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Hope and Explanatory Style: A Study of Outcomes in Inpatient Headache Sufferers

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HOPE AND EXPLANATORY STYLE:

A STUDY OF OUTCOMES IN INPATIENT HEADACHE SUFFERERS

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Dissertation Approval

This is to certify that the thesis presented to us by Angela Borsuk

on the 28th day of May, 2013, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

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Dedication

This research is dedicated to those who have the courage to hope, no matter what.

Hope is searching for a place where doubt and faith cohabitate. Where they cease to compete and instead mutually inform. Hope is tested and born in suffering and loss. Hope is moving towards wholeness accepting all offers, that there will be meaning and despair, connectedness and separateness, commitment and freedom, head and heart, faith and doubt, life and death. (Jevne,1994).

Abstract

Chronic daily headache (CDH) imposes significant burden on sufferers, among which are impaired quality of life, physical suffering, and financial cost. Psychological factors are known to play a considerable role in headache onset, maintenance, progression, and treatment outcome. Furthermore, headache-related disability cannot be accounted for by biological factors alone; both headache symptoms and psychological variables contribute to headache-related disability (Nicholson et al., 2007). Hope is an important predictor of improved health-related quality of life and has been linked with better outcomes for many diseases, disorders, and also in managing pain. Explanatory style, an individual's style of making sense out of life events, has been associated with a variety of positive health outcomes. At this time, no research exists linking hope and explanatory style with treatment outcomes for CDH. Findings indicate that hope, as assessed through the Herth Hope Index (HHI), and an optimistic explanatory style, as assessed through the Attributional Style Questionnaire (ASQ), are closely related constructs. In this study greater hope predicted reduced headache impact for inpatient headache sufferers. Implementation of a hope instilling intervention could be helpful in reducing headache impact for those with CDH.

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CHAPTER 1: Introduction

Statement of the Problem

In summarizing the literature on Positive Psychology, Seligman (2008), observed a pronounced theme linking positive psychology and good health. Empirical evidence is emerging that supports the connection between positive psychological states and behavioral and social processes that impact health (Aspinwall & Tedeschi, 2010). Headache disorder is a somatic problem known to be influenced appreciably by psychological states (Buse & Adrasik 2010). Anxiety, depression, stress and catastrophic thinking are known risk factors for headache and can aggravate or worsen an existing headache disorder (Nicholson, Houle, Rhudy, Norton, 2007; Schwartz & Adrasik 2003). Identifying specific, positive psychological factors that predict or facilitate recovery from chronic daily headache (CDH) could be instrumental in improving headache outcome. Explanatory style and hope have been associated with better health outcomes in a variety of illnesses and may predict improved outcomes for chronic headache sufferers. The first aim of this study is to identify how headache, hope and explanatory style relate. Optimistic explanatory style and hope represent two different but closely related positive states. Aspinwall and Tedeschi (2010) suggested that in order for the field of positive health to evolve, research studies should determine those positive states that are related to specific health outcomes. Therefore, the second aim of this study is to clarify distinctions in health-related outcomes between hope and explanatory style in chronic headache.

CHAPTER 2: Literature Review

Positive Health and Headache

Seligman (2008) suggested that research on positive health place its focus on disorders that are costly in terms of medical care, have a variable prognosis, are a significant public health problem, are prevalent, and are disabling. Headache disorder meets each of these criteria and is among the most common somatic disorders known to be influenced by psychological factors and interventions (Grazzi & Andrasik, 2010). Therefore headache disorder is well suited to the investigation of positive health. The estimated annual healthcare costs in the US in 2010 for migraine alone was $375 million for inpatient hospitalizations, 700 million for ED visits, and a staggering $3.2 billion dollars was spent on outpatient visits for migraine (Insinga, Ng-Mak, & Hanson, 2011). In fact**, "**head pain" was the fifth leading cause of ED visits overall in the US and was among the top 20 reasons for outpatient office visits (Smitherman, Burch, Sheikh, & Loder 2013). Headache is known to have a variable prognosis with some individuals maintaining mild episodic headache over a lifetime and others' conditions progressing to a severe, chronic daily headache. Headache disorders are unquestionably a significant public health concern, given the great amount of associated disability and financial costs to society (WHO, 2012). Furthermore, headache disorder is among the most common medical complaints worldwide. It has been estimated that the global prevalence among adults of current headache disorder for migraine is >11%; of current tension- type headache it is 40%, and of current chronic daily headache 3% (Stovner et al., 2007). According to Disability- Adjusted Life Year (DALY), the measure of disease burden used by the World Health Organization (WHO), taking into consideration the most recent information available on headache disorder, headache disorders would be the tenth

most disabling medical conditions overall and the fifth most disabling medical condition for women (Stovner et al., 2007).

Chronic daily headache (CDH) is a particularly severe and disabling form of headache which is often difficult to treat (Silberstein, Lipton, & Dalessio, 2001).CDH is any type of headache occurring 15 days or more per month (International Headache Society Guideline; Scher, Midgette, & Lipton 2008). CDH usually occurs initially as an episodic tension type headache or migrainous headache that increases in frequency and is transformed to chronic status (Scher et al., 2008). Patients with CDH often seek treatment at tertiary or specialty headache centers or in extreme cases, through inpatient hospitalization. Individuals may be admitted to inpatient headache treatment if pain is unresponsive to aggressive outpatient treatment or is of such severity that it requires urgent intervention. According to Silberstein et al. (2001), the goal of inpatient headache treatment is medication withdrawal and rehydration, the institution of an effective preventative treatment, pain control, interruption of the pain cycle, patient education, and the establishment of an outpatient pain control regiment.

Psychological Factors and Headache

Research efforts have uncovered the fact that biological risk factors alone are insufficient in accounting for all aspects of headache and headache-related disability (Nicholson, et al., 2007). Currently, a shift towards a biopsychosocial approach to headache treatment and management emphasizes the importance of considering psychological factors in headache (Nicholson, et al., 2007). Psychological factors can contribute to headache onset, maintenance, progression, and treatment outcome. Key psychological risk factors for developing or worsening headache include: major life stressors, many minor daily stressors, negative cognitive appraisal

of stress events, prolonged emotional reaction to stress, poor stress management skills, personality factors, obsessive compulsive tendencies, and negative emotional states such as anger, anxiety, and depression (Nicholson et al., 2007; Schwartz & Adrasik, 2003).

Health Related Quality of Life and Headache - Related Disability

Not only do psychological factors figure prominently into the course and progression of headache disorder but these factors also significantly impact the headache sufferers' health-related quality of life. Health-related quality of life (HRQoL) is an aspect of overall quality of life which includes an individual's health state and physical and mental health status (CDC, 2000). So, although the severity of headache symptoms is an important factor in HRQoL, psychological factors are also prominent in influencing HRQoL and headache-related disability (Tkachuk, Cottrell, Gibson, Holroyd, & O'Donnell, 2003). Headache-related disability is closely associated with HRQoL yet it is also distinct. According to the World Health Organization (2001), a disability is a restriction or lack of ability to perform an activity within the range considered normal for most people. Several studies have examined HRQoL in conjunction with migraine-specific disability. Generally, improvements in health status equate to improved HRQoL and reduced headache-related disability (Lipton, 2003). As might be expected, both anxiety and depression significantly impact headache sufferers' HRQoL (Lanteri-Minet & Radat, 2005); however, catastrophizing was found to be an independent and stronger predictor of HRQoL than either anxiety or depression (Holroyd, Drew, Cotrell, Romanek & Heh, 2007).

