Although the negative mental health effects of traumatic experiences have been extensively examined, research has also demonstrated that people can experience a range of positive outcomes as a result of exposure to various kinds of traumatic life events. This study examined the impact of being a volunteer in a nongovernmental disaster preparedness organization, together with pre-disaster, within disaster and post-disaster variables, on posttraumatic growth among the survivors of the 1999 Marmara earthquake. The sample consisted of 200 survivors of the 1999 Marmara earthquake, 100 of whom are volunteers of the Kocaeli Neighborhood Disaster Volunteers Organization (NDV) and a control group of 100 survivors who are not volunteers, from two provinces with varying degrees of impact from the quake. Data were collected 4.5 years after the Marmara earthquake. The questionnaire used for data collection had items on socio-demographic variables, severity of subject’s earthquake experiences, perceived social support and three scales assessing psychological distress, coping strategies, and stress related growth level. The results showed that, earthquake experience severity can be grouped into perceived severity of impact and perceived life threat, while coping consisted of problem focused, fatalistic, helplessness and escape coping approaches. Possible factors that may be related to growth were examined with regression analyses. The results showed that, using problem solving/optimistic and fatalistic coping, and being a disaster preparedness volunteer are significant predictors of post-traumatic growth. Results also showed that the significance of being a volunteer appeared only after controlling for coping approaches.

Key Words: posttraumatic growth; earthquake preparedness volunteers; Marmara Earthquake

The negative psychological impacts of natural disasters, like earthquakes, floods and hurricanes on survivors have been widely documented (Lai, Chang, Connor, Lee, & Davidson, 2004; Rubonis & Bickman, 1991; Steinglass & Gerrity, 1990). It has been shown that certain pre-disaster variables, such as gender (i.e.; being a woman) and education (Basoglu, Salcigolu, & Livanou, 2002; Karanci, Alkan, Aksit, Sucuoglu & Balta, 1999), the severity of the disaster impact and the perceptions of the disaster by the survivors (Chen et al., 2001; Goenjian, Steinberg, Najarian, Fairbanks, Tashjian, & Phynoos, 2000), the post-disaster environment and coping strategies of survivors (Bolton, Glenn, Orsillo, Roemer & Litz, 2003; Carr, Lewin, Webster, Kenardy, Hazell, & Carter, 1997; Karanci et al., 1999) are related to distress. Considering all these findings, Freedy, Kilpatrick and Resnick (1993) proposed a multivariate model for examining adjustment, including both negative and positive outcomes, following disasters. According to this model pre-disaster, within disaster and post-disaster variables need to be considered when evaluating the impact of disasters on psychological well-being of survivors.

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2 Ceren Acarturk is affiliated with Doğus University.
Despite the preponderance of research on negative effects of disasters, research examining positive changes experienced by disaster survivors is relatively more recent and relatively rare (McMillen, Zuravin, & Rideout, 1995; Powell, Rosner, Butollo, Tedeschi & Calhoun, 2003; Tedeschi, Park, & Calhoun, 1998). Positive changes following traumatic events have been empirically demonstrated after various kinds of violence, such as rape and sexual abuse, combat and hostage taking (Tedeschi, 1999), natural, and technological disasters (McMillen, Zuravin, & Rideout, 1995), living with AIDS (Siegel & Schrimshaw, 2000), suffering heart attacks (Affleck, Tennen, & Croog, 1987), and war experiences (Powell, Rosner, Butollo, Tedeschi and Calhoun, 2003). Although there are different labels such as stress-related growth, posttraumatic growth (PTG), thriving, resilience and perceived benefits for positive changes following trauma, they all share the idea that post-traumatic growth is the process of getting and maintaining perceived positive outcomes from a traumatic experience (Siegel & Schrimshaw, 2000; Tedeschi, Park & Calhoun, 1998).

Theories about post-traumatic growth (PTG) emphasize the importance of schema reconstruction (Tedeschi, 1999). According to Janoff-Bulman (1992), people have basic assumptions about the benevolence of the self, personal invulnerability, and the perceptions of the world as meaningful and comprehensible. The traumatic event shatters those assumptions and causes important losses. Accordingly, following the trauma the fundamental beliefs need to be modified and this change may bring alterations in main areas of life. The adversity which is brought by the trauma may lose its severity through cognitive adaptations through which the assumptions about the self, others, and the world are reconstructed (Calhoun & Tedeschi, 2000).

In their functional-descriptive model of posttraumatic growth, Calhoun and Tedeschi (1998) emphasized the importance of initial distress, personality characteristics, type of trauma and the context of social support as factors related to PTG. Consistent with the literature of perceived growth, which proposed a significant relationship between perceived life threat and perceived growth, in order to experience posttraumatic growth, the traumatic event must be severe enough to produce significant reconsideration of previously held assumptions. While reconsidering these assumptions, the survivor may gain new perspectives and learn new precious lessons (Tedeschi, Park & Calhoun, 1998). McMillen Zuravin and Rideout (1995) found that more than half of the women who were sexually abused and reported benefits, also reported perceptions of harm. Thus, growth and distress can be experienced by the same survivor.

