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Preschool Children's Perceptions of The Concept of Earthquake: A Metaphor Analysıs

Okul Öncesi Dönem Çocuklarının Deprem Kavramına İlişkin Algıları: Bir Metafor Analizi

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Abstract: Natural disasters constitute profoundly disruptive phenomena that exert severe psychological and social consequences, with children representing one of the most vulnerable groups to such traumatic experiences. The principal aim of this study is to investigate how children conceptualize earthquakes and examine the affective and cognitive dimensions of their responses through metaphoric expressions. We conducted this research with a sample of seventy-two children, aged between forty-eight and seventy-two months, enrolled in preschools in Ankara during the 2023–2024 academic year. We collected the data through the "Earthquake Metaphor Analysis Form," a research instrument designed and validated by the investigators for this study. We presented semi-structured prompts embedded within the form to children and documented their responses verbatim. We subsequently subjected the resulting corpus of data to descriptive and content analyses, with particular attention to categories such as colors, musics, animals, plants, seasons, emotions, and temporal constructs. We observed that children most frequently associated earthquakes with earth tones and colors that conveyed death and fear, particularly red and black. When we analyzed their responses concerning music, we found that children often expressed the idea that earthquakes represent "different music" or that "earthquake is not music." In the category of animals, we observed that children most commonly compared earthquakes to "wild animals." When considering plants, we identified that children frequently described earthquakes as "grass." Regarding seasons, we noted that children most often likened earthquakes to "winter." Regarding emotions, we observed that children primarily associated earthquakes with negative feelings such as fear, anger, and sadness, though some children also connected the experience to "happiness." Finally, in the temporal domain, we found that children most often described earthquakes in relation to "daytime." Our findings demonstrate that children construct metaphoric associations between earthquakes and negative emotions, framing the event as a frightening experience.

Keywords: Preschool, Children, Earthquake, Metaphor, Perception

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Öz: Doğal afetler, özellikle çocuklar üzerinde travmatik etkilere yol açabilen yıkıcı olaylardır. Çocukların depremi nasıl anlamlandırdıklarını, bu olayla ilgili duygularını ve düşüncelerini metaforlar aracılığıyla ortaya koymak çalışmanın temel hedefidir. Araştırma, 2023-2024 eğitim öğretim yılında Ankara ilinde 48-72 aylık yetmiş iki çocukla gerçekleştirilmiştir. Veri toplama aracı olarak araştırmacılar tarafından geliştirilmiş olan "Deprem Metafor Analizi Formu" kullanılmıştır. Çocuklara formda yer alan yarı yapılandırılmış sorular yöneltilmiş ve verilen cevaplar aynen kaydedilmiştir. Elde edilen veriler renkler, müzikler, hayvanlar, bitkiler, mevsimler, duygular ve zaman kavramları kullanılarak betimsel analiz ve içerik analizi yöntemiyle değerlendirilmiştir. Çocukların depremleri en sık toprak tonları ve özellikle kırmızı ve siyah gibi ölüm ve korkuyu çağrıştıran renklerle ilişkilendirdiği görülmüştür. Müzikle ilgili tepkileri incelendiğinde, çocukların sıklıkla depremlerin "Farklı bir müzik" olabileceği görüşünü ya da "Deprem müzik olmaz" fikrini belirttikleri görülmüştür. Hayvanlar kategorisinde çocukların depremi "Vahşi hayvanlar" olarak belirttikleri ortaya konulmuştur. Bitkiler söz konusu olduğunda ise çocukların depremleri "Çim" olarak tanımladığı tespit edilmiştir. Çocuklar, depremi en çok "Kış" mevsimine benzetmiştir. Duygular konusunda ise çocukların depremi öncelikle "Korku, öfke ve üzüntü" gibi olumsuz duygularla ve "Mutluluk" duygusu ile ilişkilendirdikleri görülmüştür. Son olarak, çocukların depremi en fazla "Gündüz" ile ilişkilendirdikleri ortaya konulmuştur. Araştırma bulguları, çocukların depremi genellikle olumsuz duygularla ilişkilendirdiğini ve bu olayı korkutucu bir deneyim olarak algıladığını göstermektedir.

Anahtar Kelimeler: Okul Öncesi, Çocuk, Deprem, Metafor, Algı

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1. INTRODUCTION

In the natural environment, we encounter various phenomena throughout the day. While many of these occurrences pose no direct threat to humans, we classify them as disasters when they cause harm to individuals or the surrounding environment (Tekin & Dikmenli, 2021). Disasters profoundly affect societies because they disrupt or even halt the ordinary rhythm of daily life and human activity (Ergünay, 2007).

Among sudden-onset natural disasters, we recognize earthquakes (AFAD, 2025) as seismic waves generated by the release of energy in the earth's crust, which subsequently manifest as ground tremors (Edemen, Okkay, Tuğrul, Kurt, Bircan, Yoldaş, Güzel & Aslan, 2023). Because our country lies along some of the world's most significant fault lines, we experience severe earthquakes as recurring events (Özcan Araç & Ateş Duru, 2021). These earthquakes have left an indelible mark in recent years, devastatingly impacting residential areas and industrial activities (Yolcu & Bekler, 2020).

Natural disasters also constitute events with the potential to inflict deep psychological trauma (Çakar, 2021, p.3). Earthquakes, in particular, qualify as traumatic experiences because of their far-reaching social and individual impacts (Yelboğa, 2023). Given their severity, such experiences may lead to posttraumatic stress disorder (PTSD), a clinically recognized psychological condition (Gordon, Farberow & Maida, 1999, p.117; Bateman & Danby, 2013).

Children represent one of the most vulnerable groups in the face of earthquakes (Tuncer, Sözen & Sakar, 2021). Their heightened susceptibility stems from critical competencies—such as taking safety precautions, perceiving hazards, and seeking help—that remain underdeveloped during childhood. As a result, children are particularly prone to experiencing adverse outcomes after traumatic events (Çakar, 2021, pp.14–15). For example, Ak (2014) investigated the behavioral effects of earthquakes on school-aged children and found that children were strongly shaped by their earthquake-related experiences.

