ERPA 2014

Determination and evaluation of effects of earthquake on school age children’s (6-12 years old) behaviours

Bedriye Ak*  

*Department of Nursing, Abant Izzet Baysal Universit, Bolu Health School, Bolu/ 14280,Turkey

Abstract

This study was performed to determine and evaluate the effects of earthquake on school age children’s behaviours. Total 420 children from five primary school were covered by the survey. The data were obtained from a questionnaire which was prepared by taking expert opinion and examining related literature. Children’s 49.0 % consisted of girls and children’s 51.0 % consisted of boys. The mean age of the children is 9.05 ± 1.42. That all of the children had experienced at least once, in addition to this nearly half of the children’s houses and more than half of the children’s schools had damaged was learned. That the earthquake had affected almost all of the girls’ and boys’ experiences were stressed, besides it was seen statistically found significant among boys. That the earthquake affected children’s daily life activities were determined; furthermore it was seen that some post-traumatic stress disorder findings were higher in girls when compared to boys. When more than half of the children remembered the earthquake it was found that they felt fear, nearly half of them did not know the reason of earthquake and a great majority of them had happy and living together expectations from the future.

Keywords: disaster, earthquake, children, post traumatic stress disorder, traumatic event

1. Introduction

Earthquakes, the most tremendous and devastating of all natural disasters, significantly affect urban superstructure and its residents and cause substantial damage and casualties. Turkey is situated on the crossroads of important fault lines and earthquakes that occur in Turkey take up 23% of all earthquakes in a year around the world.
(Ütük 2000). 96% of Turkey stands on great seismic zones ranked at the top four scales, which increases the risk of severe disasters (Balta, 1998; Atabey, 2000).

Natural disasters like earthquakes also create an unexpected trauma for children, which eventually results in emotional disorders and radical changes in lifestyle and habits of children. Each child perceives and responds to such a traumatic experience in their own way, in other words, children are affected by earthquakes differently (Margolin, Ramos & Guran, 2010). Their reactions differ from each other; while some demonstrate behavioral changes, some others may pretend to ignore what has happened for days, weeks, and even months and finally come up with problem behaviours (Ergen 2009).

Children might report depression, anxiety, behavioural problems, and post-traumatic stress disorder (PTSD) after earthquakes (Şahin, Batigün & Yilmaz, 2007; Giannopoulou, Dikaiaakou & Yule, 2006). It has been noted that the proportion of post-traumatic stress disorder complaints rose to 42% among all quake related complaints in outpatient clinics within the first six months after the Marmara earthquake (Sabuncuoğlu, Ebrinç & Çetin 2000). The recent studies additionally provided substantial evidence on the increase in panic, depression, and post-traumatic stress disorder among children and adolescents after earthquakes (Salcıoğlu & Bașoğlu 2008).

Determining risk groups and predicting potential problems are elemental to plan educational programs about natural disasters. Children are the most vulnerable risk group in earthquakes. Rapidly expanding database on the responses of children and adolescents to natural disasters provides comprehensive reports on evidence-based interventions that will be instrumental to deal with children and adolescents who had a previous experience of trauma or natural disasters (American Academy of Child & Adolescent Psychiatry, 1998; La Greca & Silverman, 2009; Vickerman & Margolin, 2007; Salcıoğlu & Başoğlu, 2008).

This particular study was considered to generate a framework for health professionals and family and school circles in defining and intervening behavioural changes among 6-12 years old children and it was conducted to determine and evaluate the effects of earthquakes on school age children (6-12 years old).

2. Methodology

2.1 The sample group and the place of research

This study was designed as a descriptive study and its universe included 6-12 years old children who were attending a primary school in one of the provinces that was primarily affected by the Marmara earthquake in 1999. The study sample was composed of 6-12 years old children attending five different primary schools in the city center. The study was carried out with 420 children who were at school on the day of interviews and who consented to participate in the study. The children were chosen with disproportionate stratified sampling regardless of their sex and grade. The participant children had at least one earthquake experience and the study data were collected 13 months after the last earthquake experience.

2.2 Data collection instrument

The data collection form was developed by the researcher in accordance with the recent data. The first section of the form included questions enquiring the socio-demographic characteristics of the child and their families. The second section included questions about child’s experiences during the earthquake and the third section included questions about the experiences following the earthquake. The data collection form was filled in by the researcher in a face to face interview with the child in a private room to ensure direct communication and to prevent interaction between children.

2.3 Data analysis

The study data were analysed with statistical package software and the data were evaluated with a chi square test to compare percentages and groups.
3. Results and Discussion

The study results indicated that 49.0\% of the participants were girls and 51\% of the students were boys and the average age was 9.05 \pm 1.42. All students in the study had at least one earthquake experience and almost half of
their houses and most of their schools were damaged in the quake. 76.5% of the children in the study lost their property, 12.2% of them were injured, 11.3% of them lost a family member or a relative. The primary response of the children towards earthquake was associated with physical pain and loss of lives (Sarp, 2000; Türk Psikologlar Derneği, 2000). Pynoos & Geonjian (1993) found that children who suffered more in the quake demonstrated more severe and violent reactions.

