Psychosocial Predictors of Post-traumatic Growth in Patients after Myocardial Infarction

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The present research was conducted to investigate the psychosocial predictors of post-traumatic growth in patients after myocardial infarction. A sample of 90 patients with myocardial infarction (Men = 53; Women = 37) were recruited with an age range of 45-65 years using cross-sectional research design and purposive sampling technique. Urdu translations of Big Five Inventory (Raiha, 2012; originally developed by John & Srivastava, 1999), Multidimensional Scale of Perceived Social Support (Qureshi, 2011; originally developed by Zimet, Dahlem, Zimet & Farley, 1988), Brief COPE (Akhtar, 2005; originally developed by Carver, 1997) and Post-traumatic Growth Inventory (Arif, 2011; originally developed by Tedeschi & Calhoun,1996) were used to assess personality traits, perceived social support, coping strategies and post-traumatic growth, respectively. Post-traumatic growth was found to be positively related with personality traits of extraversion, agreeableness, conscientiousness, and openness to experience and negatively related with neuroticism. Post-traumatic growth and perceived social support were positively correlated with each other. Post-traumatic growth was also found to be positively related with the use of problem focused and active emotional coping and negatively related with the use of avoidant emotional coping. Moreover, personality trait of openness to experiences and high perceived social support predicted high post-traumatic growth; while, use of avoidant emotional coping predicted low post-traumatic growth. These findings provide an important insight into the phenomenon of post-traumatic growth which can be utilized for the benefit of people in enhancing and promoting positive psychological growth after experiencing heart attack.

Keywords. Personality traits, perceived social support, coping strategies, post-traumatic growth, myocardial infarction

For millions of people in this world, traumatic experiences in the form of physiological illnesses are the realities of life (Goldberg,

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2012). In Pakistan, coronary heart disease accounts for 200,000 deaths per year and it is expected that by the year 2030, the rise in annual death, will reach up to 23.3 million (Qasim, 2012). Suffering from coronary heart disease like myocardial infarction (heart attack) can be traumatic and stressful (Kulick, 2014), as people normally have to take medications for the rest of their lives and having one heart attack increases the likelihood of having others attacks or developing more serious heart problem (Kenny, 2012). Such illness can cause suffering, pain, and emotional distress due to uncertainty of recovering from it (Scott, 2013), but researches have also shown that it can also be positive and constructive for some individuals (Park & Helgeson, 2006; Tedeschi & Calhoun, 2004). The ongoing literature and developing researches on the phenomenon of post-traumatic growth suggest that the psychiatric disorders experienced after the trauma are far outnumbered by the experiences of positive growth after trauma (Tillier & Alberta, 2012).

The concept of positive psychological changes after experiencing a traumatic event is not new. It has been used in the Christian literature (Keidar, 2013), in the work of philosophers (Nietzsche, 1986), humanist psychologists (Tillier & Alberta, 2012), and writers (Frankel, 1985); but, this concept became the focus of research and investigation when the word post-traumatic growth was used for the first time by Tedeschi and Calhoun (1995). They defined it as positive psychological changes experienced as a result of the struggle with highly challenging life circumstances. They argued that loss or trauma does not cause direct benefit but it is the struggle with trauma which has the potential to produce growth. For them the term post-traumatic growth acknowledges the potential for growth without minimizing the distressing nature of the events that prompt change. According to them, post-traumatic growth can be manifested in the form of better relationships with others, embracing new life opportunities, increased personal strength, experience of spiritual change/philosophical shift and more gratitude towards life (Tedeschi & Calhoun, 2004).

Researches indicate that some of the factors which contribute towards post-traumatic growth are demographic characteristics, distress, personality traits, perceived social support, self disclosure, rumination/cognitive restructuring, and coping strategies (Bostock, Sheikh, & Barton, 2009; Lindstrom et al., 2013; Schaefer & Moos, 1998; Tedeschi & Calhoun, 2004).