Psychological Factors and Headache Outcome

Many psychological factors have been found to predict treatment outcome for headache. Psychiatric co-morbidity is a well established predictor of intractability for headache disorder (Silberstein, et al., 2001). The presence of psychiatric co-morbidity observed in initial

evaluation, using the Structured Clinical Interview for the DSM (SCID), is related to worsening or unchanged headache disorder at an eight year follow- up. Headache-free subjects showed no evidence of psychiatric disorders at the time of the 8 year follow–up (Guidetti et al., 1998). Dysphoric mood and anxiety have also been shown to be poor prognostic indicators for response to headache treatment (Nicholson et al., 2007).Even after excluding those migraine patients with psychiatric comobidities, individuals who had not improved at least 50% at a three year follow-up had higher scores on the MMPI-2 in areas of depression, hypochondriasis, hysteria, and schizophrenia than did those migraine sufferers who had improved more than 50% at the three year follow-up (Luconui, Bartolini, Taffi, & Vignini, 2007). In terms of pain reduction for headache, lower pain perceptions, less functional impairment, and less depressive symptoms clustered together with better outcome and greater treatment response (Davis et al., 2003).

Catastrophizing, Locus of Control, Self- Efficacy and Outcome

Certain patterns of perception and cognition such as catastrophizing, locus of control, and self- efficacy have emerged repeatedly in the headache literature as having value for predicting outcome. Catastrophizing is a psychological response to pain which has been associated with impaired functioning and reduced quality of life across a variety of chronic pain disorders (Peolsson, 2004; Burns, Bruehl, Harden, & Lofland, 2003; Rothrock, Lutgendorf, & Kreder, 2003). Catastrophizing intensifies the possible negative impact of pain and exaggerates helplessness (Holroyd, 2007). This usually results in patients feeling powerless to participate actively in managing their pain (Holroyd, 2007). In various chronic pain disorders, catastrophizing has been associated with elevated pain ratings (Hassett, 2000), reduced pain tolerance (Geisser, 2003), greater use of healthcare services, longer hospital stays (Witvrouw et al., 2009), and greater disability (Turner & Jensen 2002; Martin, et al., 1996).

Locus of control is the extent to which one believes one has personal control over an event or outcome (Nicholson et al., 2007). High internal locus of control and low external locus of control have been linked with better headache outcome (Hudzynski & Levenson, 1985; Martin, Holroyd & Penzien, 1990). Headache sufferers with greater external locus of control are more apt to overuse medication and develop medication overuse headache, a poor prognostic indicator (Martin, et al., 1990). Those headache sufferers with low internal locus of control were found less likely to engage in behaviors which could reduce headache attack (Martin, et al., 1990).

Self-efficacy, an individual's belief that he or she can successfully engage in a course of action to produce a desired goal (Bandura, 1977), has also been linked with improved outcome for headache treatment (Andrasik, 2003). Baseline self-efficacy has been found to predict differential response to combined pharmacologic and behavioral treatment in headache disorders (Smith & Nicholson, 2006).

From these findings, it is possible to surmise how headache sufferers think about their headaches and their related consequences, the control they believe they can exert over their headache experiences and the extent to which they believe that their experiences are catastrophic or not, predict, to some degree, treatment outcome for headache.

Hope and Disease

Hope has long been recognized as a key element of coping with illness and has emerged as a factor related to health and well-being. Hope has been found to help patients and their families endure rigorous medical treatment (De Graves & Aranda, 2005) and to engage actively in rehabilitation and recovery (Arnaert, Filteau, & Sourial, 2006). Although there is clear and conclusive evidence linking hope with psychological adjustment to disease, findings connecting

hope with physical recovery and health have yielded varying results and appear somewhat disease specific or illness specific. Moreover, hope is often studied as an outcome variable in its own right in medical patients, particularly for those facing end of life issues (Herth, 2001, 1992, 1991).

In the case of some health problems, hope is more important for HRQoL than for influencing physical health. A study focusing on hope in patients who have had knee and hip replacement found that hope is useful in predicting emotional adjustment before and after joint surgery, but has limited value in anticipating functional abilities following surgery (Hartly, Vance, Elliott, Coupler, & Barry, 2008). Similarly, in patients with end-stage renal failure, hope played a less important role with regard to physical symptoms and physical quality of life than it did with factors related to psychological adjustment. Patients' hope was a significant predictor of reduced anxiety, depression, reporting of symptoms, burden related to kidney failure, and improved mental health quality of life (Billington, Simpson, Unwin, Bray, & Gile 2008).

Research on hope and heart disease has yielded findings indicating a connection between hope and health. This seems to be attributable to the fact that patient outcome in heart disease is largely predicated on patients' abilities to comply with the treatment regimen (McAlister, Stewart, Ferrua, & McMurray, 2004). Hope, in large part, predicted the abilities of patients with heart disease to comply with the treatment regimen (Davidson, Dracup, Philips Daly, & Padilla, 2007), leading to improved health outcomes.

Research on hope in patients with cancer has been pivotal in increasing an understanding of how hope influences coping. Studies looking at hope in patients with cancer pain revealed that stage of disease and presence of pain did not correlate with level of hope (Chen, 2003), nor were the sensory components of pain such as intensity, location and quality, linked with hope.

However, the cognitive dimensions of pain (the meaning ascribed to the pain experience) were significantly correlated with hope. Those patients viewing pain as loss or threat reported significantly lower hope than those who viewed pain as a challenge. This suggests that the objective aspects of pain may be less important for hope than are the cognitive interpretation that patients make of pain (Chen, 2003).

Not only does one's interpretation of pain seem to influence one's level of hope but there is also evidence to suggest that one's level of hope may influence pain. In one study, higher hope was linked with better pain management in patients with chronic pain (Affleck & Tennen, 1996). Some hope theorist have viewed hope as being synonymous with expectancy (Stoland, 1969); in a study with chronic pain patients, the degree of expected emotional distress from pain did not predict pain experience; however, the level of confidence in the expectation did, and thus the extent to which a belief about pain is held influences pain experience (Brown, Seymour, El - Deredy & Jones, 2008). In attempting to elucidate the relationship between hope and pain, Berg, Snyder, and Hamilton (2008) developed an intervention to increase hope and to study pain in university students performing a cold presser task. In this experiment, receiving a hope intervention resulted in an increase in perceived pain severity as well as pain tolerance. This suggests that although the hope intervention may have primed participants for pain, pain tolerance is not contingent on the sensory experience of pain. Hope then may be closely linked with the ability to tolerate pain and therefore may influence HRQoL.

Varying Definitions of Hope

Hope has been conceptualized differently by various disciplines and researchers. In attempting to elucidate hope, psychology as a research discipline, has focused predominantly on goal attainments and generalized expectation (Snyder 2000; Scioli, Ricci, Nyugen & Scioli,

2011). Current psychological research on hope commonly cites hope theory (Snyder; 1994, 1996, 2002). Hope theory views hope as a goal directed, positive motivational state that is based on the interaction derived from agency and pathway planning. Some of the major criticisms of hope theory include: lacking an integration with other related psychological concepts, ignoring important affective aspects of hope and not recognizing problems outside of internal control (Aspinwall et al., 2002). Furthermore, in focusing narrowly on goal pursuit that rests solely within the individual, hope theory misses important relational and spiritual dimensions of hope (Bernardo 2010; Scioli et al., 2011).

The nursing and palliative care literature offers a more expansive approach to hope; rather than viewing hope as trait-oriented and one-dimensional, or a point on a continuum between hopeful and hopeless, hope is viewed as multidimensional dynamic process (Nekolaichuk, Jevne, &Maguire 1999; Dufault & Martocchio, 1985). In addition to addressing aspects of expectation and goal directedness, nursing research has emphasized both the spiritual and relational aspects of hope. Hope is seen as something that occurs between persons, a relational process. Emphasis is placed on the notion that individuals can influence another person's hope through therapeutic presence, by communicating positive expectation and by exhibiting a confidence in the individual's ability to overcome hardship (Farran, Herth, & Popovich, 1995).