In regards to the type of trauma, Tedeschi, Park and Calhoun (1998) proposed that after large-scale disasters such as earthquakes, because of decreased social support, growth will not be as high, as it can be after individual traumas such as being diagnosed with cancer. Although massive aid from both international and national agents increases after disasters (Jalali, 2002), at the individual level, due to the displacement of neighbors and family members, available social support from closer social networks tends to decrease (Karanci & Aksit, 1999). Social support is important because it affects the rumination and the coping behaviors of the person (Tedeschi, Park, & Calhoun, 1998). In their study with the survivors of the Yugoslavia war, Rosner, Butollo, Tedeschi and Calhoun (2003) found that being a member of a group was a predictor of growth. The authors explained this finding by the opportunity membership may provide for sharing trauma history, world view and collective coping strategies with each other. Therefore social support seems to be an important
facilitator of growth. Supportive social networks are often cited as a buffer against stress (Pittman & Lloyd, 1997).

Although there are not enough studies about the effects of volunteer work on psychological well being, “most people say that helping others makes them feel good” (Wuthnow, 1991, p. 87, as cited in Musick & Wilson, 2003). Volunteers do not want something material or economic in return for their work. However, helping others may provide various kinds of benefits, such as a sense of mission, security, trust, or improvement of the sense of self in many ways (Musick & Wilson, 2003). In some studies it has been shown that being a volunteer is associated with health. However, there is a debate about whether healthier people are more likely to be volunteers or volunteering makes people healthier (Chambré, 1987, p.41, as cited in Musick & Wilson, 2003). Two explanations about how volunteering may improve well-being have been offered in the literature. According to the first one, through volunteering, people gain positive perceptions about themselves and their abilities, which enhance their self-esteem. Consequently, they feel and think more positively. In short, being a volunteer enhances psychological resources of the person. The second view emphasizes the importance of social resources and is based on the theory of suicide of Durkheim, which states that social integration is very important for one’s psychological well-being. It is claimed that through increased social integration which is caused by volunteering, people find enormous opportunities to gather social support and helpful information (Musick & Wilson, 2003). However, here it is important to consider what kind of work volunteers are doing. It has been found that being a disaster relief worker exposes the individual to a considerable amount of stressors and thus can contribute to negative psychological reactions (McCaslin, Jacobs, Meyer, Johnson-Jimenez, Metzler, & Marmar, 2005; Marmar, Weiss, Metzler, Ronfeldt & Foreman, 1996). The current study does not focus on disaster relief workers but examines the impact of being a community disaster preparedness volunteer. Being a volunteer in community disaster preparedness work is likely to give a sense of being useful in helping others and thus increase the self-esteem of volunteers. Furthermore, learning specific preparedness skills may enhance the sense of self-efficacy, and being a participant of an organization may provide social support to the volunteer.

Post traumatic growth is reported more by women than men in a number of studies (Park, Cohen, & Murch, 1996; Powell et al., 2003; Tedeschi, Park, & Calhoun, 1998). Coping skills are also found to be related to growth. Park et al., (1996) found that there is a significant relationship between acceptance coping, positive reinterpretation and perceived growth. Moreover, studies reported that people, who use active coping strategies such as a problem-focused approach, can more easily handle stressful situations (Tedeschi, Park, & Calhoun, 1998).

The Marmara Earthquake

The Marmara earthquake with a magnitude of 7.4 on the Richter scale occurred in August 17, 1999 while much of the population was asleep. It affected the most industrialized area of Turkey and caused 17,127 deaths, 43,953 injuries, and the displacement of 250,000 people (Karanci & Aksit, 2000). Right after the earthquake, both governmental and non-governmental emergency response teams started to rescue victims and responded to their medical and physical needs. However, after the post-disaster acute phase, the need for more organized and well equipped organizations which can deal with the issue of being prepared
for a future large-scale disaster, such as an earthquake, became well recognized in Turkey. With this awareness, the “Neighborhood Disaster Support Project” was initiated in July, 2000, a year after the quake, in the Marmara Region of Turkey. The project was started by The Swiss Agency for Development and Cooperation in cooperation with local partners including provincial governors, civil defense directorates, municipalities and fire departments. The goal of this organization is to improve the community response capability at the neighborhood level in order to save lives, especially during the initial 72 hours, by efficient training and adequate equipment and to raise disaster awareness in the community by nation-wide media campaigns. The Neighborhood Disaster Volunteers (NDV) are composed of men and women between the ages of 18-55 who are survivors of the Marmara earthquake, are in good health, and are living and planning to stay in the neighborhood for a long term.

