The Role of Emotional Approach Coping in Facilitating Posttraumatic Growth after Medical Trauma

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AMENDED VERSION
Declaration

This thesis is submitted in partial fulfilment of the Degree of Doctorate in Clinical Psychology (D.Clin.Psy) from the Department of Clinical Psychology, School of Applied Psychology, University of Leicester.

I hereby declare that the research reported in this thesis is my own work unless otherwise stated. No part of it has been submitted for either a qualification at another institution or as a publication for a journal.

Miss Melanie Jane Smart

Signature ................................................................................................................

Dated ..................................................................................................................
Acknowledgments

Many thanks to the following people:

Dr Noelle Robertson and Dr Alex Linley for their supervision, support and advice throughout every stage of this project - It has been invaluable and is very much appreciated.

Professor Mike Wang for his support during the more difficult moments

Mr Nigel Schofield for his patience and understanding throughout the duration

Rosemary, Linda, Nikki and Celia for tireless efforts in collecting data

Anne Hogg and Ceri Jones for their swift and professional work, thus restoring my faith in R+D Departments

My family for their patience and tea making skills, especially during write-up

The patients who filled in the questionnaires and gave me such wonderful feedback on the study

And finally Murphy (aka Sod) for his law – never has a truer word been spoken than in NHS research
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Abstract

Individuals who suffer a traumatic medical event, such as diagnosis of life-threatening illness or invasive treatment, are now recognised as at significant risk of posttraumatic stress disorder (PTSD) and PTSD symptomology (DSM-IV, American Psychiatric Association, 1994). Yet, these individuals also have the opportunity to transform their negative experience into a positive, life-changing experience; a process known as posttraumatic growth (PTG) (Tedeschi & Calhoun, 1996). Given this apparent dichotomy, this review attempts to integrate the literature on these phenomena, to identify the common variables involved in producing these outcomes. Published studies were included if they focused on adult medical populations (of 18 years and above) and assessed predictor variables of either PTSD or PTG. Exclusion criteria applied to studies were; articles where samples included family and carers, studies that implemented interventions, qualitative studies and studies without objective, standardised psychometric measures. A total of 27 studies were included in this review (18 PTSD; 9 PTG). Similarities and dichotomies in the literature were found, indicating that both phenomena may be inextricably linked. In general, sociodemographic and medical variables showed inconclusive patterns of prediction. Instead psychological and interpersonal factors, namely personality and coping styles, were found to have a consistent influence on outcomes. Methodological limitations and recommended future directions in the research are discussed, as are the implications for clinical practice.
Literature Review

Posttraumatic Stress Disorder and Posttraumatic Growth following a Traumatic Medical Event: A Review of the Literature

Aim

The aim of this paper is to review the psychosocial outcomes reported following trauma from an unexpected medical event. In particular, this paper will look at the evidence for the development of posttraumatic stress disorder symptomology and positive growth after trauma. It will then examine what the research base considers to be the common factors involved in these processes and extrapolate areas of interest and directions for future research.

Introduction

Research on trauma and coping has largely followed the premise that traumatic events often lead to harmful cognitive, emotional and physiological effects and this has guided many important avenues of research (Updegraff, Taylor, Kemeny & Wyatt, 2002). Indeed, the negative effects of trauma are well documented and include such cognitive disruptions such as avoidance and rumination (Horowitz, Wilner & Alvarez, 1979), and cognitive emotional disturbances such as depression (Bifulco & Brown, 1996) and anxiety (Finlay-Jones & Brown, 1981). The positive effects of experiencing trauma are less well understood and research is in its infancy. However, more studies are beginning to focus on the phenomenon of psychological growth as an
interesting and significant outcome of trauma experience (See Linley and Joseph, 2004, for an extensive review).

In medical care there is a growing recognition of the role a well-functioning psyche plays in the initiation and maintenance of health and responses to ill health, and interventions to support this functioning need to be empirically supported (Bultz & Carlson, 2006). Understanding and possibly predicting those at risk of developing PTSD symptomology in medical settings is essential to helping those in distress. Whilst many hospitals do assess anxiety and depression routinely, using measures such as the HADS (Zigmond & Snaith, 1983), trauma symptoms are rarely routinely assessed. Furthermore, identifying the contributing factors for individuals who experience growth and positive outcomes after trauma may be useful in designing interventions for those at risk of PTSD.

There are significant risks to physical health for those who go onto develop PTSD symptoms, such as increased likelihood of non-adherence to medication, poorer disease management and often a lower life expectancy (Shemesh, Yehuda, Milo, Dinur, Rudnick, Vered & Cotter, 2004; Shemesh, Rudnick, Kaluski, Milovanov, Salah, Alon, Dinur, Blatt, Metzkor, Golik, Verd & Cotter, 2001). In contrast, patients who report psychological benefits and growth after medical trauma often demonstrate health gains. For example, independently of initial prognosis, patients who reported psychological benefits and growth after surviving a heart attack were less likely to have
another attack and had lower levels of morbidity 8 years later (Affleck, Tennen, Croog & Levine, 1987).

However, in the aftermath of trauma, many patients are only referred for psychological or psychiatric treatment when they are severely depressed or anxious, or until some observable crisis event occurs (Weisman, 1979). The accurate detection of distress or identification of those at high risk of psychological distress enables health professionals to initiate early intervention, tailor services to meet individual needs and target limited resources to where they are most needed (Thewes, Meiser, Tucker & Schnieden, 2003). For example, Levine, Eckhardt and Tard (2005) found a 91% reduction in PTSD symptoms in women attending a 12 week psychosocial support group for breast cancer. Early psychosocial intervention may also produce a significant reduction in long-term health care costs (Bares, Trask & Schwartz, 2002; Allison, Williams & Miller, 1995). Thus, understanding the factors involved in PTSD and psychological growth after medical trauma should have a far reaching impact on the treatment and management of patients in the health services.

Search Strategy

Four strategies were used to interrogate the literature forming the basis for this review. A literature search of English language journals from 1994 onwards \(^1\) was conducted using the Psychinfo, Psychlit and Medline databases using the key words PTSD, post traumatic stress disorder, post

\(^1\) This is when the DSM criteria changed to include medical events as a potential stressor for PTSD.
traumatic growth, adversarial growth, positive growth, coping and medical*. These articles were then checked for references to other articles containing the relevant search terms and these articles were obtained for inclusion or citation in the review. Pertinent articles were subjected to a prospective citation search to ascertain subsequent articles published which contained references to the original article of interest. When key findings had been identified such as well-researched medical events, a further search of the literature was made, following the first three steps above, to examine each of these factors in more depth.

Inclusion/Exclusion Criteria

The following inclusion and exclusion criteria were applied to the research base. The review is focused on adult medical populations, thus articles referring to children or non medical traumatic events have been excluded. Other exclusion criteria applied were; articles that included family and carers in the sample, studies that implemented interventions, qualitative studies and studies that did not use objective, standardised psychological measures. A total of 26 studies were excluded from this review using these criteria.

Posttraumatic Stress Disorder

Criteria for the diagnosis of Posttraumatic Stress Disorder (PTSD) have been revised for the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994) (see appendix 2 for diagnostic criteria). PTSD is a serious condition categorised by an individual experiencing a traumatic event that involves actual or threatened death or
serious injury. The event must elicit a reaction of intense fear, helplessness or horror, and subsequently, symptoms of intrusions/reliving, avoidance/numbing, and arousal, sufficient to meet predefined criteria. Typically, the type of traumatic events that result in PTSD are exposure to combat, criminal or sexual assault, natural disaster, or man-made accident. These events occur in the person’s external environment and result in exposure to extreme external threat to the person’s physical integrity.

Diagnosis of a life threatening illness now meets criterion A for exposure to an extreme traumatic stressor, which is fundamental to the diagnosis of PTSD. This revision would suggest that the occurrence of PTSD and quasi PTSD symptoms amongst medical populations are beginning to be recognised. Nevertheless, there remains a paucity of literature examining the incidence and consequences of PTSD in life-threatening illness (see Tedstone & Tarrier, 2003, for an exhaustive review). The onset of some physical illnesses, for example, myocardial infarction (MI), stroke, or haemorrhage may be sudden, unexpected, and immediately life-threatening and as such appear to be comparable to events explored in the general PTSD literature. In other cases, external events such as being given a life-threatening diagnosis of heart failure or human immunodeficiency virus (HIV) may be perceived as traumatic. PTSD may also arise following prolonged or unpleasant medical or surgical procedures and treatment. Psychological reactions may include high levels of fear, realistic anxiety about the future, and feelings of helplessness and loss of control (Linley & Joseph, 2004). The potential for psychological...
reaction to these events would appear similar to the potential in other traumatic incidents.

Prevalence of PTSD in Medical Populations

The evidence suggests a prevalence rate of PTSD of about 10 percent among survivors of an MI. Doerfler, Pbert and DeCosimo (1994) found a prevalence rate of 8 percent in a sample of post-MI and cardiac surgery patients 6–12 months following the event using self-report scale based on a checklist of criteria taken from DSM-III (American Psychiatric Association, 1980). Using similar measures, a higher prevalence rate of 16 percent was found in a sample of Israeli patients 6–18 months following MI (Kutz, Shabata, Solomon, Neumann & David, 1994) and in a sample of British patients 1-3 months post-MI (Bennett, Conway, Clatworthy, Brooke, & Owen, 2001). A lower prevalence rate of ten percent was previously found in a smaller sample of British patients three months following MI (Bennett & Brooke, 1999).

Posttraumatic stress has been studied in a variety of cancers including melanoma, Hodgkin's lymphoma, breast cancer, and mixed cancers (Gurevich, Devins & Rodin, 2002). The incidence of patients meeting the full DSM-IV diagnostic criteria (American Psychiatric Association, 1994) is estimated to range from 3% to 4% in early-stage patients recently diagnosed to an average of 35% in patients evaluated after treatment (National Cancer Institute, 2005). This seems to hold true in the literature. Kangas, Henry and Byrant (2002) found in an extensive review that whilst the incidence of cancer-related posttraumatic stress disorder appears to be no more than 10%, it can range from zero to 60% depending on the measure used to diagnose it (Alter, Pelcovitz, Axelrod, Goldenberg, Harris, Meyers, Grobois, Mandel, Septimus & Kaplan, 1996; Cordova, Andrykowski, Kenady, McGrath, Sloan & Redd, 1995; Green, Rowland, Krupnick, Epstein, Stockton, Stern, Spertus & Steakley, 1998; Tjemsland, Soreide & Malt, 1996a, b).

Research into sudden onset cerebro-vascular accidents has also looked at PTSD rates. Berry (1998) carried out a case review of 28 patients who were presenting with anxiety symptoms following a ruptured cerebral aneurysm. Despite the fact that they had all recovered well physically, 32% met the DSM-III-R (American Psychiatric Association, 1987) criteria for PTSD. Sembi, Tarrier, O'Neill, Burns, and Faragher (1998) studied 61 patients who had experienced their first stroke or transient ischemic attack (TIA) and found that 9.8% fulfilled the criteria for PTSD.
As general population studies reveal a current UK prevalence of PTSD of 3.6 percent (National Institute of Mental Health, 2001) the prevalence in medical populations appears higher than average, and thus warrants further attention. In particular, further understanding of the mechanisms involved in developing or preventing the development of PTSD symptomology in different disease entities is needed in order to address this growing issue.

Medical Populations and PTSD Symptomology

Despite a dearth of literature into what is now becoming recognised as a common feature of medical trauma, 17 studies have addressed factors relating to PTSD and PTSD symptomology in medical populations. Operationalisation of the PTSD construct varies greatly in these studies. Most have correlated symptom reporting against predictor variables to look for bivariate relationships, however, some studies have investigated caseness. Where applicable, this is made clear in the text. A methodological description of each study is shown in Table 2 (see page 26). Predictor variables examined by the studies reported can be separated into sociodemographic, medical and psychosocial factors.

Sociodemographic Variables

Age. Three studies established an association between lower age and PTSD development in medical patients (Bennett & Brooke, 1999; Cordova, Andrykowski, Kenady, McGrath, Sloan & Redd, 1995; Kangas, Henry & Byrant, 2005), with younger participants reporting more symptomology. Bennett and Brooke (1999) theorise that older people may have a more
sanguine reaction to the onset of disease. However, in later studies using similar methods but larger sample sizes neither Andrykowski and Cordova (1998), nor Jacobsen, Sadler, Booth-Jones, Soety, Weitzner and Fields (2003) found a relationship with age. No relationship was found in women with various cancers (Alter, Pelcovitz, Axelrod, Goldenberg, Harris, Meyers, Grobois, Mandel, Septimus, & Kaplan, 1996), women with HIV (Martinez, Israeliski, Walker, & Koopman, 2002) and a small sample (n= 17) of women undergoing bone marrow transplants (Mundy, Blanchard, Cirenza, Gargiulo, Maloy & Blanchard, 2000). However, the latter study may have been too small to detect significant differences relative to the other studies included in this portion of the review.

**Education.** Three studies found that education appears negatively related to PTSD symptomology in cancer sufferers and MI patients (Cordova et al., 1995; Ginzburg, Solomon & Bleich, 2002; Jacobsen, Widows, Hann, Andrykowski, Kronish & Fields, 1998). Jacobsen et al. (1998) postulate that patients who are less educated have fewer cognitive, emotional and material resources to cope with the stress of treatment. No association was found in patients with cancer of the head and neck (Kangas et al., 2005), patients with various cancers (Widows, Jacobsen & Fields, 2000) and people undergoing bone marrow transplant for cancer (Jacobsen et al., 2003).

**Income.** Only one study considered income in relation to PTSD symptomology. Cordova et al. (1995) found that low income was associated
with higher PTSD symptomology. Again, this may reflect a lack of practical resources available to adjust to what can be seen as a life changing event.

**Marital Status.** One study found that marital status was negatively related to PTSD symptomology (Kangas et al., 2005). However it is not clear how marital status was classified and thus transformed into numerical data in order to perform correlational analysis. Furthermore, this factor may link in to the psychological factor of social support, which is explored later.

**Medical Variables**

**Time since Diagnosis.** No relationship was found between time since diagnosis and PTSD symptomology in three cross sectional studies (Alter et al., 1996; Kelly, Raphael, Judd, Perdices, Kernutt, Burnett, Dunne & Burrows, 1998; Widows et al. 2000) and a further longitudinal study (Kangas et al., 2005). This is noteworthy as research into more traditionally recognised forms of trauma has found a significant relationship between time lag and symptomology (Linley & Joseph, 2004). In creating a PTSD group and non-PTSD comparison group in their sample, Kelly et al. (1998) anchored the caseness onto a diagnosis of HIV. However, Alter et al. (1996) used a diagnosis of lifetime PTSD rather than relating the diagnosis to the event. This confounds the findings of this study somewhat as any associations may be related to pre-morbid factors such as previous trauma.

**Time since Treatment.** Four studies have considered the relationship between elapsed time since treatment and PTSD symptomology.
Andrykowski and Cordova (1998) found a significant negative relationship, with patients early in treatment reporting higher levels of PTSD symptomology. However, Cordova et al. (1995) found time since treatment completion was inversely related to intrusion and avoidance phenomena (IES, Horowitz, Wilner & Alvarez, 1979) but not to PTSD diagnosis, indicating a need to recognize sub-syndromal aspects of PTSD symptomology. Kangas et al. (2005) and Alter et al. (1996) found no relationship. However, the variance in length of time considered by these studies ranges from 6-72 months post treatment time, making comparisons difficult.

Severity/Stage of Disease. In comparing PTSD cases to non-PTSD cases and healthy controls, this was found to be negatively related to PTSD in a cross sectional study of women with early to mid stage breast cancer (Amir & Ramati, 2002). In a similarly designed study, looking at symptomology, Andrykowski and Cordova (1998) found a positive relationship in women with more advanced disease. Jacobsen and colleagues (1998) studied mid to late stage cancer patients longitudinally and also found a positive association. In looking at caseness, Alter et al. (1996) found no relationship in women in remission for various cancers. This may reflect a positive relationship between the variables, with more advanced disease prompting higher PTSD symptoms. However, Cordova et al. (1995) studied mid stage breast cancer and found no relationship between disease stage at diagnosis and PTSD symptomology. This may reflect an ongoing process of rumination through disease stages that occurs sometime after diagnosis.
Prognosis. No relationship was found between prognosis and PTSD symptomology (Widows et al., 2000) or caseness (Alter et al., 1996; Kangas et al., 2005) contrary to the findings demonstrated in stage of disease. This, in the context of other factors, would imply that the immediacy of the diagnosis and treatment are the more significant time points for developing PTSD than the more distant factors of outcome and recovery.

Treatment. Unsurprisingly, treatment complications were found to have a positive association with PTSD symptomology (Hampton & Frombach, 2000) and caseness (Kangas et al., 2005). Similarly, treatment intensity was positively related, with patients with more invasive, risky and prolonged treatment (transplant, chemotherapy etc.) reporting higher levels of symptoms (Amir & Ramati, 2002; Hampton & Frombach, 2000). Length of hospital stay also showed a positive relationship with PTSD (Jacobsen et al., 1998), but this may be related to the previous factors, as longer hospital stays may imply more serious illness or invasive treatment.