Personality can be defined as relatively permanent patterns and unique characteristics of an individual that remain stable over time (Feist & Feist, 2009). Though there are different conceptualizations of personality but the modern consensus is on the five factor theory or

more commonly known as Big Five, which is a broad classification of personality traits and these five categories are usually described as extraversion, openness to experience, conscientiousness, agreeableness, and neuroticism (Cherry, 2013). Extraversion is characterized by energetic, loquacious, action oriented, and enthusiastic people who enjoy gatherings and like talking and interacting with people; openness to experience is admiration and general gratitude for a variety of experiences (imagination, creativity, arts, adventures); conscientiousness trait depicts determination, self control, hard work, responsibility, orderliness, planning, and organization. The trait of agreeableness portrays individual differences in cooperating with other people and personal disparities in social harmony (such people are trustworthy, cooperative, altruistic, and friendly); and neuroticism is intolerance, emotional reactiveness, and vulnerability to negative emotions such as depression, anxiety, stress, and anger (Eysenck, 1992; McCrae & Costa, 1987; Rothmann & Coetzer, 2003; Sincero, 2012).

Perceived social support can be defined as an exchange of social resources between individuals or groups which enhances the health of the recipient (Shumaker & Brownell, 1984). It is the awareness that social support or help from family friends and significant others is available if someone liked to reach the support of another person during times of need (Gurung, 2006). Researchers have suggested that perceived social support is more beneficial and more helpful in dealing with trauma as compared to received social support (Barrera, 1986; Uchino, 2009; Wethington & Kessler, 1986).

Coping is a process of managing demands which are beyond the resources of an individual (Folkman & Lazarus, 1980). Coping can be regarded as an individual's effort to master a problem and the coping response can be regarded as a mean of recreating balance (homeostasis) in the individual (Miller, 2000). Most researchers agreed upon two broad categories of coping strategies: Problem focused coping and emotion focused coping strategies (Folkman & Lazarus, 1991; Moos, 1990). Problem focused coping consists of a vast array of cognitive and behavioral maneuvers that attempt to make changes in the environment that will eliminate the external sources of stress (Zeidner & Endler, 1996); while, emotion focused coping strategies are the attempts that are meant to alleviate emotional distress (Brannon & Feist, 2010; Lazarus & Folkman, 1984) and comprises of active emotional coping and avoidant emotional coping (Holahan & Moos, 1987). Active emotional coping involves the direct discharge of emotions. Seeking support and comfort from loved ones, taking responsibility for one's own actions, seeing the stressor in a

positive way and changing the way one think are all examples of active emotional coping (Brannon & Feist, 2010; Folkman & Lazarus, 1991). Whereas avoidant emotional coping decreases the emotional stress by venting emotions indirectly through cognitive and behavioural avoidance (Holahan & Moos, 1987). Cognitive avoidance involves distracting oneself so that stress related thoughts cannot come into conscious mind and behavioural avoidance involves withdrawing problem oriented coping strategies or getting involved in self destructive behaviours like using drugs and alcohols (Zeidner & Endler, 1996).

Empirical studies have suggested that individual's personality traits, perceived social support and ways of coping determine the outcome of the traumatic event. For instance, individual's personality and support system effects the way the individual cope with the trauma and the coping, in turn, determines the level of growth (Schaefer & Moos, 1998; Tedeschi & Calhoun, 2004). People who are high on extraversion, openness to experience, conscientiousness, and agreeableness and who perceive that they have good support system use more adaptive coping strategies (such as engagement coping, problem solving, social support seeking and cognitive restructuring). On the contrary, people with high neuroticism and low perceived social support use more maladaptive coping strategies (such as withdrawal, avoidance, and wishful thinking). Among the coping strategies, adaptive coping strategies are linked with high level of posttraumatic growth and maladaptive coping strategies are linked with low levels of such growth (Connor-Smith & Flachsbart, 2007; Linley & Joseph, 2004; Tedeschi & Calhoun, 2004).