The degree of negative impact children endure depends on several interrelated factors, including the magnitude of physical destruction, the loss of close relatives, the availability of social support, and demographic variables such as age or gender (Tuncer, Sözen & Sakar, 2021). Because disasters also overwhelm families and social institutions, adults may lack the capacity to provide children with the necessary physical or psychological support (Cornelli Sanderson, Gross, Sanon, & Janairo, 2016). Consequently, children may suffer distress not only from their parents' inability to provide comfort and the terror of the event itself but also from disruptions in daily routines, the reactions of adults, and the painful reality of losing significant figures in their lives (Margolin, Ramos & Guran, 2010). Proctor, Fauchier, Oliver, Ramos, and Margolin (2007), in a study conducted in Los Angeles, demonstrated that children's responses to earthquakes and other sudden natural disasters were shaped both by the quality of parent–child relationships prior to the event and by parental reactions afterwards. In this regard, children's emotional responses are essential: they help them process what has happened and reestablish psychological equilibrium (Veenema & Schroeder-Bruca, 2002).

The consequences of earthquakes for children can be examined under two categories: emotional and behavioral responses. It should be emphasized that these reactions vary according to the child's demographic characteristics and the intensity of the trauma experienced. The primary emotional response observed in children following an earthquake is heightened anxiety and fear, often triggered by aftershocks or the anticipation of another earthquake. Such responses may lead to panic attacks, excessive anxiety, and sleep disturbances. A second emotional reaction, particularly among children who are displaced from their homes or who have lost relatives, is grief, expressed through crying, social withdrawal, silence, or reluctance to engage in play. A third emotional outcome is the emergence of anger and irritability, evident in aggressive behaviors, difficulty concentrating, and restlessness (Szente, 2018, pp.1–8).

Behavioral reactions to earthquakes among children can be grouped into four main categories:

1. Regressive behaviors – re-emergence of previously outgrown behaviors, such as thumb-sucking or bed-wetting.
2. Sleep disturbances – difficulty initiating sleep, night sweats, and frequent nightmares.
3. Concentration difficulties – symptoms such as distractibility and compulsive behaviors.
4. Social withdrawal – avoidance of peers and reluctance to participate in social interactions.

In terms of long-term consequences, as previously noted, PTSD may develop following traumatic events, significantly impairing daily functioning. Additional long-term outcomes in children may include depression, anxiety, diminished self-esteem, deficits in social skills, and declines in academic performance (Gordon, Farberow & Maida, 1999, p.117).

When addressing the needs of children affected by earthquakes, we identify the most fundamental intervention as providing a nurturing and secure environment. To help children cope with traumatic circumstances, adults must remain composed and behave consistently in their interactions. We further recommend that children be given opportunities to articulate their emotions through play and creative activities, supported by structured intervention programs designed for this purpose. Adults should listen to and validate children's emotions while delivering accurate, developmentally appropriate information. In addition, we emphasize the importance of reestablishing children's daily routines, particularly within the home and school settings (Kısaç & Öğretir, 2001).

We note that overcoming trauma becomes more difficult when children experience bereavement, constant exposure to distressing images in the media, or the psychological burden of belonging to a traumatized community (Aker, 2012). In this sense, trauma influences the individual and the broader social environment to which the individual belongs (Shaw, Espinel & Shultz, 2012). We observe that stress manifests differently in young children than in adults, mainly because children lack the linguistic and cognitive capacity to fully articulate their feelings (Margolin, Ramos & Guran, 2010). Kinoshita and Woolley (2015) show that the psychological sequelae of disasters, such as earthquakes, often appear in children's play behaviors, where catastrophic events emerge as recurring themes.

As we emphasized earlier, earthquakes affect not only directly impacted populations but also individuals residing outside the affected regions, creating indirect psychological consequences (Işıklı & Tüzün, 2017). For example, Karaırmak and Aydın (2008) found no significant difference in earthquake-related fears between children who experienced the disaster firsthand and those who did not. They interpret this finding as evidence that children outside the disaster zone also suffer secondary trauma through indirect exposure. From this perspective, natural disasters, human-induced catastrophes, and armed conflicts generate widespread or "mass" trauma among children and adolescents. We see that millions of children worldwide endure such mass trauma, whether through direct victimization or indirect exposure (Chrisman & Dougherty, 2014). We can situate this dynamic within Bronfenbrenner's ecological systems framework. Bronfenbrenner argues that individuals interact with environmental factors from the earliest stages of life, and we recognize that psychological development is shaped by the multiple environmental systems in which individuals are embedded (Bronfenbrenner, 2004). These influences extend from proximal contexts of direct interaction to more distal, macro-level cultural systems that exert indirect yet consequential effects (Bronfenbrenner & Morris, 2006). Within this framework, we interpret the February 6, 2023, earthquake in Kahramanmaraş and surrounding provinces as an event that not only inflicted direct harm on affected populations but also reverberated across society as a whole (Bıçakçı & Okumuş, 2023).

Metaphor

Perception refers to how individuals interpret stimuli reaching their sensory organs by attributing meaning to them. The primary function of perception is to comprehend the phenomena within the universe (Frostig & Maslow, 1973; cited in Akaroğlu & Dereli, 2012). Within this framework, the term metaphor, derived from the Greek metapherein (Levine, 2005), denotes an individual's mode of seeing and apprehending the world (Girmen, 2007). As a powerful mechanism of mental mapping and modelling, metaphors constitute an important methodological tool for uncovering insights into individual perceptions (Arslan & Bayrakçı, 2006, p.103). For example, early childhood education was likened to a tree in a study conducted with preservice preschool teachers. The participants explained: "The foundations of life are laid for children for the first time. If we neglect the tree when we first plant it and fail to give it the necessary care, it will wither in the future" (Ertürk-Kara, 2014, p.111).

Metaphors not only facilitate and sustain creative thought (Girmen, 2007; Özsarı & Öğretir-Özçelik, 2021) but also provide opportunities for the articulation of emotions and ideas (Girmen, 2007; Akar & Öğretir-Özçelik, 2017). In education, they enable teachers to construct comparisons, emphasize similarities, and explain concepts by substituting one phenomenon for another (Ertürk-Kara, 2014, p.111). Social psychologist Gergen (1982) underscored the significant functions of metaphor in processes of social change, particularly in the aftermath of disasters. He argued that metaphors possess the capacity to reshape individuals' understandings of their social environment and, in doing so, hold transformative power over their lives. Accordingly, metaphors may be employed in post-disaster contexts such as reconstruction. In this respect, metaphors can be regarded as providing distinctive cognitive and social benefits.

