



A study of preschoolers' perceptions of earthquakes through drawing



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ABSTRACT

In Iran, disaster preparedness for children has been instituted since 1990. However, to date, no extensive work has addressed the concept of drawings by preschool children on the subject of earthquakes. Consequently, this pilot study aims to demonstrate that by employing tools such as drawings which engage children to think, preschool children are able to demonstrate the extent of their learning and knowledge as well as their perception. In this 2012 study, the “content analysis” technique has been used. Two hundred and two preschool children, aged 5–6 years, from nine kindergartens in four areas of Tehran (Iran) were asked to draw pictures about earthquakes. These children have been already taught about earthquakes but have no previous experience. The study analyzes the content of drawings of each child, who were separately asked to explain their drawings. The findings were reviewed by checking with a pediatric specialist. Features that were observed from the children's drawings included: using color to indicate anxiety and fear; using parts of the body in taking shelter from earthquakes; providing as well as seeking assistance at the time of disasters; and appropriate (safe) and inappropriate (unsafe) places for sheltering. The drawings were analyzed, key elements were extracted and suggestions have been made. This study is original as it explores the perceptions and knowledge of those children who have been taught about earthquakes, but have no physical experience of it. This research is significant because it shows that, even at a young age, complex cognitive processes were engaged for learners to use their knowledge within the context of their own art, illustrating it to others through drawings.

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1. Introduction

Children are highly impacted by disasters and at increasing risk due to climate change. Estimates of impact rise from 66.5 million children each year at the end of the twentieth century [1] to 175 million children affected every year over the second decade of the twenty-first century [2]. Children are at special risk in disasters, but they are not passive victims [3,4]. Iran is located in one of the main seismically active areas of the globe. The seismicity of the country and the impossibility to predict the exact time of earthquake occurrence predicate the need to plan for, educate and prepare against earthquakes, in order to avoid disastrous consequences. In Iran, disaster preparedness has been instituted for many years since 1990. Preparing children for disasters is of prime importance, due to the increased vulnerability of this age group.

There is emerging evidence that involving children and youth in disaster preparedness and response activities in their homes, schools, and communities can minimize some of the probable

risks they face and promote resilience post-disaster [3–5]. Including disaster risk reduction information in school curricula is an excellent way to reach children. They may then communicate risk information to their peers and family members [6,7]. In order to educate children about disasters and engage them in preparedness activities, age-appropriate materials and processes must be developed [8] and implemented within a supportive social context that recognizes children's potential to make a constructive contribution [9]. Children may have practical and creative ideas for helping their families and communities recover from disasters [3]. Disasters can harm the physical spaces where children live, learn, and play—their homes, neighborhoods, schools, parks, and playgrounds. Yet, adults rarely ask children pre-disaster about what spaces should be protected or how they would like these spaces to be rebuilt post-disaster. Systems can be established to include children's voices in decision-making processes, which would contribute to more holistic community-based disaster recovery planning [9]. This is also consistent with the United Nations Convention on the Rights of the Child, particularly Article 12 which states children's right to participate in all matters which affect their lives [10], although it is important to ensure that opportunities for children to speak are meaningful and their

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contributions are considered [11].

Various methods and media have been designed and adopted in Iran to educate preschool children in respect of disasters. Drawing as one of the forms of the visual art has been considered in this study in the context of preschool children's disaster education. The present study aims to evaluate the thoughts of children who have been taught about earthquakes, but do not have practical experience of an earthquake.

In this paper, the focus of the study is on identifying knowledge gained from an earthquake program in Iran. Drawing is initially utilized as a tool for the Iranian children to express their feelings. A brief background of children and their introduction to drawing are also presented briefly. The children's learning about disasters and the history of earthquake education in Iran are addressed. Thereafter, the children's drawings have been evaluated, coded, classified and analyzed based on their interpretations, according to aspects extracted from drawings which include: Using colors in drawing as a sign of fear and danger; use of body in taking shelter from earthquakes; providing and seeking assistance; and appropriate and inappropriate places to shelter during an earthquake.

2. Childhood and drawing

Children use various methods to express their own perspectives of the world. With drawing and other activities they enjoy the experience while discovering their surroundings [12]. It is noted that children's drawings are full of meaningful signs and indirect statements which are increasingly being used in research to provide insights into children's thoughts [13].

