic experiences of breast cancer survivors.

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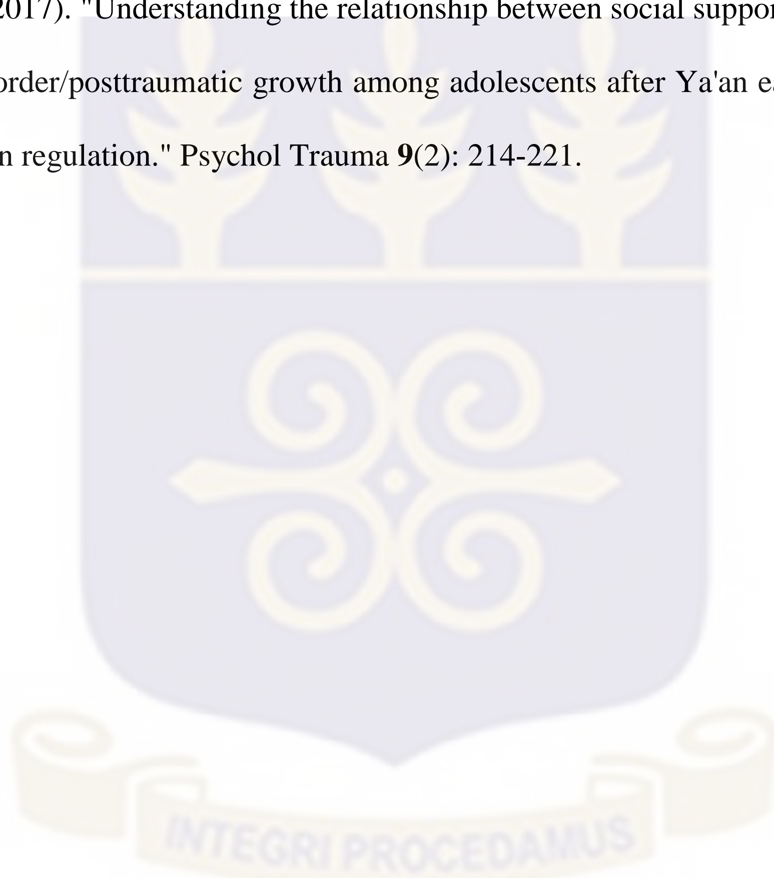

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

Questionnaire Number: ________________

Section A (Sociodemographic information)

1. Age ________________
2. Marital Status: Single ☐ Married ☐ Divorced ☐ Widow ☐
3. Level of Education: No school ☐ Primary/JHS ☐ Secondary/vocational ☐ Tertiary ☐
4. Current employment status:
   Not employed ☐ Employed full-time ☐ Employed part-time ☐ Self -Employed ☐
   Student ☐
5. Religion: Christianity ☐ Islam ☐ African Traditional ☐ No Religion ☐

   Other (Please Specify) ________________
6. Number of years of survival form Breast Cancer: ________________

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Section B (Posttraumatic Growth Inventory)

Indicate for each of the statements below the degree to which this change occurred in your life as a result of the experience of breast cancer, using the following scale.

1 = I **did not experience** this change
2 = I experienced this change to a **very small degree**
3 = I experienced this change to a **small degree**
4 = I experienced this change to a **moderate degree**
5 = I experienced this change to a **great degree**
6 = I experienced this change to a **very great degree**

		1 I *did not experience this change*	2 *I experienced this change to a very small degree*	3 *I experienced this change to a small degree*	4 *I experienced this change to a moderate degree*	5 I *experienced this change to a great degree*	6 *I experienced this change to a very great degree*
1	I changed my priorities about what is important in life.						
2	I have a greater appreciation for the value of my own life.						
Decisions	I developed new interests.						
4	I have a greater feeling of self-reliance.						
5	I have a better understanding of spiritual matters.						
6	I more clearly see that I can count on people in times of trouble.						
7	I established a new path for my life.						
8	I have a greater sense of closeness with others.						
9	I am more willing to express my emotions.						
10	I know better that I can handle						