During the preschool years, children tend towards concrete modes of thinking (Piaget, 1951, as cited in Aydın, 2016, pp.45–47). Piaget (1962) observed that children can differentiate between the real and the unreal by approximately age four, thereby attaining the capacity to produce and comprehend metaphors. Through metaphor, children may articulate their perspectives by traversing a cognitive path from the known to the unknown, while simultaneously employing creativity. This process clarifies their perception of earthquakes and, in turn, may assist them in developing the capacity to respond adaptively to such events (Aküzüm, Aküzüm & Dervişoğlu, 2024).

Studies on earthquake-related metaphorical perceptions reveal a range of insights. For instance, Baytiyeh and Öcal (2016) compared the earthquake perceptions of high school students in Lebanon and Turkey, demonstrating statistically significant differences in how schools implemented disaster risk education. Both groups, however, exhibited a firm adherence to fatalistic beliefs. Similarly, Karabey and Aras (2022), in a study of 490 university students enrolled in Disaster Management and First Aid programs, examined 458 earthquake-related metaphors and identified seven principal conceptual categories: fatal, bridge, enemy, punitive, domino, irresistible, and suffocating. In another study, Kahraman et al. (2023) surveyed 164 teachers from 11 provinces affected by the February 6 earthquakes. The teachers employed 65 metaphors related to earthquakes, 74 related to the future, and 86 related to the home. The earthquake metaphors clustered into three overarching categories: "like doomsday," "despair," and "catastrophe." In a separate investigation, Değirmenci (2019) reported that prospective classroom teachers generated 56 valid metaphors concerning natural disasters, the most common being apocalypse, destruction, death, catastrophe, and humanity.

Research on children's metaphorical perceptions spans multiple domains, including teachers (Karademir & Demirel, 2020), science and mathematics (Emen & Aslan, 2018; Solomon & Grimley, 2011), environmental issues (Ayvacı, Bülbül & Bebek, 2021), and earthquakes (Yılmaz & Arslan, 2023; Aküzüm, Aküzüm & Dervişoğlu, 2024; Izadkhah & Gibbs, 2015; Saatçi, Saatçi & Köstekçi, 2024). Distinct from prior work, the present study provided children with concrete categories and required them to engage in deeper levels of reflection.

Compared with adults, children in the preschool period frequently encounter difficulties in articulating their emotions and thoughts with clarity. At this developmental stage, they express situations that affect them—directly or indirectly—through diverse modalities. Within this context, this study seeks to contribute to the existing body of literature by uncovering, through children's own expressions, the meanings they attribute to the phenomenon of earthquakes.

1.1. Purpose

We anticipate that this study will provide a substantive contribution to the existing body of literature by offering insights into how the effects of earthquakes on children can be recognized and how their psychological and behavioral equilibrium, along with their daily routines, may be reconstructed (Gergen, 1982). Furthermore, we expect the study to yield practical implications for parents, educators, and researchers by offering perspectives on cultivating calm and consistent approaches in their interactions with children (Kısaç & Öğretir, 2001). The findings can also be valuable for developing intervention strategies and prospective disaster-focused educational programs. This research aims to examine and interpret the metaphors generated by preschool children in relation to the concept of "earthquake."

In accordance with this aim, we seek to address the following research questions:

1.2. Research Questions:

Preschool children aged 48-72 months:

1. What meaning do they attribute to earthquakes in the context of color?
2. What meaning do they attribute to earthquakes in the context of music?
3. What meaning do they attribute to earthquakes in the context of animals?
4. What meaning do they attribute to earthquakes in the context of plants?
5. What meaning do they attribute to earthquakes in the context of seasons?
6. What meaning do they attribute to earthquakes in the context of emotions?
7. What meaning do they attribute to earthquakes in the context of time?

2. METHOD

2.1. Research Model

This study adopted the phenomenological design within the qualitative research tradition. Phenomenology concentrates on phenomena that individuals recognize but have not yet examined with sufficient depth or precision. Through this approach, we aim to investigate experiences that are neither entirely unfamiliar nor fully understood, and we seek to uncover their underlying meanings and structures (Yıldırım & Şimşek, 2021).

2.2. Working Group

In forming the study group, we employed a convenience sampling strategy and determined the group size based on data saturation. Guest, Bunce, and Johnson (2006, p.79) argue that in many investigations designed to capture relatively homogeneous individuals' shared perceptions and lived experiences, as few as twelve interviews can be sufficient. Guided by this principle, we carried out the present study with seventy-two children between 48 and 72 months of age, enrolled in preschools in Ankara during the 2023–2024 academic year, all of whom belonged to a middle socioeconomic stratum and were recruited through convenience sampling. This approach offered efficiency and practicality, allowing us to conserve time and financial resources (Patton, 2002). Moreover, we selected convenience sampling because it facilitated direct access to participants and ensured their suitability for inclusion (Creswell, 2017, p.158). We considered data saturation to be achieved when the volume of information collected indicated that

we had reached an adequate number of sources and that the data were both comprehensive and complete (Glesne, 2020).

Table 1.

Gender Information of Children Participating in the Research

	Frequency	Percentage (%)	Valid Percentage (%)
Male	40	55,6	55,6
Female	32	44,4	44,4
Total	72	100,0	100,0

A total of 72 children participated in the study, 40 (55.6%) boys and 32 (44.4%) girls.

2.3. Limitations of the Study

The study was limited to 72 children who indirectly experienced the earthquake and attended a university kindergarten in Ankara.

2.4. Data Collection Tool

We employed the Earthquake Metaphor Analysis Form for data collection, which we developed specifically for this study. In designing the instrument, we first reviewed the relevant literature. We sought expert feedback from three specialists: a female Child Development and Education professor, a female practitioner in the field, and a female preschool teacher. We revised the form in light of their evaluations and finalized its structure.