Acute Stress Disorder (ASD). Two studies (Ginzburg et al., 2002; Kangas et al., 2005) found patients meeting criteria for ASD (DSM-IV, American Psychiatric Association, 1994) (see appendix 3 for diagnostic criteria) at diagnosis were significantly more likely to go on to develop PTSD at follow-up than those who did not meet criteria. Both of these studies were longitudinal and so demonstrate the need for short and long term follow-up in predicting PTSD in medical populations.
Psychosocial Variables

Previous History of Trauma/PTSD. This was found to be positively related to current PTSD in five studies (Andrykowski and Cordova, 1998; Ginzburg et al., 2002; Kangas et al., 2005; Kelly et al., 1998; Widows et al., 2000). In all studies, trauma was related to various previous events including traditional forms of trauma (sexual abuse, road traffic accidents) and past medical experiences. One study found no relationship (Alter et al., 1996) but counted previous trauma as previous MIs and hospital stays only, rather than broader forms of trauma. These findings suggest that previous trauma may leave individuals vulnerable to further difficulties and may reflect limited resources to deal with ongoing cumulative stressors.

Previous History of Depression/Anxiety. Four studies found a positive relationship between previous distress and functional illness occurrences and PTSD symptomology (Jacobsen et al., 1998; Kangas et al., 2005; Kelly et al., 1998; Mundy et al., 2000). These were for incidences both prior to, and unrelated to, the medical event and for distress prior to treatment. This again may imply that cumulative experiences of stress have an ongoing and ever more deleterious impact upon outcomes, and thus emphasises the need for identification of these more vulnerable patients.

Depression/Anxiety after Diagnosis. Similarly, ongoing distress has implications for recovery from medical trauma. Eight studies found an association between psychological distress after diagnosis and treatment, and later development of PTSD symptomology (Alter et al., 1996; Bennett,
Conway, Clatworthy, Brooke & Owen, 2001; Bennett, Owen, Koutsakis & Bisson, 2002; Jacobsen et al., 1998; Jacobsen et al., 2003; Kangas et al., 2005; Mundy et al., 2000; Pedersen, Middel & Larsen, 2003). Whether this reflects a causal relationship in either direction, the association shows the need for a dual approach to managing distress and PTSD symptomology. Moreover, Bennett et al. (2002) found that their results were not consistent over time and thus concluded that screening for anxiety and depression in isolation is insufficient for identifying those at risk of PTSD.

Dissociation. Two studies measured dissociation at the time of diagnosis and found this to be related to later development of PTSD symptoms (Bennett et al., 2002; Kangas et al., 2005). Early dissociation is a core feature of Acute Stress Disorder and has been found to be predictive of PTSD in medical and general trauma populations (Brewin, 2001). The risk of dissociating, and thus not processing emotional effects of diagnosis, would appear to leave patients vulnerable to developing PTSD symptomology. It may also be that dissociative responses after medical traumas reflect a poor coping strategy or pre-existing cognitive style that increases vulnerability to maladaptive responses to stress (Kangas et al., 2005).

Intrusion. Two studies measured intrusion using the IES (Horowitz, Wilner & Alvarez, 1979), one at diagnosis and three month follow-up (Bennett et al., 2001) and one at two years post diagnosis (Cordova et al., 1995). Both found a significant relationship between PTSD and intrusion.
Bennett et al. (2001) found a moderate reduction of intrusive memories over time. The severity of intrusive memories, whilst diminishing, may be related to the difficulty in avoiding reminders of the index event whilst undergoing treatment, and the fact that many reminders are linked to internal events (shortness of breath, pain etc.) rather than external factors (places, noises etc.) often seen in traditional forms of trauma (see Mundy & Baum, 2004, for a review).

Avoidance. Related to intrusion, three studies measured avoidance symptoms in patients. Bennett et al. (2001) found a relationship at both time points mentioned previously, but with a non-significant reduction in cognitive avoidance phenomena over time. Cordova et al. (1995) and Hampton and Frombach (2000), in cross sectional studies, found an association between avoidance and PTSD symptoms in cancer sufferers. Hampton and Frombach (2000) distinguished between behavioural avoidance and cognitive avoidance; behavioural manifesting in avoidance of places and activities associated with the trauma and cognitive being the avoidance of thinking about the event. Both men and women demonstrated cognitive avoidance, but males demonstrated more behavioural avoidance. Thus, it is important to distinguish between the two phenomena as it may be that different strategies are employed by different individuals.

Avoidant Coping. Hampton and Frombach (2000), Amir and Ramati (2002), Jacobsen et al. (2003) and Widows et al. (2000) found a positive relationship between the use of avoidant coping strategies (such as resignation,
fantasising and social withdrawal) and PTSD development. Again, this may be a manifestation of avoidance symptoms, and may reflect a reluctance to process the distress and thus the traumatic event.

**Alexithymia.** This describes a cognitive-emotional deficit in naming and processing emotions (Sifneos, 1973). Bennett and Brooke (1999), using a cross sectional study of 44 patients who had suffered an MI, found a positive relationship between this factor and PTSD symptomology. Again, this may relate to the processing difficulties associated with PTSD (Brewin, 2001). However, these findings were not replicated in a second longitudinal study (Bennett et al., 2002) using a slightly smaller sample size (n=39).

**Neuroticism.** Two studies found neuroticism to be related to PTSD symptomology (Kelly et al., 1998; Pedersen et al., 2003). Neuroticism can relate to shyness, guilt, worry and low self-esteem, and has been genetically (Jardine, Martin, Henderson & Rao, 1984) and behaviourally (Jorm, Christensen, Henderson, Jacomb, Korten, & Rodgers, 2000) related to depression and anxiety. Thus it may be that the personality trait of neuroticism is a direct risk factor for PTSD, and also a risk factor for distress which then leads to PTSD symptomology.

**Quality of Life.** Cordova et al. (1995) and Jacobsen et al. (1998) found a negative relationship between this variable and PTSD symptomology. In particular, Jacobsen et al. (1998) reported that females in their study had a lower health related quality of life. This may reflect their illness manifestation
causing PTSD symptoms (through reminders, intrusions etc), or conversely, their PTSD symptoms giving rise to adverse health effects. It has been reported in traditional trauma literature that PTSD can lead to higher reporting of health problems and somatisation (Litz, Keane, Fisher, Marx & Monaco, 1992).

**Social Support.** Six studies found a negative relationship between social support and PTSD symptom reporting (Andrykowski & Cordova, 1998; Bennett & Brooke, 1999; Bennett et al., 2002; Jacobsen et al., 2003; Martinez et al., 2002; Widows et al., 2000). Although no formal definition of social support is apparent in these studies, Bennett and Brooke (1999) and Bennett et al. (2002) found “low confidante support” was significantly related to PTSD symptomology, particularly avoidance, in MI sufferers. Andrykowski and Cordova (1998) found a similar effect in cancer sufferers, speculating that affective (emotional) social support in particular may act as a buffer against trauma. Conversely, low social support may be a result of the effects of poor health and subsequent social isolation.
<table>
<thead>
<tr>
<th>Negatively related</th>
<th>Number of studies</th>
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<tbody>
<tr>
<td>Time since treatment</td>
<td>Andrykowski &amp; Cordova (1998)</td>
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<td>Marital Status</td>
<td>Kangas et al (2005)</td>
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<th>Positively related</th>
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<td>Treatment intensity</td>
<td>Amir &amp; Ramati (2002); Hampton &amp; Frombach (2000)</td>
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<td>Depression/Anxiety</td>
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<td>Acute Stress Disorder</td>
<td>Ginzburg et al (2002); Kangas (2005)</td>
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<td>Dissociation</td>
<td>Bennett et al (2002); Kangas et al (2005)</td>
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<td>Intrusion</td>
<td>Bennett et al (2002); Cordova et al (1995)</td>
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<tr>
<td>Alexithymia</td>
<td>Bennett &amp; Brooke (1999)</td>
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<th>Unrelated</th>
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<tr>
<td>Previous history of trauma/PTSD</td>
<td>Alter et al (1996)</td>
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<tr>
<td>Alexithymia</td>
<td>Bennett et al (2002)</td>
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<td>Author (Year)</td>
<td>Design</td>
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<td>Jacobsen et al (1998)</td>
<td>Cross sectional</td>
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<td>Mundy et al (2000)</td>
<td>Cross sectional</td>
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<td>Jacobsen et al (2003)</td>
<td>Longitudinal</td>
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<td>2. 5 m post op</td>
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<td>Cordova et al (1995)</td>
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² Index event = Illness onset, Diagnosis, Medical event/procedure

³ Cancer staging: 0 - cancer in situ, present only in the layer of cells in which it began, I- small tumour <2cm, II- tumour >2cm <5cm, III- spread into lymph nodes or surrounding tissues, IV- spread to other organs.
<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Design</th>
<th>Participants</th>
<th>Index event</th>
<th>Time since index event</th>
<th>Measures</th>
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<td>39 F controls</td>
<td>Healthy</td>
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<td>IES, ALTTIQ, WOC-CA, Meaning of Illness Scale, Researcher-created Social Support items</td>
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<td>61 M, 21 F</td>
<td>Cancer of Head and Neck</td>
<td>1.1 m, 2.6 m</td>
<td>PDS, Trauma Symptom Checklist, Eysenck Personality Questionnaire</td>
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<td>112 gender unknown</td>
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<td>4-6 weeks, post event</td>
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<td>ASCI-D-NVP-PTSD, SCL-90, WHOQOL-bref, AECOM coping styles questionnaire</td>
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<tr>
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<td>1. 52 M 18 F</td>
<td>MI</td>
<td>1. Immediate</td>
<td>1+2. IES</td>
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<td>MI (first event)</td>
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<td>MI</td>
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<td></td>
<td>61 M</td>
<td>HIV</td>
<td>R = 4.96 m</td>
<td>Life Events Inventory</td>
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**Key to abbreviations**

- PCL-C = PTSD Checklist - Civilian Version
- PSQI = Pittsburgh Sleep Quality Index
- POMS = Profile of Mood States
- SCID = Structured Clinical Interview for DSM-IV
- CRI = Coping Responses Inventory
- ISEL-SF = Interpersonal Support Evaluation List - Short Form
- IES = Impact of Events Scale
- MOS-20 = Medical Outcomes 20 item General Health Survey
- DUKE-SSQ = Duke UNC Functional Support Survey
- SCID-NP-PTSD = Structured Clinical Interview Non Patient Version
- SCL-90 = Symptom Checklist
- WHOQOL-Bref = World Health Organisation Quality of Life Assessment
- ALTTIQ = Appraisal of Life Threat and Treatment Intensity Scale
- WOC-CA = Ways of Coping Questionnaire - Cancer Version
- EORTC QLQ-C30 = European Organisation for Research and Treatment of Cancer Core Questionnaire
- Mini MAC = Mini-Mental Adjustment to Cancer Scale
- BDII = Beck Depression Inventory
- STAI-Y = State-Trait Anxiety Inventory Form Y
- PTCI = Posttraumatic Cognitions Inventory
- CAPS = Clinician Administered PTSD Scale
- PANAS = Positive and Negative Affect Schedule
- TASI = Toronto Alexithymia Scale
- PDS = Posttraumatic Diagnostic Scale
- GMC = Global Mood Scale
- CAQ = Cognitive Appraisal Questionnaire
- HADS = Hospital Anxiety and Depression Scale
- SASRQ = Stanford Acute Stress Reaction
- EPI = Eysenck Personality Inventory
- LCB = Locus of Control of Behaviour
Posttraumatic Growth

Interest in PTSD in medical populations has grown, increasingly paralleled by exploration of a related field of research, that of psychological growth after medical trauma. The positive changes associated with psychological growth after trauma have been variously termed stress-related growth (Park, Cohen & Murch, 1996), Self-transcendence (Coward, 1990), perceived benefits (McMillen, Zuravin & Rideout, 1995), thriving (Abraido-Lanza, Guier & Colon, 1998) and adversarial growth (Linley & Joseph, 2004).

For the purpose of this literature review, Tedeschi and Calhoun's (1996) terminology and conceptualisation of psychological growth is used to describe the phenomenon. They described the positive process and outcomes of trauma as posttraumatic growth, which means a positive change in one's previous level of functioning following a traumatic event. According to Tedeschi and Calhoun (1996), in order for psychological growth to occur, one must be exposed to an extremely undesirable and intense event that causes a breakdown in past and future assumptions about one's life. It is through the process of rebuilding that some people reconstruct a revised life structure that is perceived to be of a higher quality than their previous existence. Thus, the term posttraumatic growth (PTG) will be used throughout this review to describe positive changes in the following areas according to Tedeschi and Calhoun's (1996) model: appreciation of life, life priorities, spirituality, relationships and self-reliance.
Medical Populations and PTG

There are relatively fewer studies examining PTG in medical populations, but they show some interesting parallels with the literature on PTSD and so are worthy of consideration in the context of medical trauma and its outcomes. Nine studies were found to address this issue and their methodologies are listed in Table 4 (see page 38). As with PTSD, factors associated with PTG can be separated into psychosocial, sociodemographic and medical variables.

Sociodemographic Variables

Age. Four studies found a negative association with age, with younger participants reporting more PTG both in cross sectional (Bellizzi & Blank, 2006; Lechner, Zakowski, Antoni, Greenhawt, Block & Block, 2003) and longitudinal designs (Milam, 2004; Widows, Jacobsen, Booth-Jones & Fields, 2005). Bellizzi and Blank (2006) speculate that older cancer sufferers may be dealing with other co-morbidities and are thus less able to adapt to their diagnosis. However, three studies found age to be unrelated to growth (Cordova, Cunningham, Carlson & Andrykowski, 2001; Mohr, Dick, Russo, Pinn, Boudewyn, Likosky & Goodkin, 1999; Sears, Stanton & Danoff-Burg, 2003).

Education. Two studies found that lower educational status was associated with PTG (Urcuyo, Boyers, Carver & Antoni, 2005; Widows et al., 2005), with less well educated participants reporting more PTG after bone marrow transplant for cancer. However, Urcuyo et al. (2005) did not use a validated measure of PTG, instead relying on benefit-finding items created for parents
of disabled children (Behr, Murphy & Summers, 1991); therefore its validity in assessing changes in a cancer sample is questionable. Three studies found education to be unrelated to growth (Bellizzi & Blank, 2006; Lechner et al., 2003; Sears et al., 2003).

**Income.** Cordova et al. (2001) found that participants with higher income reported more PTG. This may be due to more resources for recovery after breast cancer, or the lack of financial worries after treatment. Lechner et al. (2003) and Widows et al. (2005) found no relationship between income and PTG.

**Marital Status.** Bellizzi and Blank (2006) found that marital status was positively related to growth, with single people reporting less growth than those in relationships. Again, this may be related to access and quality of social support, which is addressed later.

**Medical Variables**

**Time since Diagnosis.** This variable demonstrated a differing relationship with PTG. Milam (2004), in a longitudinal study, found that participants new to a diagnosis of HIV showed more PTG than those who had been diagnosed for a longer time, but that this relationship decreased over time. Cordova et al. (2001) and Sears et al. (2003) found the opposite relationship with cancer patients, with those more distant from the diagnosis reporting more PTG. This may reflect a curvilinear relationship between time since diagnosis and PTG, with patients immediately after diagnosis and those later in the illness process.
reporting more growth. Opportunities for growth diminish in the time immediately after diagnosis, indicating an optimum time for promoting PTG.

**Time since Treatment.** In two cross sectional studies, no relationships were found between this variable and PTG in patients who had undergone adjuvant treatment for breast cancer (Urcuyo et al., 2005) and in patients who had completed bone marrow transplant for various cancers (Widows et al., 2005). This is similar to the findings in PTSD symptomology, indicating that time since diagnosis is the more critical event in trauma outcomes and opportunities for growth.

**Severity/Stage of Disease.** Research produced mixed findings with two studies, of cardiac arrest and bone marrow transplant respectively, finding no relationship (Sheikh, 2004; Widows et al., 2005) and one study of HIV patients at various stages of the disease process finding a negative relationship (Milam, 2004). However, it is noteworthy that Milam (2004) altered the PTGI (Tedeschi & Calhoun, 1996) to include only 11 of the 21 items, and changed the responses to include negatively worded responses. Thus, all conclusions reached by this study are based upon an invalidated instrument.

Only in cancer patients was a consistent positive relationship found, with higher disease stage relating to more PTG (Bellizzi & Blank, 2006; Lechner et al. 2003; Urcuyo et al., 2005). This indicates a relationship that may be unique to the disease process of cancer, thus not allowing for generalisations between specific conditions to be made.
Psychosocial Variables

Depression after Diagnosis. Four studies examined the relationship between depression and PTG. Milam (2004) and Urcuyo et al. (2005) found that depression at diagnosis was negatively related to PTG, whereas Mohr et al. (1999) and Widows et al. (2005) found no relationship. Milam (2004) speculates that the process of PTG has a beneficial effect on psychological health. However, Milam (2004) cautions that depression and growth may coexist and that the absence of depression may not necessarily indicate PTG, which is an interesting paradox and worthy of future consideration.

Anxiety/Anger after Diagnosis. Instead, Mohr et al. (1999) found that elevated levels of anxiety and anger were related to PTG, although it is not clear in which direction this relationship goes. Moreover, this study used a researcher created scale to assess benefit-finding, thus negating comparisons with studies using validated measures of PTG.

Distress. Actual distress at diagnosis was negatively related to PTG in one study (Urcuyo et al., 2005). This study used a series of adjectives created by Carver, Pozo, Harris, Noriega, Scheier, Robinson, Ketcham, Moffat and Clark (1993) to rate distress. Conversely, recalled distress at diagnosis, examined retrospectively, was positively related to growth in two studies (Bellizzi & Blank, 2006; Widows et al., 2005), which supports previous trauma literature indicating that the more traumatic the stressor, the more potential there is for growth (Calhoun & Tedeschi, 1998). However, this method of retrospective assessment affords opportunity for recall bias. Furthermore, distress is poorly
operationalised in these studies, described variously as anxious and depressive symptoms (Widows et al., 2005), intensity of feeling about the diagnosis (Bellizzi & Blank, 2006) and distress emotions (Urcuyo et al., 2005).

