

THE IMPACT OF EARTHQUAKES ON CHILDREN'S LANGUAGE AND SPEECH DEVELOPMENT: THE CASE OF THE FEBRUARY 6, 2023 EARTHQUAKE

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ABSTRACT

This study aims to evaluate the impact of earthquakes on the language and speech development of children. Traumatic effects of earthquakes on children may negatively influence language acquisition and speech development. The stress and insecurity experienced during such disasters can lead to delays or disorders in children's language learning abilities. Our research was conducted in the cities of Malatya, Adiyaman, Kahramanmaraş, and Hatay, which were affected by the earthquake centered in Kahramanmaraş on February 6, 2023. A total of 145 children receiving speech and language therapy were included in the study. A 25-question survey was administered to gather sociodemographic data and evaluate earthquake-related changes in language and speech abilities. While 60% of participants believed their child's language development regressed after the earthquake, 32.4% did not observe any regression. Communication with the child increased in 73.2% of families, while 11.7% reported no change. A lack of self-confidence was observed in 53.1% of children, and 26.9% did not exhibit any notable difference. Among children, 58.6% were described as understanding events and asking questions, while 29.7% did not. Use of earthquake-related vocabulary in peer communication increased in 63.4% of children. The ability to express emotions through language was negatively affected in 55.1% of cases, and 73.1% of parents observed the impact of stress on language development. Children with speech and language disorders living in disaster zones were evidently affected by this crisis. Disruptions in both psychological and educational processes resulted in psycholinguistic impairments. This study emphasizes the necessity for support mechanisms and targeted interventions to mitigate these effects.

INTRODUCTION

Childhood is one of the most sensitive developmental periods in which cognitive, social, and linguistic skills are established. Environmental, psychosocial, or traumatic experiences during this stage can lead to long-lasting developmental consequences. Language and speech development are especially critical as they are directly tied to interaction, emotional expression, and social adjustment.

Language and speech are essential communication skills that allow children to express themselves and build healthy relationships with their environment. Any disruption during this critical early childhood phase can have adverse effects on overall development. Speech and language disorders are defined as delays or abnormalities in acquiring, comprehending, or

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producing language appropriate for the child's age and developmental level. These disorders can deeply impact academic performance, social relations, and psychological well-being.

Studies report that 5–10% of preschool-aged children experience speech and language disorders (Law, Boyle, Harris, Harkness & Nye, 2000). These rates are reported to be higher among children exposed to traumatic life events. Major traumas like natural disasters can undermine a child's sense of safety, leading to chronic stress, regression behaviors, and communicative withdrawal (Pynoos, Steinberg & Piacentini, 1999). These experiences may disrupt core elements of language development, including social interaction, emotional sharing, and participation, thereby triggering or exacerbating developmental language disorders (Eigsti & Cicchetti, 2004).

The earthquakes that struck southeastern Türkiye on February 6, 2023, with Kahramanmaraş as the epicenter, caused immense physical and psychosocial devastation. Thousands of children were exposed to life-threatening conditions either directly or indirectly. For children already diagnosed with speech and language disorders, the consequences of such trauma are presumed to be multifaceted.

Accordingly, the aim of this study is to determine how the earthquakes affected the language development and communicative skills of children with pre-existing speech and language disorders. This investigation seeks to contribute to post-trauma intervention planning and the reassessment of speech-language therapy strategies.

MATERIAL AND METHOD

Research Setting and Participants

This study was conducted in the provinces of Malatya, Adıyaman, Kahramanmaraş, and Hatay, which were directly affected by the February 6, 2023 earthquakes. The sample consisted of 145 parents of children aged 3–12 who had been previously diagnosed with speech and language disorders and were currently undergoing therapy. A structured questionnaire comprising 25 items was administered to the participants to evaluate earthquake-related disruptions in speech and language development, along with sociodemographic data.0 pt before and after, justified. 1 cm indent. Only 10 pt should be added after the last line.

Data Collection Tools

Initially, a 40-item questionnaire was developed for the study. Following expert review by three specialists, the final version consisted of 25 items. A pilot test was conducted to ensure clarity and reliability. The questionnaire covered five core domains: (1) regression in language

development and parental observations, (2) behavioral and psychological changes, (3) family communication and support, (4) adaptation and continuity in rehabilitation, and (5) trauma-related linguistic manifestations. Informed consent forms were obtained from all participants.

Data Analysis

The data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics, including frequency and percentage distributions, were used to summarize the data. Cross-tabulations were employed when necessary to explore relationships between participants' demographic characteristics and observed changes in their children's linguistic and communicative development. The internal consistency of the questionnaire was assessed using Cronbach's Alpha to ensure reliability. Findings were interpreted in accordance with the research objectives.