Because children aged 48–72 months are known to encounter difficulties in abstract thinking (Piaget, 1951, as cited in Aydın, 2016, pp.45–47), we designed the questions to encourage them to express their feelings and thoughts about earthquakes through concrete categories familiar from daily life, such as colors, animals, and plants. Accordingly, during the data collection process, we asked the children the following questions:

- *If the earthquake were a color, what color would it be, and why?*
- *If the earthquake were a piece of music, what kind of music would it be, and why?*
- *If the earthquake were an animal, which animal would it be, and why?*
- *If the earthquake were a plant, which plant would it be, and why?*
- *If the earthquake were a season, which season would it be, and why?*
- *If the earthquake were an emotion, which emotion would it be, and why?*
- *If the earthquake were a period of time, which time would it be, and why?*

After each question, we posed a follow-up prompt—"Why?"—to elicit more detailed and reflective responses. As Saban (2008) argues, encouraging participants to frame their answers with the conjunction "because" ensures that they provide a logical rationale and justification for the metaphors they produce. We did not pressure the children to respond; instead, we recorded their answers verbatim to preserve the authenticity of their perspectives.

2.5. Analyzing the Data:

We analyzed the preschool children's responses using qualitative descriptive and content analysis. Descriptive analysis allowed us to summarize and interpret the data, while content analysis enabled a deeper examination, making it possible to explore the findings in greater detail possible. Content analysis integrates, organizes, and interprets similar data within the framework of concepts and themes, with the central objective of drawing precise conclusions from the information obtained (Yıldırım & Şimşek, 2018).

The analytic process unfolded in several stages. First, we compiled all metaphors generated by participants and provisionally organized them alphabetically. We then examined whether each child had articulated a clear metaphor. We excluded responses that were blank or that lacked a metaphor. At this stage, we coded each expressed metaphor simply and systematically.

Second, we revisited the metaphors and re-ordered them alphabetically. We selected representative metaphor statements for each category to facilitate categorization and ensure interpretability. We incorporated direct quotations from the children's responses to ensure validity and reliability—specifically credibility, consistency, confirmability, and transferability. Transferability was supported by providing detailed descriptions of the research process. For dependability and consistency, both researchers analyzed the data independently and then jointly, reconciling their interpretations (Lincoln & Guba, 2013). Through this iterative process, we identified common categories and codes. We also developed a word-concept framework to further structure the evaluation.

To reinforce the reliability of the study, we sought expert consultation to determine whether the metaphors aligned appropriately with the seven conceptual categories. We engaged three experts: a female Child Development and Education professor, a female practitioner in the same field, and a female preschool teacher. Based on this process, we identified seven conceptual categories: color, music, animal, plant, season, emotion, and time. The lists of metaphors and categories, prepared by the researchers, were reviewed independently by both researchers and the external expert. We then compared the categorizations made by the researchers with those produced by the expert. We calculated agreement and disagreement rates and assessed reliability using Miles and Huberman's (1994) formula (Reliability = agreement / [agreement + disagreement]). These authors say agreement levels of 90% or above indicate acceptable reliability. Our reliability analysis yielded an agreement rate of 96% in this study. Based on these comparisons, we finalized the categories and codes and presented them in tabular form.

Third, to enhance methodological rigor and ensure the credibility of the findings, we reported the data in detail and explicitly described how we reached our conclusions (Yıldırım & Şimşek, 2006). We also provided comprehensive explanations of both the data collection and analysis procedures. We supported the findings with direct quotations from participants' statements. In addition, we analyzed and cross-checked the data collaboratively. Once we established the categories, we transferred all data into the SPSS statistical software. Using SPSS, we calculated the frequency and percentage distributions of the categories identified. We employed SPSS to determine these distributions to ensure accuracy and completeness, expedite the analysis process, and maintain consistency and systematic organization (İlgar & İlgar, 2014).

2.6. Ethical Approval of the Research

In this study, we conducted all procedures per principles that safeguard children's rights and welfare. On September 5, 2023, we obtained formal ethical approval from the Ethics Committee of Gazi University (Decision No: E-77082166-604.01.02-752501). Because the research occurred in a university-affiliated preschool, we secured ethical clearance and conducted the study under these requirements. We recruited only children who volunteered to participate, and we provided both the children and their parents with detailed information about the study's purpose, scope, and procedures. We obtained informed consent from all participants. In the consent form, we clarified that participation was voluntary and that they could withdraw from the study without penalty. Finally, we ensured that no identifying or personally revealing information about the participants appeared in the data or the reporting of the findings.

3. FINDINGS

Metaphor Tables Related to the Concept of Earthquake

Table 2.

Frequency Analysis Table of Colors Resembling Earthquakes

	Frequency	Percentage (%)	Valid Percentage (%)
Earth Tones	33	45,8	45,8
Colors That Represent Death and Fear (Red, Black)	20	27,8	27,8
I do not know	19	26,4	26,4
Total	72	100,0	100,0

As shown in Table 2, the frequency and percentage distributions of children's color-related metaphors for earthquakes reveal three dominant patterns. A total of 33 children (45.8%) described the earthquake using earth tones, 20 children (27.8%) associated it with colors symbolizing death and fear, and 19 children (26.4%) responded with "I do not know."

"It would be the color of sand. Because my father turned on the television, I saw the buildings there."

"It would be grey. Because when buildings collapse, that is how they look."

"It is brown. Because in real life, earthquakes are also brown."

"Red, because earthquakes are very noisy and destructive."

"It would be yellow and white. Because my father heard that those colors appear during an earthquake."

"I do not know. Because earthquakes do not have a color."

"It would be grey. Because when things collapse in an earthquake, there is so much dust and smoke, and then everywhere turns grey."

Table 3.

Frequency Analysis for the Reasons Earthquakes Were Compared to the Mentioned Colors

	Frequency	Percentage (%)	Valid Percentage (%)
Dust and Concrete Colors Are Visible When Buildings Collapse	23	31,9	31,9
Earthquakes Kill People	9	12,5	12,5
I do not know	40	55,6	55,6
Total	72	100,0	100,0

In Table 3, we examined the frequency and percentage distributions of children's explanations for the color metaphors they associated with earthquakes. Our analysis shows three dominant categories. Specifically, 40 children (55.6%) responded "I do not know," 23 children (31.9%) explained "When

buildings collapse, the dust and concrete colors become visible," and nine children (12.5%) stated "Earthquakes kill people."

Table 4.

Frequency Analysis Table of Music Likening Earthquakes

	Frequency	Percentage (%)	Valid Percentage (%)
A Different Music	46	63,9	63,9
Earthquake No Music	26	36,1	36,1
Total	72	100,0	100,0

In Table 4, we analyzed the frequency and percentage distributions of children's music-related metaphors for earthquakes. Our findings indicate two principal categories. Specifically, 46 children (63.9%) described earthquakes as producing "A different kind of music," whereas 26 children (36.1%) asserted that "Earthquakes are not music."