The Marmara earthquake was a common traumatic event for the NDVs. It was hypothesized that the NDVs will have higher posttraumatic growth scores as compared to a control group of earthquake survivors who are not volunteers. It was expected that being a disaster preparedness volunteer will give volunteers an opportunity to share memories, ideas, and feelings about the earthquake with others and to receive social support. Furthermore, serving other survivors may play an important role in the change process. Herman (1992) (as cited in, Tedeschi, Park, & Calhoun, 1998, p. 207) stated “The trauma is redeemed only when it becomes the source of a survivor mission.” Doing something for others and not avoiding the traumatic event may facilitate the development of posttraumatic growth among NDV volunteers. Furthermore, being a member of a volunteer group can provide a social network and skills and information to deal with future earthquakes. All these resources can increase the self-esteem, improve the interpersonal relationships and add meaning to the lives of individuals, which are all components of PTG.

The Present Study

The aim of the present study was to specifically examine the predictors of perceived post-traumatic growth among the survivors of the 1999 Marmara, Turkey earthquake. The predictors were based on the Multivariate Risk Factor Model. Demographic variables such as gender, age, and education were taken as pre-disaster factors. Within-disaster factors were represented by exposure severity, perceived threat to life and location during the quake. Ways of coping, perceived social support and status in relation to being a disaster volunteer were used as post-disaster variables in the analysis.

Method

Participants

Two hundred adult survivors of the 1999 Marmara, Turkey earthquake participated in the study. Half of the sample were neighborhood volunteers (NDV) (N= 100), whereas the other half were survivors who are not members of the NDV or any other voluntary organization (NNDV) (N = 100). The gender proportion of the study sample reflected the gender proportion of the NDV organization in which there are about two males for one female. Sixty-six per cent of the volunteers were (N=66) male and 34% were female (N=34). The same gender proportion was applied to the control group. The mean age, years of
education, marital and employment status and previous earthquake experience of the NDV and the NNDV groups are presented in Table 1.

Table 1. Socio-Demographic Characteristics of the Sample

<table>
<thead>
<tr>
<th></th>
<th>Volunteer</th>
<th>Non-Volunteer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td></td>
<td>Range (SD)</td>
<td>Range (SD)</td>
</tr>
<tr>
<td>Age</td>
<td>32.86 (9.34)</td>
<td>31.91 (11.09)</td>
</tr>
<tr>
<td></td>
<td>(18-59)</td>
<td>(18-60)</td>
</tr>
<tr>
<td>Education (in years)</td>
<td>11.15 (3.24)</td>
<td>10.2 (3.57)</td>
</tr>
<tr>
<td></td>
<td>(5-17)</td>
<td>(0-17)</td>
</tr>
<tr>
<td>Marital Status</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Married</td>
<td>54 %</td>
<td>58 %</td>
</tr>
<tr>
<td>Single</td>
<td>37 %</td>
<td>31 %</td>
</tr>
<tr>
<td>Widowed/Separated</td>
<td>6 %</td>
<td>6 %</td>
</tr>
<tr>
<td>Engaged</td>
<td>3 %</td>
<td>5 %</td>
</tr>
<tr>
<td>Currently Employed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>62 %</td>
<td>63 %</td>
</tr>
<tr>
<td>No</td>
<td>38 %</td>
<td>37 %</td>
</tr>
</tbody>
</table>

Materials

The questionnaire for data collection had three parts. The first part had questions on socio-demographic variables such as gender, age, marital and employment status and years of education. Two items related to perceived social support (How much support they received from their family and friends and from disaster relief organizations after the quake) were rated on three point scales (3 = Very much; 1 = None).

Earthquake Experience. The first part also contained ten items related to the earthquake experience and impact (e.g.; previous earthquake experience, location of the respondent during the quake; whether the respondent had thoughts about dying during the quake, whether the respondent had thoughts about family members/relatives dying during the quake, whether they saw a dead or injured person after the quake, whether they were trapped under the rubble; extent of material loss from the earthquake, etc.). In order to examine whether these items can be grouped into meaningful categories, a factor analysis, using principal component analysis with varimax rotation was conducted. Initial analysis
employing an eigenvalue of 1.00 as the criterion yielded 3 factors explaining 57% of the variance. Further analysis, with restriction on the number of factors, after examining the scree plot, revealed that a 2 factors solution, explaining 47% of the variance gave the clearest result. A factor loading of .35 was used as the criterion to determine the item composition of the factors. Five items (i.e.; receiving rental allowance 3; extent of damage to the house; extent of property loss; being a right holder for compensation; being trapped under the rubble) loaded on the first factor labeled as “severity of impact” (Cronbach’s alpha reliability coefficient = .82). The other five items (i.e.; thinking that they will die during the quake; thinking that someone from the family may die; being in Golcuk or Izmit; seeing a dead or injured person after the quake; whether someone from the family died or was severely injured) loaded on the second factor labeled as “perceived life threat” (Cronbach’s alpha reliability coefficient = .62).