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		1 I *did not experience this change*	2 ***I experienced this change to a very small degree***	3 ***I experienced this change to a small degree***	4 ***I experienced this change to a moderate degree***	5 I ***experienced this change to a great degree***	6 ***I experienced this change to a very great degree***
	difficulties.						
11	I am able to do better things with my life.						
12	I am better able to accept the way things work out.						
13	I can better appreciate each day.						
14	New opportunities are available which wouldn't have been otherwise.						
15	I have more compassion for others.						
16	I put more effort into my relationships.						
17	I am more likely to try to change things which need changing.						
18	I have a stronger religious faith.						
19	I discovered that I'm stronger than I thought I was.						
20	I learned a great deal about how wonderful people are.						
21	I better accept needing others.						

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Section C (Cognitive Processing of Trauma Scale)

Please rate the extent to which you agree with each of the following statements, using the following rating scale:

1 = strongly disagree
2 = moderately disagree
3 = slightly disagree
4 = neither mainly agree nor disagree
5 = slightly agree
6 = moderately agree
7 = strongly agree

		1 *strongly disagree*	2 *moderately disagree*	3 *slightly disagree*	4 *neither mainly agree nor disagree*	5 *slightly agree*	6 *moderately agree*	7 *Strongly agree*
1	There is ultimately more good than bad in this Breast cancer experience.							
2	I have figured out how to cope with the distress of Breast Cancer							
Decisions	I say to myself ‘this isn’t real’							
4	I have moved on and left Breast Cancer in the past							
5	Overall, Breast Cancer feels resolved for me							
6	I have come to terms with this experience of Breast Cancer							
7	I often think, ‘if only I had done something different’							
8	I blame myself for what happened							
9	I refuse to believe that this really happened to me							
10	I wish I could have handled this differently							
11	Other people have had worse experiences than mine							
12	I act as if this event never							

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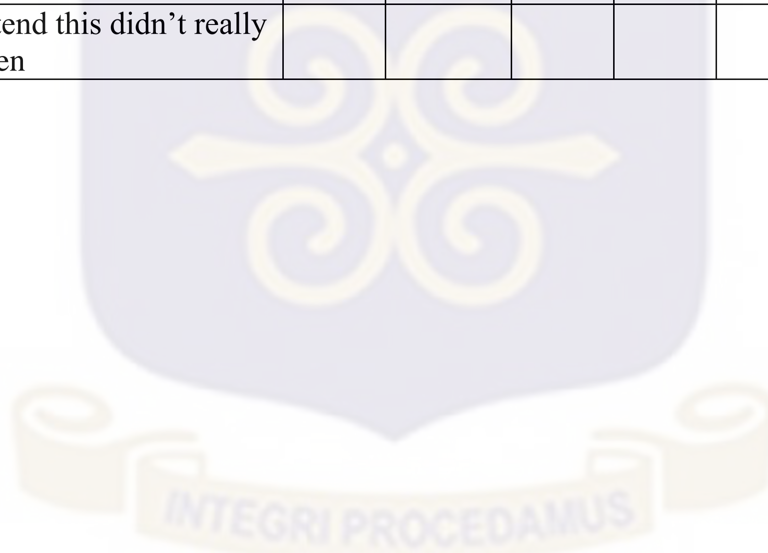
		1 *strongly disagree*	2 *moderately disagree*	3 *slightly disagree*	4 *neither mainly agree nor disagree*	5 *slightly agree*	6 *moderately agree*	7 *Strongly agree*
	really happened							
13	Even though my experience was difficult, I can think of ways that it could have been worse							
14	My situation is not so bad compared to other peoples' situations							
15	I am able to find positive aspects of the Breast Cancer							
16	I have been able to find a 'silver lining' after experiencing Breast Cancer							
17	I pretend this didn't really happen							