Examples of children's responses include the following:

> *"All the houses would collide with each other and make a strange sound; it would be a different kind of music, but I do not know why."*
>
> *"It would be a different kind of music. Because when there is an earthquake, it becomes different music."*
>
> *"It would be the sound of the earthquake. Because earthquakes shake."*
>
> *"It would be a loud and different kind of music. Because the shaking is so fast."*

Table 5.

Frequency Analysis Table of the Reasons Why Earthquakes Are Likened to Music in the Answers Given

	Frequency	Percentage (%)	Valid Percentage (%)
Earthquake Shakes	24	33,3	33,3
I do not know	48	66,7	66,7
Total	72	100,0	100,0

In Table 5, we analyzed the frequency and percentage distributions of children's explanations for the music metaphors they associated with earthquakes. Our results revealed two dominant categories. Specifically, 48 children (66.7%) responded "I do not know," while 24 children (33.3%) explained that "Earthquakes shake."

Table 6.

Frequency Analysis Table of Animals That Liken Earthquakes

	Frequency	Percentage (%)	Valid Percentage (%)
Wild Animals	32	44,4	44,4
Delicate Animals	18	25,0	25,0
I do not know	22	30,6	30,6

Table 6.

Frequency Analysis Table of Animals That Liken Earthquakes

Total	72	100,0	100,0

Table 6 examined the frequency and percentage distributions of children's animal metaphors for earthquakes. Our analysis identified three main categories. A total of 32 children (44.4%) associated earthquakes with "Wild animals," 18 children (25.5%) compared them to "Delicate animals," and 22 children (30.6%) responded with "I do not know."

"It would be a lion. A lion is very vocal. I am saying that because it is very vocal."

"It would be a shark. Because buildings and sharks are huge."

"It would be a rhinoceros because it is enormous during an earthquake. They are powerful."

"It would be a tiger. An earthquake would have big eyes, and then it would turn into a tiger. A very big, huge, and powerful tiger, though."

"It would be a rhinoceros. Because it has horns, and if it hits houses, it could destroy them."

"It would be a lion. Because lions are angry and gulp meat."

"A flamingo. I do not know why. I love flamingos."

Table 7.

Frequency Analysis Table of the Reasons Why Earthquakes Are Likened to Animals in the Responses Given

	Frequency	**Percentage (%)**	**Valid Percentage (%)**
It is Very Powerful	27	37,5	37,5
I do not know	45	62,5	62,5
Total	72	100,0	100,0

Table 7 examined the frequency and percentage distributions of children's explanations for their music-related earthquake metaphors. Our analysis shows two dominant categories. A total of 45 children (62.5%) responded "I do not know," while 27 children (37.5%) explained their choice by stating that earthquakes are "Mighty."

Table 8.

Frequency Analysis Table of Plants That Likened Earthquakes

	Frequency	**Percentage (%)**	**Valid Percentage (%)**
Grass	41	56,9	56,9
Tree	15	20,8	20,8
I do not know	16	22,2	22,2
Total	72	100,0	100,0

In Table 8, we analyzed the frequency and percentage distributions of children's plant-related metaphors for earthquakes. Our results highlight three primary categories. Specifically, 41 children (56.9%) likened earthquakes to "Grass," 15 children (20.8%) compared them to "Trees," and 16 children (22.2%) responded with "I do not know."

"It would be a little yellow plant. Because the pieces of houses are tiny and scattered everywhere."

"It would be grass. Because earthquakes and grass both come from the ground. They exist everywhere."

"It would be a grass plant. I do not know why."

"It would be a tree. Birds land on it, and I love trees. I do not know why."

Table 9.

Frequency Analysis Table of the Reasons Why Earthquakes Are Likened to Plants in the Answers Given

	Frequency	Percentage (%)	Valid Percentage (%)
It is Everywhere	23	31,9	31,9
I do not know	49	68,1	68,1
Total	72	100,0	100,0

Table 9 examined the frequency and percentage distributions of children's explanations for their plant-related earthquake metaphors. Our findings revealed two main categories. A total of 49 children (68.1%) responded "I do not know," while 23 children (31.9%) explained their choice by noting that earthquakes are "Everywhere."

Table 10.

Frequency Analysis Table for the Seasons in Which the Earthquake Is Likened

	Frequency	Percentage (%)	Valid Percentage(%)
Winter	34	47,2	47,2
Summer	23	31,9	31,9
Intermediate Seasons	15	20,8	20,8
Total	72	100,0	100,0

In Table 10, we analyzed the frequency and percentage distributions of children's season-related earthquake metaphors. Our results indicate three main categories. A total of 34 children (47.2%) associated earthquakes with "Winter," 23 children (31.9%) compared them to "Summer," and 15 children (20.8%) linked them to the "Transitional seasons."

"It would be winter. Because it has winds, too, and winds move."

"It would be summer. Because the air is blue and warm in summer."

"It would be winter because earthquakes occur in winter. Because people's houses collapse, people are freezing. So they try to protect themselves by pitching tents outside."

Table 11.

Frequency Analysis Table for the Reason Why Earthquakes Are Likened to Seasons in the Answers Given

	Frequency	Percentage (%)	Valid Percentage(%)
Earthquakes Happen in Hot Weather	18	25,0	25,0
The Earthquake Happens in Winter	15	20,8	20,8
It is Mobile (Wind, Snow, Rain)	10	13,9	13,9
I do not know	29	40,3	40,3
Total	72	100,0	100,0

Table 11 examined the frequency and percentage distributions of children's explanations for their season-related earthquake metaphors. Our analysis revealed four categories. Specifically, 29 children (40.3%) responded "I do not know," 18 children (25.0%) explained their choice by stating that "Earthquakes happen in hot weather," 15 children (20.8%) linked it to the statement "The earthquake happened in winter," and 10 children (13.9%) associated it with the idea of being "Active or in motion."

Table 12.

Frequency Analysis Table of Emotions Likened to an Earthquake

	Frequency	Percentage (%)	Valid Percentage (%)
Negative Emotions (Fear, Anger, Sadness)	54	75,0	75,0
Happiness	18	25,0	25,0
Total	72	100,0	100,0

In Table 12, we analyzed the frequency and percentage distributions of children's emotion-related earthquake metaphors. Our findings show two clear categories. Fifty-four children (75.0%) associated earthquakes with "Negative emotions" such as fear, anger, and sadness, while 18 children (25.0%) described them as "Happiness."