The second section consisted of the following three scales which assessed the survivors’ psychological distress, coping strategies, and stress related growth level.

Symptom Checklist-40 (SCL-40). General distress level was assessed by the Symptom Checklist-40, which was adopted and modified from the original scale of Derogatis and Cleary (1977), by Karanci and Rüstemli (1995). The modified scale was used previously with the survivors of the Erzincan and Dinar earthquakes in Turkey (Karanci & Rüstemli, 1995; Karanci et al., 1999). The SCL-40 uses a three point scale for responding (1= not at all, 2= somewhat, 3= very much). Statistical analyses were performed by using the mean total distress score. In the present study the Cronbach’s alpha reliability coefficient of the whole scale was found to be .92.

Ways of Coping Questionnaire. Coping strategies were assessed with the Ways of Coping Questionnaire (WCQ- Folkman & Lazarus, 1985) which was translated and adapted into Turkish by Siva (1988) (as cited in Ucman, 1990). Eight new items about fatalism and superstition that were thought to be relevant to the Turkish culture were added to this Turkish adaptation. Later, Karanci et al (1999) used the Turkish version of the WCQ with the survivors of the 1995 Dinar, Turkey earthquake. In order to make the scale more suitable for an earthquake context, they both reduced the item number to 60, after pilot testing, in order to increase ease of comprehension and changed the response format to a 3 points scale (1= never, 2= sometimes, 3= always). In the present study, this 42-item WCQ was used.

For the present sample, an initial factor analysis using principal component analysis with varimax rotation and an eigenvalue of 1.00 yielded 11 factors explaining 63% of the variance. Further analysis, with restrictions on the number of factors, after the examination of the scree plot, showed that a 4 factors solution, explaining 42% of the total variance produced the clearest result. In determining the item composition of the factors, a factor loading of .35 was used. Two items not meeting this criterion were excluded, leaving forty items. The first factor was labeled as “problem solving/optimistic coping” (% of explained variance = 21; Cronbach’s Alpha=.89; 17 items), the second factor was “fatalistic approach” (% of explained variance = 11; Cronbach’s Alpha=.84; 10 items), the third factor was “helplessness approach” (% of explained variance = 6%; Cronbach’s Alpha=.79; 9 items) and finally the fourth factor ,“escape coping” (% of explained variance = 4%

3 According to the Turkish Disaster Law, after an earthquake rental help is given to families whose house is assessed by technical experts as heavily damaged.
Cronbach’s Alpha=.53 ; 4 items). The internal consistency of the whole scale was found to be .88. Mean factor scores were calculated by summing up the responses to items that belonged to each factor and dividing them by the number of items in each factor.

**Stress Related Growth Scale (SRGS).** Park, Cohen and Murch (1996) developed a measure of stress-related growth, in order to assess growth in the areas of self-concept, relationships and coping skills. Sample items are “I developed new relationships with supportive others”; “I learned that I was stronger than I thought I was”; “I rethought how I want to live my life”; “I learned to live for today, because you never know what will happen tomorrow”; “I learned to find more meaning in life”; “I learned to deal better with uncertainty.” Park et al., (1996) in their study with a college student population found that as a result of factor analysis, the items loaded the highest on one general factor. Thus, the authors reported that the SRGS, which consists of 50 items, reflects overall stress-related growth. Güneş (2001) adapted the scale into Turkish in order to investigate stress related growth among the 1999 Marmara earthquake survivors. As found by Park et al. (1996), most of the items loaded the highest on one general factor. The Cronbach’s alpha reliability of the whole scale was found to be .94 (Güneş, 2001). In the present study, the 50 item SRGS, with 3 point scale response format, adapted by Güneş (2001) was used. Respondents were asked to rate the suitability of the items for themselves on the basis of their earthquake experience. Mean SRGS scores were obtained by summing up the responses to the items of the whole scale and dividing it by fifty (the mean item SRGS scores; $M = 2.41; SD = .41; R =1- 3$). Cronbach’s alpha for the total SRGS was found to be .95 for the present study.

The third section of the questionnaire was only presented to the NDVs, designed to tap their experiences about their involvement in the neighborhood disaster support project, and will not be used in the present paper. This section was presented as the last part of the survey instrument in order to eliminate any probing effects for this group and to have the same item sequences for the two groups.