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Section D (Life Orientation Test-Revised)

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

1 = I strongly disagree
2 = I disagree
3 = I neither agree nor disagree
4 = I agree
5 = I strongly agree

		1 *I strongly disagree*	2 *I disagree*	3 *I neither agree nor disagree*	4 *I agree*	5 *I strongly agree*
1	In uncertain times, I usually expect the best.					
2	It's easy for me to relax.					
Decisions	If something can go wrong for me, it will.					
4	I'm always optimistic about my future.					
5	I enjoy my friends a lot.					
6	It's important for me to keep busy					
7	I hardly ever expect things to go my way					
8	I don't get upset too easily.					
9	I rarely count on good things happening to me.					
10	Overall, I expect more good things to happen to me than bad.					

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Section E (Santa Clara Strength of Religious Faith Questionnaire)

Please answer the following questions about your religious faith using the scale below. Indicate the level of agreement (or disagreement) for each statement.

1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree

		1 *strongly disagree*	2 *disagree*	3 *agree*	4 *strongly agree*
1	My religious faith is extremely important to me.				
2	I pray daily.				
3	I look to my faith as a source of inspiration.				
4	I look to my faith as providing meaning and purpose in my life.				
5	I consider myself active in my faith or church.				
6	My faith is an important part of who I am as a person.				
7	My relationship with God is extremely important to me.				
8	I enjoy being around others who share my faith.				
9	I look to my faith as a source of comfort.				
10	My faith impacts many of my decisions.				

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Section F (Brief Cope)

These items deal with the ways you've been coping with the stress associated with breast cancer. There are many ways to try to deal with problems. These items ask what you've been doing to cope with breast cancer. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not – just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true *for you* as you can.

1= I haven't been doing this at all
2= I have been doing this a little bit
3= I have been doing this a medium amount
4=I have been doing this a lot

		1 *I haven't been doing this at all*	2 *I have been doing this a little bit*	3 *I have been doing this a medium amount*	4 *I have been doing this a lot*
1	I've been turning to work or other activities to take my mind off things				
2	I've been concentrating my efforts on doing something about the situation I'm in				
3	I've been saying to myself "this isn't real".				
4	I've been using alcohol or other drugs to make myself feel better				
5	I've been getting emotional support from others				
6	I've been giving up trying to deal with it (the disease)				
7	I've been taking actions to try to make the situation better				
8	I've been refusing to believe that it has happened				
9	I've been saying things to let my unpleasant feelings escape				
10	I've been getting help and advice from other people				
11	I've been using alcohol and other drugs to help me get through it				
12	I've been trying to see it in a different light, to make it seem more positive				
13	I've been criticizing myself				
14	I've been trying to come up with a strategy about what to do				
15	I've been getting comfort and understanding				

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		1 *I haven't been doing this at all*	2 *I have been doing this a little bit*	3 *I have been doing this a medium amount*	4 *I have been doing this a lot*
	from someone				
16	I've been giving up the attempt to cope				
17	I've been looking for something good in what is happening				
18	I've been making jokes about it				
19	I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping				
20	I've been accepting the reality of the fact that it has happened				
21	I've been expressing my negative feelings				
22	I've been trying to find comfort in my religious or spiritual beliefs				
23	I've been trying to get advice or help from other people about what to do				
24	I've been learning to live with it				
25	I've been thinking hard about what steps to take				
26	I've been blaming myself for things that happened				
27	I've been praying or meditating				
28	I've been making fun of the situation				

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Section G (The Multidimensional Scale of Perceived Social Support)

I am interested in how you feel about the following statements. Read each statement carefully. Indicate how much you agree or disagree to each statement. Use the following answers:

1= **Very strongly Disagree**
2= Strongly Disagree;
3= Mildly Disagree;
4= Neutral;
5= Mildly Agree;
6= Strongly Agree;
7= Very strongly Agree