"It would be angry. Because it is shaking."

"It would be sad. Because the people who survived the earthquake are sad."

"Of course, it is angry. Because the earthquake could be angry at people. The earthquake actually wants people to come closer and drag everyone away."

"Happiness. Because those people would be happy too, because they gave people bread during the earthquake."

"Fear. Because sometimes children get scared when they lose their parents."

"It would be both a tearful feeling and a happy feeling. Because I love being happy."

"I think it would be sad because their houses are collapsing. I sent them toys and clothes."

Table 13.

Frequency Analysis Table of the Reasons Why Earthquake is Likened to Emotions in the Responses Given

	Frequency	Percentage (%)	Valid Percentage (%)
Earthquakes are Scary and Sad	30	41,7	41,7
Houses are Demolished	30	41,7	41,7
It is Good to Be Happy No Matter What	12	16,7	16,7
Total	72	100,0	100,0

Table 13 examined the frequency and percentage distributions of children's explanations for their emotion-related earthquake metaphors. Our results revealed three main categories. Specifically, 30 children (41.7%) explained their choice by stating that "Earthquakes are frightening and sad," another 30 children (41.7%) justified their response with "Houses collapse," and 12 children (16.7%) expressed the view that "It is good to be happy no matter what happens."

Table 14.

Frequency Analysis Table for the Likened Earthquake Time

	Frequency	Percentage (%)	Valid Percentage (%)
Day	39	54,2	54,2
Night	22	30,6	30,6
Both Day and Night	11	15,3	15,3
Total	72	100,0	100,0

In Table 14, we analyzed the frequency and percentage distributions of children's time-related metaphors for earthquakes. Our findings point to three distinct categories. A total of 39 children (54.2%) associated earthquakes with "Daytime," 22 children (30.6%) linked them to "Nighttime," and 11 children (15.3%) explained that earthquakes occur in "Both day and night."

"It would happen at night. Because earthquakes mostly happen at night."

"It would happen at noon. Earthquakes happen at noon."

"It would happen at night. Because earthquakes happen when people are in bed."

"At night. Because earthquakes always happen at night."

Table 15.

Frequency Analysis Table for the Reason for the Earthquake to be Likened to Time in the Answers Given

	Frequency	Percentage (%)	Valid Percentage (%)
Earthquakes happen during the Day	35	48,6	48,6
Earthquakes happen at Night	19	26,4	26,4
Earthquakes Can Happen Anytime	18	25,0	25,0
Total	72	100,0	100,0

Table 15 examined the frequency and percentage distributions of children's explanations for their time-related earthquake metaphors. Our results highlight three categories. A total of 35 children (48.6%) stated that "Earthquakes happen during the day," 19 children (26.4%) explained that "Earthquakes happen at night," and 18 children (25.0%) emphasized that "Earthquakes can occur at any time."

4. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This study aimed to examine how preschool children conceptualize the phenomenon of "earthquake" through the metaphors they generate. We conducted the research with seventy-two children aged 48–72 months from middle socioeconomic backgrounds who were enrolled in preschools in Ankara during the 2023–2024 academic year. We used the Earthquake Metaphor Analysis Form, designed for this purpose, to collect the data. During the research process, we posed the questions in the form directly to the children and recorded their metaphorical expressions verbatim.

As a result of this study, when the distribution of metaphors produced by children was examined;

Colour versus Earthquake: The findings revealed that children's metaphorical associations for the earthquake were predominantly related to colour. Most participants (n=53) linked the event to earth tones and colours associated with negative emotions. For the children who explained, this preference was influenced by exposure to destructive earthquake news and imagery through mass media and their environment. For instance, some responses were directly related to the destruction of buildings, with several participants specifically mentioning the dust clouds from collapsing structures seen in media coverage. Despite these connections, it is notable that when asked to provide a rationale for their choice, most of these children (n=43) could not articulate a reason, commonly responding with "I do not know". Prior research supports the link between colors and emotional states. Izadkhah and Gibbs (2015) reported that preschool children, when depicting earthquakes in drawings, frequently used red or black to symbolize danger. Similarly, Ramazan and Öveç (2017) found that children used brown, yellow, black, and red to depict fear, and red, black, yellow, and light blue to represent sadness. By producing comparable outcomes, our study corroborates and extends these earlier findings.

Music versus Earthquake: Regarding musical metaphors, the children found it challenging to associate the earthquake with music, a concept they overwhelmingly described as positive in their daily lives. This conflict was a central theme, with many participants stating they had difficulty creating a metaphor for such an adverse event. Despite this, a significant group of children (n=46) did conceptualize the earthquake as a "different" or unconventional kind of music. The primary rationale provided for this connection was the physical sensation of shaking. However, many participants who formed this metaphor could not articulate why they chose it. At the same time, other children could not relate the earthquake to music at all, underscoring the cognitive difficulty of the task.

Animals versus Earthquake: When associating the earthquake with animals, a distinct pattern emerged where most children (n=32) used metaphors involving wild animals. For those who articulated their reasoning, this comparison was often linked to the concept of 'power'. They explained that the earthquake's destructive effect, loud noise, and the large area it impacted were characteristics they shared with powerful, wild creatures. This suggests an overarching perception of the earthquake as a dangerous entity capable of harming people and their homes. However, this association was not universal. A smaller group of participants likened the earthquake to delicate animals, while for 22 children, the event did not evoke any animal imagery. It is also important to note that most participants (n=45) across all groups could not provide a specific reason for their metaphorical choices. Our findings align with prior research. For instance, Saatçi, Saatçi, and Köstekçi (2024) reported that children often likened earthquakes to a "wild lion." According to the children in that study, the lion symbolized fear and uncontrollable strength, reflecting an earthquake's perceived danger and severity. Our results reinforce these earlier conclusions by showing that children commonly employ animal metaphors, especially those associated with strength and fear, to conceptualize earthquakes.