**Procedure**

Initially the aims and the procedure of the study were explained to the directors of the NDV Organization, and their consent for contacting their members was obtained. A list of all registered Neighborhood Disaster Support volunteers in two provinces, Gölcük and İzmit, was obtained. The NDV sample was chosen randomly from the list of registered NDV members in two provinces differently hit by the quake, whereas the NNDV participants were chosen randomly from the same neighborhoods or work places of the NDVs. In order to get a sample with varying levels of exposure to the quake severity, half of both the NDV and the NNDV group were chosen from Gölcük, a province in the epicenter of the earthquake and the other half from İzmit, a province which is further away from the epicenter of the earthquake. The sample was contacted by the researchers. After explaining the study, participants’ consent was obtained. The entire sample agreed to participate in the study. Data was collected by six NDVs and one graduate psychology student, after receiving training on the administration of the research instrument. Data collection took place four and a half years after the Marmara earthquake. Survey instruments were individually administered in houses, work places and NDV offices. From each household, only one adult was contacted. The aims of the study were briefly explained and confidentiality was emphasized. The participants were informed that they would be free to discontinue
Results

Stress Related Growth Scale

In order to examine possible differences between neighborhood disaster volunteers and non-volunteers, and participants from Gölcük (near epicenter) versus those from İzmit (further away from the epicenter) independent samples t-tests were conducted. The results showed that volunteers ($M = 2.45, SD = .36$), and non-volunteers ($M = 2.36, SD = .43$) ($t(198) = 1.56, p = .12$), did not significantly differ from each other, although volunteers had slightly higher SRG scores. On the other hand, participants from Gölcük (severely damaged area) had significantly higher mean ($M = 2.48, SD = .38$) scores as compared to those from İzmit (lightly damaged area) ($M = 2.34, SD = .402, t(198) = 2.51, p < .05$). The mean values for the SRG show that the Gölcük group reported considerably higher growth, considering that three is the maximum that can be obtained.

Predictors of Stress Related Growth

Hierarchical multiple regression analyses were conducted in order to examine how well the respondents’ demographic characteristics, previous earthquake experience, 1999 Marmara earthquake experience, perceived social support, four types of coping strategies and finally status as a volunteer (NDV/NNDV), accounted for stress related growth. In this study, SCL-40 scores were used as a control variable, in order to parcel out the effects of general distress. It has been found that negative life events after a disaster can mediate negative psychological reactions (McCaslin et al., 2005). For this reason, since no measure of negative life events after the quake was obtained in the present study, SCL-40 scores were taken as a measure reflecting general distress of the sample and were controlled for in the first step of the regression analysis in predicting growth.

Prior to examining the predictive value of pre-disaster, within disaster, and post-disaster variables for perceived growth, a correlation analysis was conducted. The Pearson product moment correlations among the predictors and criterion measure showed that PTG was significantly correlated with the perceived severity of impact ($r = .22; p > .01$), perceived life threat ($r = .22; p > .01$), perceived social support ($r = .205; p > .05$), problem-focused coping ($r = .47; p > .01$), fatalistic coping ($r = .36; p > .01$), and helpless coping ($r = .34; p > .01$). The zero order correlation between PTG and being a volunteer/ non-volunteer was not significant ($r = .11, p > .05$). However, the examination of partial correlations showed that, when the effects of the four coping approaches are all parcelled out, then the correlation between PTG and status as volunteer became significant ($r(194) = -.22; p < .002$). Furthermore, when the effects of the four types of coping were parcelled out one by one, then the relation between PTG and status as volunteer became significant only after parcelling out fatalistic coping ($r(197) = -.25; p < .001$) and helplessness coping ($r(197) = -.16; p < .05$). Examination of the coping scores of the volunteers and non-volunteers showed that, the non-volunteers ($M = 2.37; s.d = .46$) had significantly higher fatalistic coping scores as compared to the volunteers ($M = 2.10; s.d = .47$) ($t(198) = 4.17; p < .001$). The differences in other coping types were not significant. Therefore in the regression analysis being a volunteer was entered in the last step, after entering the four coping factors, in order to examine its
association with PTG (after controlling for coping approaches). The test for multicollinearity showed that only the last root had a Conditioning Index that approached 30, only two of the Variance Proportions being greater than .5. Furthermore, the examination of the correlations between the predictor variables showed that the largest correlation was .50.

The predictor variables were entered on the basis of a temporal model which examines variables along a time line. The predictors were entered in four blocks. Table 2 displays the variables in each block and the results of the regression analysis. According to this analysis, all of the variables explained 35% of the variance in PTG. The first block did not account for a significant proportion of variance in PTG \((R^2 \Delta =.017, F (5, 195) = .68, p >.05)\). The second block, (perceived severity of impact, perceived threat and location during earthquake), explained a significant per cent of variance in survivors’ posttraumatic growth \((R^2 \Delta =.046, F (3, 191) = 3.11, p<.05)\). Four coping approaches and perceived support, entered in the third step, explained a large proportion of the variance in PTG \((R^2 \Delta =.264, F (5, 186) = 14.61, p<.001)\). Lastly, status as volunteer (NDV versus NNDV), entered in the last step accounted for a further two per cent of the variance in growth \((R^2 \Delta =.02, F (1, 185) = 6.78, p<.01)\). In the final analysis, problem solving/optimistic coping, fatalistic coping and being a neighborhood disaster volunteer, appeared as significant predictors of posttraumatic growth.