In short, the diagnosis of a life threatening illness like myocardial infarction can be an extremely stressful and traumatic experience. When individuals struggle with it, it is likely for them to experience negative psychological outcomes, but researches have shown that this struggle can also have a paradoxical effect by bringing changes in the lives of individuals in a positive way; which is termed as post-traumatic growth in literature (Park & Helgeson, 2006; Tedeschi & Calhoun, 2004). The paucity of research in the domain of positive outcomes of illness, especially in the context of Pakistan, highlighted the need to carry out the research in this domain. Therefore, the present study was based on the rationale that usually illnesses have negative connotation and mostly people link the illness with negative psychological outcomes; however, illness can also bring constructive changes in the life of people, which are often undermined.

Objectives of the present study were to investigate the positive psychological changes experienced by the patients diagnosed with

myocardial infarction in the form of posttraumatic growth. It was also intended to focus on the contributory role of personality traits, perceived social support, and coping strategies in the emergence of posttraumatic growth.

Hypotheses

In order to meet above mentioned objectives, four hypotheses were formulated.

1. Extraversion, agreeableness, conscientiousness and openness to experience are positively related with post traumatic growth, while neuroticism is negatively associated with post traumatic growth.

2. Perceived social support is positively associated with post-traumatic growth.

3. There is positive relationship between problem focused coping, active emotional coping and posttraumatic growth; while negative relationship exists between avoidant emotional coping and posttraumatic growth.

4. Personality traits, perceived social support and coping strategies are significant predictors of post traumatic growth.

Method

Cross-sectional research design and non probability purposive sampling was used for the present study.

Sample

The sample consisted of 90 patients with myocardial infarction taken from four government hospitals of Lahore. Sample size was decided on the basis of G Power analysis with medium effect size ($\alpha = .05$, power = .95).

Inclusion criteria. Patients from both genders were taken; who fell in the age range of45 to 65 years; and who had experienced only one myocardial infarction at least one month to three years before the data collection and were taking treatment for the same period of time.

Exclusion criteria. The patients who didn't have any hope for recovery; had gone through major surgical procedure after heart attack; who were suffering from any other physical illness other than hypertension and diabetes; who had diagnosed cardiovascular disease

before heart attack, and who had any psychiatric illness at the time of data collection were excluded from the study.

The demographic characteristics of sample included education of mean 5.36 years (*SD* = 4.99) with average personal income of Rs. 11588 and average family income of Rs. 27844; while, average duration of myocardial infraction was 17.77 months (*SD* = 13.39). Moreover, 56% of patients were employed; whereas 44% were unemployed (including housewives and retired patients); 40% were living in nuclear family and 60% were living in joint family. In addition, 16% of the respondents had personal residence, while 84% were living on rent. In terms of marital status, 82% were married, whereas 18% were widowed; and 51% did not have any other major physical illness and 49% have illness in the form of diabetes, hypertension, or both.

Measures

Demographic Questionnaire. Demographic questionnaire was constructed by the researchers which included participants' information about age, gender, education, occupation, personal income, family income, family status, residence, family members, marital status, children, duration of myocardial infarction and other physical illnesses.

Big Five Inventory (BFI). To assess personality traits, Urdu version of Big Five Inventory (Raiha, 2012; originally developed by John & Srivastava, 1999) was used. It had 44 items that measure five factors of an individual personality: Extraversion (8 items), Agreeableness (9 items), Conscientiousness (9 items), Neuroticism (8 items), and Openness to experience (10 items); while, 7 items were reverse scored. Items were rated on a 5-point Likert scale which ranged from 1 (*disagree strongly*) to 5 (*agree strongly*). Mean value was computed for each factor which was then used for calculating results. For the present sample, and the alpha reliabilities for Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to experience came out to be .64, .58, .86, .97, and .80; respectively. According to Tuckman (1972), the alpha value of .50 (and above) is acceptable for the measures/ scales that assess attitudes and preferences. The ranges provided by George and Mallory (2003) indicate that the alpha value below .50 is unacceptable; with higher values showing higher internal consistencies. Considering these criteria, the alpha reliabilities for the current research can be considered in the acceptable range.