Eisner, in his early writing on the history of studies in children's drawing noted different positions on the interpretation of the drawings [14]. This included understanding them as a reflection of: individual personalities and responses to the world around them [15–17]; increasing conceptual maturity [18,19]; increasing perceptual capacity [20]; inherited ability [21]; position on a visual–haptic continuum that determines if the individual experiences the world primarily as a visual observer or through kinesthetic and tactile experiences [22]; and perception-delineation theory that describes a combination of factors including child readiness, capacity and psychological environment [23]. Eisner [14, p. 17] noted that “All of the major positions that have been advanced to account for children's art do account for some “slice of the pie.”

Children's drawing evolves as they progress developmentally, beginning as seemingly random marks from around 18 months old, providing sensory enjoyment and supporting physical development, progressing to formation of abstract lines and shapes as children grow older, and then becoming a means for representing their world [24–26].

The role of creativity and meaning making in children's art has also been highlighted [27]. From the age of two and a half years, children use their drawings to explain concepts or thoughts. Sometimes even before making the drawing they announce their intentions.

“Between the ages of two and three the child begins to form what Kellogg (1970) has termed shapes. The scribble forms a cross, an X, and enclosures resembling primitive circles, squares, triangles, and oblongs. Soon after, two of those shapes are used in combination. By age three, the child puts together several shapes to form what Kellogg termed aggregates. An important point is reached when the child converts the linear scribble into an enclosed shape. The enclosed shape seems to be the focus of the child's first attempt to make a realistic drawing... Three- and four-year-olds develop other generic symbols for the repeated drawings of common objects like the sun, dog, and house. As children begin

to draw in a more realistic manner, they may oscillate between realism and earlier scribbling patterns...” [24, p. 1]

Drawings by children between ages 5–7 years include elements of which the child has knowledge. According to Luquet (the French psychologist), the details of the drawings will become more realistic and the children will start to illustrate more “real” images [28], with an increasing focus on these realistic images as their thought patterns become more concrete from the age of six or seven years [24]. However, as previously noted, children's drawings are also recognized to be expressions of children's perceptions of the world rather than simply visual representations [29–31]. In this sense, they provide researchers with an opportunity to gain insights into children's experience and understanding of their world. This understanding is likely to be fluid and subject to change during discussion about the drawing, as part of a process of meaning making and dynamic social construction [31,32]. “When children draw and talk, they construct and convey meaning” [31, p. 229]. This meaning can be captured by the researcher by assigning the child's words as a label to the drawing reflecting their thoughts at that moment in time [31].

Drawing has been identified as an inclusive research activity for children given it is unstructured, a familiar activity, and a popular means of communication particularly for young children [31,33]. It is the inherent fluidity and creativity involved in the art process that is likely to give valuable insights into child perceptions that may be less available through more structured research activities [27]. For example, when researchers rely solely on close-ended questionnaires, they may not learn of concepts and situations that children find important, whereas “circumstances that researchers regard as deeply disturbing, may in fact be of far less concern to children” [34, p. 18]. Hence, it is necessary to develop participatory, child-centered research methods and approaches that could offer children and youth the opportunity to give voice to their own thoughts and interpretations of events. This ensures research identifies and addresses topics that are relevant to young people [35].

3. Children's learning about disasters

Research by Sharpe and Izadkhan [36] and Wachtendorf [37] has established that through appropriate education, children living in risk prone areas will have more realistic perceptions of the threats, will gain more confidence in their ability to cope with them, and have more knowledge of proper protective behaviors. In other words, “They will have a greater level of self-efficacy (an important psychological building block) that enables individuals to meet challenges more confidently and therefore have the ability to be more resilient in the future” [36, p. 140]. This is an important factor in developing resilience in both individuals and in the communities in which they live. As noted by Wachtendorf, “Although age-based vulnerabilities place children at risk, children may offer unique capacities for bolstering disaster resilience” [37, p. 456]. Allowing children and youth's self-efficacy to develop independently of parental involvement may also be an important method of enabling a future generation of prepared and resilient communities [9].

A 2003 study examining the psychological impacts on children and youths, of living in a hazard prone country, identified that: “More children developing unrealistic risk perceptions (i.e. those perceiving low frequency events at a high rate) also had much greater frequencies of hazard related fears (by a factor of more than 2) and lower levels of confidence in their ability to cope emotionally with future hazard compared to children with more realistic risk perceptions” [6, p. 1010]. Ronan and Johnston further indicated that: “The more a child is educated about hazards, the

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