Discussion

The present study aimed to examine the contributions of pre-earthquake, within earthquake and post-earthquake variables, and specifically the contribution of working as a neighborhood disaster preparedness volunteer on post-traumatic growth. When the perceived growth levels of volunteers (NDVs) and non-volunteers (NNDVs) were compared, although volunteers had slightly higher scores, the difference was not significant. However, for both groups the scores of growth indicated moderate to high levels of growth, showing that four and a half years after a major devastating quake, survivors report positive changes in relation to perceptions about themselves, other people and the meaning of their lives. During the administration of the survey questionnaire the respondents stated that they appreciated the questions that focus on the positive aspects of their experiences. They stressed that generally everyone has been interested in negative experiences; however they also felt positive changes in themselves following the quake. This stresses the importance of focusing on both the positive and the negative experiences of survivors. Focusing on the positive may also facilitate further adjustment and combat distress.

Similar to the results of the t-test analysis, showing no significant difference between volunteers and non-volunteers, in the initial correlation analysis the relationship between growth and status as volunteer was not significant. However, when the effects of coping strategies were parcelled out, then the relationship between growth and status as volunteer became significant. Relatedly, when the differences in the four coping strategies were examined it was found that the NDVs and the NNDVs differed significantly only in fatalistic coping, the latter group reporting higher use of fatalistic coping. Thus, one important difference between the two groups was that the non-volunteers reported using more fatalistic coping, which is an emotion-focused approach that appears to be related with growth.
Table 2. Variables related to Post-Traumatic Growth: The results of the regression analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>R^2 Δ</th>
<th>Beta (within set)</th>
<th>t (within set)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1: Pre-Disaster</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (years)</td>
<td></td>
<td>-0.09</td>
<td>-1.21</td>
</tr>
<tr>
<td>Previous quake experience (No =0; Yes= 1)</td>
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<td>-0.06</td>
<td>-0.72</td>
</tr>
<tr>
<td>Gender (Male=0; Female=1)</td>
<td></td>
<td>0.04</td>
<td>0.61</td>
</tr>
<tr>
<td>General Distress (SCL-40)</td>
<td></td>
<td>0.03</td>
<td>0.34</td>
</tr>
<tr>
<td><strong>Block 2: Disaster</strong></td>
<td>.046</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived life threat (0-1)</td>
<td></td>
<td>0.16</td>
<td>1.76</td>
</tr>
<tr>
<td>Severity of impact (0-1)</td>
<td></td>
<td>-0.01</td>
<td>-0.17</td>
</tr>
<tr>
<td>Location (İzmit=1; Gölcük =2)</td>
<td></td>
<td>-0.08</td>
<td>-0.87</td>
</tr>
<tr>
<td><strong>Block 3: Coping and support</strong></td>
<td>.264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived support</td>
<td></td>
<td>0.15</td>
<td>2.14*</td>
</tr>
<tr>
<td>Problem-solving coping</td>
<td></td>
<td>0.34</td>
<td>4.76***</td>
</tr>
<tr>
<td>Fatalistic coping</td>
<td></td>
<td>0.21</td>
<td>2.76**</td>
</tr>
<tr>
<td>Helplessness coping</td>
<td></td>
<td>0.12</td>
<td>1.45</td>
</tr>
<tr>
<td>Escape coping</td>
<td></td>
<td>0.06</td>
<td>0.88</td>
</tr>
<tr>
<td><strong>Block 4 (and Final Analysis): Status as Volunteer</strong></td>
<td>.024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NDV/NNDV (0 = NNDV; 1= NDV)</td>
<td></td>
<td>0.17</td>
<td>2.60**</td>
</tr>
<tr>
<td><strong>Additional Variables</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fatalistic Coping</td>
<td></td>
<td>0.27</td>
<td>3.44**</td>
</tr>
<tr>
<td>Problem Focused Cop.</td>
<td></td>
<td>0.32</td>
<td>4.43***</td>
</tr>
<tr>
<td><strong>Total R^2</strong></td>
<td>.341</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(14,199)</td>
<td>7.15***</td>
<td></td>
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</tbody>
</table>

* p < .05; ** p < .01; *** p < .001
The results of the regression analysis showed that coping strategies are very important in accounting for PTG. More specifically fatalistic coping and problem solving/optimistic coping approaches explained a large proportion of variance in PTG. The growth literature suggests that problem focused coping, positive reappraisal, and acceptance are positively related with growth. After a traumatic event, believing in fate and hoping for help from God may help the person to accept the situation and experience posttraumatic growth. According to Tedeschi, Park & Calhoun (1998), people may experience growth in three domains; personal changes, social changes, and spiritual changes. In spiritual changes, people reported changes similar to the items of fatalistic coping such as ‘I tried to be happy with what I have had.’ Thus the results of the present study are in line with the literature showing that problem focused/optimistic coping and a fatalistic approach, which is an approach that entails acceptance, are related to growth.