Limitations of the Study

Important limitations of this study include the fact that the forms were filled out by parents, the child was not directly evaluated, and the number of patients was relatively small.

Ethical Aspects of the Research

Ethical approval (2025/6294) was obtained from İnönü University Social and Human Sciences Scientific Research and Publication Ethics Committee.

RESULT

When the socio-demographic data were analyzed, the majority (61.4%) of the parents who participated in the study were male, and the highest participation was from Kahramanmaraş (34.5%). Most of the children (44.1%) had 2-3 siblings. While 75.9% of mothers were not working, 88.3% of fathers were working. Most families live in apartments (56.5%), while 19.3% live in containers and 2.8% live in tents. 31.7% of the participants were university graduates and 51.7% declared an income above the minimum wage. 42.8% of the children have additional disabilities.

These data show that the negative effects observed in children's language development after the disaster are closely related to factors such as living conditions, socioeconomic level and disability status. The importance of supportive rehabilitation increases especially for children with temporary shelter conditions and additional disabilities.

Table 1. Distribution of Descriptive Characteristics of Participants

		n	%
Gender	Male	89	61.4
	Female	56	38.6
Cities	Malatya	43	29.7
	Adiyaman	29	20
	Kahramanmaraş	50	34.5
	Hatay	23	15.9
Number of Siblings	No brother or sister	33	22.8
	1	25	17.2
	2-3	64	44.1
	Brother-sister over 4	22	15.2
Working Mother	Yes	35	24.1
	No	110	75.9
Working Father	Yes	128	88.3
	No	17	11.7
Place of Stay	Apartment	58	56.5
	Village house	31	21.4
	Container	28	19.3
	Tent	4	2.8
Education Status (The surveyed parent)	Primary School	36	24.8
	Middle School	32	22.1
	High School	31	21.4
	University	46	31.7
Financial Status	Below minimum wage	24	16.6
	Minimum wage	46	31.7
	Above minimum wage	75	51.7
Additional barrier	Yes	62	42.8
	No	83	56.6

The values of 13 questions of high significance from the 25-question form are shown in Table 2.

Table 2. Distribution Results of the Questions with High Significance Level of the Applied Questionnaire

Questions	1	2	3	4	5
	%	%	%	%	%
1. After the earthquake, my child's language development regressed.	8.3	24.1	7.6	46.9	13.1
2. After the earthquake, my child had to return to the subject of rehabilitation.	7.6	24.8	13.1	41.4	13.1
3. I observed more irritability in my child after the earthquake.	8.3	22.8	14.5	36.6	17.9
4. After the earthquake, my child understood and could answer the questions I asked.	2.1	20	17.2	46.2	14.5
5. After the earthquake, my child adapted and continued rehabilitation.	2.1	20	15.2	49.7	12.4
6. I spent more time with my child during the earthquake.	0.7	15.9	9.7	57.9	15.2
7. My communication with my child increased more after the earthquake	1.4	10.3	15.2	56.6	16.6
8. I observed a lack of self-confidence in my child during the earthquake.	6.2	20.7	20	42.8	10.3
9. In the sentence my child formed after the earthquake	6.2	29.7	13.8	41.4	9
10. After the earthquake, I observed an increase in earthquake-related words when my child communicated with his/her peers	2.1	26.2	8.3	44.1	19.3
11. After the earthquake, your child's ability to express his/her emotions using language skills was negatively affected.	4.8	21.4	18.6	44.1	11

12. I observed the effect of stress on your child's language development after the earthquake.	1.4	13.8	11.7	55.9	17.2
13. After the earthquake, I think it had an effect on your child's language development.	4.1	20.7	18.6	39.3	17.2

According to Table 2;

1. Regression in Language Development and Observations

More than 60% of the participants stated that they noticed various negativities in their children's language development. In particular, the total number of respondents who agreed with the statement “After the earthquake, my child's language development declined” (46.9% “agree”, 13.1% “strongly agree”) is above 60%. In addition, 55.2% of the respondents agreed that their children needed to restart rehabilitation. These findings suggest that trauma can cause linguistic regressions.

2. Behavioral Changes and Psychological Effects

More than 54.5% of the participants stated that they observed increased irritability in their children and 53.1% stated that they noticed a lack of self-confidence in their children. These data indicate that the psychological state of children after the earthquake may indirectly affect language development. Moreover, 62.1% of the respondents agreed with the statement “Your child's ability to express their emotions using language skills was negatively affected after the earthquake”, indicating that their emotional expression skills were also shaken.