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

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APPENDIX 2: **Disease and Treatment Checklist**

1. Type of Breast Cancer
   - i. Ductal Carcinoma In Situ ☐
   - ii. Invasive Ductal Carcinoma ☐
   - iii. Tubular Carcinoma of the Breast ☐
   - iv. Medullary Carcinoma of the Breast ☐
   - v. Mucinous Carcinoma of the Breast ☐
   - vi. Papillary Carcinoma of the breast ☐
   - vii. Cribriform Carcinoma of the Breast ☐
   - viii. Invasive lobular Carcinoma ☐
   - ix. Inflammatory Breast Cancer ☐
   - x. Lobular Carcinoma In Situ ☐
   - xi. Paget's Disease of the Nipple ☐
   - xii. Phyllodes Tumor of the Breast ☐
   - xiii. Recurrent & Metastatic Breast Cancer ☐

2. Stage of Breast Cancer:
   - i. Stage I ☐
   - ii. Stage II ☐
   - iii. Stage III ☐
   - iv. Stage IV ☐

3. Type of treatment: select as many as applicable
   - i. Type of Surgery
     - a. Lumpectomy ☐
     - b. Mastectomy ☐
   - ii. Radiotherapy ☐
   - iii. Chemotherapy ☐
   - iv. Hormone therapy ☐

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*APPENDIX 3: **Principal Component Analysis using Varimax with Kaiser Normalization of the Posttraumatic Growth Inventory.***

	Component				Communalities
	1	2	3	4	
PTG1	.279	-.034	**.649**	.031	.50
PTG2	**.822**	.053	.234	-.114	.75
PTG3	.014	.143	**.820**	.210	.74
PTG4	**.475**	-.147	**.526**	.174	.56
PTG5	**.565**	**.364**	.020	.294	.54
PTG6	**.459**	**.590**	-.023	.249	.62
PTG7	.270	.094	**.699**	-.271	.64
PTG8	**.648**	**.310**	.038	**.447**	.72
PTG9	.272	.128	.122	**.769**	.70
PTG10	**.817**	.180	.164	.204	.77
PTG11	**.615**	**.514**	.043	-.155	.67
PTG12	.207	**.306**	**.482**	.188	.40
PTG13	**.793**	.215	.222	.142	.75
PTG14	-.154	.280	**.558**	**.514**	.68
PTG15	**.695**	**.376**	.203	.110	.68
PTG16	**.416**	**.685**	.063	.214	.69
PTG17	-.072	**.703**	**.448**	-.041	.70
PTG18	**.744**	**.349**	.163	.053	.70
PTG19	**.551**	**.304**	.264	**.316**	.57
PTG20	.291	**.751**	.149	.047	.67
PTG21	**.331**	**.730**	-.037	.267	.71
Eigenvalue	**8.76**	**2.14**	**1.70**	**1.15**	
%variance explained	**41.70%**	**10.19%**	**8.11%**	**5.48%**	

KMO statistic = .847; Bartlett test = 1383.65 (df = 210), $p < .001$. Factor loadings < .3 are Highlighted.

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APPENDIX 4: ***Principal Component Analysis using Varimax with Kaiser Normalization of the Cognitive Processing of Trauma Scale***