The use of a fatalistic coping approach, needs to be evaluated within the context of the predominantly Muslim sample of the present study. Some items of the fatalistic approach of coping such as, “I believe in that god knows the best”; “I try to be happy with what I have”; “I go along with fate sometimes I just have bad luck” have similarities with Islamic religious beliefs. According to Islam, the individual should conduct every possible responsible action; however, the rest is upon God to decide. Thus, fatalism gives the individual responsibility for active problem solving attempts and therefore does not imply a helpless approach. Since the faith of Islam is not submissive, a fatalistic approach to coping does not necessarily imply being submissive or helpless, but implies that God has a plan for the individual and one needs to accept this after taking all necessary actions. The first author’s clinical experience in the post-quake environment, while conducting debriefing groups and intensive interviews with the survivors, showed that those who believed in fate were better able to accept the calamities. They seemed to show a serene acceptance of the event, and frequently stated that God knows the best, that their loved ones are at peace and have united with God.

A fatalistic approach may also function for the regulation of emotions and can be a potent process for emotional relief (Silver & Wortman, 1980; cited in Folkman, 1984, p. 844). Thus, in turn, a fatalistic approach may facilitate the use of problem solving strategies. Theoretically, the effectiveness of problem-focused coping depends on the success of emotion focused coping. “Otherwise, heightened emotions may interfere with the cognitive activity necessary for problem-focused coping” (Folkman, 1984, p. 845).

Being a volunteer appeared to be a significant predictor of growth, only after controlling for coping strategies. An examination of the differences between volunteers and non-volunteers in the four coping approaches showed that the groups only differed in fatalistic coping. It was seen that the non-volunteers had higher fatalistic coping scores, and thus only after controlling for the variance introduced by coping, volunteerism related to growth and not very strongly. It is important to examine, in a longitudinal study, the characteristics of individuals who choose to enlist as volunteers. The present study does not give information about why the two groups differed in fatalism. It may be possible that those who believe more in fatalism do not become volunteers, or that being a volunteer lessens a fatalistic approach. Whichever is true, the present results showed that, although not strongly, volunteerism still has some relation to growth after controlling for coping. Being a volunteer might have provided opportunities for sharing traumatic memories and narratives in the volunteer group, leading to successful processing of the cognitive information related to the
earthquake experience. Furthermore, being a disaster preparedness volunteer may give individuals a sense of self-efficacy in relation to knowing what to do in future earthquakes and a sense of being helpful to others. It is also possible that being a member of a voluntary group may provide social support from other members. It was found that a higher degree of perceived social support is significantly associated with less psychological distress (Dirkzwager, Bramsen, & Ploeg, 2003). Moreover, a supportive social network may cause the use of more active coping strategies (Dirkzwager et al., 2003). In the present study, the correlation analysis showed that perceived social support is correlated with being a volunteer and posttraumatic growth. Further analysis revealed that volunteers had significantly higher perceived support scores, which lends support to the above stated views on voluntary work. In the regression analysis, although perceived social support was a significant predictor for PTG, when status as volunteer was entered, it lost its significance. Thus, it is important that future studies examine the social support perceptions of volunteers both when they start their work and over time.

The participants of the present study were all survivors of a devastating earthquake. In the post-quake period massive material and psychological support and psycho-education programs were applied in the area (Basoglu et al, 2002). This widespread attention and support might have led to a post-disaster environment conducive for growth for all survivors and thus being a NDV related only moderately to growth. Furthermore, the present study was conducted four and a half years after the quake and the effects of being a volunteer may have been stronger in an earlier period of time. The inspection of the PTG scores shows that both the NDV’s and the NNDV’s had relatively high mean scores, considering that three is the highest mean score that can be obtained. Another factor that may explain why being a volunteer had only a small contribution to posttraumatic growth may be related to the concept of being a volunteer. In Turkey, the tradition of voluntary organizations and active membership in them is not very strong. There has been a rapid acceleration in the number, activities and members of voluntary organizations following the 1999 Marmara earthquake in Turkey (Jalali, 2002). In the present study, the volunteer sample was selected randomly from the list of NDV members. No attempt was made to assess how active the members were and how much they contributed to the organization. This might have led to the inclusion of some members who are listed as members but who are not highly involved in the activities of the organization. Thus, considering the increase in the popularity of joining such voluntary groups after the 1999 earthquake in Turkey, we may have failed to get a sample that is truly exposed to all potential benefits of membership. In future studies the degree of involvement needs to be assessed, together with the resource gain and loss of volunteers and non-volunteers in order to better understand the effects of volunteerism on psychological well-being. Furthermore, the examination of the experiences of survivors on opportunities for sharing their trauma memories by means other than being involved in volunteer organizations is needed. There may be natural support groups for survivors that facilitate sharing and growth and membership in voluntary organizations may not add significantly to this natural support.