3. Family Communication and Support

Especially the high rate of participation in the statements “I spent more time with my child during the earthquake” and “My communication with my child increased more after the earthquake” (57.9% and 56.6%) shows that families try to support their children by spending more time with them. This emphasizes the role of parental support in the recovery of children after trauma.

4. Compliance and Continuity in Rehabilitation

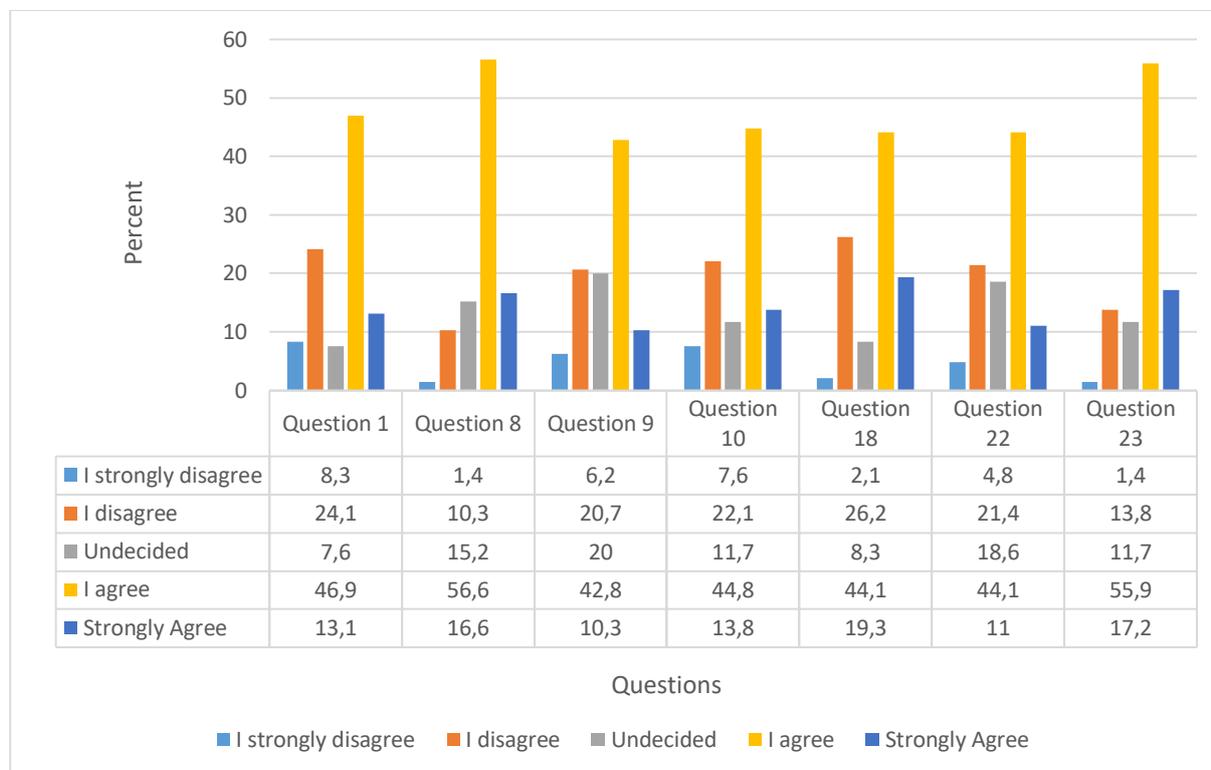
62.1% of the participants stated that their children adapted to rehabilitation. This positive finding shows that with the support of the families, children were able to adapt to the therapy process again.

5. Posttraumatic Linguistic Symptoms

In the survey, 63.4% of the respondents said, “After the earthquake, I observed an increase in words related to the earthquake when my child communicates with his/her peers”.

This situation reveals that trauma has a significant impact on children's word choices and expression styles.

Table 3. Results of the Most Impactful Survey Questions



Question 1: After the earthquake, our child's language development regressed, Question 8: After the earthquake, my communication with my child increased more, Question 9: I observed a lack of self-confidence in my child during the earthquake, Question 10: During the earthquake, my child understood the events and asked questions, Question 18: After the earthquake, I observed an increase in words related to the earthquake when my child communicated with his/her peers, Question 22: After the earthquake, your child's ability to express his/her emotions using language skills was negatively affected, Question 23: I observed the effect of stress on your child's language development after the earthquake.

The survey responses of the participants revealed that there were various changes in children's linguistic, emotional and social communication after the earthquake:

Language Development: 60% of the parents stated that their children's language development regressed after the earthquake. 32.4% did not observe any change in this direction.