Furthermore, models of hope in the nursing and palliative care literature differ from some of the more prominent theories on hope in psychological studies because they were initially derived from qualitative rather than quantitative research (Dufault & Martocchio, 1985; Snyder 2000). Based on qualitative data obtained from elderly patients with cancer, Dufault and Martocchio (1985) developed a multidimensional model of hope with the goal of better

understanding how hope operates to facilitate and support the patient throughout the illness experience and particularly during the final stage of life. According to Dufault and Martocchio (1985) model, hope is a, "multidimensional dynamic life force characterized by a confident yet uncertain expectation of achieving good which to the hoping person is realistically possible and personally significant". Based on this multidimensional view, Herth (1991) developed the Herth Hope Scale (Herth, 1992). Herth's hope scale, (1991; 1992) looks at the cognitive temporal aspect of hope (the perception that a positive, desired outcome is realistically probable in the near or distant future), the affective behavioral aspect (a feeling of confidence with initiation of plans to affect the desired outcome), and an affiliative contextual aspect (a recognition of the interdependence and interconnectedness between self and other and between self and spirit). This unique perspective seems to grasp the less tangible aspects of hope and comes closer to reflecting people's internal and lived experience of hope.

Hope Interventions

Based on this model, Herth (2000, 2001) implemented a group protocol aimed at instilling hope in patients experiencing a first recurrence of cancer. The hope intervention consisted of eight group sessions. The first two sessions were referred to as "Searching for Hope", an experiential processes aimed at eliciting participants' fears, expectations and hopes. The third session focused on "Connecting with Others". Two sessions were devoted to "Spiritual Transcendent Process" and aimed at reflecting on the meaning and purpose of life, death, and suffering and in doing so, indentifying sources of strength. The final two sessions focused on cognitive reframing and on strategies to engender hope (Herth, 2000). Those who participated in treatment experienced an increase in hope level as well as improved quality of life immediately after intervention and at a 3, 6 and 9 month follow - up (Herth, 2000). More recently, hope

interventions have been implemented with oncology patients, using the Herth Hope Index to assess change in hope following intervention. A psychosocial supportive intervention called the "Living with Hope Program" (LWHP) was found to increase hope and quality of life for older adult, community-living, terminally ill cancer patients. Patients receiving this intervention had statistically significant, higher hope and quality-of-life scores than those in the control group at the one week follow- up (Duggleby, et al. 2007). HOPE-IN, an 8- week group hope intervention significantly increased levels of hope immediately, and at the 3, and 12 month follow- up in community-based oncology patients (Rustøen, Cooper, & Miaskowski, 2010).

Explanatory Style

Optimistic explanatory style, also referred to as learned optimism, is an individual's style of making sense out of life events. Explanatory style is modifable through cognitive behavioral therapy and has been linked with positive health outcomes. Depression following an aversive event is likely to be a result of the causal attribution the individual makes about the situation. If the uncontrolled aversive circumstance is believed to be caused by some aspect of the individual (internal attribution) as opposed to something about the situation (external attribution), then the resulting experience is likely to be decreased self- esteem (Peterson et al., 1982). If the uncontrollable circumstance is attributed to stable and unchanging factors (stable attribution) rather than transitory factors (unstable attribution) then depressive symptoms are predicted to be long- lasting. If the uncontrollable, aversive circumstance is perceived to be present in a wide variety of situations (global attribution) rather than this particular situation only (specific attribution) the resulting depression is likely to be pervasive (Peterson et. al, 1982). Peterson and Seligman, (1984) found that individuals who typically explain bad events with an internal, stable,

and global explanatory style are at risk for demoralization, depression, passivity, failure, and other helpless deficits.

Explanatory Style and Health

Conversely, research has shown that those who explain bad life events as having external, unstable and specific causes tend to experience better health than their more pessimistic counterparts (Peterson, 1995). Peterson (1988) found that explaining bad events as being due to global and stable causes foreshadows later infection. Dua, (1995) found similar results which suggest that explanatory style plays a role in health and illness. Dua (1995) investigated the role of explanatory style subsequent to bad events; global attributions were the most significant predictors of retrospective and prospective health in college students. Dykema, Bergbower, and Peterson, (1995), investigated the relationship between explanatory style, stress, and illness. The tendency to explain bad events with stable and global causes was related to greater reported hassles, which in turn were related to poor health status. These studies found a connection between poor health and attributing negative events to global and stable factors. Internal versus external explanatory style, however, was not correlated with health, and appears extraneous to understanding the link between explanatory style and health (Peterson, 1988, Dua, 1995; Dykema et al., 1995). Of note, explanatory style resembles in many ways the psychological concepts of locus of control, self-efficacy and catastrophizing, all known to influence headache outcome. At this time no research exists linking the importance of hope and explanatory style with the successful treatment of chronic headache.

Distinguishing Hope from Optimism

Hope and an optimistic explanatory style (learned optimism) represent two different but related positive states. Many researchers have suggested that the redundancy among positive psychological constructs has been largely overlooked (Aspinwall, et al., 2002). Moreover, multiple operational definitions of hope and optimism pose a barrier to making meaningful connections in the literature or to arriving at definitive conclusions. In order to advance the field of positive health, studies should differentiate various forms of positive thinking and affect and determine those states which influence particular health outcomes (Aspinwall & Tedeschi, 2010). Hope theory and explanatory style, for example, have been found to share similarities in predicting academic success, athletic performance, adjustment to illness, pain, pain tolerance, treatment adherence, psychological adjustment and psychotherapy outcome (Tennen, Affleck, & Tennen, 2002)**.** Less is known regarding the similarities and differences between Herth's model of hope (1992) and explanatory style. Furthermore, although there is ample evidence to suggest an overlap in outcome between various theories of hope and optimism, some research is beginning to focus on identifying their conceptual differences and distinctive outcome features. Scioli et al., (1997) found that hope as defined by Gottschalk (1985) was a more robust predictor of reported health outcomes than was optimism, as measured by Scheier and Carver (1985). Furthermore, lower hope scores, rather than optimism, were significantly correlated with a greater frequency of reported illness. In investigating the roles of hope and optimism in coping, Bryant and Cvengros, (2004) found that hope (Snyder, 2002) had a stronger influence on general self- efficacy, whereas optimism **(**Scheier & Carver,1985**)** influenced the use of positive reappraisal as a coping strategy. Gallagher and Lopez (2009) found that hope (Snyder 2002) and optimism **(**Scheier & Carver,1985**;** Scheier, Bridges, & Carver, 1994) uniquely contribute to

flourishing mental health and well being. Gallagher and Lopez (2009) concluded that in these models, optimism (Scheier & Carver,1985) focuses to a greater degree on generalized expectancies, that which is not within the individual's control, whereas hope theory places more emphasis on internal agency, that which is within an individual's control (Rands & Cheavens, 2009; Gallagher& Shane 2009). These findings highlight the fact that different definitions of hope and optimism are likely to lead to different conclusions about divergence and convergence as well as differing understandings about the distinctive contribution each makes to health and well-being.

The purpose of examining Herth's model of hope (1991; 1992) and explanatory style is that, unlike trait and dispositional attributes, both of these constructs are amenable to intervention. Furthermore, Herth's model of hope (1991; 1992) was developed for and tested with medical patients and is thought to offer a more encompassing understanding of hope. Finally, identifying possible divergence in outcomes between hope (Herth, 1991; 1992) and explanatory style could help to clarify further the conceptual distinctions in these related, positive health concepts and by doing so, inform treatment practice for CDH sufferers.