**Perceived Threat.** Relating to the previous finding of recall bias, perceptions of threat (e.g. disease recurrence, disability and death) are positively related to PTG (Cordova et al., 2001; Lechner et al., 2003; Sears et al., 2003; Widows et al., 2005). Widows et al. (2005) found that subjective concerns about mortality and recalled distress were associated with post traumatic growth, whereas an objective measure of mortality (disease progression/recurrence) was not. This would appear to indicate that post traumatic growth is related to psychological factors rather than medical outcomes and lends support to using subjective measures of distress and growth. In contrast, directly opposing findings were shown in a study of 886 patients with HIV diagnosis (Milam, 2004) as healthier patients reported higher post traumatic growth than did less healthy patients. However, the health of patients was measured in objective terms using viral load as an indicator of health. It is possible that a subjective measure of perceived health would have yielded differences in significance.

**Individual Differences.** Pessimism was found to be negatively related to PTG post-diagnosis of HIV but this relationship did not persist over time (Milam, 2004). Extraversion was positively related to growth in MI patients and this predictor was mediated by problem-focused coping (Sheikh, 2004). Optimism had mixed results with two studies finding a positive relationship.
(Milam, 2004; Urcuyo et al., 2005) and two studies finding no relationship
(Bellizzi & Blank, 2006; Sears et al., 2003). Milam (2004) found that the
relationship between optimism and PTG did not persist, although Sears et al.
(2003) did find that optimism predicted more positive coping strategies. This
suggests that some people may be pre-disposed to PTG based upon their
pre-morbid personalities, but that other contributing factors, such as specific
coping strategies are needed to optimise this effect.

**Active/Approach Coping.** The most consistent finding in this field was the
positive association between active and approach based coping strategies
and PTG. Bellizzi and Blank (2006), Cordova et al. (2001), Mohr et al. (1999),
Sheikh (2004), Urcuyo et al. (2005) and Widows et al. (2005) found that
participants who utilised such strategies such as seeking social support (Mohr
et al., 1999), talking about their cancer (Cordova et al., 2001), and positive
reinterpretation and problem solving (Widows et al., 2005), reported higher
levels of PTG. Although these studies used varying methodologies and
measures, this is clearly a strong predictor of PTG, and is worthy of further
investigation. It is particularly pertinent when coupled with the previous finding
that avoidant coping appears to be associated with PTSD symptomology.

**Avoidant Coping.** However, one study found that as well as approach coping
strategies, one avoidant coping strategy - seeking alternative rewards – prior
to bone marrow transplant, was associated with PTG (Widows et al., 2005).
This may reflect a distraction technique from the forthcoming event, due to the
process of knowing about a possible trauma. Unfortunately, coping was not
measured after transplant to assess whether this strategy persisted and what effect it may have had on PTG.

**Social Support.** This construct has varying associations with PTG. Actual social support does not appear to be related to PTG (Cordova et al., 2001; Sears et al., 2003; Widows et al., 2005). However, social support satisfaction was significantly positively related (Sheikh, 2004) demonstrating the quality of social support is more important than its quantity and availability. Seeking social support (an active coping strategy) was also related to PTG (Mohr et al., 1999).

**Quality of Life.** Urcuyo et al. (2005) found that PTG was positively related to perceived quality of life and this relationship makes conceptual sense. Again, the direction of this relationship may be reciprocal – a pre-morbid high quality of life may facilitate positive outcomes and PTG may lead to an enhanced quality of life.
Table 3. Factors associated with PTG

<table>
<thead>
<tr>
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<td>Depression</td>
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<td>Milam (2004)</td>
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<td>Education</td>
<td>Urcuyo et al (2005); Widows et al (2005)</td>
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<tr>
<td>Age</td>
<td>Bellizzi &amp; Blank (2006); Lechner et al (2003); Milan (2004); Widows et al (2005)</td>
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<td>Avoidant coping</td>
<td>Widows et al (2005)</td>
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<td>Optimism</td>
<td>Milan (2004); Urcuyo et al (2005)</td>
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<tr>
<td>Anxiety</td>
<td>Mohr et al (1999)</td>
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<tr>
<td>Social support satisfaction</td>
<td>Sheikh (2004)</td>
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<tr>
<td>Seeking social support</td>
<td>Mohr et al (2001)</td>
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<td>Quality of Life</td>
<td>Urcuyo et al (2005)</td>
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<td>Cordova et al (2001)</td>
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**Key to abbreviations**
- LOT-R= Life Orientation Test- Revised
- PTGI= Post Traumatic Growth Inventory
- CES-D= Centre for Epidemiological Studies Depression Scale
- MOS-20= Medical Outcomes
- General Health Survey
- DUKE-SSQ= Duke UNC Functional Social Support Questionnaire
- POMS= Profile of Mood States
- Profile of Concerns about Breast Cancer
- POMS-SV= Profile of Mood States Short Version
- SSQSR= Social Support Questionnaire
- WOC= Ways of Coping Questionnaire
- SLESQ= Stressful Life Events Screening

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Methodological Issues

The variance in quality of all studies included in this review constrains the generalising of findings. Many studies utilised cross sectional designs and small sample sizes (Amir & Ramati, 2002; Cordova et al., 2001; Pedersen et al., 2003) and statistical analyses lacked sufficient power. Where there were follow-ups, researchers debated the length of time between phases, concluding that most were too soon after index event (Jacobsen et al., 2003). Given that optimally, PTSD and PTG need to be assessed and monitored over time, it makes sense to allow adequate time for these outcomes to develop. Indeed, multiple time-points are suggested to increase the likelihood of finding definitive relationships and monitoring changes (Widows et al., 2000).

PTSD as a nosological entity was used broadly by individual studies. Whilst some studies identified patients with PTSD and then performed analyses of their results only (e.g. Alter et al., 1996), other studies reported across the range and identified correlates with patients suffering from sub-syndromal PTSD (e.g. Bennett et al., 2002). Similarly, a wide variety of measures were utilised in all areas under investigation and so grouping together findings becomes difficult (see Tables 2 and 4). Many studies relied on self-report to distinguish between clinically significant individuals and their sub-syndromal counterparts (e.g. Amir & Ramati, 2002), or diagnosed symptoms of distress retrospectively (e.g. Milam, 2004). In light of the findings on biased recall and perceived versus real threat in this review, these findings must be seen as tentative.
Given the varying approaches adopted in the studies identified, this review reports on all factors that demonstrated an association with the investigated outcomes. Other reviews of PTSD have reported only those factors consistently found in multiple regression analyses (Thewes, Meiser, Tucker & Schnieden, 2003). This would have been a more reliable way of identifying consistent factors as some variables associated with outcomes at bivariate correlational level did not stand up to further regression analysis (e.g. Social Support satisfaction, Sheik, 2004). However, due to the relative infancy of this research and the limited availability of longitudinal designs an inclusive approach was adopted. Thus, this review can be seen as a starting point for further empirical examination of these variables and their predictive utility in screening for and monitoring trauma outcomes.

**Integration of the Evidence**

Despite methodological and conceptual limitations, the similarities and dichotomies in the PTSD and PTG literature are compelling and seem to indicate that both phenomena are inextricably linked. This literature review is the first to compare the trauma outcomes side by side and it is through this approach of integration that the following factors become significant.

Younger age seemed to provoke more extreme reactions to illness, both in terms of distress and trauma symptoms, and in potential for growth. This may be due to the shock of discovering one has an illness usually associated with old age (MI or cancer), but then having more potential for recovery. The reduced incidence of both PTSD and PTG in older people may reflect the
acceptance of illness as part of the aging process, and thus more attenuated reactions. Education showed a mixed relationship, but generally a lower education level predicted both PTSD and PTG. More logically, income and marital status showed dichotomous relationships to outcomes, and may reflect the resources available to those facing illness. These mixed findings would appear to indicate that sociodemographic variables, whilst playing a part in resources, are not sufficient for predicting outcomes and that interpersonal and event related factors may play a more central role.

Following this implication, medical variables showed interesting associations with trauma outcomes. Poor relationships were demonstrated in time since treatment for both outcomes, and time since diagnosis only emerged as correlating with PTG. These mixed findings may reflect the nature of medical illness as a traumatic stressor, in that it is experientially different to traditional forms of trauma. Mundy and Baum (2004) propose that the key difference is the focus of threat in time. Most stressors (e.g. road traffic accidents etc.) are acute events and have happened in the past. Medical stressors are often ongoing illnesses which can continue to pose a threat to life long after the index event. The psychological processes in trauma can be linked to this unique aspect, as patients re-live their trauma in subsequent treatment phases and hospital appointments. This review has shown that ongoing and invasive treatment is linked to more symptomology reporting. Although prognosis did not emerge as a significant factor in predicting outcomes, it is important to consider the nature of ongoing threat in trauma. Medical traumas
will undoubtedly contain a future-oriented aspect, involving speculation about survival and recurrence.

Thus, the PTSD symptomology reported may be unique in this population. Intrusions may be both retrospective and future-oriented (e.g. being told the diagnosis, wondering if one will live to old age), and avoidance and numbing may be a protective response to ongoing threat (e.g. avoiding exercise after an MI). Cognitions seem to play an important role in the adjustment to illness, and this is most evident in the findings on perceived threat. Whilst medical variables demonstrate inconsistencies, perceived threat emerges as a consistent predictor of growth. The actual severity of disease and the threat to life posed is not as important as the threat to life the patient perceives. Thus, objective measures of mortality may be redundant in predicting outcomes and cognitions and attributions patients have about their illness need to be measured and accounted for in planning interventions.

Furthermore, this need to further explore psychological factors may explain the varying findings between the relationship of distress and post traumatic growth. Whilst most hospitals routinely screen for anxiety and depression, the findings would seem to suggest that this is not sufficient. Ryff (1989) states that the absence of distress does not automatically imply well-being. Therefore, it would appear that in assessing purely for distress, the potential for growth may be missed and thus opportunities for maximizing this are neglected. As this review has highlighted, anxiety is positively related to growth, whereas depression is negatively related. In PTSD, more depression
predicts more symptomology and previous depression history predicts poorer adjustment. Thus, in describing distress as one entity studies may miss the varying expressions of emotional suffering and highlights the importance of assessing anxiety, depression and anger (among other expressions of distress) separately.

Concurrent with the monitoring of distress and adjustment, it may be of benefit to understand individual patients' psychological robustness when monitoring adjustment to their illness. This review demonstrates that pre-morbid personality has some role in affecting outcomes as patients who showed propensity for pessimism reported less PTG (Milam, 2004) than those who demonstrated the personality trait of optimism (Urcuyo et al., 2005). This mutually exclusive relationship would make conceptual sense, although Urcuyo et al. (2005) emphasise that optimism and growth are distinct concepts. Furthermore, extraversion emerged as a factor associated with PTG (Sheikh, 2004).

These findings may link with research regarding coping styles and social support. The most consistently demonstrated finding in this review is the dichotomy between avoidant and approach coping styles. Whilst avoidant coping would seem to promote PTSD, approach coping would seem to promote growth. Thus, it would follow that people who are more psychologically robust may be more sensitive to their emotional support needs, and so will actively seek social support and process their trauma experiences. Indeed, Sheikh (2004) proposes a mediational model in which
personality and social support influence coping style and thus affect PTG. This would fit with other literature governing stress and trauma which has demonstrated that people who rely more upon approach coping such as problem solving and support seeking, tend to adapt better to life stressors and experience fewer psychological symptoms (Holahan, Moos & Schaefer, 1996) and people who use avoidance based coping such as denial and withdrawal generally experience more psychological distress (Holmes & Stephenson, 1990). Consistent with current theories of PTSD, approach coping involves active efforts to process the source of the stressor and the emotions coupled with that (Brewin, 2001). Thus those who take an active role in overcoming their trauma may experience more positive adjustment as they gain control over their reactions and this may be conceptually related to health locus of control (Wallston & Wallston, 1978). Conversely, those who avoid processing their reactions may feel trapped by their illness and thus experience symptoms of learned helplessness (Seligman, 1975).

As such, this seems to be an important area for further research, particularly in the area of intervention. It would seem sensible to postulate that approach coping strategies can be taught within a supportive environment and that this may then negate the need for pre-dispositional robustness, allowing individuals with poor prognosis to learn the behavioural and cognitive strategies needed to cope with adversity.

In conclusion, whilst sociodemographic and medical variables need to be considered when looking at individuals' physical and social resources in
recovery, far greater emphasis needs to be placed upon their perceptions of illness and their psychological resources to adjust to poor health. In measuring ‘actual’ factors such as disease stage and expressions of distress, healthcare seems to be missing a vital part of the process – that is, the individual’s illness experience. Thus a holistic approach to treatment is required.

Implications for Future Research and Intervention

Whilst it has emerged that diagnosis of disease is the key time for screening for later distress and PTSD symptomology, research is inconsistent on what the screening process should comprise. The HADS (Zigmond & Snaith, 1983) has emerged as a reliable tool for assessing distress at diagnosis and follow up and is normed on medical populations. In studies reviewed herein, the IES (Horowitz, Wilner & Alvarez, 1979) appeared to be a good indicator of early PTSD symptomology and as it is not a diagnostic tool it can be used to assess patients who may demonstrate sub-syndromal symptoms. Both of these measures are easily administered, and can be used routinely by qualified medical staff.

Furthermore, some studies have begun to promote treatment programmes for PTSD in medical populations (Tomich & Helgeson, 2004; Levine, Eckhardt & Tard, 2005). However, as this review demonstrates, there has been little empirical reporting on consistent predictors of outcomes and so these programmes may be ill-informed. The nature of trauma in medical populations may be experientially different from other traumas and thus may be novel to
clinicians. In addition, researchers stress the importance of timeliness in providing intervention (Bennett et al., 2001). Formal interventions conducted in the early days after the trauma have shown to worsen rather than improve the long-term prognosis in other medical traumas (Bisson, Jenkins, Alexander & Bannister, 1997). Therefore screening for risk at diagnosis and then monitoring changes would be more beneficial. However, early symptomology may not always indicate pathology and it is important to understand distress as a normal part of the adjustment process (Joseph & Williams, 2005).

It can be surmised that early identification of PTSD symptoms would be of benefit in helping those at risk of poor adjustment. Those who cope well with their illness manage their condition better and have more positive medical and psychological outcomes, and the factors demonstrated by these individuals (such as coping and seeking support) can be utilised to help patients who cannot make this positive adjustment alone. However, although this review is extensive and all factors included have been identified by more than one study, further research is needed to tease apart these variables. Future studies need to employ the longitudinal design, in order to measure consistent factors over time. Furthermore, multiple time points need to be factored in to provide a systematic approach to measuring these variables. This approach would seem to be the logical way forward. Finally, in order to create a coherent structure for this research, a person-centred approach, based on a within-persons design and looking at the stability (or instability) of variables over time may bring new depth to the broad ranging but largely superficial research on trauma outcomes in medical populations.
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Abstract

There is a growing recognition that the experience of a myocardial infarction (MI) is not only potentially traumatic but that it can have a positive psychological impact on individuals, resulting in an opportunity to transform their negative experience into a positive, life-changing experience from which they can grow; a process known as posttraumatic growth (PTG) (Tedeschi & Calhoun, 1996). This cross sectional study sought to identify predictors of PTG amongst patients (n = 30) six weeks post-MI. In particular, the study focused on the variables of emotional expression and emotional processing; a process known as emotional approach coping (EAC) (Stanton, Danoff-Burg, Cameron & Ellis, 1994). Greater PTG was related to expression of positive emotion and greater anxiety post-MI. Positive changes in outlook were positively correlated with expression of intimacy. No relationship was found between PTG and EAC, expression of negative emotion and intimacy, and emotional intelligence. These results suggest that emotional approach coping does not facilitate PTG in the short-term adjustment phase, but that certain types of emotional expression may lead to more growth phenomena. More research is needed to understand the longer-term effects of emotional coping. Further exploratory findings are discussed and methodological limitations acknowledged. Recommendations for future research and implications for clinical practice are considered.
Introduction

The Phenomenon of Posttraumatic Growth

Posttraumatic growth (PTG) as a construct and process is attracting increasing research interest particularly as a potentially significant outcome of trauma experience. Tedeschi and Calhoun (1996) describe the process of PTG as a positive psychological change consequent upon a traumatic event, with traumatic events themselves defined as any set of circumstances that represent significant challenges to the adaptive resources of the individual. In order for psychological growth to occur, it is argued that one must be exposed to an event that is extremely undesirable and intense, causing a breakdown in past and future assumptions about one's life, and often shattering the individual's way of understanding their world (Janoff-Bulman, 1992; Tedeschi & Calhoun, 1996). This process is frequently accompanied by strong experiences of distress, and perceptions of threat continuing long after the actual threat is removed (Tedeschi & Calhoun, 2004) and for sudden and unexpected events, initial reactions can include numbing, intrusive thoughts and avoidant behaviours (Horowitz, Wilner & Alvarez, 1979).

PTG is not initially a conscious process in that individuals do not systematically intend to make meaning out of trauma or to benefit from it (Tedeschi & Calhoun, 2004). Instead, where PTG occurs, it seems to be a spontaneous and almost immediate consequence of surviving both physically and psychologically. Thus, trauma itself is not seen as a precursor for growth, rather PTG occurs with the affective and intellectual accommodation of highly
negative circumstances. This process of accommodation permits some people to reconstruct a revised life structure that is perceived to be of a higher quality than the old one. Thus, PTG is not simply a return to baseline but a transitional experience that surpasses previous functioning (Tedeschi & Calhoun, 2004). In this way, there is a basic paradox apprehended by such trauma survivors – their losses have produced something of value.