Frequency of Communication: 73.2% stated that their communication with their children increased. The rate of those who stated that there was no change was 11.7%.

Self-confidence Observation: 53.1% of parents reported that they observed a lack of self-confidence in their children.

Asking and Understanding Questions: 58.6% reported that children tried to understand the events and asked questions.

Use of Earthquake Related Words: 63.4% reported an increase in earthquake-related words in peer communication.

Capacity for Emotional Expression: 55.1% stated that their children's ability to express their emotions verbally was negatively affected.

Impact of Stress: 73.1% of parents reported that they observed negative effects of stress on language development.

DISCUSSION

Times The findings of this study revealed that negative effects were observed in communication, language development and social-emotional skills of children diagnosed with speech and language disorders after the 6 February 2023 Kahramanmaraş earthquake. When the findings are evaluated both quantitatively and qualitatively, it is seen that the results such as regression in language development, weakening in social interaction and difficulty in verbalising emotions are directly related to the traumatic process (Bates, 2024).

Sixty per cent of the participants stated that they observed regression in language development in their children. This rate supports the effects of post-disaster stress on cognitive functioning and especially on language (Rupert, & Bartlett, 2022). Children's impairments in memory, attention and executive functions after traumas may directly affect language learning negatively (Cohen, Mannarino, & Deblinger, 2006). In addition, since language development depends on a sense of emotional security and healthy interaction with the social environment, changing living conditions after disasters interrupt children's linguistic development (Coster & Cicchetti, 1993).

73.1% of the participants stated that stress had an effect on their children's language development. This is consistent with the literature on how the changes caused by trauma in the frontal cortex and limbic system affect communication and expression skills at the neuropsychological level (Anda et al., 2006; Perry, 2009). It has been shown that especially traumas experienced at an early age can cause permanent structural and functional changes in the language centres of the brain (De Bellis et al., 2002).

The mothers of most of the parents who participated in the survey were not working (75.9%) and undertook the responsibility of care. Mothers' communication with the child in the posttraumatic period may be decisive in the child's recovery process. The role of mothers is critical in the development of emotional regulation, trust building and expression skills (D. E. Sperry, & L. L. Sperry, 2018).

A significant proportion (42.8%) of the children in the research group had additional disabilities. This increases sensitivity to trauma and makes the need for intervention more complex. Children with special needs are more affected by loss of routine, social isolation and

emotional breakdowns due to trauma, which leads to serious regressions in language development (Bilik & Akdağ, 2023; Emerson, 2004).

According to the findings of the study, 63.4% of the children started to use earthquake-related words more frequently in peer communication. This observation shows that children express the trauma they have experienced through language. Verbal expression of traumatic events plays a healing role in children's meaning-making and coping processes (van der Kolk, 2014). At the same time, this expression is a developmental necessity for the integration of trauma (Terr, 1991).

Post-traumatic language regressions can also become more permanent when combined with environmental factors such as disruption of educational environments and limitation of social interaction. Temporary shelter conditions (containers, tents, etc.) cause children to be deprived of symbolic games and communication practices due to lack of stimuli (Aykaç, Akdaş, Leblebiciler & Meral, 2024).

CONCLUSION

Overall, the results reveal that children with speech and language disorders living in disaster-affected areas are significantly influenced by both environmental and psychosocial variables. Integrating psychological support with individualized speech-language therapy could enhance developmental outcomes for these children. Moreover, family-centered and environmentally supportive intervention strategies should be systematically included in post-disaster policies.

This study reveals that large-scale disasters such as earthquakes have a detrimental impact on children's language development. It was particularly observed that children with pre-existing speech and language disorders were more vulnerable during this process. Therefore, the following measures are recommended to mitigate these negative effects and support recovery:

- **Development of Multidisciplinary Support Systems:**

Multidisciplinary approaches should be implemented for children affected by trauma, incorporating psychological, educational, and linguistic support services.

- **Parental Education and Support Programs:**

Training and guidance should be provided to families, especially caregivers, to enhance their role in supporting children's language development post-trauma.

- **Inclusion of Speech and Language Therapists in Disaster Management Plans:**

Speech-language pathologists should be actively integrated into disaster preparedness and response strategies to ensure timely and effective rehabilitation.

• Expansion of Trauma-Informed Language Interventions for Early and School-Age Children:

Targeted intervention models focusing on language-based trauma recovery should be widely promoted in both preschool and school settings.

These findings highlight the necessity of early, targeted, and integrated intervention plans that address the unique needs of children with communication difficulties in disaster-affected areas. Future policies and rehabilitation programs should emphasize continuity of care, individualized therapy, and community-based support to foster resilience and developmental progress.

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