CHAPTER 3: Purpose of the Study

This study examined the relationship between headache patients' hope, explanatory style, headache impact, reduction in pain level and length of hospitalization. The convergent and divergent aspects of hope and explanatory style on the stated outcome measures were investigated. The knowledge gained from this study will be used to ascertain whether or not an intervention aimed at instilling hope and modifying explanatory style would be useful in improving outcomes for inpatient headache sufferers. Additionally, divergence in associated outcomes for hope, and explanatory style could help to clarify conceptual difference in these concepts.

Rationale and Hypotheses

Because hope and optimistic explanatory style (defined here as attributing bad events to specific and unstable causes) are closely related psychological states, **Hypothesis 1 suggests:** that hope as measured by the HHI will be negatively correlated with scores on the ASQ for bad events. The rationale for this prediction is that as scores on the HHI increase (which reflects increased hope); scores on the ASQ for attributions about bad events will decrease (which reflects an optimistic explanatory style, that is, specific and unstable).

Headache related disability and HRQoL are important aspect of the headache experience. Hope has been correlated with adjustment to disease and HRQoL (Hartly et al., 2008; Billington et al., 2008). Optimistic explanatory style for bad events has been linked with better health and well-being; therefore, it is hypothesized in **Hypothesis 2:** that it is expected that hope, as measured by the HHI, will be negatively correlated with headache impact, as measured by the HIT-6. The rationale for this hypothesis is that as scores on the HHI increase (increased hope), scores on the HIT-6 will decrease (meaning the impact of the headaches will be reduced).

A corollary hypothesis is that as scores on the ASQ decrease (optimistic explanatory style for bad events, i.e., specific and unstable), scores on the HIT-6 will also decrease (meaning less adverse impact of the headaches). These scales will be positively correlated.

Hope and an optimistic explanatory style for bad events have been associated with improved health outcome. Because headache is known to be strongly influenced by psychological factors (Buse & Andrasik, 2009), it is presumed that those who are more hopeful and have an optimistic explanatory style should respond to treatment and recover more quickly than those who are more pessimistic and less hopeful. Therefore, it is hypothesized, in **Hypothesis 3:** It is expected that as hope scores, as measured by the HHI increase, length of hospitalization will decrease, meaning that a negative correlation is predicted. A corollary hypothesis is that as scores on the ASQ for a bad event decrease, length of hospitalization will also decrease. Likewise, high scores on the ASQ for bad events (more global and stable attributions) will be associated with high scores on the length of hospitalization scale. Furthermore in **Hypothesis 4:** It is expected that hope scores, as measured by the HHI, will be positively correlated with the amount of pain reduction at discharge. A corollary hypothesis is that as ASQ scores decrease (optimistic explanatory style for bad events, specific and unstable), the amount of pain reduction at discharge will be greater.

The advancement of positive health is dependent upon identifying those concepts that relate to specific health outcomes. Cognitive factors such as hope and confidence in pain belief have been shown to influence pain perception (Brown, et al., 2009; Chen, 2003; Berg et al., 2008) It is thought that hope may indirectly influence patients' pain. Therefore, **Hypothesis 5 suggests:** It is expected that hope and optimistic explanatory style will be significant predictors

of decreases in pain at discharge; also, hope is predicted to be a stronger predictor of pain reduction than optimistic explanatory style.

Catastrophizing has been associated with patients feeling powerless to participate actively in managing their pain and with a longer hospital stay (Holroyd, 2007; Sullivan, 2001) Catastrophizing and attributing bad events to global and stable causes share, in common, exaggerated distortions of aversive experiences which can result in helplessness. Therefore, **Hypothesis 6**: It is expected that hope and optimistic explanatory style will be significant predictors of length of stay; also, optimistic explanatory style is predicted to be a stronger predictor of length of stay than hope.

CHAPTER 4: Methods

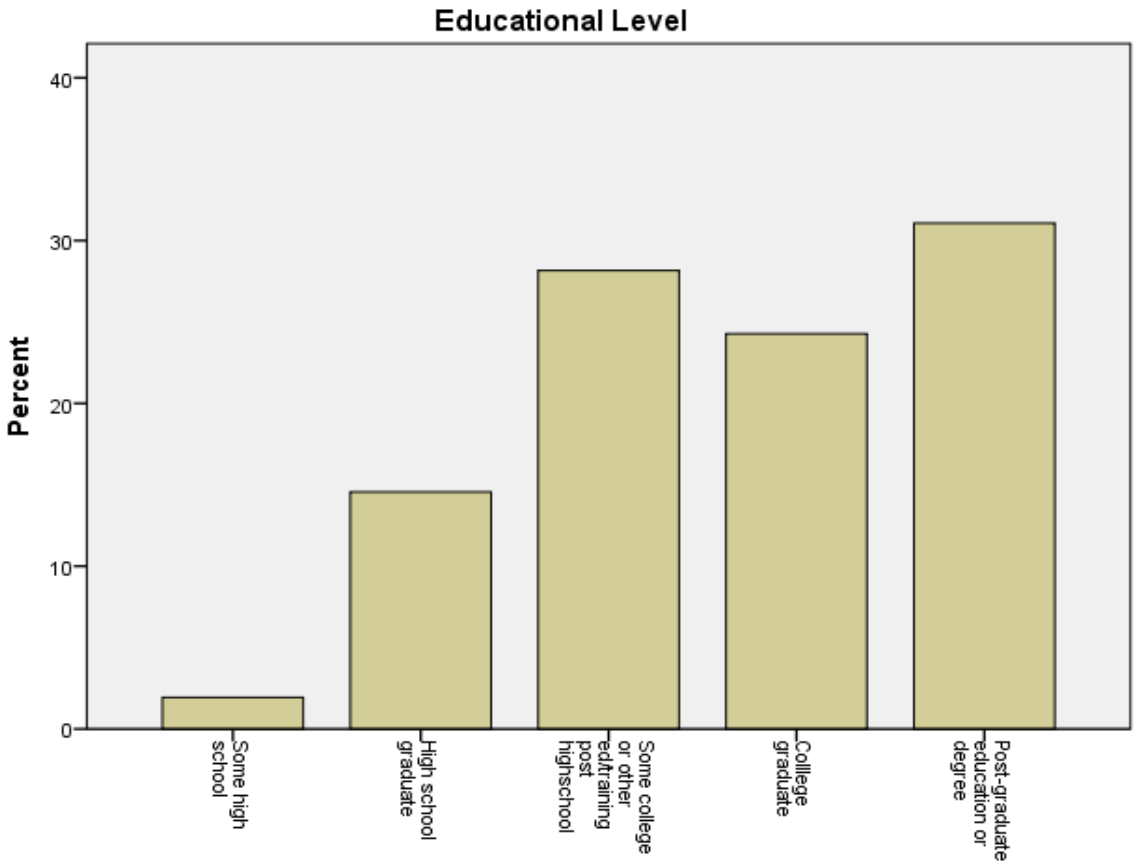
Research Design

This study used a correlational design to gain understanding of how hope and explanatory style relate to one another, to headache impact, to reduction in headache pain and to length of inpatient hospitalization. Additionally, correlational analysis was used to better understand the overlaps and distinction in hope measured by the HHI and optimistic explanatory style as measured by the ASQ.