Tedeschi and Calhoun (1996) describe five domains of positive change, which they posit quantify the experience of growth. These five domains emerged from an extensive literature review of interviews with individuals who had suffered a variety of life crises, such as bereavement, onset of physical disability and war trauma. Whilst subsequent studies found slightly different factors in non-English populations (Maercker & Langner, 2001; Powell, Rosner, Butollo, Tedeschi & Calhoun, 2003; Weiss & Berger, 2006), more recent research into English-speaking populations has largely supported the original five factor model (e.g. Morris, Shakespeare-Finch, Rieck & Newberry, 2005).

The five factors of the PTGI are described as appreciation for life, more meaningful relationships, increased personal strength, identification of new possibilities and spiritual growth. Appreciation of life in general and a changed sense of what is important is a common feature of PTG as individuals typically report a major shift in how they approach and experience their daily lives (Jordan, 2000). More meaningful relationships are experienced through having found support in unlikely places or having realised the importance of
cherishing others (Calhoun, Tedeschi, Fulmer & Harlan, 2000). Individuals can also report an increase in personal strength, or recognition of a strength that was previously unnoticed or unappreciated. Tedeschi and Calhoun (2004) state that this strength is often correlated with an increased sense of vulnerability, and that growth in this domain is from the sense that whilst negative things happen, they can be overcome. Identification of new possibilities refers to the trauma having opened up the possibility of a new and different life path to the individual. Finally, there is the growth of spiritual or existential understanding. Even those who are not religious may find growth through engaging with existential questions and reflecting on the meaning of their experience (Tedeschi & Calhoun, 1996).

PTG and Related Constructs

PTG is seen as a process that goes beyond normal adjustment to stressful life events. It has been argued that incremental changes and developmental life events such as marriage and childbirth can result in increased wisdom and personal strength (Aldwin & Levenson, 2004). Similarly, more traumatic events can result in an adjustment process that is gradual and results in pre-trauma levels of functioning, albeit with a revised life path or life goals. Adjustment in this sense can be quantified as coping with a major life change by assimilating this change into ones current understanding of the self and world with the primary goal of reducing distress (Aldwin, Sutton & Lachman, 1996). Psychological adjustment has been studied in couples experiencing infertility (McEwan, Costello, & Taylor, 1987) and individuals coping with rheumatoid arthritis (Revenson & Felton, 1989).
Other studies of chronic medical conditions have looked at the role of acceptance in promoting positive outcomes in psychological well-being and reducing distress. Acceptance is defined as a willingness to remain in contact with thoughts and feelings without having to follow or change them (Hayes, Jacobson, Follette & Dougher, 1994). Thus, aspects of the problem are accepted as they are and efforts are directed away from struggles that keep the individual stuck and towards a course of action that is personally meaningful and satisfying (McCracken, Carson, Eccleston & Keefe, 2004). Acceptance is seen as appropriate when adversity is difficult to control and a stressor has to be endured. However, this concept does not promote the finding of benefits in an experience but rather a need to think in positive terms before acting in ways that constitute healthy functioning (Hayes, Strosahl & Wilson, 1999). Studies of chronic pain sufferers have found that individuals who show more accepting responses to pain demonstrate better adaptation to their condition and report less distress and disability (McCracken, 1998; McCracken & Eccleston, 2005; McCracken, Spertus, Janeck, Sinclair & Wetzel, 1999; Jacob, Kerns, Rosenberg & Haythornthwaite, 1993).

Acceptance and adjustment theories have largely been explored in relation chronic illness and disability. The study of PTG has instead often been applied to events that are sudden and unexpected, although these events can have effects which are long lasting and often lead to chronic or disabling illness. Adjustment and acceptance seem temporally different to PTG in that they imply a process which takes place over a period of time. In further contrast to PTG, both acceptance and adjustment appear to constitute purposeful and
deliberate attempts to integrate the new experience into one’s current understanding of the world, often with external support such as psychological therapy (Hayes, Luoma, Bond, Masuda & Lillis, 2006). It is argued that PTG involves a more immediate, dramatic and comprehensive revision of one’s understanding, thus reflecting a change far beyond the natural process of adjustment to trauma (Christopher, 2004; Joseph & Linley, 2005; Linley & Joseph, 2004; Tedeschi & Calhoun, 2004). In PTG, the trauma shatters the individual’s assumptive word (Parkes, 1971) thus revising concepts of self, other and the world. New information is then accommodated into this revised schema. Therefore, rather than returning to baseline levels of functioning or well-being, albeit with revised plans and goals, the individual transcends this baseline to a new, revised and often more optimal level of functioning.

This paper acknowledges the infancy of PTG research and the challenges of current research to empirically and operationally separate PTG from normal psychological adjustment, acceptance (Hayes et al, 1994), optimal psychological functioning (Seligman, 2002), and general well-being (Keyes, Shmotkin & Ryff, 2002). Indeed, the various definitions of PTG and benefit finding are widely documented (e.g. stress-related growth, Park, Cohen & Murch, 1996; self-transcendence, Coward, 1990; perceived benefits, McMillen, Zuravin & Rideout, 1995; thriving, Abraido-Lanza, Guier & Colon, 1998; adversarial growth, Linley & Joseph, 2004). Whilst the scope of this paper does not permit a wider debate of these issues, the author encourages further research into the cognitive and social processes common in those adapting to trauma, including broader evaluations of well-being and
adjustment, and their conceptual relationships to PTG (see Psychological Inquiry, 2004, for a special issue on this topic).

Despite its conceptual and methodological limitations, the study of PTG is an emerging field, which correlates with an increase in interest in positive psychology (Seligman & Csikszentmihalyi, 2000). Rather than focusing solely on pathogenesis post trauma, study of those who cope well with adversity may inform less adaptive reactions and shape interventions. However, much of the work in PTG to date has been constrained by reliance on secondary findings from research that primarily focused on maladjustment and distress (Tennen & Affleck, 2005). Thus, in order to address some of these issues, further research investigating PTG as a primary outcome in trauma is warranted.
Figure 1. Model of Posttraumatic Growth

Person pre-trauma

Seismic event

Challenges

Management of emotional distress

Fundamental schemas, beliefs and goals

Life narrative

Rumination  
 Mostly automatic and intrusive

Reduction of emotional distress
Management of automatic rumination
Disengagement from goals

Rumination – more deliberate
Schema change
Narrative development

Self disclosure
Writing, talking and praying

Social support
Models for coping, schemas, posttraumatic growth

Enduring distress

Posttraumatic growth (5 domains)

Wisdom

(Tedeshci & Calhoun, 2004)
PTG and Medical Populations

Recently, medical populations have begun to emerge as groups at significant risk of trauma symptoms following various medical events such as diagnosis and treatment of life-threatening conditions. Indeed, criteria for the diagnosis of PTSD have been revised for the Diagnostic and Statistical Manual of Mental Disorders 4th Edition (DSM-IV) (American Psychiatric Association, 1994) to include diagnosis of a life threatening illness. There are significant risks to physical health for those who develop trauma symptoms, with increased likelihood of non-adherence to medication, poorer disease management and often a lower life expectancy (Shemesh, Yehuda, Milo, Dinur, Rudnick, Vered & Cotter, 2004; Shemesh, Rudnick, Kaluski, Milovanov, Salah, Alon, Dinur, Blatt, Metzkor, Golik, Verd & Cotter, 2001). As the interest in PTSD as an outcome of medical trauma has developed, so too has the interest in PTG, with growing recognition of positive adjustment and growth after threat as an important aspect of illness experience. PTG has been identified in medical populations such as those receiving cancer diagnosis and those engaged in treatment (Bellizzi & Blank, 2006; Cordova, Cunningham, Carlson & Andrykowski, 2001; Sears, Stanton & Danoff-Burg, 2003; Urcuyo, Boyers, Carver & Antoni, 2005; Widows, Jacobsen, Booth-Jones & Fields, 2005), patients diagnosed with neurological disease (Mohr, Dick, Russo, Pinn, Boudewyn, Likosky & Goodkin, 1999) and people who have experienced a myocardial infarction (MI) (Sheikh, 2004). Thus, the factors involved in PTG may have significant utility in aiding those who experience maladaptive adjustment to their diagnosis and treatment.
Patients who report PTG after medical trauma often demonstrate health gains. Independent of initial prognosis, patients who reported psychological benefits and growth after surviving an MI were less likely to incur a subsequent MI and had lower levels of morbidity eight years later (Affleck, Tennen, Croog & Levine, 1987). As the area develops, studies have begun to promote treatment programmes for traumatised medical populations (Levine, Eckhardt & Tard, 2005; Tomich & Helgeson, 2004), focusing on education and peer support. However, with equivocal improvements in outcome these interventions may be primitive and arguably require a more detailed understanding of the factors involved in adjustment to medical trauma.

**PTG and Coping Styles**

One of the emerging key factors in the development of PTG is the role of coping styles. Coping has long been defined as problem focused or emotion focused (Lazarus & Folkman, 1984), a definition which breaks down the practical, intellectual (problem-focused) element of coping and the affective, psychological (emotion-focused) element. Problem solving involves looking for ways to alter or rid oneself of the source of the stress and can involve several distinct activities – planning, direct action, seeking assistance or waiting, whereas emotional coping involves managing or reducing the distress caused by the situation using strategies such as denial, re-interpretation, and seeking of social support. Most stressors elicit both types of response but problem-focused occurs when people feel something constructive can be done and emotion-focused predominates when people feel the stressor must be endured (Lazarus & Folkman, 1984). Emotion-focused coping, as it is
operationalised in current literature, often entails avoidant fantasies such as escapesm and denial, and research has found that this correlates with higher levels of depression (Endler & Parker, 1990). Thus, since its conceptualisation, emotion-focused coping has consistently been found to be associated with negative adaptation (Kohn, 1996).

Although several studies examining the structure of coping and coping measures have provided some consensus for distinguishing between the previous two coping dimensions (Billings & Moos, 1984; Carver, Scheier & Weintraub, 1989; Pearlin & Schooler, 1978; Stone & Neale, 1984), other studies have highlighted additional dimensions of approach and avoidance (Miller, 1987; Roth & Cohen, 1986; Suls & Fletcher, 1985). Approach coping refers to the use of strategies that focus on both the source of stress and reactions to it, whereas avoidant coping refers to the use of strategies that place focus away from both the source of stress and reactions to it (Suls & Fletcher, 1985). In general it is believed that people who rely more upon approach coping such as problem solving and support seeking, tend to adapt better to life stressors and experience fewer psychological symptoms (Holahan, Moos & Schaefer, 1996). In contrast, people who use avoidance based coping such as denial and withdrawal generally experience more psychological distress (Holmes & Stephenson, 1990). Thus, these concepts require further investigation.

A review of the literature exploring PTG within medical populations appears to lend support to this assumption, finding PTG to be related to various aspects
of coping associated with approaching or processing the trauma (Smart, Robertson & Linley, 2006). For example, using the brief COPE (Carver, 1997), Urcuyo, Boyers, Carver and Antoni (2005) found that religious coping and positive reframing were related to higher levels of PTG in a sample of cancer patients one year post invasive surgery. Active coping and acceptance were also correlated although this correlation was weaker. Similarly, Bellizzi and Blank (2006) also used the brief COPE (Carver, 1997) but re-organised the 14 subscales into two factors, Active Adaptive Coping and Maladaptive or Escapist Coping. Using these factors, a significant association was found between women with breast cancer who used the active adaptive coping styles and PTG, as measured by the posttraumatic growth inventory (PTGI – Tedeschi & Calhoun, 1996).

Mohr, Dick, Russo, Pinn, Boudewyn, Likosky and Goodkin (1999) found that in patients with multiple sclerosis, PTG was related to positive reappraisal and seeking social support measured by the Ways of Coping (WOC) questionnaire (Folkman & Lazarus, 1988). Furthermore, Sheikh (2004) studied a group of patients undergoing cardiac rehabilitation following a myocardial infarction and found that, using the WOC (Folkman & Lazarus, 1988) both problem-focused and emotion-focused coping correlated positively with PTG measured using the PTGI total score (Tedeschi & Calhoun, 1996). This would appear to indicate that both types of strategy have utility in promoting growth after trauma.
Using the coping responses inventory (Moos, 1993) and the PTGI (Tedeschi & Calhoun, 1996), Widows, Jacobsen, Booth-Jones and Fields (2005) found that greater use of the strategies of positive reappraisal and problem solving prior to a bone marrow transplant for cancer were significantly related to PTG. Widows et al. (2005) also found an association between the total avoidance coping score and the specific strategy of seeking alternative rewards and PTG. This is an anomaly in the research as avoidance coping, in all its forms, is strongly correlated with PTSD symptomology. Moreover, seeking alternative rewards could also be seen as active or problem solving coping. This leads us to begin to question some of the constructs used by researchers and contemporary measures of coping.

**Critiques of the Research**

Current considerations of coping have begun to question the assumption that emotion-focused coping is negative and problem-focused positive suggesting that the dichotomous distinction is too simplistic (Stanton, Danoff-Burg, Cameron & Ellis, 1994). Indeed, Lazarus distinguishes between coping processes and coping outcomes, explaining that people often use different types of coping in a single situation and that coping processes are neither inherently adaptive nor maladaptive (Lazarus, 2000).

Similarly, the dichotomy of avoidance and approach appears too simplistic. Indeed, since behavioural and cognitive elements are seldom clearly operationalised, it is important to distinguish between behavioural avoidance and cognitive avoidance; behavioural manifesting in avoidance of places and
activities associated with the trauma and cognitive being the avoidance of thinking about the event. As such, efficacy of coping efforts must be investigated within a situational context.

Difficulties inherent in the measures used in contemporary research reflect the tendency to merge these dichotomies into one item, or to confuse emotionality with distress. For example, some items measuring emotion-focused strategies facilitate approach towards a stressor whilst others describe avoidance (Carver, Scheier & Weintraub, 1989). Thus, items measuring emotion-focused coping can equally be classed as problem-focused coping such as “seeking social support” (COPE, Carver et al., 1989). Moreover, many items confound coping efforts with emotional outcome, such as distress. For example “I get upset and let my emotions out” from the COPE (Carver et al., 1989) merges distress and emotional expression (Stanton, Danoff-Burg, Cameron & Ellis, 1994). Others concentrate on distressing processes such as “I become very tense” (Coping Inventory for Stressful Situations - Endler & Parker, 1990), which is an emotional response rather than a coping strategy. Central to the PTG literature is the consistent finding that increased threat and often, increased early anxiety predicts greater PTG (Bennett & Brooke, 1999). Thus previous research examining coping may be flawed, having used contaminated measures to conclude, in general, that emotion-focused and avoidant coping strategies are detrimental and problem-focused or approach coping strategies are adaptive and lead to positive outcomes (see Coyne & Racioppo, 2000 for a critique).
Emotional Approach Coping and Positive Outcomes

As emotionality has been better operationalised, more recent research has begun to focus on the acknowledgement, understanding and expression of emotion, a process labelled Emotional Approach Coping (EAC) (Stanton, Danoff-Burg, Cameron & Ellis, 1994). This has been embodied in an instrument to measure EAC comprising eight items, measuring emotional processing and emotional expression (Stanton, Kirk, Cameron & Danoff-Burg, 2000), which can be embedded in other measures. The items have been successfully evaluated on participants undergoing various medical procedures that may potentiate traumatic experiences or adverse coping strategies. In a cross-sectional evaluation of 80 adults with chronic myofascial pain, Smith, Lumley and Longo (2002) examined the relations of the EAC scales and a passive coping scale with four indices of adjustment. After controlling for negative affect, results suggested that EAC was a unique predictor of lower affective pain and depressive symptoms. Emotional expression in particular was related uniquely to lower sensory pain and lower physical impairment in males.

A further longitudinal study examined EAC and health-related outcomes in women completing treatment for breast cancer (Stanton et al., 2000), finding women who reported coping through emotional expression at baseline evidenced fewer medical appointments for cancer-related morbidities and reported enhanced physical health, more vigour, and less distress three months later relative to women deemed lower in emotionally expressive coping.
Application of EAC and PTG to Medical Trauma

Understanding the role emotions play in processing trauma would appear to be of profound importance, particularly in medical populations when a stressor has to be endured (Mundy & Baum, 2004). Non-medical stressors tend to be acute events that quickly pass, although the psychological responses are often more enduring. By contrast, medical stressors are often both past and future oriented, involving ongoing threats to survival, fear of recurrence and fears of disability and impaired quality of life. Accommodating this ongoing threat clearly requires endurance and thus emotional coping may be necessary and even paramount when faced with this type of trauma.