	Component				Communalities
	1	2	3	4	
CPOTS1	**.762**	-.221	.270	.037	.70
CPOTS2	-.026	.097	**.840**	.108	.73
CPOTS3	**-.579**	**.445**	-.011	.166	.56
CPOTS4	**.410**	**-.422**	**.436**	.022	.54
CPOTS5	.252	-.290	**.737**	-.073	.70
CPOTS6	**.385**	-.233	**.413**	**.370**	.51
CPOTS7	**-.302**	**.757**	.085	.047	.67
CPOTS8	-.053	**.821**	-.009	**-.256**	.74
CPOTS9	.072	**.654**	-.121	-.064	.45
CPOTS10	-.171	**.632**	**-.331**	.184	.57
CPOTS11	**.440**	.016	-.139	**.362**	.34
CPOTS12	-.096	-.042	.028	**.761**	.59
CPOTS13	**.513**	**-.328**	.146	**.344**	.51
CPOTS14	**.436**	-.196	.088	**.467**	.46
CPOTS15	**.837**	-.015	.071	.028	.71
CPOTS16	**.781**	.016	.135	.157	.65
CPOTS17	.167	.068	.033	**.689**	.51
Eigenvalue	**5.16**	**1.94**	**1.45**	**1.39**	.70
%variance explained	**30.37%**	**11.43%**	**8.53%**	**8.17%**	

KMO statistic = .791; Bartlett test = 630.474 (df = 136), $p < .001$. Factor loadings < .3 are highlighted.

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APPENDIX 5: ***Principal Component Analysis using Varimax with Kaiser Normalization of the Life Orientation Test.***

	Component			Communalities
	1	2	3	
LOT1	**.744**	-.137	.224	.62
LOT2	.120	**.822**	.124	.71
LOT3	**.305**	-.035	**.749**	.65
LOT4	**.523**	**.674**	-.118	.74
LOT5	-.203	**.641**	**.397**	.61
LOT6	**.800**	.137	.037	.66
LOT7	.020	.158	**.803**	.67
LOT8	**.440**	.203	**.412**	.41
LOT9	**.527**	.136	**.319**	.40
LOT10	**.589**	**.511**	-.040	.61
Eigenvalue	**3.376**	**1.356**	**1.342**	
%variance explained	**33.77%**	**13.56%**	**13.42%**	

KMO statistic = .714; Bartlett test = 265.096 (df = 45), p < .001. Factor loadings < .3 are highlighted.

APPENDIX 6: ***Principal Component Analysis using Varimax with Kaiser Normalization of the Santa Clara Strength of Religious Faith Questionnaire.***

	Component		Communalities
	1	2	
Religiousity1	**.881**	.157	.80
Religiousity2	.232	**.770**	.65
Religiousity3	**.749**	.141	.58
Religiousity4	**.537**	.173	.32
Religiousity5	.031	**.765**	.59
Religiousity6	**.842**	.107	.72
Religiousity7	**.717**	.102	.52
Religiousity8	.139	**.763**	.60
Religiousity9	**.532**	**.356**	.41
Religiousity10	**.549**	.030	.30
Eigenvalue	**4.012**	**1.477**	
%variance explained	**40.12%**	**14.77%**	

KMO statistic = .808; Bartlett test = 366.203 (df = 45), p < .001. Factor loadings < .3 are highlighted.

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APPENDIX 7: ***Principal Component Analysis using Varimax with Kaiser Normalization of the Brief Cope.***