Participants

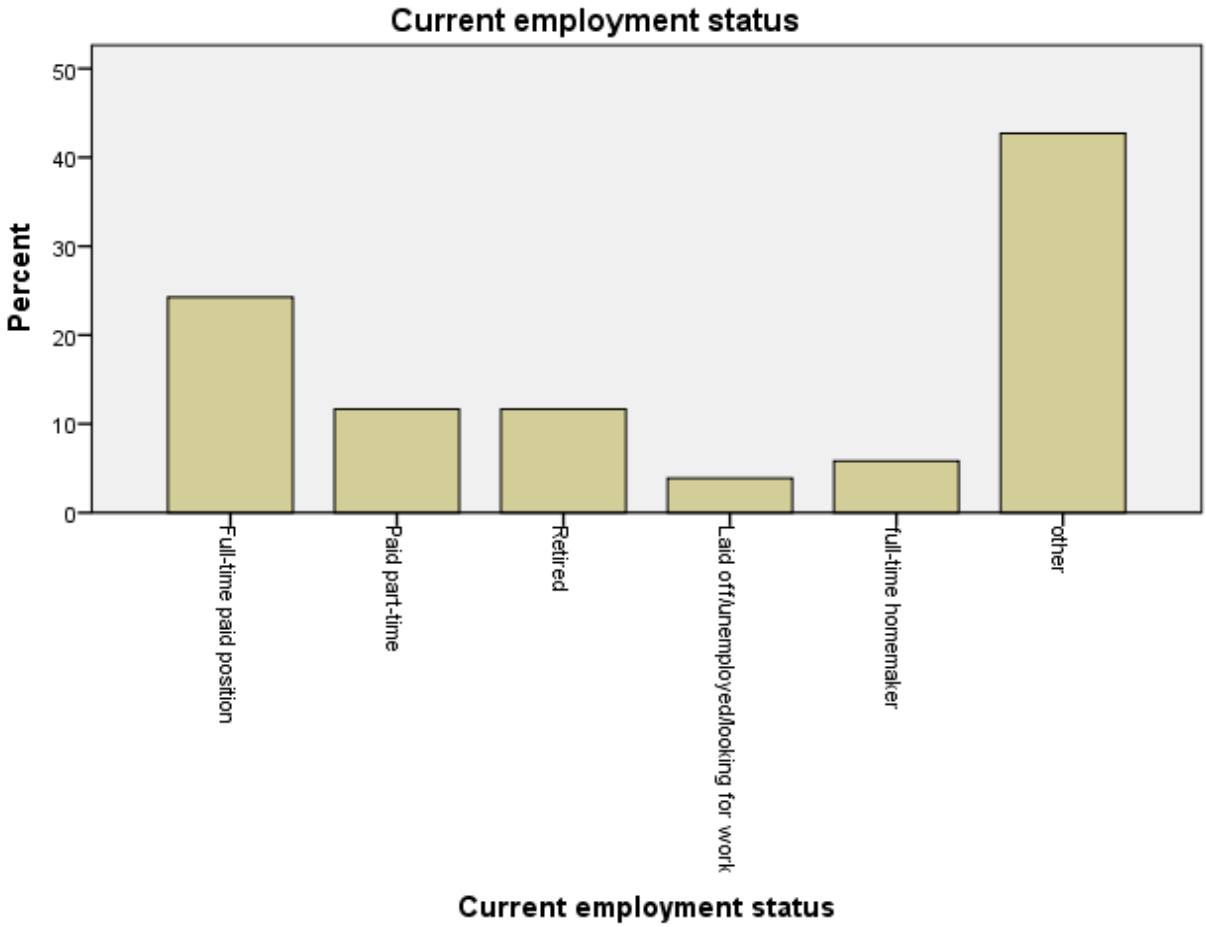
Participants in this study were 103 adults (19 males, 84 females) receiving inpatient headache treatment at a specialty headache center in the Northeastern United States. Participants' ages ranged from 18 to 71 with a mean age of 41.53. Participants' educational profile was as follows; some high school 1.9%, high school graduate 14.4%, some college 27.9%, college graduate 24%, post graduate 30.8%. See Figure 1.

Figure 1. Education Level



Participants' employment status was: full- time 24%, part- time 11.5%, retired 11.5%, laid off /unemployed 3.8%, full -time home maker 5.8%, and other 42.3%. See Figure 2.

Figure 2. Current Employment Status



Participants' marital status was: married 58.7%; separated 3.8%; divorced 7.7%; widowed 1%, and never married 27.9%. Participants' physical activity level prior to hospitalization was as follows: less than once a week 44.2%; once a week 12.5%,;twice a week 9.6%,;three times a week 13.5%; four or more time a week18.3%. See Figure 3.

Figure 3. Exercise Level

As indicated by the necessity for inpatient hospitalization, all participants in this study experience chronic daily headache which substantially impacts their quality of life. The majority of participants were Caucasian (90%) women (84%); this group tends to be heavy utilizers of inpatient headache treatment.

Inclusion Criteria

The inclusion criteria for this study are that subjects are adult patients over the age of 18, admitted to inpatient headache treatment at a specialty headache center.

Exclusion Criteria

Exclusion criteria for this study include patients with significant comorbid medical disorders, defined as having more than two life threatening diseases or diagnosis of a terminal illness. Life threatening diseases include, but are not limited to a myocardial infarction in the previous year, hypertension, angina, morbid obesity, congestive heart failure, cancer, chronic obstructive pulmonary disease (COPD), kidney problems, liver disease, and stoke.

Recruitment

All participants admitted for inpatient headache treatment were asked to participate. Patients were recruited for this study within 48 hours of admission. Potential participants were approached by the researcher or medical staff in patients' hospital rooms. The voluntary nature of participation in this study was emphasized.

Measures

The Herth Hope Index (HHI)

The Herth Hope Index (HHI), (Herth, 1999) is a 12 item, abbreviated version of the Herth Hope Scale (HHS). Items on the HHI are rated on a four point Likert scale (1 = strongly disagree, 2= disagree, 3=agree, 4= strongly agree). Total scores range from 12-48. The HHI was designed to assess hope in adults in clinical settings. The multidimensional nature of hope is assessed in the

HHI, through subscales that identify three distinct dimensions of hope (a) cognitive temporal aspects, (b) an affective behavioral component and (c) an affiliative-contextual component (Herth, 1992).

Construct validity for the multidimensional approach on the HHI was supported through the factorial isolation of the three factors; cognitive temporal, affective behavioral, and affiliative –contextual (Herth, 1992). These three factors accounted for 41% of the total variance in the measure. Each of the three factors was examined for reliability as subscales; Alpha coefficients ranged from 0.78 to 0.86 with a two week test retest reliability of 0.91. The HHI has an overall Alpha coefficient of 0.97, indicating strong internal consistency and high concurrent criterion related validity of (r=0.92) (Herth, 1992).

The Participant Information Questionnaire (PIQ)

The Participant Information Questionnaire includes demographic questions, which are geared toward identifying exclusion criteria, level of pain upon admission, and other factors known to relate to headache.

Attributional Style Questionnaire (ASQ)

The Attributional Style Questionnaire (ASQ) (Peterson, et al., 1982) is used to assess individual difference in explanatory style. The ASQ contains 12 different hypothetical scenarios, six positive situations and six unpleasant situations. Participants are asked to write down what caused the situation, and then decide if the event occurred as a result of internal causes or external causes, stable causes versus unstable causes, and global causes versus specific causes (Peterson et al., 1982). Items on the ASQ are rated on a seven point Likert scale. For the

purposes of this study, only the subscales for global versus specific and stable versus unstable attribution for bad events were used (Peterson et al., 1982).

Composite subscales for bad events had good internal reliability and an alpha coefficient of .72 (Peterson et al., 1982). Attributional style of stability for bad events achieved a Cronbach alpha of .59, and attributional style of globality for bad events reached .69. The distinctiveness of the three dimensions was adequate for bad events. Finally, stability over a five week period showed that composite scores for bad events were .64, indicating sufficient test re- test reliability (Peterson et al., 1982).

Headache Impact Test -6 (HIT-6)

The HIT-6 is one of the most commonly used assessment instruments for measuring disability in chronic headache and migraine (Piovesan & Silberstein, 2006). The HIT-6 examines disability over a four-week period and assesses areas of functioning on the job, at home, and in social situations, as well as the emotional impact of headaches on everyday life. Internal consistency for the HIT-6 showed a Cronbach's alpha of 0.89 and a test re-test reliability of .80 (Kosinski, et al., 2003). In tests of validity in discriminating across diagnostic and headache severity groups, relative validity of 0.82 and 1.00 were observed in comparison with the total score (Kosinski, et al., 2003). Based on these results, the HIT-6 is a reliable and valid instrument for assessing headache impact.