Multidimensional Scale of Perceived Social Support (MSPSS). In the present study, Urdu version of MPPS (Qureshi, 2011; originally developed by Zimet, Dahlem, Zimet and Farley, 1988) was used to measure perceived social support. This scale consisted of 12 items and these items were scored on 7-point rating scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). The minimum score on this scale was 12 and maximum score was 84. It had three subscales: Family, Friends, and Significant Others. In present research, alpha reliability of .98 was achieved for MSPSS.

Brief COPE. Coping strategies were measured by using Urdu version (Akhtar, 2005) of Brief COPE. Originally, it was developed by Carver in 1997. It has 14 subscales with 2 items each, which are as follows: active coping; acceptance; planning; emotional support; instrumental support; behavioural disengagement; self-distraction; self-blame; denial; substance use; venting; positive reframing; humor and religion. Alpha reliability of subscales ranged from 0.57 to 0.90. Items were measured on 4 point Likert scale ranging from 1 (*I haven't been doing this at all to*) to 4 (*I have been doing things a lot*) (Carver, 1997). Based on conceptual and empirical literature describing coping strategies, these 14 types were grouped into three broad categories: Problem-focused coping (planning, active coping, religion and instrumental support scale) (α = .96 for this sample); active emotional coping (acceptance, humor, venting, emotional support, positive reframing scales) (α = .88); and avoidant emotional coping (self-distraction, denial, behavioural disengagement, self-blame, and substance use scales) (α = .90) (Carver, 1997; Folkman & Lazarus, 1980, 1991; Moos, 1990; Schnider, Elahi, & Gray, 2007).

Post-traumatic Growth Inventory (PTGI). To measure post traumatic growth, Urdu translation (Arif, 2011) of Post-traumatic Growth Inventory, devised by Tedeschi and Calhoun (1991) was used in present study. It was a 21 item inventory which assessed positive changes experienced in the aftermath of highly stressful life experiences. Ratings were made on 6-point Likert scale, ranging from 0 (*not experiencing the change after trauma*) to 5 (*experiencing a great deal of change after crisis*). The alpha reliability of PTGI for this research was found to be .89.

Procedure

The permissions related to research questionnaires were taken from original authors as well as from those who translated them in Urdu language. Then permissions were taken from hospitals from

where the data was collected. The doctors in the outdoor units of cardiology wards were informed about the inclusion and exclusion criterion and were requested to recommend only those patients who fulfil those criteria. The medical record files of the patients were also seen to validate the diagnosis. The written consents were taken from the participants about their willingness to participate in the research. Then participants were given instructions regarding the questionnaires. The purpose/rationale of the present research was explained to them. They were assured about the anonymity and confidentiality of the information they would provide. All their queries regarding the research were answered. After acquiring their signature or thumb prints on consent form, the demographic information was obtained and then all the four questionnaires were administered on the participants. These questionnaires were filled by the researcher and were reviewed for any missing response to items. The participants were thanked and appreciated by the researcher for their time and help after getting the required information from them.

Results

Correlations among personality traits, perceived social support, coping strategies, and posttraumatic growth are provided in Table 1.

Table 1
Inter-correlation among Study Variables with Descriptive Statistics

Measure	1	2	3	4	5	6	7	8	9	10	M	SD
1.Ext	-	.70***	.60**	-.63***	.75**	.63**	.60**	.57**	-.61**	.63**	3.52	1.02
2.Agr		-	.60**	-.57***	.53**	.48**	.50**	.63**	-.52**	.53**	3.570	.84
3.Con			-	-.70***	.75**	.68**	.73**	.71**	-.73**	.73**	3.800	.60
4.Neu				-	-.80**	-.78**	-.79**	-.80**	.80**	-.81**	2.89	1.33
5.Open					-	.80**	.84**	.79**	-.78**	.85**	3.240	.68
6.PSS						-	.90**	.86**	-.78**	.91**	57.87	17.55
7.PFC							-	.89**	-.85**	.90**	6.50	1.58
8.AEC								-	-.79**	.85**	5.46	1.10
9.AC									-	-.83**	4.21	1.38
10.PTG										-	67.82	25.95