	Component								Communalities
	1	2	3	4	5	6	7	8	
Cope1	.213	-.095	-.021	**.820**	-.032	.133	.098	.080	.76
Cope2	.096	.072	.034	.125	**.702**	.251	-.007	.249	.65
Cope3	-.244	.243	**.699**	.059	-.169	.047	-.087	.165	.68
Cope4	-.013	**.750**	.056	-.251	.136	.016	.005	.079	.65
Cope5	**.536**	-.098	-.067	.243	.195	-.097	**-.546**	.224	.76
Cope6	.071	**.681**	.145	.173	-.084	-.113	.194	.145	.60
Cope7	.113	-.056	-.111	.111	.187	-.025	.029	**.861**	.82
Cope8	-.025	.192	**.349**	.035	**-.547**	-.066	-.192	**.399**	.66
Cope9	**.814**	.079	-.078	.056	-.191	.118	.235	.108	.80
Cope10	**.782**	-.284	.035	.171	**.307**	-.001	-.190	.182	.89
Cope11	-.042	**.815**	.175	.030	-.014	.116	-.018	-.181	.74
Cope12	**.701**	-.118	-.112	-.066	**.360**	.192	.196	.256	.79
Cope13	.041	.148	**.790**	-.056	.144	-.126	.195	-.248	.79
Cope14	.263	.156	.131	.296	.129	-.015	**.729**	.085	.75
Cope15	**.805**	-.058	-.114	.131	.109	-.115	**-.304**	-.029	.80
Cope16	-.124	**.806**	.267	.083	.027	.115	.048	-.076	.77
Cope17	**.670**	-.018	-.075	.258	-.175	-.045	-.085	-.064	.57
cope18	**.832**	.119	-.034	.072	.168	.214	.143	.026	.81
Cope19	.236	.159	.101	**.735**	.193	.174	.133	.070	.72
Cope20	.244	-.048	-.092	**.521**	**.397**	.030	-.174	.042	.53
Cope21	.256	.266	-.142	.198	**.533**	-.279	-.008	.126	.57
Cope22	**.628**	-.030	-.118	.158	.104	**.563**	.151	.095	.79
Cope23	**.774**	-.216	-.078	.153	.273	-.136	-.050	-.015	.77
Cope24	-.078	.122	.154	.173	.038	**.712**	-.020	-.039	.59
Cope25	**.443**	.280	-.172	**.326**	-.227	-.092	.222	-.138	.54
Cope26	-.162	.277	**.799**	-.013	-.173	.195	.061	-.045	.82
Cope27	**.562**	-.015	-.219	.063	.164	**.530**	.000	-.025	.68
Cope28	**.865**	.120	.002	.185	.049	-.094	.189	.002	.84
Eigenvalue	**7.944**	**3.875**	**1.787**	**1.529**	**1.486**	**1.319**	**1.119**	**1.066**	
%variance explained	**28.37%**	**13.84%**	**6.38%**	**5.46%**	**5.31%**	**4.71%**	**4%**	**3.81%**	

KMO statistic = .729; Bartlett test = 1821.771 (df = 378), $p < .001$. Factor loadings < .3 are highlighted.

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APPENDIX 8: ***Principal Component Analysis using Varimax with Kaiser Normalization of the Multidimensional Scale of Perceived Social Support***

	Component		**Communalities**
	1	**2**	
SocialSupport1	**.924**	.140	.87
SocialSupport2	**.895**	.168	.83
SocialSupport3	**.749**	**.378**	.70
SocialSupport4	**.808**	**.340**	.77
SocialSupport5	**.897**	.208	.85
SocialSupport6	.265	**.895**	.87
SocialSupport7	.231	**.865**	.80
SocialSupport8	**.663**	**.418**	.61
SocialSupport9	**.399**	**.782**	.77
SocialSupport10	**.871**	.105	.77
SocialSupport11	**.761**	**.344**	.70
SocialSupport12	.083	**.887**	.79
Eigenvalue	**7.364**	**1.973**	
%variance explained	**61.37%**	**16.45%**	

KMO statistic = .897; Bartlett test = 1347.412 (df = 66), $p < .001$. Factor loadings < .3 are highlighted.

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APPENDIX 9: ETHICAL APPROVAL LETTER

UNIVERSITY OF GHANA
ETHICS COMMITTEE FOR THE HUMANITIES (ECH)

P. O. Box LG 74, Legon, Accra, Ghana

My Ref. No ....

10th October 2016

Mr. Samuel Agyei Wiafe
Department of Psychology
University of Ghana
Legon

Dear Mr. Wiafe,

ECH 022/16-17: POSTRAUMATIC GROWTH IN WOMEN SURVIVORS OF BREAST CANCER IN GHANA

This is to advise you that the above reference study has been presented to the Ethics Committee for the Humanities for a full board review and the following actions taken subject to the conditions and explanation provided below:

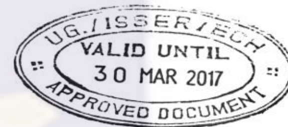
Expiry Date: 30/03/17

On Agenda for: Initial Submission

Date of Submission: 12/09/16

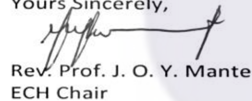
ECH Action: Approved

Reporting: Quarterly



Please accept my congratulations.