Numeric Rating Scale (NRS)

Because headache pain is an internal experience, no method yet exists that can objectively quantify headache parameters (Piovesan & Silberstein, 2006); therefore, subjective ratings of head pain sampled daily are considered the "gold standard" in behavioral headache

research (Andrasik, Lipchik, McCrory, & Wittrock, 2005). The numeric rating scale (NRS) assesses pain on a scale of 0-10, in which 0 = no pain; 1-3 = mild pain (nagging, annoying); 4–6 = moderate pain (interferes significantly), and 7-10 = severe pain (National Institute of Health, 2003). This scale is easily understood by most patients and can be administered in oral or written form (Chapman& Syrjala, 1990). NRS has been used as a primary outcome in several studies on headache and its use for assessing pain is supported by NIH (Friedman, Solorzano et al., 2010; Charles & von Dohln, 2010; Friedman et al., 2010b; Riff et al., 2010). NRS are highly patient centered, and have the greatest value when looking at change within an individual (Khorsan, Coulter, Hawk, Choate, & 2008). Using convergence methods, the NRS was compared with the Visual Analog Scale (VAS); the two were strongly and statistically significantly correlated ($r = 0.847$, $p < 0.001$), supporting the validity of the verbally administered NRS (Paice & Cohen, 1997).

Length of Stay

Length of stay in inpatient hospitalization for headache is an important outcome variable because it is thought to reflect efficiency and efficacy of treatment. Several studies examining inpatient headache treatment have used length of stay as the critical outcome variable (Primavera& Kaiser, 1994; Lake, Saper, Young, Richardson, & Shulka, 2009). Although it might appear that LOS would be determined by the payer, as a whole this is not the case, particularly in specialized and severe instance such as CDH. According to Lake et al., (2009) an analysis of variance indicated that in an inpatient headache unit, LOS for the four primary payers (in-state Blue Cross, out-of- state Blue Cross, Medicare, and commercial insurance) were not statistically significant [$F(3) = 0.33$, $P < .80$]. Although financial constraints may have reduced LOS for some individual patients, length of stay was based primarily on clinical need (Lake et al., 2009).

Setting

The study was conducted on an inpatient headache unit, which is part of a specialty headache center. This center uses a biopsychosocial approach to headache treatment. Combining behavioral approaches with pharmacological interventions in headache treatment is considered best clinical practice (Andrasik, Lipchik, McCrory, &Wittrock, 2005). The multidisciplinary treatment team includes an attending physician, a physician's assistant, a neurology resident, a psychologist, a psychiatrist, and the unit nurses, along with other allied health professionals. In addition to receiving intravenous medications and continuous IV fluids throughout their stay, headache patients are required to attend a nutrition group led by a registered dietician, a yoga and physical therapy group, a coping skills group led by a psychologist or a psychology intern, and a family support group. Furthermore, each patient meets individually for a consultation with a team member from psychology and /or psychiatry. The treatment team works collaboratively to educate patients regarding headache management and lifestyle change and meets weekly to facilitate patient recovery efficiently.

Procedure

Patients were given a packet including the Herth Hope Index (HHI), the Headache Impact Test (HIT-6), The Attributional Style Questionnaire (ASQ), a participant information questionnaire (PIQ), an informed consent letter, and an envelope. Upon completion of the packet, participants were asked to place forms in a sealed envelope, and to place the sealed envelope in a locked box. The researcher retrieved the completed forms from the locked box, and through the review of a weekly report ascertained the patient’s length of stay and the level of pain at the time of discharge. The data were then entered into an electronic data set.

CHAPTER 5: Results

Analysis

Means, standard deviation, and ranges, of the total sample, for all variables are shown in Table 1.

Table 1. Descriptive Statistics

	M	*SD*
Pain level at Discharge	1.75	2.20
Yrs HA has been a problem	11.63	12.65
# of previous Hosp for HA	2.64	3.48
# of functional syndromes	1.13	1.13
Total scores on HIT-6	67.40	6.21
Total Scores on HHI	38.19	6.50
ASQ Specific vs. Global for bad events	4.21	1.36
ASQ Unstable vs. Stable for bad events	4.38	.97
LOS	5.5	2.04
Pain decrease	5.54	2.95

Note: Pain level at discharge rated on scale from 0-10 where 0= no pain; 1-3 = mild pain; 4-6 = moderate pain, and 7-10 = severe pain; HA=headache; HIT-6 scores range from 36-78; ≤ 49 =little or no impact; 50-55= some impact; 56-59= substantial impact; ≥ 60 = severe impact ; HHI scores range from 12-48 with a higher score = higher hope ; ASQ scores range from 1-7 where 1 is an optimistic explanatory style and 7 is a pessimistic explanatory style; LOS= length of hospital stay in days.

A Pearson correlation analysis was conducted to determine if, **Hypothesis 1 was supported.** **Hypothesis 1** predicted that hope, as measured by the HHI would be negatively correlated with scores on the ASQ for bad events because higher scores on the HHI are associated with greater hopefulness and lower scores on the ASQ for bad events are indicative of a more optimistic explanatory style. Pearson correlational analysis revealed that higher scores on the HHI and lower scores on the ASQ global scale for bad events (which indicates a more optimistic explanatory style) are negatively correlated $r(103)=-.324$, $p<.01$. 2). Pearson correlational analysis also showed that higher scores on the HHI and lower scores on the ASQ stable scale for bad events (which indicates a more optimistic explanatory style) were also negatively correlated $r(103)=-.378$, $p<.01$. Thus, hope and an optimistic explanatory style for bad events are related psychological states. (See Table 2.).

Table 2. Pearson Correlation HHI, ASQ bad events global, and ASQ bad events stable

	Herth Hope	ASQ bad event Stable vs .Unstable	ASQ bad event Global vs. Specific
ASQ bad event Stable vs. Unstable	- .378**	1.00 .	.655
ASQ Bad event Global vs. Specific	- .324**	.655	1
Herth Hope	1	-.378**	-.324**

** Correlation is significant at the 0.01 level

Next, a regression analysis was conducted to test a model for predicting ASQ scores (global versus specific attribution for bad events). The predictor variable was total score on the HHI with the ASQ (specific versus global attribution for bad events) as the criterion. This model was able to account for 10.5 % of the variance in ASQ global attribution for bad events, $F (1, 101) = 11.83$, $p=.001$, $R^2=.105$.

Another regression analysis was used to develop a model for predicting ASQ scores (stable versus unstable attribution for bad events). The predictor variable was total score on the HHI with ASQ scores (stable versus unstable attribution for bad events) as the criterion. This model accounted for 14.3% of the variance in the ASQ scores F (1, 101) = 16.82, p=.000, R^2=.143. Basic descriptive statistics and regression coefficients are shown in Table 3. Results showed that in general, the more hopeful a headache patient is, the more specific and unstable the attributions are for a bad event.

Table 3. Model using HHI for predicting ASQ scores (attribution for bad events)

	HHI	Unstandarized Beta	Standard Error	R^2	P
ASQ Bad event Global vs. Specific	-.324**	.067	.020	.105	.001
ASQ Bad event Stable vs. Unstable	-.378**	-.056	.014	.143	.000

Hypothesis 2 stated that hope, as measured by the HHI, would be negatively correlated with headache impact; therefore, as hope increases, headache impact decreases. Hypothesis 2 also stated that as scores on the ASQ for bad events decrease, indicating a more optimistic explanatory style, scores on the HIT-6 should also decrease, indicating less headache impact. Thus, the HIT -6 and the ASQ for bad events will be positively correlated. The observed Pearson correlation between the HHI and the HIT- 6 is statistically significant, r(103) = -.319, p<.001.