Note. Ext = extraversion; Agr = agreeableness; Con = conscientiousness; Neu = neuroticism; Open = openness to experience; PSS = perceived social support; PFC = problem focused coping; AEC = active emotional coping; AC = avoidant emotional coping; PTG = post-traumatic growth.
***$p < .00$

Psychosocial correlates of post-traumatic growth are evident in Table 1. It can be seen that post-traumatic growth was positively

related with personality traits of extraversion, agreeableness, conscientiousness, and openness to experience and negatively related with trait of neuroticism. Post-traumatic growth was also found to be positively related with high perceived social support. Moreover, post-traumatic growth was positively related with problem focused and active emotional coping and negatively related with avoidant emotional coping.

Results of hierarchical regression analysis to find out the predictors of post-traumatic growth are provided in Table 2.

Table 2

Multiple Hierarchical Regression Analysis Predicting Post-traumatic Growth from Personality Traits, Perceived Social Support, and Coping Strategies (N = 90)

Predictors	Post-traumatic Growth			
	B	$SE\ B$	β	ΔR^2
Step 1				.23[*]
Control variables				
Step 2				.70[***]
Extraversion	-2.59	1.76	-.10	
Agreeableness	1.88	1.94	.06	
Conscientiousness	1.13	2.85	.03	
Neuroticism	-1.00	1.39	-.05	
Openness	9.16	3.37	.24[**]	
Perceived Social Support	.53	.14	.36[***]	
Problem Focused Coping	2.40	1.85	.15	
Active Emotional Coping	.09	2.35	.00	
Avoidant Emotional Coping	-3.53	1.44	-.19[*]	
Total R^2				.93[***]

Note. [a]Control variables included participant's age, gender, education, job, personal income, family income, family system, residence, marital status, duration of myocardial infarction, and presence of other physiological illness.
[*]$p < .05.$ [**]$p < .01.$ [***]$p < .001.$

After controlling for the demographic variables, personality trait of openness to experience and high perceived social support predicted high post-traumatic growth and use of avoidant emotional coping predicted low post-traumatic growth. Among the demographic predictors, education ($\beta = .09, p < .05$) was the significant predictor.

Discussion

Personality Traits and Post-traumatic Growth

Personality traits influence one's reactions to traumatic situations, thus playing an important role in shaping one's psychological life after trauma (Tedeschi & Calhoun, 1996). Present research supported this view as personality traits of extraversion, agreeableness, conscientiousness and openness to experience were found to be positively related with post-traumatic growth and personality trait of neuroticism was found to be negatively related with post-traumatic growth. These results are consistent with previous researches conducted on personality traits and post-traumatic growth which reported similar phenomenon (Connor-Smith & Flachsbart, 2007; Karanci et al., 2012; Linley & Joseph, 2004; Tedeschi & Calhoun; 2004). Among these personality traits, openness to experience predicted post-traumatic growth because people who are open to experience are imaginative, creative, intellectually inquisitive, curious and adventurous, so it may be argued that they may take trauma as a challenge to overcome; they may process it cognitively and draw meaningful aspects out of it; and use their imaginative power and inquisitive nature to think about different ways to cope with it. Therefore, this direct confrontation with the trauma, that facilitates positive growth.

Perceived Social Support and Post-traumatic Growth

Social support plays a significant role in coping with a traumatic event (Calhoun & Tedeschi, 2006). In present research, perceived social support was not only found to be significantly positively related with post-traumatic growth but it was proved to be a significant predictor indicating that people who perceive more social support, experience high post-traumatic growth. Theoretical perspectives and previous research findings corroborate these results which indicate that social support is an important aspect of dealing with stressful situations and individuals demonstrate more post-traumatic growth when perceived levels of social support are high (Cadell et al., 2003; McIntosh, Silver, & Wortman, 1993; Tanriverd, Sava, & Can, 2012). This positive relation between perceived social support and post-traumatic growth, indicated by the results of present study, may be due to the opportunity social support provides to the individual for catharsis and self disclosure which ultimately leads to stress reduction and paves the way for post-traumatic growth. Sharing one's own

traumatic experiences especially with those who have faced similar experiences may be remedial and therapeutic because it seems natural for the sufferers to take the advice and help of those people more seriously with whom they can relate well.