It has also been maintained that girls started crying during the earthquake while boys rushed out or ran towards a particular person. That the boys cried a little indicates a traditional code in Turkish society that crying is a sign of weakness for men. Self-protection behaviour for both sexes during the quake was found to be insufficient (girls 5.0%, boys 11.8%). Maida et. al. conducted a study with 7-13 years old children and reported that 30% of the children demonstrated self-protection behaviour (Maida, Gordan & Strauss, 1993). Considering that behaviour acquisition and development are much easier with education programs at earlier ages, it can be suggested that education programs about how to act during the earthquake are crucial to shape children’s behaviour.

The study results also indicated that children were concerned about their families, collapse of the building, and death. The priority of family may account for their dependence on their families. Similarly, the idea of death wasn’t their immediate concern probably because of the fact that young children don’t have well-developed abstract thinking skills at that age.

Table 1. The influence of the earthquake on children’s lives according to age and sex

<table>
<thead>
<tr>
<th>Influence of the earthquake</th>
<th>Age and Sex</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9 years old under</td>
<td>Female</td>
<td>Male</td>
<td>9 years old and above</td>
<td>Female</td>
<td>Male</td>
<td>Total*</td>
<td>Female</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>74(87.1)</td>
<td>70(85.4)</td>
<td>113(99.4)</td>
<td>125(94.7)</td>
<td>187(90.8)</td>
<td>195(91.1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>11(12.9)</td>
<td>12(14.6)</td>
<td>8(6.6)</td>
<td>7(5.3)</td>
<td>19(9.2)</td>
<td>19(8.9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>85(100.0)</td>
<td>82(100.0)</td>
<td>121(100.0)</td>
<td>132(100.0)</td>
<td>206(100.0)</td>
<td>214(100.0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Column percentage is taken

Female $X^2$: 2.389, Sd: 1, P > 0.05

Male $X^2$: 5.444, Sd: 1, P < 0.05

Table 1 shows that a majority of boys and girls in the study were greatly influenced by the earthquake and that most of these children were 9 years old and above, which may not be statistically significant for girls (p>0.05) while it is statistically significant for boys (p<0.05). It suggests that boys assume the roles and responsibilities of their fathers as the problem solver of their families.

Table 2. Symptoms of PTSD after the earthquake according to sex

<table>
<thead>
<tr>
<th>Symptoms of PTSD</th>
<th>Female Yes</th>
<th>Female No</th>
<th>Male Yes</th>
<th>Male No</th>
<th>Total* Yes</th>
<th>Total* No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Having dreams about the earthquake</td>
<td>152(53.5)</td>
<td>54(39.7)</td>
<td>132(46.5)</td>
<td>82(60.3)</td>
<td>284(100.0)</td>
<td>136(100.0)</td>
</tr>
<tr>
<td>Having nightmares</td>
<td>158(52.5)</td>
<td>48(40.3)</td>
<td>143(47.5)</td>
<td>71(59.7)</td>
<td>301(100.0)</td>
<td>119(100.0)</td>
</tr>
<tr>
<td>Being afraid of staying indoors</td>
<td>150(58.8)</td>
<td>56(33.9)</td>
<td>105(41.2)</td>
<td>109(66.1)</td>
<td>255(100.0)</td>
<td>165(100.0)</td>
</tr>
<tr>
<td>Being afraid of having another earthquake</td>
<td>136(50.7)</td>
<td>70(46.1)</td>
<td>132(49.3)</td>
<td>82(53.9)</td>
<td>268(100.0)</td>
<td>152(100.0)</td>
</tr>
<tr>
<td>Talking about the earthquake with their friends</td>
<td>151(55.7)</td>
<td>55(45.1)</td>
<td>147(49.3)</td>
<td>67(42.5)</td>
<td>294(100.0)</td>
<td>122(100.0)</td>
</tr>
<tr>
<td>Reluctance to join in games</td>
<td>100(57.5)</td>
<td>106(43.1)</td>
<td>74(42.5)</td>
<td>140(56.9)</td>
<td>174(100.0)</td>
<td>246(100.0)</td>
</tr>
<tr>
<td>Reluctance to go to school</td>
<td>32(60.4)</td>
<td>174(47.4)</td>
<td>21(39.6)</td>
<td>193(52.6)</td>
<td>53(100.0)</td>
<td>367(100.0)</td>
</tr>
<tr>
<td>Reluctance to communicate with people</td>
<td>74(48.7)</td>
<td>132(49.3)</td>
<td>78(51.3)</td>
<td>136(50.7)</td>
<td>152(100.0)</td>
<td>268(100.0)</td>
</tr>
<tr>
<td>Reluctance to play their favorite games</td>
<td>113(56.2)</td>
<td>93(42.5)</td>
<td>88(43.8)</td>
<td>126(57.5)</td>
<td>201(100.0)</td>
<td>219(100.0)</td>
</tr>
<tr>
<td>Having sleeping difficulties</td>
<td>166(55.7)</td>
<td>40(32.8)</td>
<td>132(44.3)</td>
<td>82(67.2)</td>
<td>298(100.0)</td>
<td>122(100.0)</td>
</tr>
<tr>
<td>Having difficulties in understanding lessons at school</td>
<td>206(49.2)</td>
<td></td>
<td>213(50.8)</td>
<td>1(100.0)</td>
<td>419(100.0)</td>
<td>1(100.0)</td>
</tr>
<tr>
<td>Being disturbed with sudden noises and sounds</td>
<td>179(56.1)</td>
<td>27(26.7)</td>
<td>140(43.9)</td>
<td>74(73.3)</td>
<td>319(100.0)</td>
<td>101(100.0)</td>
</tr>
</tbody>
</table>