However, the Pearson correlations between the ASQ (stable versus unstable attribution for bad events) and the HIT 6 was not significant r(103)= -.086, p= .195. Likewise, the correlation between ASQ global versus specific for bad events and the HIT-6 was also not significant, r (103)= .10, p= .157. A regression analysis was then conducted using total score on the HHI as the predictor and the HIT-6 score as the criterion. Scores on HHI made a significant contribution to the prediction of the HIT-6 and accounted for 10.2% of the variance in headache impact (scores on HIT-6), F (1, 101) =11.449, p=.001, R^2=.102. Regression analysis supported the hypothesis that increased hope predicts decreased headache impact.

A correlation analysis was then conducted to establish whether or not, **Hypothesis 3** was supported. Hypothesis 3 stated that as hope scores, as measured by the HHI increase, length of hospitalization will decrease, demonstrating a negative correlation. Hypothesis 3 also stated that as scores on the ASQ for bad events decrease, showing a more optimistic explanatory style, length of hospitalization would decrease, indicating a positive correlation. Pearson's correlation between length of stay in inpatient hospitalization and hope did not support the research hypothesis *r(103)*= -.077, *p* = .219. Furthermore, Pearson's correlation between length of stay and attributing bad events to specific causes *r(103)*= -.129, *p*=.096 or unstable causes *r(103)*= -.122 , p=0.11 found no linear relationship. Contrary to the hypothesis, findings suggest that hope and an optimistic explanatory style for bad events are not related to length of hospitalization.

Hypothesis 4 stated that hope scores as measured by the HHI would be positively correlated with reduction in pain from admission to discharge, whereas scores on the ASQ for bad events will be negatively correlated with greater pain reduction. Thus, greater hope and a more optimistic explanatory style determine greater pain reduction. Pearson's correlation

between reduction in pain and hope did not support the research hypothesis *r(103)*= .016, *p* = .436. Pearson's correlation between reduction in pain and attributing bad events to specific causes *r*= .080, *p*= .210 or unstable causes *r*(103)= .084, *p*=.200 also did not support the research hypothesis. Results indicate no relationship between pain reduction, hope, and an optimistic explanatory style for bad events.

Hypothesis 5: stated that both hope and optimistic explanatory style would be significant predictors of pain reduction and that hope would be a stronger predictor of pain reduction than would optimistic explanatory style for bad events. A multiple linear regression analysis was used to develop a model for predicting patients' decreases in pain. Regression coefficients are shown in Table 4. None of the predictor variables was found to be significant F (1, 101) =.375, p=.772, R^2=.011. Therefore, this hypothesis was not supported. (See table 4).

Table 4. Decrease in Pain

	Decrease in pain	Beta	Intercept	Standard Error	B
ASQ bad event Stable vs. Unstable	.084	-.072	3.061	.414	.219
ASQ bad event Global vs. Specific	.080	-.053	3.061	.290	.115
Herth Hope	.016	.060	3.061	.049	.027
Mean	5.55				
SD	2.95				
R^2	0.11				
P	.772				

Hypothesis 6: stated that both hope and optimistic explanatory style for bad events would be significant predictors of length of hospitalization. It was also expected that optimistic explanatory style for bad events (attributing specific and unstable causes to bad events) would be a stronger predictor of length of stay than hope. A multiple linear regression was used to develop a model for predicting duration of hospitalization. Regression coefficients are shown in Table 5. None of the predictor variables was found to be significant $F(1,101) = 1.339$, $p=.266$ $R^2 = .039$. Therefore, this hypothesis was not supported.

Table 5. Duration Hospitalization

	Duration Hospitalization	Beta	Intercept	Standard Error	B
ASQ bad event Stable vs. Unstable	-.122	-.109	9.05	.283	.230
ASQ bad event Global vs. Specific	-.129	-.107	9.05	.198	.162
Herth Hope	-.077	.153	9.05	.034	.048
Mean	5.52				
SD	2.04				
R^2	.039				
P	.266				

Ancillary Analysis

Although not related to the original hypotheses, additional analyses were conducted to mine the data. The correlation between all scales of the ASQ and total score on the HHI were examined in order to identify areas of overlap or distinction. In comparing scores on the HHI with scores on the ASQ it is critical to note that *lower* scores on the ASQ for bad events indicate a more optimistic explanatory style; however, higher scores on the ASQ for good events are indicative of a more optimistic explanatory style. This analysis found that the sub scales of the ASQ were highly correlated with the total scores on the HHI; global attributions for good events

were correlated with total score on the HHI $r(103) = .399$ at $p < 0.01$; stable attributions for good events were correlated with total score on the HHI $r(103) = .391$ at $p < 0.01$; internal attributions for good events were correlated with total score on the HHI $r(103) = .285$ $p < 0.01$. Likewise, scores on HHI and subscales of the ASQ for bad events were negatively correlated; global attributions for bad events were negatively correlated with total score on the HHI $r(103) = -.324$ $p < 0.01$. ; stable attribution for bad events were negatively correlated with total score on the HHI at $r(103) = -.378$ $p < 0.01$; internal attributions for bad events were negatively correlated with total score on the HHI at $r(103) = -341$, $p < 0.01$. Combined global and stable attributions for bad events (ASQ hopelessness scale) were negatively correlated with total score on the HHI $r(103) = -.380$, $p < 0.01$. The subscales of the ASQ most strongly correlated with the HHI were stable and global attributions for good events $r(103) = .399$ $p < 0.01$ and $r(103) = .391$, $p < 0.01$, respectively. The areas of weakest correlation between HHI and the ASQ were global attributions for bad events $r(103) = -.324$ at $p < 0.01$ and internal attribution for good events $r(103) = .285$ $p < 0.01$. See table 6.

Table 6. Correlations between HHI and scales on the ASQ

	ASQ Good Global	ASQ Good Stable	ASQ Good External	ASQ Bad Global	ASQ Bad Stable	ASQ Bad External	Hopelessness Bad (Global & Stable)
Herth Hope Index	.399**	.391**	.285**	-.324**	-.378**	-.341**	-.380**

** Correlation is significant at the 0.001 level

CHAPTER 6: Discussion

This study is unique because it offers some understanding about how hope and explanatory style relate to one another and to chronic headache, thereby contributing both to positive health psychology and to the headache literature. The results of this study are consistent with research in positive psychology, suggesting that hope and optimism are related. This study showed that hope and an optimistic explanatory style for bad events are related in inpatient headache sufferers. Furthermore, ancillary analysis revealed that total scores on the HHI and all subscales of ASQ are correlated. The ASQ corresponds most significantly with the HHI on subscales of stable attributions for good events and global attributions for good events. This finding suggests that hope, as measured by the HHI, may pertain more specifically to how one interprets good life events rather than bad life events.

Although all subscales of the ASQ were correlated with total scores on the HHI, the subscales that were least correlated with the HHI were global attributions for bad events and internal attribution for good events. The distinction between hope and global attribution for bad events is curious and raises the question of what other factors might be present in order to allow a person to hold on to hope yet still explain the cause of bad events as having global implications. Of the ASQ subscales, internal attribution for good events was correlated least with the HHI. This could be explained by considering the conflict between attributing good events to one's own doing, internal causes and the affiliative contextual aspect of the HHI (recognition of the interdependence and interconnectedness between self and other and between self and spirit). Thus hopeful individuals, according to Herth's model, may differ from optimistic individuals, according to the model of learned optimism because they are more apt to consider good events as being due to a higher power, to others' help, to destiny, to luck or to forces beyond them rather than as a result of their own efforts. This is in contrast to Gallager and Lopez (2009) findings

comparing hope theory (Snyder,) and optimism (Scheier & Carver,1985); according to these models, optimism related more closely to generalized expectation of positive outcome and hope theory related more closely to internal agency (Rands & Cheavens, 2009; Gallagher& Shane 2009). These contrasting findings highlight the fact that different definitions of hope and optimism are likely to lead to very different assumptions about the role that hope and optimism plays in health and well- being.