Plants versus Earthquake: When we analyzed the plant-related metaphors, we found that the most frequent response was "grass" (n = 41). Other children either compared earthquakes to trees or reported that they did not know which plant resembled an earthquake. A large proportion of participants (n = 49) explained their responses simply by saying "I do not know." Those who did provide reasons often associated earthquakes with the idea that plants, like grass, are found everywhere. The widespread occurrence of earthquakes and the shaking of the ground appeared to influence children to liken earthquakes to grass, a plant close to the ground and commonly encountered. These findings resonate with the work of Saatçi et al. (2024), who reported that children associated earthquakes with trees and wind. In that study, wind symbolized the expansive power of earthquakes, while the tree symbolized their natural and inevitable character.

Seasons versus Earthquake: In season-related metaphors, most children (n = 34) associated earthquakes with winter, while others compared them to summer (n = 23) or the transitional seasons (n = 15). When asked for reasons, 29 children could not explain their choices, while others linked their responses to weather phenomena. Because the February 6 earthquake occurred during winter and dynamic meteorological events characterize winter, we interpret that children often associate earthquakes with winter for these reasons.

Emotions versus Earthquake: In emotion, most children (n = 54) associated earthquakes with negative feelings such as fear, sadness, and anger. These associations reflect their perception of earthquakes as frightening, destructive, and sorrowful experiences. A smaller group of participants linked earthquakes with happiness; 12 children explained their choice by saying, "It is good to be happy no matter what happens." Based on children's statements, we infer that their exposure to negative earthquake-related news through mass media and their social environment played an important role in shaping these associations. Anger was expressed metaphorically when children described the earthquake as a furious being that destroys homes. These findings align with earlier research. Izadkhah and Gibbs (2015) found that children frequently depicted fear and anxiety in their drawings of earthquakes. Similarly, Fivush, McDermott Sales, Goldberg, Bahrick, and Parker (2010) reported that children aged three to four who experienced Hurricane Andrew could recall details of the event even six years later, underscoring the long-lasting emotional impact of disasters. Kaya (2010) also showed that middle school students most often perceived earthquakes as "burning and destructive events," followed by associations with death, horror, and anxiety. Likewise, Aküzüm, Aküzüm, and Dervişoğlu (2024) emphasized that children's earthquake metaphors overwhelmingly reflected the emotion of fear. These findings mirror and reinforce the emotional metaphors that emerged in our study.

Time versus Earthquake: In time-related metaphors, most children (n = 39) perceived earthquakes as disasters that occur during the day. Others believed they occurred at night (n = 22) or both day and night (n = 11). During data collection, some children explicitly stated that "earthquakes can happen at any time." We interpret these responses as influenced by their exposure to earthquake news reported at various times of the day. Similarly, Aküzüm et al. (2024) noted that children conceptualized earthquakes as sudden, unpredictable phenomena that catch people unprepared. Our findings parallel these conclusions.

Atsumi et al. (2019), in their study of post-disaster recovery following the Niigata-Chuetsu earthquake of October 2004, demonstrated that metaphors can exert both positive and negative effects. On the positive side, the generative power of metaphor contributed to the recovery process by fostering a sense of community among survivors. At the same time, metaphors may also hinder recovery in specific ways. First, the impact of a metaphor can diminish over time, and once users grow weary of it, new metaphors may not emerge. Second, while a single metaphor can be helpful, it may also constrain thinking by limiting the range of possible future actions. Moreover, metaphors often have positive and negative connotations depending on the user's perspective. For this reason, remaining bound to a single metaphor

is not always prudent; in some cases, shifting the conceptual frame of recovery may prove more effective, as a once-useful metaphor can ultimately impede progress (Atsumi et al., 2019). Karakuş (2014) argued that understanding how children perceive traumatic events such as earthquakes is critical for developing effective strategies of support and assistance. Natural disasters are among the most significant adversities affecting children, and they can cause both psychological and physical harm (Akman & Yıldırım, 2022). Beyond this, people exposed to natural disasters worldwide often confront devastating economic, social, and medical consequences (Alipur & Ahmadi, 2020). We found that earthquakes affect children more profoundly than adults. This impact was evident not only among children directly exposed to earthquakes but also among those, like the participants in our study, who encountered earthquake-related news through the media (Soygüt, Gündoğdu, Kılıç & Tekin, 2023).

In reviewing our findings, we observed that children's perceptions and emotions regarding earthquakes were primarily shaped by the destructive force of earthquakes and their widespread effects. Consequently, when responding to interview questions, children typically chose metaphors that best conveyed the violent impact of earthquakes. They often compared earthquakes to destructive, harmful, omnipresent forces with negative emotions. Many children explicitly told us that the scale of the February 6 Maraş earthquake and the influence of mass media coverage strongly shaped their responses. Aküzüm et al. (2024) similarly reported that children's metaphors reflected their emotional systems and imagination, enriched by input from their surrounding environment. This finding can be situated within Bronfenbrenner's ecological systems theory, which posits that the environment exerts a powerful influence on the individual (Bronfenbrenner, 1986). We also found that some children struggled to generate metaphors and instead answered with "I do not know." This difficulty can be explained through Piaget's assertion that children in the preoperational stage lack the developmental capacity to establish logical relationships (Piaget, 1951, as cited in Aydın, 2016, pp.45–47). Their limited ability for abstract thinking, combined with a relatively restricted vocabulary, makes it challenging for them to construct complex metaphors. For this reason, many children defaulted to the response "I do not know."

In this study, seven questions were asked of preschool children to generate earthquake-related metaphors, and suggestions for future studies are presented below:

Suggestions for families and teachers;

- Children are affected by natural disasters. In this regard, families and teachers can communicate with children about natural disasters by considering the metaphors identified in the study's findings.
- Based on children's perceptions of earthquakes, support can help them return to their daily routines and rebuild their emotional balance.
- Children can be informed about natural disasters early, provided their developmental level is considered.

Recommendations for researchers and policymakers;

- The study was conducted quickly and with a limited number of children. Therefore, expanding the scope of the research could yield more generalizable results.
- The study involved children indirectly affected by the earthquake disaster that occurred in February 2023 in our country. Future research may be conducted with children who directly experienced the earthquake.
- The study can be repeated by including parents and teachers.
- The study can be carried out by considering the gender factor.

- Metaphorical studies can be conducted with children directly or indirectly exposed to disasters.
- This study's findings can be considered in the design of intervention and education programs related to natural disasters.