In addition to this, researchers have begun to consider the experiential differences in medical traumas. Existentially, there is argument among researchers as to whether a diagnosis of cancer is a traumatic event (Kangas, Henry & Byrant, 2005) or a psychosocial transition (Andrykowski, Brady & Hunt, 1993, 1996; Cordova et al., 2001; Parkes, 1971). Pitman, Lanes, Williston, Guillaume, Metzger, Gher and Orr (2001) have found that physiological reactions to re-enactments of diagnosis in cancer patients are similar to those of ‘typical’ PTSD cases. However, because there are many appointments and tests needed to diagnose cancer, it would seem that a diagnosis, whilst being unwanted news, is often expected or at least prepared for. This may be similar for people diagnosed with HIV; seeking a test indicates some prior knowledge of risk or fear of exposure. Additionally people with life long debilitating illness such as psoriasis could be said to be constantly adjusting to the course of their illness rather than experiencing the
trauma of a new diagnosis or medical difficulty. In this way, MI patients are often described as experiencing trauma that is more consistent with current conceptualisations of traumatic events (Bennett & Brooke, 1999; Bennett, Conway, Clatworthy, Brooke & Owen, 2001; Bennett, Owen, Koutsakis & Bisson, 2002). A sudden MI, is often unexpected and intense, and involves immediate threat to life. As such, the proximity of threat is far nearer and the intensity of the stressor is far higher than those experiencing a diagnosis of cancer or HIV. Therefore, a sample of individuals who have experienced an MI can be seen as an appropriate population to study in order to determine the factors involved in PTG following medical trauma.

Coronary Heart Disease and Myocardial Infarction

Coronary heart disease (CHD) is the most common form of cardiovascular disease. It involves a reduction in the blood supply to the heart muscle by narrowing or blockage of the coronary arteries. Research estimates that in 2004 2.7 million people were living with CHD in the UK with mortality amongst the highest in Western Europe (British Heart Foundation, 2006). CHD is believed to cause around 117,000 deaths a year in the UK, approximately one in five deaths a year in men and one in six deaths a year in women.

CHD is often characterised by angina pectoris (chest pain), atherosclerosis (hardening and thickening of the arteries) and myocardial infarction (heart attack (MI)). An MI involves irreversible damage to the heart tissue and muscle, through insufficient oxygen reaching the heart muscle via the arteries. In 2004, 4% of males and 2% of females in the UK population suffered an MI,
and 105,000 deaths (35,000 in people under 65 years old) were recorded as MIs.

The National Service Framework for CHD (Department of Health, 2000) recognises that the psychological consequences of an MI can be persistent and disabling, and can be a barrier to making lifestyle changes necessary to reduce subsequent cardiac risk. Standard Seven identifies targets for cardiac rehabilitation, including identifying those in need of further support and psychological intervention. It suggests that good rehabilitation including psychological input can reduce mortality by as much as 20-25 percent.

Overview of Study
Therefore, this study will look at the role of emotional coping, in particular emotional expressiveness and emotional processing, in facilitating PTG in a sample of patients who have suffered their first MI. It is hoped that through identifying factors involved in PTG, interventions can be tailored to those who have poor adjustment reactions to their MI. This will add to the literature on psychological reactions to MI, the literature on PTG and potentially inform cardiac rehabilitation programmes.

Research Question and Hypotheses
As EAC appears to facilitate decreased distress following medical events and approach coping strategies seem to be a consistent predictor of PTG in similar populations, this study aimed to further both of these findings by making the conceptual link between EAC and the opportunity for PTG.
Therefore, the research question “Does emotional approach coping facilitate PTG following medical trauma?” is proposed.

Although the research will focus on PTG as the main outcome measure, this study is exploratory in nature and has included measures of factors found to be significant in reducing distress or promoting growth in an extensive literature review (see first chapter). Therefore, the following hypotheses are proposed for testing:

H1
- EAC will be positively correlated with PTG

H2
- PTSD symptomology (intrusions and avoidance) will correlate negatively with PTG

H3
- Anxiety will be positively correlated with PTG whereas depression will be negatively correlated with PTG in the immediate post-MI phase

H4
- EAC will correlate with reduced anxiety and depression at four month follow-up

H5
- EAC will correlate positively with Emotional Intelligence (TEIQue) and Emotional Expressiveness (EEQ)
Methods of Enquiry

Design
The present study set out primarily to investigate the role of emotional approach coping and emotionality with regard to the concept of Posttraumatic Growth (PTG) in post-MI patients. The aim was to determine whether patients who use more emotional approach coping, or are more aware of their emotions in terms of emotional intelligence, emotional processing and emotional expression, are more likely to develop positive outcomes following a medical trauma. Positive outcomes can involve PTG, positive changes in life outlook and lower incidences of clinically significant distress. These differences were measured by looking at measures of emotionality, and measures of distress and PTG.

A quantitative, within-subjects design was considered most suitable, since standardised measures were thought to be easily administered and scored. Such merits outweighed a more exploratory, qualitative approach which may have been too time-consuming and fatiguing for people who were recovering from a potentially life-threatening medical event. Moreover, previous literature has identified putative factors involved in PTG with further opportunity to study a particular dimension in more detail. A longitudinal approach was considered most beneficial to measure the immediate, short-term and long-term outcomes of medical trauma. As PTG may be a gradual or varying process, it was considered important to use a repeated measures design. The majority of
previous studies of PTG in medical populations have adopted such an approach.

The dependent variable was PTG as an outcome of medical trauma. The independent variables were trait emotional intelligence, emotional expression and processing, emotional expressiveness, positive and negative changes in outlook, PTSD symptomology, and anxiety and depression (see measures). In summary, a quantitative, within-subjects, longitudinal design was proposed to address the hypotheses and research questions proposed for this study.
Participants

Participants comprised cardiac rehabilitation patients in receipt of care from two acute hospitals in the East Midlands region. Purposive sampling was adopted in line with the following inclusion and exclusion criteria:

Inclusion

- MI event <6 weeks previously
- Adults 18+ years old.
- First MI event
- MI as primary reason for hospitalisation

Exclusion

- Heart trauma a result of traumatic injury or long-term illness.
- Other co-morbid injury or illness (excluding diabetes and angina)
- Primary purpose of hospital admission is cardiac arrest.
- Patient taking part in other research trials in NHS (excluding drug trials).

Five hundred and thirty seven patients with a confirmed diagnosis of MI were admitted to the coronary care units (CCUs) of the hospitals involved between October 2005 and June 2006. It is unclear what percentage of these were first MIs as the hospitals do not routinely collect this data. However, it is known that 63 of these patients were approached to take part in the study and were

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4 For the purposes of this study, an MI event was classified in line with acute trust guidelines which state that a patient with a Troponin Level of 0.6 would show some evidence of myocardial damage and therefore have the diagnosis of Non ST Elevation Myocardial infarction (NonSTEMI) or Myocardial infarction (MI). These are the criteria used to distinguish between MI and other cardiac events.
eligible to take part. It is possible that many more patients were eligible for participation in the study than were approached. This low recruitment rate can be explained by staff shortages, changes to recruitment procedures imposed by the R+D department and by the ineligibility of the author to recruit participants (see the critical appraisal (p132) for a more detailed description of the recruitment difficulties and a reflection on this process).

Of the 63 patients approached, 47 returned consent forms and agreed to take part, and of these 47, 30 completed their questionnaires and returned them to the researcher, giving a response rate of 64%. No attempt was made to contact those 17 who did not return questionnaires as this was deemed withdrawal of participation consistent with Trust R+D guidelines. Figure 2 gives a breakdown of participant recruitment.

All participants were confirmed by their consultant to be aware they had experienced an MI and that this was the reason for their hospitalisation. Research has shown that patients who experience a 'silent MI' or those that misunderstand their diagnosis may attribute symptoms to benign causes and thus be unaware of their health status (Bennett & Brooke, 1999) potentially compromising measures of outcome.

The final sample therefore consisted of 30 patients who had experienced their first MI within six weeks of data collection and had spent time in CCU. 20 (67%) were males and 10 (33%) were females. The mean age was 57.90 years at time of event ($R = 28-80$, $SD = 10.835$).
Of the non-responders, 14 were male and 3 female. The average age was 58.65 (\( R = 40-86, \ SD = 10.994 \)). An independent samples t-test revealed no significant difference between responders and non-responders with regard to age (\( t \ (45) = .226, \ p = .822 \)).
Figure 2. Participant Recruitment

- **351** Patients admitted to hospital A with MI between Oct 2005 – June 2006
- **139** Patients admitted to hospital B between Feb 2006 – June 2006
- **47** Patients admitted to hospital C in June 2006

- **63** Patients approached and given packs
  - **47** Patients consented to take part
    - **30** Patients returned questionnaires
Rationale for Criteria

Research suggests that 20 weeks post-diagnosis or post-treatment is optimal for data collection pertaining to adjustment and mood as this is a period of increased distress (Beisecker, Cooke, Ashworth, Hayes, Brecheisen, Helmig, Hyland, & Selenke, 1997; Tross & Holland, 1989; Ward, Viergutz, Tormey, deMuth & Paulen, 1992). However, this covers a substantial timeframe and potentially overlaps with the four-month follow-up for those participants completing their questionnaires within a week of MI. This could lead to variability in, and compromise the quality of, the data. Thus, a six-week timeframe was specified as a tighter boundary, fitting neatly with the existing timeframe of the outpatient appointments.

Patients experiencing their first MI were focused on as previous research has been compromised by inclusion of a mixed sample of patients experiencing second, third, or even fourth MI (Bennett & Brooke, 1999; Bennett, Owen, Koutsakis & Bisson, 2002). Those who are experiencing a second or third MI may be undertaking various forms of intervention, both pharmacological and therapeutic, and be experienced and knowledgeable about their condition and its risks, thus already adjusting to their illness and taking active steps to cope. This is similar to those who are experiencing an MI secondary to a chronic or congenital illness (i.e. pulmonary stenosis) where MI has been identified as a major risk factor. It was also felt that those experiencing an MI or cardiac arrest as a result of other trauma (i.e. road traffic accident) may have other symptoms and traumatic memories that would confound the data. Thus, a
sample of people experiencing their first MI was thought to be more representative of a medical trauma population.

**Measures**

The research instruments employed were two questionnaires compiled by the researcher comprising a number of previously validated individual inventories and measures. Questionnaire 1 was an eleven page document consisting of all of the measures described below, excluding the HADS$^5$. This was constructed to measure or elicit information pertaining to all the variables under investigation. Questionnaire 2 consisted of the measures pertaining to the potential outcomes following trauma. Examples of both questionnaires can be found in the appendices (appendix 4 & 5).

**Trauma Measures**

**Post Traumatic Growth Inventory** (Tedeschi & Calhoun, 1996)

The Post Traumatic Growth Inventory (PTGI) is a 21-item scale that measures the positive legacy of trauma. It has utility in determining how successful individuals, coping with the aftermath of trauma, are in reconstructing or strengthening their perceptions of self, others, and the meaning of events. The PTGI can be split into five subscales, New Possibilities, Relating to Others, Personal Strength, Appreciation of Life, and Spiritual Change. It has been used to measure PTG in people who have suffered cardiac arrest following heart attack (Sheikh, 2004).

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$^5$ This was routinely administered by the cardiac department and so results were collected from the records for the first data set.
Participants are asked to rate items on how much they have changed since the identified traumatic event. Items include "my priorities about what is important in life", and "knowing I can count on people in times of trouble". Each item is answered on a six-point scale from 0 (did not change as a result of the event described above) to 5 (changed a very great degree as a result of the event described above). During construction of the scale, results yielded an internal reliability coefficient of α 0.93 for the total scale of 21 items (Tedeschi & Calhoun, 1996).

**Impact of Events Scale** (Horowitz, Wilner & Alvarez, 1979)

The Impact of Events Scale (IES) consists of 15 items, seven of which measure intrusive symptoms (intrusive thoughts, nightmares, intrusive feelings and imagery), such as "I thought about it when I didn't mean to" and eight which measure avoidance symptoms (numbing of responsiveness, avoidance of feelings, situations, ideas) such as "I stayed away from reminders of it". The IES has been successfully used to determine early PTSD symptomatology in people who have suffered from an MI (Bennett & Brooke, 1999; Bennett, Conway, Clatworthy, Brooke & Owen, 2001; Bennett, Owen, Koutsakis & Bisson, 2002).

All items are to be anchored to a particular event and respondents are asked to rate the items on a four-point scale according to how often each has occurred in the past seven days. The points on the scale are: 0 (not at all), 1 (rarely), 3 (sometimes), and 5 (often). Combined, they provide a total subjective stress score. A score of 0-8 is considered subclinical, 9-25 mild
symptoms, 26-43 moderate symptoms and a score in excess of 44 is considered severe symptomology and requires intervention.

Both the intrusion and avoidance scales have displayed acceptable reliability (alpha of $a\geq0.79$ and $a\geq0.82$ respectively), and a split-half reliability for the whole scale of $a\geq0.86$ (Horowitz, Wilner & Alvarez, 1979). Internal consistency of the subscales is also high (intrusion $a\geq0.78$, avoidance $a\geq0.82$).

**Changes in Outlook Questionnaire** (Joseph, Williams, & Yule, 1993)

The Changes in Outlook Questionnaire (CiOQ) consists of 26 items, 11 of which assess positive changes (CiOQpos) in the aftermath of trauma such as “I value my relationships much more now”, and 15 of which assess negative changes (CiOQneg) such as “My life has no meaning anymore”. Each item is answered on a six-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). Scores on the CiOQpos subscale have been found to be associated with the PTGI, and scores on the CiOQneg subscale with the IES (Joseph, Linley, Andrews, Harris, Howie, Woodward & Shevlin, 2005). Thus, scores on this measure will be used to triangulate the previous two measures.

This measure has been used in studies with a variety of participants following trauma and adversity and both the scales were found to possess good internal consistency reliability ranging from $a\geq0.80$ to $a\geq0.87$ for positive changes, and $a\geq0.86$ to $a\geq0.88$ for negative changes across 4 samples (Joseph et al., 2005).
Emotionality Measures

Emotional Approach Coping Scales (Stanton, Kirk, Cameron & Danoff-Burg, 2000)

The Emotional Approach Coping scale (EAC) is an eight-item measure that measures two distinct forms of emotional approach coping, coping through emotional expression (four items) and coping through emotional processing (four items). Items include “I take time out to explore my emotions” and “I realise my feelings are valid and important” and are rated on a four point scale from 1 (I usually don’t do this at all) to 4 (I usually do this a lot).

The EAC has been used to investigate the role of emotional coping in a variety of medical populations (Stanton, Danoff-Burg, Cameron, Bishop, Collins, Kirk, Sworowski & Twillman, 2000; Smith, Lumley & Longo, 2002; Berghuis & Stanton, 2002). In both dispositional and situational versions, the scales demonstrate high internal consistency reliability ranging from α0.72 to α0.88 for processing and α0.82 to α0.92 for expression.

Emotional Expressiveness Questionnaire (King & Emmons, 1990)

The EEQ is a 16-item scale that looks at the overall trait emotional expressiveness of individuals. It measures three different subsets of expressiveness: expression of positive emotions such as “I often touch friends during conversations”, expression of negative emotions such as “I always express disappointment when things don’t go as I’d like them to”, and expressions of intimacy such as “I often tell people that I love them”. Items are
rated on a seven point likert scale from 1 (completely disagree) to 7 (completely agree). Some items are reversed during scoring.

The EEQ has been used to determine emotional expressiveness and its role in coping in cancer survivors (Schmidt & Andrykowski, 2004; Graves, Schmidt, Bollmer, Fejfar, Langer, Blonder & Andrykowski, 2005).

During the scale construction, the alpha reliability coefficient was calculated at α 0.78, with α 0.74 for expression of positive emotion, α 0.67 for expression of negative emotion and α 0.63 for expression of intimacy.

**Trait Emotional Intelligence Questionnaire –short form (Petrides & Furnham, 2004)**

This is a 30-item questionnaire designed to measure global trait emotional intelligence (trait EI). It is based on the long form of the TEIQue (Petrides & Furnham, 2003). It taps 15 domains of emotional intelligence (EI) *Adaptability, Assertiveness, Emotion perception (self and others), Emotion expression, Emotion management (others), Emotion regulation, Impulsiveness (low), Relationships, Self-esteem, Self-motivation, Social awareness, Stress management, Trait empathy, Trait happiness and Trait optimism* and gives a global trait EI score. Items are rated on a seven point likert scale from 1 (completely disagree) to 7 (completely agree). Some items are reversed in scoring.
Although the TEIQue has not been used to study medical populations, it was felt that EI may have links with emotional expression and emotional processing as evidenced in previous research with breast cancer sufferers (Schmidt & Andrykowski, 2004). Thus it was felt that this was a variable to be included for exploratory purposes.

**Psychological Distress Measure**

**Hospital Anxiety and Depression Scale** (Zigmond & Snaith, 1983)

The HADS is a 14-item scale which detects states of anxiety and depression in hospital patients. It is widely used in both clinical and research settings and is suitable for assessing distress in medical patients as it does not include somatically focused items. The HADS has been used to measure distress in patients who have suffered an MI (Martin & Thompson, 2000; Roberts, Bonnici, Mackinnon & Worcester, 2001; Bennett et al, 2002).

Items are scored on a scale of 0 to 3 and respondents underline the statement that best reflects their feelings regarding a number of statements. Responses are then scored to give separate anxiety and depression scores. It is reported to have good internal consistency with alphas of between 0.80 and 0.90 for both scales and the two scales combined have an internal consistency of $\alpha 0.89$ (Zigmond & Snaith, 1983).
**Procedure**

Potential participants were identified by cardiac rehabilitation nurses and ward staff on admission to the coronary care units (CCUs) of the participating hospitals. On admission to CCU, potential participants were approached by the nursing staff and given a patient information sheet detailing the study alongside the standard hospital information pack given to all cardiac patients.

Patients who indicated their wish to participate in the study to nursing staff were given the research pack containing an invitational letter, another patient information sheet, the first questionnaire, and the consent form (three copies), examples of which can be found in the appendices (appendix 4, 6, 7 & 8). The pack was given in an A4 envelope and all information was coded using a unique three-digit identifier known only to the researcher and consenter.