Consistent with the hypothesis, hope predicted less headache impact. This finding is in accordance with results of studies concluding that hope is strongly correlated with adjustment to illness and quality of life in a variety of medical conditions (Hartly et al., 2008; Billington et al., 2008). Headache impact is a measure of the effect that headache has on daily life and on one's ability to function (Quaulitymetrics.com, 2013). Measurement of headache impact is used as a clinical tool to monitor change in individual headache sufferers and inform treatment planning (Buse, Marcia, Rupnow, & Lipton; 2009). Although further research support is needed, hope interventions may be relevant in reducing headache impact for CDH sufferers. Implementing a CBT intervention aimed at instilling hope could help mitigate headache impact and therefore improve headache sufferers' quality of life. Furthermore, because hope and optimism are so closely connected, interventions aimed at impacting hope are likely to generalize to explanatory style which has been shown to be important for well-being (Gallager & Lopez, 2009).

Contrary to the hypothesis, attributing bad events to specific and unstable causes was not correlated with headache impact; this makes this finding incongruous with what was expected, based on previous findings linking optimism with health related quality of life. This unanticipated lack of correlation could be explained by any number of mediating factors and may highlight the pitfalls of using the ASQ to conceptualize and generalize about optimistic or

pessimistic thinking styles. Gillham, Shatté, Reivich, and Seligman, (2001) question the utility of viewing the ASQ in terms of optimism and pessimism, noting that a pessimistic explanation of bad and good events reflects opposite patterns of attribution; therefore, it is unclear if the concepts actually exist on a continuum, because, for example, an unstable attribution for bad events, an optimistic explanatory style, is not necessarily correlated with a stable attribution for good events, also an optimistic explanatory style.

The fact that neither hope nor optimistic explanatory style for bad events was correlated with greater reduction in pain or shorter length of hospitalization may to some extent be due to the high instance of alexithymia (Yalug et al., 2010) and somatization in the headache patient population. Alexithymia is a personality variable which includes difficulty in identifying and describing emotions, difficulty in distinguishing between emotions and the physical sensations, limited imaginal processes, and an externally oriented cognitive style. Individuals with alexithymia are prone to developing psychosomatic symptoms (Yalug et al., 2010). High somatic symptom severity is prevalent in women with chronic headache and with those reporting greater headache impact (Tietjen, et al. 2007). Therefore it would not be uncommon for headache patients to manifest physical symptoms of stress and yet not be aware of emotional distress; this may lead to describing themselves as “hopeful and optimistic” despite underlying distress, depression or anxiety.

Peterson (1988) remarked on the modest correlation that he found between explanatory style and illness, stating that given the numerous and complex determinants of health, these subtle findings are reasonable to anticipate. Some of the other determinants in pain reduction and length of stay for inpatient headache sufferers may be length of illness, physical and biological factors, familiarity with treatment, social supports and motivational factors. Peterson (1995)

indicated that in looking for an explanation or for a mediator to understand the correlation between explanatory style and health, it may be unwise to expect to link specific emotional states with illness; likewise it may be unwise to assume that any discreet cognitive style or pattern of cognitions could be linked so directly with headache or any other illness. Finally, from a clinical standpoint it may be helpful for clinicians to bear in mind that headache patients need not necessarily be hopeful or optimistic in order to experience positive outcomes from headache treatment.

Alternative Explanations for Finding

As with any correlational study, associations found may be due to extraneous factors. Common confounding variables known to be linked with poor outcome for chronic headache include co-morbid psychological disorder, personality disorders, severe disability, and lack of social and familial support. Controlling for these factors would require a tremendous number of resources and is beyond the scope of this project. Future research should investigate the influence of these factors or control for them.

Limitations of the Study

The narrowness of the sample used for this research poses a significant threat to external validity. Specifically, this study was conducted at an inpatient tertiary headache center. Patients requiring inpatient hospitalization for headache represent a unique challenge to treatment; they frequently suffer greater headache related disability, and have more co-morbid disorders associated with their headaches than most headache sufferers. Additionally, this center uses a multidisciplinary treatment approach including relaxation training, psychological, psychiatric and neurological interventions. Although other tertiary inpatient headache treatment facilities may use a similar treatment model, results of this study may not be generalizable to inpatient

headache treatments that do not take a multidisciplinary treatment approach. For all of the previously mentioned reasons, it is unlikely that these finding would be generalizable to patients treated in primary care settings and in general neurology.

Limitations of the experimental design of this study include the lack of random sampling; due to the practical constraints of the study, a sample of convenience was used. Furthermore, an inherent limitation of this study is the fact that patients admitted with a headache level of 10 have greater room for improvement, whereas those patients admitted with a pain level of 4, could be more hopeful or tend to make use of more optimistic explanatory styles for bad events; however, they do not evidence as significant a reduction in headache pain due to ceiling and floor effect in the NRS.

The use of pain as an outcome measure may also be viewed as a limitation to this study because pain rating is a subjective measure. However, because subjective pain rating is the primary standard by which headache patients' improvement is assessed and is of greatest concern to most headache patients, it was deemed to be an appropriate outcome measure. Using length of hospital stay as an outcome variable also has limitations because the average length of stay for most patients is five days; consequently there was minimal variability in length of stay. Furthermore, the lack of variability in length of stay could impact patients' reduction in pain level. For example, some patients may require three to four weeks to reach maximum pain reduction, an option which is not available at this inpatient treatment facility.

Other threats to validity include the fact that the instrumentation used is apt to cause participants to reflect on their hope level and may even generate a more hopeful perspective than would otherwise be experienced. The explicitness of the hope scale may have resulted in

participants reporting more socially desirable responses than is actually the case. Additionally, patients feeling more hopeful may have been more willing to participate in the research study, creating more opportunity for selection bias.

Given the more complex and, to some extent, projective nature of the ASQ, patients are required to "imagine a scenario" and answer, based on this requirement; administration in the context of an inpatient headache facility presents a significant threat to internal validity. Many participants reported finding the ASQ "confusing", wanting to "redo" their answers after the directions were explained verbally and several participants submitted incomplete ASQs. It is reasonable to assume that patients suffering with severe headache may be less able to tolerate frustration stemming from complex, ambiguous, or abstract questions, and as a result may not have completed the questionnaire or may have done so in a way that was not consistent with the directions. This presents a selection bias, potentially pulls for a more educated sample and confounds the results.

Future Studies

Future studies should consider using a more culturally diverse sample and a different setting such as those afforded in primary care or in general neurology to increase external validity and generalizability. In order to establish a link more solidly between hope and headache impact or any other positive psychological state, a longitudinal study design should be implemented (Peterson, 1995). Future studies could further clarify conceptual similarities and distinctions between hope (Herth, 1992) and explanatory style with medical patients by using factor analysis to compare the subscales on the HHI with the subscales of the ASQ. This will provide a broader understanding of the way in which these constructs overlap and differ. Given the lack of correlation between hope, explanatory style and headache outcome, it is

recommended that future studies use different instruments to measure hope and optimism, look at different positive psychological states such as meaning-making and consider using measurements that are illness- specific or specific to medical patients. Generalized hope and explanatory style may be too broad, whereas specific beliefs, hope, or meaning-making about headache or illness may yield more robust results. Finally, based on the research findings, the next important step would be to develop and test an intervention aimed at instilling hope and decreasing headache impact, using a control group design.

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