Yours Sincerely,



Rev. Prof. J. O. Y. Mante
ECH Chair

CC: Dr. Maxwell Asumeng, Department of Psychology

Tel: +233-303933866 Email: ech@ug.edu.gh | ech@isser.edu.gh

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APPENDIX 10: INTRODUCTORY LETTER.

UNIVERSITY OF GHANA
DEPARTMENT OF PSYCHOLOGY
SCHOOL OF SOCIAL SCIENCES

Ref. No......PSYC 2/33/01.......

November 14, 2016

The Administrator
Peace and Love Hospitals
Odum Kumasi

Dear Sir/Madam,

LETTER OF INTRODUCTION
SAMUEL AGYEI WIAFE (ID NO. 10344486)

The above-named is an MPhil Clinical Psychology student in the Department of Psychology, University of Ghana, Legon.

In partial fulfillment of the requirement for the awards of the MPhil degree, **Samuel Agyei Wiafe** has to write and submit an original thesis.

He has selected the topic: **"Posttraumatic Growth in Women Survivors of Breast Cancer in Ghana".**

To enable him collect data for his work he would need to administer questionnaires and/or conduct interviews. He has selected Peace and Love Hospitals as suitable for his data collection.

Any assistance you may give him would be appreciated.

Yours faithfully,

Dr. Maxwell Asumeng
(Head of Department)

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COLLEGE OF HUMANITIES
P. O. Box Lg 84, Legon, Accra-ghana

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Regression Tables

Descriptive Statistics

	Mean	Std. Deviation	N
Posttraumatic Growth	104.0667	14.59140	105
Age	52.9333	10.39255	105
Years of Survival	5.0067	3.29660	105
Optimism	27.9333	2.14506	105
Cognitive Processing	89.9524	7.64901	105
Religiosity	37.9048	2.42393	105
Coping	79.4952	9.88406	105
Social Support	4.7675	1.40401	105

Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.258[a]	.067	.049	14.23310	.067	3.651	2	102	.029
2	.724[b]	.524	.490	10.42181	.457	18.649	5	97	.000

a. Predictors: (Constant), Years of Survival, Age

b. Predictors: (Constant), Years of Survival, Age, Social Support, Cognitive Pros, Religiosity, Optimism, Coping

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1479.243	2	739.622	3.651	.029[b]
	Residual	20663.290	102	202.581		
	Total	22142.533	104			
2	Regression	11606.956	7	1658.137	15.266	.000[c]
	Residual	10535.577	97	108.614		
	Total	22142.533	104			

a. Dependent Variable: Posttraumatic Growth

b. Predictors: (Constant), Years of Survival, Age

c. Predictors: (Constant), Years of Survival, Age, Social Support, Cognitive Processing, Religiosity, Optimism, Coping

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Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	87.655	7.306		11.998	.000					
	Age	.240	.136	.171	1.761	.081	.199	.172	.168	.973	1.028
	YrSurv	.743	.429	.168	1.730	.087	.196	.169	.165	.973	1.028
2	(Constant)	-21.663	22.118		-.979	.330					
	Age	.208	.103	.148	2.022	.046	.199	.201	.142	.916	1.092
	YrSurv	1.386	.333	.313	4.166	.000	.196	.390	.292	.869	1.151
	Optimism	2.603	.617	.383	4.220	.000	.528	.394	.296	.597	1.676
	CoGPros	-.049	.164	-.026	-.301	.764	.217	-.031	-.021	.664	1.506
	Religiosity	-.022	.523	-.004	-.042	.966	.335	-.004	-.003	.650	1.538
	Coping	.367	.159	.248	2.300	.024	.480	.227	.161	.421	2.377
	Social Support	2.350	.938	.226	2.506	.014	.527	.247	.175	.602	1.661