Coping Strategies and Post-traumatic Growth

Lazarus and Folkman (1991) explained that it is not the stressful event that determines one's ability to adapt to life problems but it is one's coping which helps the person to adjust with difficult and varying circumstances. According to them, coping can shape the outcome of a traumatic event. The present research strengthened this view point as problem focused coping and active emotional coping were found to have a significant positive relationship with post-traumatic growth and avoidant emotional coping was found to have a significant negative relationship. These findings are consistent with previous literature (Chang et al., 2003; Folkman & Lazarus, 1991). Avoidant emotional coping was also found to be a significant predictor of post-traumatic growth in patients after myocardial infarction suggesting that people who use more avoidant coping experience less post-traumatic growth. Savelkoul, Post, de Witte, and van den Borne (2000) may explain this relation as they regard avoidant coping as a strategy that represents helplessness which leads to distress. This strategy redirects people's attention from the actual stressor and personal resources to other paths and activities (substance abuse, social isolation, withdrawal behavior), thus preventing them from directly addressing the stressful event (Kausar, 2010). When people are engaged in avoidant coping, it can be argued that they are unable to take any step or action to resolve the actual stressor and as a result, they feel depressed, anxious and frustrated and choose behaviors that may immediately provide them temporary relief but adversely affect their life and emotional health in long term.

Limitations and Suggestions

In the present study, the sample was drawn by establishing certain inclusion and exclusion criterion, so caution should be taken in generalizing the results to the larger population, due to representativeness issues. Further researches should be carried out by taking larger samples, from more wide geographical areas and socioeconomic backgrounds and psychosocial predictors of post-traumatic growth should be found in the context of other physical

illnesses too. This cross sectional study does not investigate issues of causality, so longitudinal researches are needed in this area to clarify this issue. Although present study highlights the role of personality traits, perceived social support, and coping strategies in the emergence of post-traumatic growth, however, it does not explain how this phenomenon develops with the passage of time and emerges after heart attack. So, there is a need to conduct qualitative studies to understand how people behave, react and cope in different phases of recovery chronologically in the days, months, and years after myocardial infarction.

Implications

Post-traumatic growth is an important concept which needs to be explored because if factors that contribute towards the development of post-traumatic growth are recognized, then it is possible to devise and implement interventions based on the findings for the people who undergo traumatic experiences. Previous researches have proved that those patients who experience post-traumatic growth after having first heart attack are less likely to have another heart attack (Affleck, Tennen, Croog, & Levine, 1987). The present study is successful in identifying some of these factors (personality, support and coping) and provides information that can be used to spread awareness among patients about the contribution of their personality and social support networks in shaping post-traumatic mental health (post-traumatic growth) and guide them in learning adequate coping skills to deal with the consequences of heart attack.

Although personality traits are generally considered as stable and are not modified easily over a short period of time, interventions can nevertheless be aimed toward promoting those attitudes, expectancies, and behaviors that are most similar to particular personality traits. Indeed, the research (Fleeson, Malanos, & Achille, 2002) shows that even by simply acting out a personality trait can lead towards positive outcomes, for example, extraversion can spur positive feelings and increase a sense of wellbeing. Thus, mental health professionals can help their patients to change self-defeating expectancies into positive expectancies consistent with those personality traits which are positively related with post-traumatic growth. Similarly, interventions could be devised for the people with recent heart attack with the focus on establishing strong social networks, learning more problem oriented coping strategies; sharing feelings and emotions with others and embracing the reality and consequences of traumatic illness rather than avoiding it, in order to attain post-traumatic growth. Moreover

family members can be counseled by encouraging them to provide social support to their loved ones during difficult times as it has been established that people who perceive more social support experience more growth.

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