The nursing staff acting as consenters competed a subject enrolment log which consisted of the three digit identifier, a patient hospital label, their GP details, HADS scores and the consenter’s signature. HADS scores were collected routinely by the cardiac service and so replication of data was minimised by collecting the hospital’s admission scores rather than including the HADS in questionnaire one.

Following discharge, patients were routinely given a six-week follow-up appointment by the hospital. At this appointment, those who wished to take part returned their consent forms and completed questionnaire. Both the information sheet and consent form clearly stated the procedures for follow-up.
to ensure participants understood they were consenting to take part in the second phase of the research and outlining procedures for withdrawal from the study.

Four months after the date of the consent form, participants were to be sent the second questionnaire by post, along with a covering letter reminding them of the study and their right to withdraw their participation. A stamped addressed envelope was to be supplied. Non-response after four weeks was to be considered a withdrawal from the research.

**Analysis**

Multiple regression analysis using stepwise selection was to be conducted with the data. This process allows a criterion variable to be regressed against several potential predictor variables. This permits a much richer analysis of variables than bivariate correlations as stepwise multiple regression eliminates those variables not strongly related to the criterion variable, nuisance (outlier) variables or those showing strong multi-collinearity. This creates a model which can then be tested using regression diagnostics to determine its reliability. Multiple regression allows more robust temporal and causal conclusions to be drawn about the relationships of variables than simple bivariate analysis.

Multiple regression has its limitations and these need to be acknowledged. For example, researchers must be aware of multi-collinearity which may inflate the standard errors and can lead to type 2 errors. Similarly, there are
often multiple tests involved in this analysis which may lead to type 1 errors. Furthermore, multiple regression is often an ad hoc process as there is no defined criterion for eliminating variables – it is at the discretion of the researcher. However, multiple regression and, in particular, backwards stepwise regression is empirically the most utilised approach in PTG research (Sheikh, 2004; Widows et al., 2005; Urcuyo et al., 2005; Bellizzi & Blank, 2006; Cordova et al., 2000; Sear, Stanton & Danoff-Burg, 2003). It is also recommended for data sets that have multiple variables and relatively few participants (Howitt & Cramer, 2000), provided the researcher cautions against the potential problems identified.

For this study, the criterion variable was to be PTG assessed by total scores on the PTGI (Tedeschi & Calhoun, 1996). Twelve variables were to be entered as possible predictor variables: anxiety, depression, emotional intelligence, emotional processing, emotional expression, positive changes in outlook, negative changes in outlook, intrusions, avoidance, expression of intimacy, expression of negative emotions and expression of positive emotions.
Changes to Methodology

Rationale
Several difficulties and barriers were encountered during the undertaking of the project. Long delays were faced in gaining ethical and trust approval which impinged upon the time-frame of the project. The researcher was also ineligible to consent patients and collect data on the wards due to trust research and development (R+D) policy, which states that all consenters need to complete trust-approved training. Therefore much reliance was placed upon the nursing staff to manage data collection. Throughout the data collection period, the cardiac department faced staff shortages and high staff turnover. This affected data collection adversely as few nurses were able to participate. The R+D department also made changes to the length and detail of the consenting procedure, which encroached on valuable nursing time, and thus left nursing staff frustrated and less motivated to engage in data collection. Therefore the following amendments were made to the project in order to complete it within the given time frame.

Changes to Procedures
Amendments were made to the collection of data to encourage a higher response rate. Many potential participants appeared to forget to return questionnaires at their outpatient rehabilitation appointment. Moreover, as cardiac services were short staffed, they were experiencing a back-log of patients and so outpatient appointments were beginning to be booked 8-10
weeks post discharge, thus taking data collection beyond the six-week deadline.

As many participants were forgetting to return the questionnaire at six weeks the choice was given to patients to fill in the pack during their stay, post it to the researcher after discharge or return it at their outpatient appointment. All packs were now issued in an A4 envelope, which was stamped and addressed to the researcher.

Changes to Design

Due to the time constraints placed upon the research, the second time point was forsaken. This altered the study from a longitudinal to a cross sectional design. Although follow-up questionnaires were sent out to those participants who were eligible, it became clear that any follow-up would be negligible by virtue of the small sample size\textsuperscript{6}. Therefore all data described in the remaining portion of this paper were attained at one time point - six weeks post MI.

Changes to Analysis

With the changes to design came significant changes to the data analysis. Hypothesis four was not addressed as this relied upon data from four-month follow-up which was not acquired. All other hypotheses were able to be tested.

\textsuperscript{6} Only 8 participants were eligible for the four month follow-up at the time of writing
Furthermore, it is recommended that to carry out stepwise regression it is desirable to have 40 times more cases than predictors (Howitt & Cramer, 2000). Whilst this convention is not always followed in published research, it was felt the small number of participants in this study negated the use of this approach. Therefore, the data set was analysed using bivariate correlations. This is the preceding step to multiple regression and looks for significant correlational relationships between variables. Identified relationships can then act as putative variables requiring further empirical investigation. As EAC and PTG have not yet been conceptually linked in the literature, this study can therefore be seen as pilot study for future research.

In summary, the study reported in the following chapters is a quantitative, within-subjects design using the cross-sectional survey method, with data analysed using bivariate correlations to test the research hypotheses. Further exploratory correlations were also undertaken to look for significant relationships, which may prove of interest to further research. Data were also split into cases based upon the two distress measures (IES and HADS) to look at differences between clinical and non-clinical populations. Again, this exploratory analysis may add further dimensions to the trauma and growth literature worthy of future consideration.
Figure 3. Flowchart of projected and actual data collection procedures

**Hospital procedures**

**Phase 1** – Ward Admission following MI

**Phase 2** – Immediate Discharge (< 4 Days post MI)

**Pre-phase 3** – Out patient assessment for rehabilitation (< 6 weeks post MI)

**Phase 3** – Rehabilitation Class (> 6 weeks post MI)

**Referral to Phase 4** – community rehabilitation (Approx 18-20 weeks post MI)

**Project procedures**

**Phase 1a** – Patient information leaflet given

**Phase 1b** – Research pack given including consent form, patient information sheet, demographic information sheet and questionnaire to take home

**Phase 2** – Return of questionnaire, demographic information sheet and consent form if taking part in study

**Phase 3** – 4 months post initial consent
Second questionnaire posted to participant for completion at home and postal return

Study terminated here due to recruitment difficulties and time constraints
Results

Data were analysed using the Statistics for Social Sciences (SPSS), version 12.0.1 (2006). This section will report on the reliability statistics of the measures, statistical power of the study, the hypotheses under investigation and the demographics of the sample. It will then explore further relationships between the variables and look at differences between clinically significant and non-clinical samples as indicated by some of the distress measures.

All variables were tested for homogeneity of variance and normal distribution to confirm that data met criteria for the use of parametric tests. The data were first assessed visually to check for normal distribution using a histogram. Where data is approximately normally distributed, the points form a bell curve with no positive or negative skew. In addition, a Q-Q normal probability plot was used as a second means of assessment. In this type of plot the data points cluster around a straight line if the sample is normally distributed, representing a match between observed and expected values.

The data were then checked for homogeneity of variance using the Shapiro Wilkes test. This tests the null hypothesis that a sample comes from a normally distributed population. Where the p value is less than 0.05, the sample is not normally distributed and so parametric tests are not deemed appropriate.

Calculations and plots were undertaken for all scores. For brevity, it is not appropriate to present the data here or in the appendices. Instead, where data
violated the criteria for parametric tests, non-parametric tests or adjusted parametric values were used. This is indicated in the text.

**Reliability Statistics**

Reliability analysis using Cronbach’s alpha (\(\alpha\)) was calculated on the majority of the variables included in this study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach’s (\alpha) for this study</th>
<th>Cronbach’s (\alpha) for the measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Traumatic Growth Inventory Total</td>
<td>0.948</td>
<td>0.93</td>
</tr>
<tr>
<td>Impact of Events Intrusions</td>
<td>0.899</td>
<td>0.79</td>
</tr>
<tr>
<td>Impact of Events Avoidance</td>
<td>0.766</td>
<td>0.82</td>
</tr>
<tr>
<td>Changes in Outlook Negative</td>
<td>0.825</td>
<td>0.88</td>
</tr>
<tr>
<td>Changes in Outlook Positive</td>
<td>0.825</td>
<td>0.87</td>
</tr>
<tr>
<td>Emotional Approach Coping Processing</td>
<td>0.785</td>
<td>0.72 / 0.88</td>
</tr>
<tr>
<td>Emotional Approach Coping Expression</td>
<td>0.844</td>
<td>0.82 / 0.92</td>
</tr>
<tr>
<td>Emotional Expressiveness Positive</td>
<td>0.785</td>
<td>0.74</td>
</tr>
<tr>
<td>Emotional Expressiveness Negative</td>
<td>0.631</td>
<td>0.67</td>
</tr>
<tr>
<td>Emotional Expressiveness Intimacy</td>
<td>0.614</td>
<td>0.63</td>
</tr>
<tr>
<td>Emotional Intelligence Total</td>
<td>0.802</td>
<td>No data available</td>
</tr>
</tbody>
</table>

As only the total scores rather than item-level data were available for the two HADS scores, it was not possible to calculate alpha scores for this participant sample. However, all other scores were comparable to scores obtained in the initial creation and analysis of the measures.

**Power Analysis**

Initially it was hoped to gather a sample in excess of 120 at time point one in order to account for attrition at time point two and thus have a probable
sample of 85 in order to meet adequate power. However, due to recruitment difficulties, a sample of 30 participants at one time point was eventually obtained. This meets criteria for a large effect size for correlation, where \( n = 28, p = 0.05 \). Therefore, all results reported below should be interpreted accordingly.

Table 6. N for small, medium and large effect sizes at power of .80 for .01, .05 and .10

<table>
<thead>
<tr>
<th>Test</th>
<th>Small</th>
<th>Med</th>
<th>Large</th>
<th>Small</th>
<th>Med</th>
<th>Large</th>
<th>Small</th>
<th>Med</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant r</td>
<td>1.163</td>
<td>125</td>
<td>41</td>
<td>763</td>
<td>85</td>
<td>28</td>
<td>617</td>
<td>68</td>
<td>22</td>
</tr>
</tbody>
</table>

(Cohen, 1992)
Demographic Analysis

Sample
The sample comprised 30 patients assessed within six weeks post-MI. 20 (67%) were males and 10 (33%) were females. The mean age was 57.90 years at time of event ($R = 28-80$, $SD = 10.835$).

Gender differences
Using an Independent Samples t-Test, gender differences within the variables were examined. In addition, a Levene’s test for equality of variances was undertaken in order to test the equality of variance across each sample. Where equal variances were not assumed, the adjusted t scores were used following SPSS convention (Cramer & Howitt, 2004).

No significant difference was found between groups’ reporting of PTG following their MI ($t (28) = -0.818$, $p = 0.420$) although males reported slightly less PTG ($M = 45.80$) than females ($M = 53.20$).

A significant gender difference was found in the negative expression of emotion score (EEQ negative) with female participants reporting significantly less expression of negative emotion ($M = 15.40$) than males ($M = 19.40$) ($t (28) = 2.436$, $p = 0.021$).
A significant difference was also found in the PTSD symptom of avoidance (IES avoidance) with male participants reporting significantly less avoidance phenomena \((M = 10.30)\) than females \((M = 16.50)\) \((t (28) = -2.084, p = 0.046)\).

Finally, a significant gender difference was found in the total IES score with males reporting significantly less PTSD symptomology \((M = 21.95)\) than females \((M = 30.80)\) \((t (28) = -2.069, p = 0.048 \text{ (adjusted score - equal variances not assumed)})\).

**Age differences**

Using bivariate correlation, age was examined against all the variables measured in this study. No significant differences were found nor did any of the variables approach the significance level of 0.05.

**Hypothesis Testing**

The following hypotheses were postulated and tested in order to answer the research questions. Results are reported after each tested hypothesis.

Hypothesis 4 was not investigated due to methodological limitations discussed previously and is therefore not included in this section.

H1
- EAC will be positively correlated with PTG

No significant correlation was found between the total PTGI score and EAC expression \((r (28) = .257, p = 0.170)\) or EAC processing \((r (28) = .060, p = \)
Similarly, no significant correlation was found between positive changes in outlook (CiOQpos) and EAC expression \( (r(28) = .164, p = 0.386) \) or EAC processing \( (r(28) = -.107, p = 0.572) \).

**H2**

- PTSD symptomology (intrusions and avoidance) will correlate negatively with PTG

No significant correlations were found between the total PTGI score and IES intrusion \( (r(28) = .230, p = 0.222) \), IES avoidance \( (r(28) = .042, p = 0.827) \) and IES total score \( (r(28) = .171, p = 0.366) \). Similarly, no significant relationship was found between negative changes in outlook (CiOQneg) and the PTGI score \( (r_s (28) = .221, p = 0.241) \).

**H3**

- Anxiety will be positively correlated with PTG whereas depression will be negatively correlated with PTG in the immediate post-MI phase

A significant positive relationship was found between PTGI total and HADS anxiety \( (r(28) = .375, p = 0.041) \). No significant relationship was found between HADS depression and the PTGI total \( (r_s (28) = .150, p = 0.428) \). Positive changes in outlook (CiOQpos) was not correlated with any of the HADS scores.
H5

- EAC will correlate positively with Emotional Intelligence (TEIQue) and Emotional Expressiveness (EEQ)

A significant positive relationship was found between emotional intelligence (TEIQue) and EAC expression ($r(28) = .397, p = 0.030$) and EAC processing ($r(28) = .519, p = 0.003$).

A significant positive relationship was also found between positive expression of emotion (EEQpos) and EAC expression ($r(28) = .485, p = 0.007$) and EAC processing ($r(28) = .461, p = 0.010$); negative expression of emotion and EAC expression ($r(28) = .476, p = 0.008$) and EAC processing ($r(28) = .363, p = 0.048$). Expression of intimacy was significant positively correlated with EAC expression ($r(28) = .450, p = 0.013$) but not EAC processing ($r(28) = .012, p = 0.948$).

Summary

The hypotheses investigated by this study are partially supported. Regarding the main research question, no significant relationship was found between EAC and PTG. However, in accordance with previous research, a relationship was found between PTG and greater anxiety. As conceptually posited in the hypotheses, emotional approach coping, emotional expressiveness and emotional intelligence showed positive correlational relationships.
Table 7. Parametric correlations between variables involved in hypothesis testing H1-H3

<table>
<thead>
<tr>
<th>Variable</th>
<th>PTGItot</th>
<th>CiOQpos</th>
<th>EACprocess</th>
<th>EACexpress</th>
<th>IESintrus</th>
<th>IESavoid</th>
<th>IEStot</th>
<th>HADSanx</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTGItot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.434(*)</td>
<td>.060</td>
<td>.257</td>
<td>.230</td>
<td>.042</td>
<td>.171</td>
<td>.375(*)</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.017</td>
<td>.753</td>
<td>.170</td>
<td>.222</td>
<td>.827</td>
<td>.366</td>
<td>.041</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>CiOQpos</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.434(*)</td>
<td>1</td>
<td>-.107</td>
<td>.164</td>
<td>-.250</td>
<td>-.303</td>
<td>-.331</td>
<td>-.119</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.017</td>
<td>.572</td>
<td>.366</td>
<td>.182</td>
<td>.104</td>
<td>.074</td>
<td>.530</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
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* Correlation is significant at the 0.05 level (2-tailed).  ** Correlation is significant at the 0.01 level (2-tailed).
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** Correlation is significant at the 0.01 level (2-tailed).  * Correlation is significant at the 0.05 level (2-tailed).
Table 9. Correlations between variables involved in hypothesis testing H5

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** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Clinically Significant Analysis

As the research is measuring a potentially traumatised sample, analysis was undertaken to investigate differences between those participants who demonstrated clinically significant symptoms and those who did not.

Two measures used in this study have numerical cut-off scores that indicate symptoms worthy of further investigation and intervention. The HADS defines a total in excess of 11 on each separate subscale (anxiety and depression) to indicate "probable clinical disorder" (Zigmond & Snaith, 1983). However, recent research with cardiac patients has found the HADS to have different psychometric properties (Martin & Thompson, 2000; Martin, Lewin & Thompson, 2003) and a total in excess of eight for each subscale is now considered optimal for assessing distress in this population (Bjelland Dahl, Haug & Neckelmann, 2002). Therefore, this convention was observed in this sample.

The IES uses a total in excess of 44 from the sum of both scales (intrusions and avoidance) to indicate "severe" trauma symptomology but a score in excess of 26 is taken to indicate presence of possible disorder or "moderate" trauma (Horowitz, Wilner & Alvarez, 1979). Thus, an Independent Samples t-Test was used to examine differences between clinically significant groups and their counterparts, and their mean scores on each variable. Again, a Levene's test for equality of variances was undertaken in order to test the equality of variance across each sample. Where equal variances were not assumed, the adjusted score is reported.
**HADS Anxiety**

Fifteen participants met the criteria for probable clinical disorder (scores in excess of eight) with a mean score of 11.13. The mean score for the non-clinical group (n = 15) was 3.3.

Significant differences were found between the two groups on PTG scores as measured by the PTGI, with those evidencing clinically significant anxiety scores reporting more PTG ($M = 58.40$) than the non-clinical group ($M = 38.13$) ($t(28) = 2.622, p = 0.014$). Those evidencing higher anxiety also expressed more positive emotion (EEQpos) ($M = 35.80$) than those low in anxiety ($M = 29.73$) ($t(28) = 2.136, p = 0.042$).