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GENİŞLETİLMİŞ ÖZET

1. GİRİŞ

Doğal afetlerin çocuklar, özellikle de okul öncesi çocuklar üzerinde travmatik etkileri olabilir. Bu çalışma, okul öncesi dönemdeki çocukların deprem algılarını metaforlar aracılığıyla incelemeyi amaçlamaktadır. Çalışmanın temel amacı, çocukların depremleri nasıl anlamlandırdığını resmetmek ve bu olaylara ilişkin duygu ve düşüncelerini metaforlar aracılığıyla ortaya koymaktır.

2. YÖNTEM

Araştırma, 2023-2024 eğitim öğretim yılında Ankara ilinde 48-72 aylık yetmiş iki çocuk ile yürütülmüştür. Veri toplama aracı olarak araştırmacılar tarafından geliştirilen "Deprem Metaforu Analiz Formu" kullanılmıştır. Formda yer alan yarı yapılandırılmış sorular çocuklara sorulmuş ve cevaplar kelimesi kelimesine kaydedilmiştir. Elde edilen veriler betimsel ve içerik analizi yöntemi kullanılarak analiz edilmiştir.

3. ARAŞTIRMA BULGULARI

Renkler:

Çocukların depremi öncelikle toprak tonları, ardından ölüm ve korku ifade eden renklerle (kırmızı, siyah) ilişkilendirdikleri görülmüştür. Renk ilişkilendirmelerinin nedenleri incelendiğinde en fazla "Bilmiyorum." cevabı ifade edilmiştir. Bunu "Binalar yıkılınca toz ve beton rengi ortaya çıkar." ve "Depremler insanları öldürür." ifadeleri takip etmiştir.

Müzik:

Çocukların, depremin "Farklı bir müzik" olabileceği görüşünü en fazla belirttikleri ortaya konulmuştur. Bunu "Deprem müzik olmaz." ifadesi takip etmiştir. Müzikal çağrışımların nedenleri incelendiğinde ise çoğunlukla "Bilmiyorum." cevabı belirtilmiştir. Bunu "Depremler sallar." ifadesi takip etmiştir.

Hayvanlar:

Hayvanlar kategorisi incelendiğinde çocukların depremi "Vahşi hayvanlara" benzettiği görülmüştür. Bunun yanında çocuklar "Bilmiyorum." ve "Narin hayvanlar" görüşlerini de belirtmiştir. Çocuklar hayvanlara benzetme nedenlerini çoğunlukla bilmediklerini söylerken diğer katılımcılar ise "Çok güçlü" görüşünü ifade etmiştir.

Bitkiler:

Bitkilere ilişkin görüşler incelendiğinde çocukların depremi en fazla "Çim" ile betimlediği saptanmıştır. Bitki ilişkilendirmelerinin nedenleri incelendiğinde "Bilmiyorum" cevabının çoğunlukla ifade edilen görüş olduğu ortaya konulmuştur. Bunu "Her yerde var." ifadesi takip etmiştir.

Mevsimler:

Çocukların depremleri en çok "Kış" mevsimine benzettikleri görülmüştür. Çocuklar, depremi belirttikleri mevsimlerle ilişkilendirmelerinin sebebini en fazla "Bilmiyorum" ifadesiyle belirtmiştir. Bunu "Depremler sıcak havalarda olur.", "Depremler kışın olur." ve "Hareket ediyor." ifadeleri takip etmiştir.

Duygular:

Deprem, çocuklar tarafından çoğunlukla "Olumsuz duygular (Korku, öfke, üzüntü)" ile ilişkilendirilmiştir. Bunu "Mutluluk" ifadesi takip etmiştir. Belirtilen duyguların çocuklar tarafından ifade edilmesinin nedenleri incelendiğinde ise "Depremler korkuç ve üzücüdür." ve "Evler yıkılır." yanıtlarının verildiği görülmüştür. Bunu "Ne olursa olsun mutlu olmak her zaman iyidir" ifadesi takip etmiştir.

Zaman:

Çocuklar, depremi en fazla "Gündüz" ile ilişkilendirdiğini belirtmiştir. Bunu "Gece" ve "Hem gündüz hem gece" ifadeleri takip etmiştir. Zaman ilişkilendirmelerinin nedenleri incelendiğinde ise "Depremler gündüz olur." ifadesi en çok tercih edilen seçenek olmuştur. Bunu "Depremler gece olur." ve "Depremler her zaman olabilir" ifadeleri takip etmiştir.

4. TARTIŞMA

Araştırma bulguları, okul öncesi çocukların depremleri somut kavramlar aracılığıyla anlamlandırdıklarını göstermektedir. Depremleri anlamlandırmak için renkler, müzikler, hayvanlar, bitkiler, mevsimler, duygular ve zaman gibi somut kavramlar kullanılmıştır. Çocuklar depremleri genellikle olumsuz duygularla ilişkilendirmiş ve olayı korkutucu bir deneyim olarak algılamışlardır.

Sınırlılıklar ve Gelecek Araştırmalar

Çalışma belirli bir bağlamda sınırlı katılımcı ile gerçekleştirilmiştir. Bulguların genellenebilirliği için daha kapsamlı ve çeşitli örneklem gruplarıyla araştırma yapılabilir. Ayrıca, çocukların depremle ilgili duygu ve düşüncelerini anlamak için farklı nitel araştırma yöntemleri kullanılabilir.

5. SONUÇ

Bu çalışma, okul öncesi çocukların deprem algılarına ilişkin değerli bilgiler sunmaktadır. Bulgular, metaforların çocukların doğal afetlerle ilgili duygu ve düşüncelerini anlamada değerli olabileceğini göstermektedir. Araştırma kapsamında elde edilen bilgiler, çocuklar için daha etkili afet yönetimi araçları ve programları geliştirmek için kullanılabilir.

ETHICAL APPROVAL

As this study does not involve any human participants, no ethical permission is required.

Ethics committee approval information

Name of the committee conducting the ethics review: Gazi Üniversitesi Ethics Committee

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CONTRIBUTION OF RESEARCHERS

The first author contributed 60% to the research, while the second author contributed 40%.

Author 1: Preparation of interview questions, data collection, analysis, and reporting.

Author 2: Design of the research, determination of the method, preparation of interview questions, data analysis.

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CONFLICT OF INTEREST

The authors declare that no financial or personal relationships with any individual or institution have been established in relation to this research. The authors declare there is no conflict of interests.