* Column percentage is taken
Responses of children after earthquake may vary in relation to sex or age. Some responses of a school age child are avoidance, getting angry, self-reproach, behavioural changes, physical complaints, and regression. Significant PTSD findings have been reported among children. Many recent studies showed that children and adults with an earthquake experience had symptoms of post-traumatic stress disorder even 6-18 months after the disaster (Azarian & Skripchenko-Gregorian, 1998; Bradburn, 1991; Lipovsky, 1991; Maida, Gordan & Strauss, 1993; Najarian & Geonjian, 1996; Pynoos & Geonjian, 1993). Children in our study also indicated symptoms of PTSD 13 months after the earthquake, which complied with the results of previous studies.

It was found that girls had certain PTSD symptoms more often than boys such as having dreams about earthquake, being afraid of staying indoors, being disturbed with sudden noises and sounds, having sleeping difficulties, reluctance to go to school and join in games. On the other hand, certain PTSD findings were more frequently reported among boys like reluctance to communicate with other people or difficulties in understanding lessons at school. Additionally, results of the relevant studies also confirmed that girls had symptoms of PTSD more often (Şalcıoğlu & Başoğlu, 2008; Ergen, 2009).

Psychosomatic problems of children after the earthquake occasionally include headache, nausea, stomach ache, fatigue and exhaustion, and enuresis. The most common psychosomatic problems were reported to be nausea, headache, stomach ache, and enuresis (Azarian & Skripchenko-Gregorian, 1998; Dede et al., 2001). While the study results suggested that girls experienced enuresis as much as boys, they certainly had much more headache, nausea, and stomach ache.

<table>
<thead>
<tr>
<th>Children’s feelings when recollecting the moment of earthquake</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fright</td>
<td>256 (61.0)</td>
</tr>
<tr>
<td>Death</td>
<td>151 (36.0)</td>
</tr>
<tr>
<td>Nothing</td>
<td>13 (3.1)</td>
</tr>
<tr>
<td>Total</td>
<td>420 (100.0)</td>
</tr>
</tbody>
</table>
It was further noted that 61% of the children were frightened when they recollected the moment of earthquake and 36% of them remembered death. In a relevant study conducted with children after the earthquake, it was reported that nearly half of the children (44.1%) were scared when they reflected back on the moment of the earthquake (Pynoos & Geonjian, 1993). A majority of children maintained that they hoped they would lead a happy life together with their family and friends and it was especially noted that these expectations didn’t significantly differ in regard to age or sex (p>0.05). The results of recent studies suggested that children felt insecure after the earthquake and therefore they would be pessimistic about future, which was found to be a common reaction among adults as well (Stuvland et.al, 2000; Türk Psikologlar Derneği, 2000). One of the expectations of children was that they hoped to have a life without the danger of earthquakes. However, given the impossibility of the case, children’s hope of a happy life all together with their family and friends can be said to reflect their desire to minimize the effects of earthquakes in their lives.

4. Conclusions and Recommendations

The results of the study pointed out that children were greatly influenced by their experiences with earthquake, which could vary according to age and sex of children. Suggestions to minimize those effects are as following:
- carrying on the daily routines of children and planning activities like drama, painting, storytelling, and excursions
- educating children to ensure earthquake preparedness and maintaining organized, applicable, and intermittent education programs
- educating families and friends about behavioural changes and problems that children may encounter as well as coping with post traumatic complaints.

Acknowledgements

I would like to thank my thesis supervisor Prof. Dr. Feray GÖKDOĞAN who has guided me in execution of this study.

References