However, in conceptual opposition to the results reported above, those in the clinically significant group also evidenced more negative changes in outlook (CiOQneg) ($M = 34.87$) than those in the low anxiety group ($M = 27.33$), although this only just met statistical significance ($t(28) = 2.050, p = 0.050$).

Significant differences were found between the two groups on PTSD symptomology scores as measured by the IES. The clinical group reported significantly more avoidance phenomena ($M = 15.27$) than the non-clinical group ($M = 9.47$) ($t(28) = 2.065, p = 0.048$). Furthermore, the clinical group recorded a significantly higher IES total ($M = 31.07$) than the non-clinical group ($M = 18.73$) ($t(28) = 2.545, p = 0.018$ (adjusted score - equal variances not assumed)).
IES intrusions just failed to reach significance with the mean scores of the clinical group and the non-clinical group being 15.80 and 9.27 respectively ($t(28) = 2.023, p = 0.053$).

**HADS Depression**

Three participants met the criteria for probable clinical disorder with a mean score of 9.66. The mean score for the non-clinical group ($n = 27$) was 3.

No significant difference was found between the two groups on reporting of PTG ($t(28) = -0.149, p = 0.882$) with those in the clinical group evidencing similar mean scores ($M = 43.33$) to those in the non-clinical group ($M = 48.48$).

A significant difference was found between the clinical group and the non-clinical group on expressions of intimacy (EEQint) with the non-clinical group reporting significantly more expression of intimacy ($M = 27.30$) than those meeting criteria for probable depressive disorder ($M = 20.33$) ($t(28) = -2.243, p = 0.033$). Conceptually linked to this was the finding that those in the non-clinical group were significantly higher in emotional intelligence (TEIQue) ($M = 141.30$) than those in the clinical group ($M = 115.00$) ($t(28) = -2.278, p = 0.031$).

Two of the PTSD symptomology scores just failed to meet clinical significance. The IES intrusions mean scores were 22.00 for those in the clinical group compared to 11.48 for those in the non-clinical group ($t(28) =$
1.944, p = 0.062) and the IES total score means were 39.00 and 23.33 respectively (t(28) = 1.852, p = 0.075).

IES Severe

Three participants met the criteria for "severe" trauma symptomology indicative of early PTSD (total score in excess of 44). The mean score for the clinical group was 49.33 whereas the mean score for the non-clinical group (n = 27) was 22.18.

No significant differences were found between the two groups in scores on all variables. However HADS depression approached significance (t(28) = 1.875, p = 0.071) with the clinical group reporting slightly more depressive symptoms (M = 6.67) than the non-clinical group (M = 3.59).

Positive changes in outlook (CiOQpos) yielded no significant differences between the clinical (M = 40.97) and the non-clinical group (M = 46.70) (t(28) = -1.009, p = .322). Posttraumatic growth (PTGI) also yielded no significant differences between groups (t(28) = -1.238, p = .226) although means for the clinical group were lower (M = 32.67) than for the non-clinical group (M = 50.00) as would be expected.

IES Moderate

When the cut off of 26 is used, 16 participants meet the criteria for possible clinical disorder (M = 36.06) and 14 did not (M = 12.14). Here, all HADS scores demonstrated significant differences between groups. The clinical
group reported significantly higher scores on HADS depression ($M = 5.44$) compared to the non-clinical group ($M = 2.14$) ($t (28) = 3.920, p = 0.001$); HADS anxiety (clinical $M = 9.88$; non-clinical $M = 4.21$) ($t (28) = 3.937, p = 0.001$) and HADS total (clinical $M = 15.31$; non-clinical $M = 6.36$) ($t (28) = 4.329, p = 0.001$).

Again, positive changes in outlook (CiOQpos) generated no significant differences between groups (clinical $M = 43.38$, non-clinical $M = 49.21$) ($t (28) = -1.672, p = .106$). Similarly, the PTGI showed no differences ($t (28) = .715, p = .481$) although interestingly the means for the clinical group were higher ($M = 51.13$) than for the non-clinical group ($M = 45.00$).
Further Exploratory Analysis

Research onto PTG is in its infancy, and so further exploratory analyses using bivariate correlations were undertaken to investigate further potential relationships worthy of underpinning future research.

Relationships between Positive Variables

Emotional Expression (EEQ)

A significant relationship was found between EEQ positive emotion and PTGI total \((r (28) = .433, p = 0.017)\). There were no significant correlations between EEQ negative and EEQ intimacy and PTG.

A significant relationship was also found between EEQ intimacy and positive changes in outlook (CiOQpos) \((r (28) = .456, p = 0.011)\).

Most of the EAC subscales and the EEQ subscales were significantly correlated with each other at the 0.05 level (see table 10).

Emotional Intelligence (TEIQue)

In addition to its relationship to EAC subscales, the TEIQue total score was significantly related to EEQ positive emotion \((r (28) = .497, p = 0.005)\). It also had a significant positive correlation with the EEQ total \((r (28) = .501, p = 0.005)\). The correlation between TEIQue total and EEQ intimacy just failed to meet statistical significance at the 0.05 level \((r (28) = .346, p = 0.061)\).

Positive Changes in Outlook (CiOQpos)

A significant positive relationship was found between CiOQpos and PTGI total \((r (28) = .434, p = 0.017)\).
Table 10. Correlations between positive variables

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* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).
**Relationships between Negative Variables**

**Anxiety and Depression (HADS)**

Although PTG seems to be related to anxiety, no relationship was found between PTGI total and either HADS depression or HADS total.

The HADS variables were all significantly correlated with each other at the 0.01 level (see tables 11 and 12).

**PTSD symptomology (IES)**

The IES avoidance subscale was significantly correlated with HADS anxiety ($r_{(28)} = .375$, $p = 0.041$), HADS depression ($r_{s(28)} = .486$, $p = 0.006$) and HADS total ($r_{(28)} = .407$, $p = 0.026$). The IES intrusion subscale was highly significantly correlated with HADS anxiety ($r_{(28)} = .559$, $p = 0.001$), HADS depression ($r_{s(28)} = .603$, $p = 0.001$) and HADS total ($r_{(28)} = .606$, $p = 0.001$). The IES total was also highly significantly correlated with HADS anxiety ($r_{(28)} = .569$, $p = 0.001$), HADS depression ($r_{s(28)} = .639$, $p = 0.001$) and HADS total ($r_{(28)} = .618$, $p = 0.001$).

**Negative Changes in Outlook (CiOQneg)**

CiOQneg was significantly positively correlated with HADS anxiety ($r_{s(28)} = .538$, $p = 0.002$), HADS depression ($r_{s(28)} = .527$, $p = 0.003$) and HADS total ($r_{s(28)} = .549$, $p = 0.002$).

A significant positive relationship was also found between CiOQneg and IES avoidance ($r_{s(28)} = .432$, $p = 0.017$), IES intrusions ($r_{s(28)} = .358$, $p = 0.052$) and IES total ($r_{s(28)} = .420$, $p = 0.021$).
### Table 11. Parametric correlations between negative variables

<table>
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<th>HADSanx</th>
<th>HADStot</th>
<th>IESintrus</th>
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* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).
Table 12. Non-parametric correlations between negative variables

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**Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).**
Discussion

This study replicated some previous findings concerning correlates of PTG, but failed to replicate others. The main hypothesis investigated by the research question was not supported. However, some secondary hypotheses were supported, and the study provided some additional information about correlates involved in the experience of medical trauma.

As with other previous studies, demographic variables (age and gender) did not seem to be related to PTG. Age has been found to be unrelated to PTG in patients with cancer (Sears et al., 2003; Cordova et al., 2001) and patients with multiple sclerosis (Mohr et al., 1999). Yet, other studies have found a significant negative relationship (Bellizzi & Blank, 2006; Lechner, Zakowski, Antoni, Greenhawt, Block & Block, 2003; Milam, 2004; Widows et al., 2005). Gender was found to be unrelated to PTG in patients with cancer (Lechner et al., 2003; Widows et al., 2005) and MI patients (Sheikh, 2004). This supports much of the previous research, which has concluded that psychological and interpersonal factors play a much greater role in trauma outcomes than do sociodemographic variables.

Exploration of the psychological and interpersonal variables revealed some interesting associations. Contrary to the expectation proposed by the research question, emotional approach coping through expression and processing of emotions (EAC) was not related to PTG. Emotional intelligence (TEIQue), expression of intimacy (EEQ intimacy) and negative emotions (EEQ negative) were also unrelated to PTG. However, expression of positive emotions (EEQ
positive) was related to increased PTG. Whilst causal inference is not possible, in the absence of a link between other emotional measures and PTG, it could be posited that those with more positive expressions of emotion are able to find benefit from traumatic experiences. Conversely, it may be that those who have experienced more PTG have become more adept at expressing positive emotion. Positive affect has previously shown a consistent positive relationship with growth (Linley & Joseph, 2004). PTG was also related to positive changes in outlook (CIOQ positive) and this makes conceptual sense as they appear to measure the same construct (Joseph et al., 2005). In this study, positive changes in outlook were correlated with expression of intimacy (EEQ intimacy). As posited above, it may be that those who are more expressive of intimacy are more able to find positive experiences in adversity, or that those who experience positive changes go onto develop more intimate forms of expression. As the items assessing intimacy in the EEQ (King & Emmons, 1990) often refer to relationships, it may be that this variable has some role in positive changes in relationships, an area of growth described by Tedeschi and Calhoun (1996). Furthermore, it may also be useful to explore its relationship with the domain of social support.

The EAC findings are interesting for a number of reasons. Coping strategies that involve approaching the trauma have been found to be associated with PTG in several medical populations (Bellizzi & Blank, 2006; Urcuyo et al., 2005; Widows et al., 2005; Sheikh, 2004; Mohr et al., 1999). Furthermore, emotional approach coping strategies have been found to be associated with
decreased distress in response to illness (Smith et al., 2004; Stanton et al., 2000). Neither finding was replicated here. However, the previous findings concerning approach coping have primarily found correlations between task related approach strategies (e.g. problem solving and cognitive reframing). Seeking emotional support (Bellizzi & Blank, 2006) was the only emotion related strategy to have a positive correlation with PTG. Yet, this too could be seen as a problem solving strategy. Initially, this bias was thought to be due to poorly constructed and contaminated measures (Stanton et al., 1994). However, a more tentative but controversial hypothesis tenured by these findings is that emotional awareness (emotional processing, expression and intelligence) may have no benefit in facilitating PTG in the post-MI phase.

It is important to note that this study was unable to assess the impact of EAC in the longer term. As previous findings have related EAC to decreased distress (anxiety and depression) over long-term follow-up, further research is needed to explore this finding. Depression following diagnosis has been associated with lower levels of PTG over time in HIV patients (Milam, 2004). Although none of the measures of distress (HADS and IES) appeared to approach significance, time constraints and procedural changes precluded the robust testing of this hypothesis.

Regarding anxiety, the hypothesis that higher anxiety at diagnosis is positively correlated with PTG was supported, corroborating previous literature (Mohr et al., 1999). Mohr et al. (1999) suggest that this anxiety is linked to uncertainty about prognosis, and thus may link this finding with previous findings of
perceived threat (Cordova et al., 2001; Lechner et al., 2003; Sears et al., 2003; Widows et al., 2005) and disease severity (Bellizzi & Blank, 2006; Lechner et al., 2003; Urcuyo et al., 2005). Anxiety is described as reaction to a threatening situation and thus heightened anxiety levels may reflect the heightened threat individuals feel after an MI. Greater perceived threat has been linked to greater levels of PTG (see Linley & Joseph, 2004); indeed Calhoun and Tedeschi (1998) postulate that the greater the trauma (and thus the distress and threat), the greater the growth.

Moreover, consistent with these findings, Bennett and Carroll (1997) found that anxiety is at its highest immediately after an MI and gradually reduces in the months post infarction. In contrast, depression is lower post infarction, with the incidence rising in the month following discharge from hospital before falling again. Although this sample showed this early pattern, a cross sectional design precluded the testing of the later effects in this study.

As expected, PTSD symptoms (IES intrusions and avoidance) were unrelated to PTG. Few previous studies have included a measure of PTSD symptomatology in investigating PTG with the exception of Cordova et al. (2001) and Sears et al. (2003) who both used the IES (Horowitz, Wilner & Alvarez, 1979). Both found that IES scores were unrelated to PTG. This would appear to suggest that PTG and PTSD do not co-exist. Whilst making conceptual sense, the absence of inverse correlations in these studies undermines such a firm conclusion. However, this finding does seem to support Tedeschi and Calhoun’s (1996) theory of PTG, which states that the
processing of the trauma is central to the attainment of growth. As processing involves approaching and engaging with the source of the trauma, avoidance and intrusive symptomology would interfere with this process and thus impede PTG.

What is observed in this study is that IES scores are significantly correlated with scores of distress (anxiety and depression). Again, the literature has consistently failed to measure these entities when investigating predictors of PTG. However this research supports findings in the PTSD literature, which has found low mood to be associated with PTSD symptomology (Bennett et al., 2001; Cordova et al., 1995). Furthermore, differences in those who met clinical caseness for PTSD (measured by the IES) support these findings, with participants in the clinical group evidencing significantly more depression and anxiety than the non-clinical group.

IES scores were also associated with negative changes in outlook (CiOQneg). Again, as with PTG and positive changes in outlook (CiOQpos), this may indicate that those who experience low mood and/or PTSD symptomology are likely to perceive negative changes in their lives following an Ml. Conversely, it may be that individuals who perceive negative changes are vulnerable to low mood and PTSD symptoms.

In general, it can be tentatively inferred that many of the negative variables inter-correlate, as do many of the positive variables. Therefore, the findings of this study seem to replicate the dichotomy between interpersonal variables
seen in the corresponding literature on PTG and PTSD, where variables
describing negative factors are associated with higher PTSD symptomology
and variables relating to positive factors are related to greater PTG.

**Implications for Cardiac Services and Health Psychology**

PTG would appear to represent a viable construct for future intervention
focus. As the findings of this and previous studies show, PTG is related far
more consistently to interpersonal resources than to sociodemographic and
disease variables. Therefore, psychologists and cardiac rehabilitation
programmes are in a unique position to enhance these resources and thus
enable the individual to realise their own efforts in recovery and growth after
MI.

Moreover, this study emphasises the need for cardiac services to recognise,
assess and monitor the early indicative signs of PTSD. Of 30 patients, three
met criteria for severe symptomology and over half (n= 16) met criteria for
probable disorder, as measured by the IES (Horowitz, Wilner & Alvarez,
1979). The IES is an instrument that is easily administered and similar in
length and design to the HADS (Zigmond & Snaith, 1983), and could therefore
be incorporated into the screening process for cardiac patients relatively
easily.

Following on from the initial screening process, cardiac rehabilitation
programmes regularly follow-up patients and monitor progress. Rehabilitation
is an active process in itself, comprising educational and support groups for
MI patients, as well as promoting lifestyle changes and physical recovery. Although this study found no significant benefits in the use of emotions in processing the trauma of illness, any intervention must stress the need to acknowledge and process the traumatic experience, consistent with PTG theory (Tedeschi & Calhoun, 1996). Cardiac rehabilitation programmes must therefore equally focus on expressing emotions associated with the trauma and problem solving tasks (such as exercise) which will help the individual gain control and personal responsibility for their recovery.

Tedeschi and Calhoun (1996) stress that PTG is not an effortful process and most individuals do not realise they are doing it. However, researchers suggest that merely asking patients to identify possible benefits in their experience may initiate a change in thinking that opens up possibilities for growth (Bellizzi & Blank, 2006; Milam, 2004; Sears et al., 2003). Indeed, some participants in this study commented to the researcher that it had challenged their thinking about their MI. Again, the PTGI (Tedeschi & Calhoun, 1996) is easily administered and can be incorporated into the assessment and outcome measures in rehabilitation programmes. However, researchers also caution against the "prison of positive thinking" (Cordova et al., 2001) where patients are inappropriately encouraged to keep a positive attitude in the face of adversity. Clinicians must be respectful of distress and avoid giving the message that positive changes are expected, rather than merely possible.

Similarly, psychological interventions should be sensitive to the potential for growth in medically traumatised populations in both treatment design and
assessment of outcomes. Therapeutic approaches that promote growth have been developed in cancer services (Tomich, Helgeson & Vache, 2005; Tomich & Helgeson, 2004), but appear lacking in cardiac services. Moreover, these interventions are supportive rather than treatment based. Tedeschi and Calhoun (2004) suggest a clinical approach to promoting growth, comprising effective listening, identifying PTG and focusing on the struggle rather than the trauma. Again, this would appear to promote agency as a mechanism for growth and places the emphasis for change on the individual as a survivor rather than a victim.

As patients are rarely referred for psychological intervention until a crisis occurs (Weisman, 1979), the emphasis for identifying and monitoring distress and promoting growth appears to be on the cardiac services. Health professionals must be aware of the multiple processes patients may experience in recovering from an MI. As this research has shown, PTG does not preclude significant anxiety symptoms, nor, as wider research has shown, does the absence of distress indicate wellness (Ryff, 1989). However, in understanding further the process of PTG, health professionals can appreciate the full range of illness experiences rather than concentrating on minimising the negative psychological sequelea that are often the sole focus of cardiac rehabilitation and psychological interventions.