Participants from two locations differing in proximity to the epicenter of the quake had different growth scores. Those who were nearer to the epicenter had significantly higher levels of growth than those from a remote location from the epicenter. This finding is in line with the literature showing that level of distress is related to PTG. Calhoun and Tedeschi (1998) stated that being severely exposed to a trauma shatters the assumptions of the survivor, and this enables the person to change them. Thus, those living closer to the
epicenter are likely to have experienced a more severe exposure which in turn may have enabled them to experience higher levels of growth. However, the effect of one’s location during the quake did not make a significant contribution to PTG, after controlling for pre-earthquake variables. Thus, it seems that the differences may also be related to socio-demographic differences among the participants from the two provinces.

Limitations

The most important limitation of the present study is its cross-sectional design and the long duration of time which elapsed after the quake. In order to understand the impacts of being a volunteer on posttraumatic growth over time, longitudinal studies need to be conducted. Moreover, longitudinal studies are needed to examine the process of resource gain/loss by participation in voluntary organizations. Due to the cross-sectional design of the present study it is not possible to make causal inferences. Furthermore, the present study lacks information on coping strategies, social support, and perceived growth in the period prior to becoming a volunteer. So, we do not know whether certain characteristics draw people to becoming a volunteer or whether voluntary work changes them. Therefore, there is a need for longitudinal studies collecting data at various time points, starting soon after the disaster event.

According to the growth literature, some personality characteristics such as being optimistic, extraverted or hopeful are related to posttraumatic growth (Park, Cohen, & Murch, 1996; Tedeschi & Calhoun, 1996). Thus, it is not possible to draw a casual inference without controlling for the personality characteristics of the volunteers. The present study only measured coping strategies, and it was seen that their effects are quite important for PTG. Unfortunately, results of the present study are inadequate to give any information about what kind of people prefer to be a NDV. People who are optimistic, extraverted and hopeful may be more likely to engage in NDV, or being a volunteer may make them more optimistic, extraverted and hopeful. Thus, in order to understand this, future studies should assess the personality characteristics of the volunteers at the time of their enlisting in organizations. Furthermore, in future studies the degree of commitment and involvement of the volunteers needs to be assessed and used in the analysis. This is especially true for countries like Turkey, in which the tradition of voluntary work is quite recent. We used the selection criterion of a person’s being listed as a member of the organization. However, through this process we may have contacted individuals who are not very actively involved in the organization. Thus, in future studies, active involvement needs to be operationally defined with measures like hours of voluntary work per week, number of activities engaged in, etc.

Clinical and Policy Implications

Overall, the results of the present study showed that coping strategies, namely problem solving/optimistic and fatalistic coping are very important contributors to perceived growth. Therefore, it is important to use post-quake interventions that facilitate problem-focused/optimistic and fatalistic coping strategies. Involving survivors in post-earthquake activities and decisions and giving them a sense of ownership may facilitate problem-focused coping. The survivors of earthquakes will benefit from being perceived as individuals with resources rather than as passive victims. When facilitating coping skills for dealing with the post-quake adversities and preparedness, it is important not to undermine
fatalistic coping. In some programs, the sole responsibility for preparedness is placed on the individual. However, fatalistic coping alongside with problem-focused coping seems valuable in regulating intense emotions and thus allowing for active problem solving. This aspect of fatalism needs to be known by policy makers, and widespread religious services may need to be provided for the survivors alongside with more rational disaster preparedness programs. Fatalistic coping involves having religious beliefs, believing in fate and accepting what has happened. Although, more research is needed in understanding factors that foster fatalistic coping, it seems important to note that such coping is different from helpless coping. Here acceptance seems to give the person a chance to perceive growth. Therefore, psychological intervention strategies fostering acceptance may be beneficial for the survivors. This acceptance may empower them in modulating their emotions and thereby enable their engagement in problem-solving coping.

Being a neighborhood disaster volunteer contributed to PTG, only after controlling for coping strategies and perceived support. Thus, with the present study we can say that being a member in a preparedness group may enhance growth. However, this result needs to be taken cautiously until future longitudinal studies focusing on the benefits of being a volunteer are conducted. In Turkey, non-profit voluntary organizations are not so common and there has been a vast increase in their number only since the 1999 earthquake (Jalali, 2002). Thus, the area has the potential of providing a rich medium for the investigation of the characteristics of individuals who join and the changes that occur over time in their coping strategies, social support and other psychological variables. Overall, this study is the first of its kind examining the benefits of being a member of non-profit voluntary organizations after an earthquake. Future longitudinal studies, taking into account the type of voluntary work and the degree of active engagement (starting at the time of joining such organizations) are urgently needed.

References


growth in women living with HIV/AIDS. *Social Science and Medicine, 51*, 1543-1554.