a. Dependent Variable: Posttraumatic Growth

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Optimism	.598[b]	7.629	.000	.605	.953	1.050	.928
	CoGPros	.249[b]	2.660	.009	.256	.986	1.014	.963
	Religiosity	.380[b]	4.189	.000	.385	.958	1.044	.932
	Coping	.534[b]	6.406	.000	.538	.944	1.059	.922
	Social Support	.538[b]	6.739	.000	.557	.998	1.002	.972

a. Dependent Variable: Posttraumatic Growth

b. Predictors in the Model: (Constant), Years of Survival, Age

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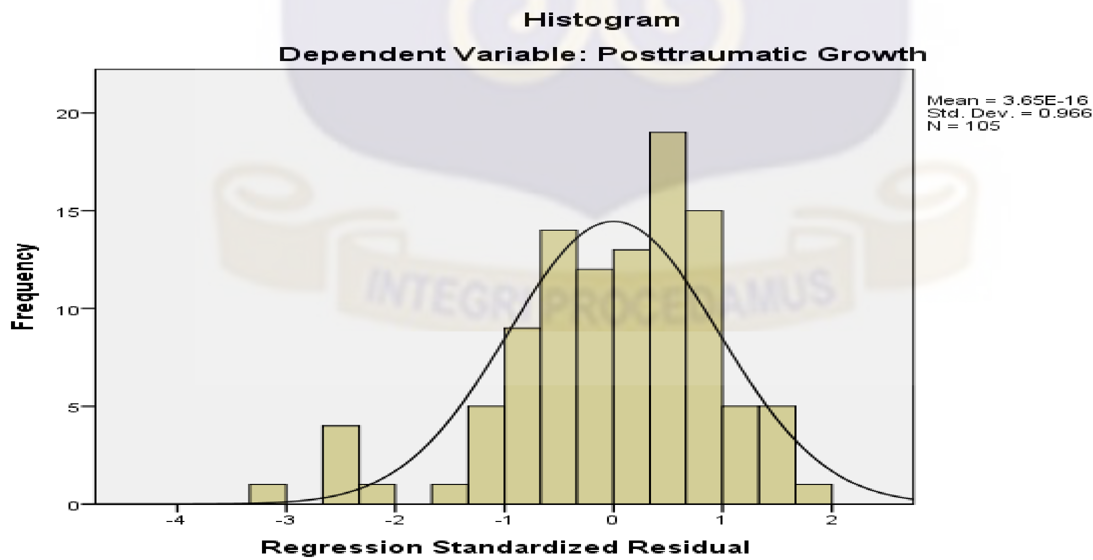
Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Age	YrSurv	Optimism	CoGPros	Religiosity	Coping	Social Support
1	1	2.773	1.000	.00	.00	.03					
	2	.209	3.643	.03	.03	.97					
	3	.019	12.224	.97	.97	.00					
2	1	7.610	1.000	.00	.00	.00	.00	.00	.00	.00	.00
	2	.283	5.184	.00	.00	.82	.00	.00	.00	.00	.01
	3	.063	10.957	.00	.10	.03	.00	.00	.00	.00	.55
	4	.028	16.371	.00	.80	.02	.00	.02	.00	.00	.14
	5	.008	31.829	.02	.01	.01	.08	.08	.03	.43	.07
	6	.004	42.070	.02	.03	.09	.08	.56	.03	.42	.17
	7	.002	57.847	.04	.02	.00	.79	.05	.47	.00	.04
	8	.001	73.331	.91	.05	.02	.05	.29	.46	.14	.02

a. Dependent Variable: Posttraumatic Growth



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