Limitations of the Study

The findings of this study are subject to many methodological limitations which need to be acknowledged. As with much of the previous research, this
study used a self-selecting sample which offers opportunity for sample bias. Although no differences were found between those who consented and returned their questionnaires and those that consented but failed to return their packs, no data was collected on non-consenters for comparative purposes. It may be that those who were experiencing a more positive adjustment, or at least those who were not psychologically unwell, comprised that majority of participants. This may have skewed the data in a positive direction, indicating that PTG occurs more often than it actually does. However, this study does not make any assertions about prevalence in MI patients; rather the aim was to look at variables involved in the process.

Furthermore, the sample size was small (n= 30) and thus lacked sufficient statistical power for robust conclusions to be made. However, the data collected was comparable to a larger scale study of PTG in MI patients (Sheikh, 2004) in terms of mean scores for participants (e.g. PTGI This study $M = 48.27, SD = 23.21, n= 30$; Sheikh (2004) $M = 55.85, SD = 24.19, n= 110$). It is important to further stress that the findings of this study can only be applied to MI patients and not to other medical groups due to the existential and experiential differences in illness process discussed in the introduction.

Due to time constraints, a cross sectional design was employed, which precluded adequate conclusions regarding temporal and causal relationships amongst variables. For example, the directional nature of the relationship between PTG and expression of positive emotion cannot be determined. Moreover, it would make sense conceptually to measure growth over time,
and this was the original intention. However, there is no empirical support in the literature for the notion that PTG occurs later in the recovery process or develops over time. Indeed, studies have shown that benefits that are identified within one week of the event are consistent and stable even after a number of years (Thompson, 1985; McMillen, Smith & Fisher, 1997). This has been found in MI patients who reported stability in measures of PTG at seven weeks and eight years post event (Affleck et al., 1987).

This study relied heavily on the use of self-report measures and did not collect illness data or detailed demographic information. Self-report measures are often subjected to methodological scrutiny as they can provide opportunities for bias. However, the emphasis on individual illness experience and interpersonal processes necessitated the use of this methodology, and previous research promotes the use of subjective measures in this area of interest (Widows et al., 2005).

**Directions for Future Research**

Despite limitations, these findings should serve as building blocks for future research development. In particular, further research is needed into the EAC model and its utility in medical populations such as the sample presented here. Whilst looking at EAC as a predictor variable in PTG may have been a conceptual leap too far at the present time, its use in minimising distress in the long term for medical populations warrants further testing. Similarly, if EI and EEQ are so highly correlated with EAC, their predictive utility with regard to minimising distress also needs to be assessed.
Further research is also needed into the specific coping variables that are involved in PTG, using a variety of measures including the EAC scales (Stanton et al., 2000). The notion that problem-focused coping predicts better outcomes than emotion-focused coping still exists and needs to be further challenged. Indeed, use of the concepts of approach and avoidant coping are far more useful and warrant further scrutiny, as EAC may sit more comfortably with other measures of approach coping.

Lastly, and perhaps most obviously, a longitudinal design with a large sample size (in excess of 100) should be employed in order to investigate these variables with regard to their inter-correlations and their predictive utility. This would allow for causal inferences to be examined. Furthermore, future studies in medical and health psychology would benefit from investigating PTG in a variety of illness populations to assess whether certain predictors are disease dependent and whether some are common across illness range. This would allow for the advancement of psychological treatment for trauma after medical event or intervention and promote the understanding of medical trauma in a wide range of hospital settings.
Critical appraisal

Conducting the research

Origins of the Study

Positive psychology was selected as an area of study because it formed a particular area of interest for the researcher. In dealing with distress on a regular basis, and having spent time on placement in medical psychology settings, the researcher became interested in those patients that did not seem to require further intervention after a life-changing diagnosis. Using a solution-focused, rather than problem-focused approach, the researcher began to ask “What happens to those who do not present at clinic? What is different about those who seem to adjust to their predicament? What can we learn from them?”

During the research fair for prospective D.Clin.Psy theses, the researcher met with a member of the department who had a keen interest in positive psychology and posttraumatic growth (PTG). The researcher was familiar with this staff member's research and it had provided inspiration for the researcher's current thinking. Both were interested in looking at PTG in a medical population, from the perspective of looking at factors and predictors involved in positive adjustment to medical trauma. Thus a field supervisor was engaged.
As the researcher also had an interest in neuropsychology, initial enquiries were made into using a sample of brain injured or spinal injured patients. However, after an extensive review of the literature, this area was found to generate many obstacles and confounding variables (such as cognitive difficulties and ongoing litigation) that would be difficult to address satisfactorily within the time and scope of a doctoral thesis. However, the review of the medical and psychological literature had revealed a circumscribed area worthy of future investigation, that of responses of individuals who had suffered a myocardial infarction (MI).

As a member of the course staff had a background in health psychology and a clinical interest in cardiac populations, this was chosen as the area of study. The staff member also had links with the cardiac department from where participants could be recruited. Supervision could thus be provided by a member of the department who had expertise in the area of health psychology, and so an academic supervisor was engaged.

Devising the Study
A review of the literature revealed consistent and ecologically valid links between coping strategies and the presence or absence of PTG, in particular the differences in outcome afforded by either approach coping or avoidant coping. Furthermore, a review of the literature pertaining to coping, completed in a previous piece of assessed work, had introduced the researcher to recent developments in conceptualising coping – that of emotional approach coping (EAC). As EAC appeared beneficial in facilitating decreased distress following
medical events and approach coping strategies had proved a consistent predictor of PTG in similar populations, this study aimed to further both findings by making the conceptual link between EAC and the opportunity for PTG. Therefore, the research question “Does emotional approach coping facilitate posttraumatic growth following medical trauma?” was proposed.

As much of the previous literature had adopted quantitative approaches, with numerous well-validated measures available to test hypotheses and assess growth, the current study adopted a similar method. Inclusion of measures was decided at a meeting between the two supervisors and the researcher. In addition to including the EAC measure, another, less well established emotional expressiveness (EEQ) measure was chosen, in order to provide triangulation for the EAC findings. Similarly, a measure of PTG (PTGI) was included alongside a measure which assesses a similar construct, that of changes in outlook (CiOQ) following trauma. Measures of distress (HADS) and PTSD (IES) were included to capture those who were experiencing less positive adjustment to their diagnosis and thus provide some comparison with those who were adjusting well. Lastly, due to its conceptual and empirical links with EAC and EEQ, a measure of emotional intelligence (TEIQue) was included to explore any relationships between this concept and PTG.

The researcher endeavoured to make the project as simple as possible by adopting a survey approach. Cardiac staff were to identify potential participants and dispense research packs, collecting them back at a later date. This method ensured minimal time commitment and interference to
duties for nursing staff, who already routinely gave out cardiac services information packs as part of their daily duties. It also meant the patients, who might have other immediate concerns, could have ample time to peruse the information at home whilst recovering, before deciding whether or not to take part.

The researcher met with the cardiac rehabilitation staff on five occasions to explain the purpose of the research and organise the practicalities of recruitment and data collection. The staff had been involved in many projects with the Clinical Psychology department and were keen to become involved. Many changes to the study, such as revisions to the inclusion criteria, were made in this stage as the medical knowledge from the staff proved invaluable. This highlighted an important learning point for the researcher – the need for an expert in the field. Some of the aspirations of the project were unfeasible, but had been included due to the lack of medical knowledge held by the researcher. An example of this was the initial decision to exclude anyone with a co-morbid injury or illness. The cardiac staff explained that by excluding those with angina or diabetes, the researcher would reduce those eligible to take part in the study by up to two thirds. The expertise of the staff provided the researcher with more feasible criteria and a realistic understanding of what could be achieved.

**Trust Approval and Ethical Submission**

Whilst the planning of the project was swift and well supported, a significant and unanticipated barrier to the undertaking of the project was encountered.
Although the researcher prepared thoroughly for ethical submission in a timely fashion, the process was delayed in gaining Trust approval from the Research and Development office (R+D). R+D act as gatekeepers for the research ethics committee and submit for ethical approval when they are satisfied it meets their clinical governance standards. Submission to R+D took place in April 2005, but after several amendments was finally forwarded to the ethics committee late in September 2005. Full approval was granted in early October 2005 but the R+D did not issue full trust approval until November 2005, further delaying the project. Due to the delays, it was decided to add second and third sites in order to maximise participant recruitment. After delays involving extensive negotiation and several amendments, this took place in January and May 2006.

This experience was extremely demoralising and frustrating for the researcher. The longitudinal time points of the study had to be abandoned and many major and anxiety provoking changes were made to data collection and methodology. The researcher had to consider how to maximise time and productivity as it became clear that much of the data analysis and write up was going to be time constrained. Thus, the researcher spent much of the November to May period completing a more comprehensive literature review, revising statistical procedures and visiting the cardiac staff weekly to ensure their continued efforts in data collection.
Recruitment and Data Collection

Recruitment was slow, as many of the cardiac staff were also frustrated by the delays imposed upon the project and the extra demands put on their time by R+D procedures. Despite approving the method for data collection, the R+D department later revised their opinion on the process of gaining consent, insisting that informed consent was obtained by going through the pack with each patient. This modification added approximately 15 minutes to the procedure and many staff felt this interfered with their nursing duties.

Moreover, during the recruitment phase, there were numerous staff changes and shortages, as well as a ward closure following an infection outbreak. Since the names of staff trained to consent had been approved five months before data collection began, many new staff were unable to take part in the project and others who were approved had left. This contributed further to the low productivity in data collection. In an attempt at resolution, the researcher offered to take over recruitment duties but this was not permitted by the R+D department. The frustration was keenly felt by all staff, the researcher and the supervisors. Here the researcher had to maintain a good rapport with the nursing staff and spent time in the department to ensure that the research was kept as a priority. This was extremely important in developing a close working relationship which endured, despite external problems. In developing a collaborative relationship with key members of staff, momentum was maintained.
Changes to Methodology and Data Collection

Due to delays and recruitment difficulties, major changes were made to the methodology of the project and means of data collection. The initial proposal to collect data at three time points; six weeks, three months and six months, was changed. The third time point was dropped in August 2005, before ethical submission, as it was no longer feasible within the timeframe. The second time point became redundant in February 2006 when it became clear that recruitment was slow and numbers were small, thus negating follow-up within the time constraints of a D.Clin.Psy time frame. Moreover, participants were forgetting to return their questionnaires at their outpatient appointments or staff were neglecting to collect them at these appointments. Thus, research packs were changed to include a stamped addressed envelope for returning the questionnaire by post. Cardiac staff also explained to patients that they could complete the questionnaires on the ward if they preferred to do so. This increased the response rate dramatically in the final months of data collection. However, numbers remained small and concerns were raised about the quality of the data and the contribution the research would make to the existing literature. Despite this, the data proved surprisingly rich. Whilst the research question was not supported by the data, some interesting links between both the measures and the variables they assessed were found. This provided an important learning experience for the researcher – research does not have to be definitive to add something to the field. This study has provided some conceptually noteworthy findings on which future research can based and thus serves as an important pilot study for the field of approach coping and PTG.
Reflections on the Process

Motivation and Momentum

Despite many attempts at resolving the problems, including amendments to ethics, changes to methodology and practical support for cardiac staff, the researcher felt impotent in conducting her own research. The frustration of relying on others left the researcher feeling marginalised in the process. It was an uncomfortable, deskilling and demoralising experience to endure. Anxieties were raised as the researcher knew that a compromised research project might jeopardise her qualification. Meetings with course staff regarding extensions, amendments and even the possibility of beginning a new project, despite being organised by the researcher to forge solutions, only served to heighten this anxiety.

Use of Supervision

Supervision during this time proved invaluable. Regular contact through email and supervision meetings served to contain anxieties and provided a safe environment to air frustrations and work through issues. Practical suggestions for increasing productivity and motivation were explored. Moreover, the academic supervisors and course director provided practical support by way of liaising with the R+D department, thus allowing the researcher to “step back” from the issues raised and concentrate on the research. This provided relief and a change of focus for the researcher who had become estranged from the department. Attempts to maintain professionalism, whilst balancing the demands of the R+D department with the needs of the research, was a
constant and exhausting process. In disengaging from this process, the researcher was able to see the end goal more clearly and maintain motivation.

The Research Process

It is with much irony that the researcher reflects on the traumatic and stressful experience of conducting this project designed to investigate PTG. In considering the responses of the participants to the questionnaire, the researcher was often confronted with her own patterns of distress and subsequent growth:

April 2005 – October 2005  Submission to R+D and ethics

"I feel tense and wound up" (HADS anxiety)

"I get a sort of frightened feeling like butterflies in the stomach" (HADS anxiety)

"Worrying thoughts go through my mind" (HADS anxiety)

"I get sudden feelings of panic" (HADS anxiety)

"I normally find it difficult to keep myself motivated" (TEIQue emotional intelligence)

"I feel as if something bad is just waiting around the corner to happen" (CiOQneg negative changes in outlook)

"I tried not to think about it" (IES avoidance)

November 2005 – May 2006  Recruitment and data collection phase

"I no longer feel able to cope with things" (CiOQneg)

"I feel very much as if I'm in limbo" (CiOQneg)

"I had trouble falling asleep or staying asleep because of picture or thoughts about it that came into my mind" (IES intrusion)

"Being able to accept the way things work out" (PTGI posttraumatic growth)

"I'm more likely to change things that need changing" (PTGI posttraumatic growth)
May 2006 - July 2006  Write up phase and reflection

"I am more determined to succeed in life now" (PTGI posttraumatic growth)

"I can deal effectively with people" (TEIQue emotional intelligence)

"On the whole, I am able to deal with stress" (TEIQue emotional intelligence)

"A feeling of self-reliance" (PTGI posttraumatic growth)

"I discovered that I’m stronger than I thought I was" (PTGI posttraumatic growth)

"Knowing I can count on people in times of trouble" (PTGI posttraumatic growth)

"I accept needing others" (PTGI posttraumatic growth)

After submission?

"I feel cheerful" (HADS depression)

"I can sit at ease and feel relaxed" (HADS depression)

"I feel more experienced about life now" (CiOQpos positive changes in outlook)

In picking out key meaningful statements and noting them in the research diary whilst completing the study, the researcher reflected on her own journey through the process. In reflecting on issues via the appraisal process and relating them to their theoretical constructs, the researcher has been surprised to find a pattern of growth similar to that described in the PTG literature – initial anxiety followed by a process of low mood and motivation culminating in growth and a sense of mastery.

Similarly, the demands of the thesis ensure approach coping strategies are utilised – there is no way of avoiding the stressor of doctoral research if one is to succeed in completing clinical psychology training. This felt similar to the nature of a medical trauma, which involves an internally located stressor that has to be acknowledged and endured due to its continuous presence. That is
not to reduce the trauma of a life threatening event to the proportions of a
doctorate. However, in completing this ultimately rewarding, but at times
arduous journey, the researcher has been able, partially, to identify with the
coping experiences of the participants.

Key Learning Points

The researcher has identified many key learning points from the experience of
conducting this study. The first learning point was established early, that of
the importance of an expert in the field. The medical and practical advice
afforded by the experience of the nursing staff made the scope of the project
far more realistic and attainable, and highlighted the potential for
discrepancies in conducting psychological research with medical patients.

The difficulties faced during the implementation of the study meant that the
researcher had to immerse herself in the process, constantly generating
solutions and making changes to reflect the extreme time constraints faced
with this project. Whilst frustrating, it allowed the researcher to maintain
momentum as she was constantly engaged with the study. Motivation during
the research phase of the course can be difficult to uphold, especially when
progress feels evasive for such long periods of time. However, this constant
engagement with issues allowed the researcher to reflect both on the process
and their role within it. It also provided a practical learning experience
regarding time keeping, prioritising and problem solving.
As discussed previously, supervision and support from course staff proved essential to aiding this process. The researcher learnt the value of this support both on a personal level (e.g. containment of anxiety) and a practical level (e.g. liaising with third parties). Far from feeling isolated in the process, the researcher felt supported by a team of people who themselves were immersed in the study. This dissolution of responsibility and sharing of duties allowed the researcher to focus on the objectives and outcomes of the research. The supportive and containing environment also encouraged a professional approach to the research as anxieties and frustrations were managed away from the context of the study, thus allowing a positive working relationship to be maintained with the hospitals involved.

**Concluding Comments**

Conducting this research has provided a significant learning experience. Whilst it was a long and often difficult process, the end result was a satisfactory piece of work that provides some insights into the experience of coping in the aftermath of an MI. It also provides a new perspective on an often overlooked aspect of illness experience, that of finding positives in the face of an otherwise negative event. Similarly, in experiencing the many difficulties in conducting this research, the researcher feels the outcomes are more valuable, as where it was felt there might be failure, the project succeeded. The researcher has learned about coping in the face of adversity both theoretically and experientially. According to the research into PTG, this process of learning and adaptation can only prove to enrich one's
understanding of the world, self and future career in the field of clinical psychology.
References


Appendices

1. Instructions for Authors – Psychology, Health and Medicine

2. PTSD diagnostic criteria - DSM-IV, American Psychiatric Association, 1994

3. ASD diagnostic criteria - DSM-IV, American Psychiatric Association, 1994

4. Questionnaire One

5. Questionnaire Two (not used in study)

6. Invitational Letter

7. Patient Information Sheet

8. Patient Consent Form

9. Leicestershire, Northamptonshire & Rutland Research Ethics Committee 2 Approval Letter – Dated 14th October 2005

10. Leicestershire, Northamptonshire & Rutland Research Ethics Committee 2 Approval Letter – Amendment dated 31st January 2006

11. Leicestershire, Northamptonshire & Rutland Research Ethics Committee 2 Approval Letter – Addition of second site dated 2nd June 2006

12. University Hospitals of Leicester NHS Trust Directorate of Research and Development – Approval Letter dated 30th November 2005
