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Turkish Preservice Teachers' Perceptions of Natural Disasters: Coronavirus, Earthquakes, Fires, and Floods

Pınar Bozca, PhD
Çanakkale Onsekiz Mart University, Canakkale, Turkey

Eylem Yalçınkaya Önder, PhD
Çanakkale Onsekiz Mart University, Canakkale, Turkey
https://orcid.org/0000-0003-1306-9931

Contact: *pinarbozca35@gmail.com*

Abstract

This research explores the perceptions of preservice teachers in Turkey in terms of their preparedness for various disasters, including epidemics, earthquakes, fires, and floods, all of which have profound social and economic impacts on education. Using a descriptive survey model, the study examined the responses of 512 preservice teachers at a single university across all levels of their educational program. The survey, conducted digitally due to the pandemic, consisted of 70 questions. Findings reveal inconsistent levels of confidence and readiness across different types of disasters. For instance, while most preservice teachers understand the severity of the coronavirus and are concerned about the long-term effects of protective measures, the majority admit to a lack of preparedness for earthquakes. While they lack practical experience with fires, they are conversant with various fire safety measures. Their understanding of and preparedness for floods, however, were limited. The study highlights the critical need for comprehensive disaster education and readiness training for preservice teachers, suggesting the urgent need for reliable, scientifically backed information.

Keywords: *natural disasters, coronavirus, earthquake, fire, flood, preservice teachers*

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Introduction

Natural disasters, such as earthquakes, volcanoes, floods, hurricanes, landslides, and droughts, pose serious threats to human life and can cause geographical fragmentation (Widowati et al., 2022). Such events can have substantial environmental impacts, often disrupting a country's infrastructure and economy. Additionally, they can result in significant social problems, such as injuries, loss of life, and housing crises (Alexander, 2018).

Note: We would like to express our gratitude to the preservice teachers who participated in the study by completing the survey. Both authors contributed equal time to this article.

Unfortunately, despite the considerable impact of natural disasters on many aspects of life, including education, societies often lack proper preparedness to respond effectively (White-Lewis et al., 2021). Indonesia, for example, known for its high susceptibility to natural disasters, has implemented several government policies and programs to tackle these issues, but their effectiveness remains questionable (Muzani et al., 2022).

Schools, as primary institutions of education, are especially vulnerable to disaster risks, as well as to similar threats, such as biological hazards and the spread of infectious diseases, and physical risks, such as fires, collapsing buildings, and falling trees. Some dangers arise from children's activities that lead to injuries (Widowati et al., 2022). Comprehensive preparedness plans aimed at protecting schools and students from potential hazards are therefore crucial.

Natural disasters and pandemics such as COVID-19 offer students unique opportunities to apply their knowledge, values, and skills. These tough situations provide valuable teaching and learning experiences, emphasizing the importance of collaboration, flexibility, and routine maintenance (Walton et al., 2021). Preparedness is key in reducing vulnerability and enhancing community resilience, with risk perception, self-efficacy, and available resources all playing vital roles (Inal et al., 2018)

Natural Disasters and Education

Natural disaster education is a crucial part of a comprehensive educational program. It not only improves students' abilities to prevent and respond to natural disasters but also aligns with the goal of education for sustainable development (Vu et al., 2023). In this field, The Integrated Disaster Education Program (IDEP) in Turkey is a notable initiative that has been shown to have a positive influence on teachers' knowledge and attitudes. It is suitable for both in-school and out-of-school learning environments (Şeyihoğlu et al., 2021). This type of education is particularly vital for secondary students, as it promotes their active participation in community response and may inspire future healthcare professionals. It is cost-effective, engaging, and replicable in high schools. Moreover, it has demonstrated an increase in emergency preparedness awareness and capacity (White-Lewis et al., 2021).

In major disasters, groups such as nursing students can become invaluable resources. Their readiness can significantly impact the efficiency of disaster response efforts, highlighting the need for adequate disaster management training for such programs (Yildiz & Yildirim, 2022). One practical way to enhance students' comprehension of geographic hazards, risks, and vulnerabilities is through municipal disaster drills. These drills offer students firsthand experience in emergency decision-making, fostering emergent behaviors, and innovative problem-solving (Zavar & Nelan, 2020).

Generally, however, disaster preparedness in K–12 schools is often inconsistent and insufficient, underlining the need for further research and improvement in this area (Horton et al., 2023). Incorporating disaster education into school curricula, however, can be difficult. A study in the Mount Sinabung region of Indonesia identified primary impediments to effectively implementing a school disaster preparedness program, including the integration of subjects, the formulation of school policy, and the development of school curricula (Muzani et al., 2022). Despite considerable efforts to incorporate disaster risk reduction into school curricula in many developing countries, financial, cultural, and technical barriers obstruct complete integration. A case study in Lebanon, for example, outlined both the achievements and challenges in this process, adding to the research that demonstrates a need for more robust and effective approaches to disaster risk education (Baytiyeh, 2018).

There is growing acknowledgment that education programs focusing on hazards and disaster preparedness for children should help them understand the link between the physical world, science, and social factors (Ronan & Towers, 2014). Schools and community centers can act to share health promotion information, raise awareness of health risks, and implement best practices in prevention, intervention, and recovery (Pascapurnama et al.,

2018). These trends in educational culture underscore the necessity of creating school-based disaster education to enhance students' awareness and capacity to manage disasters (Zhu & Zhang, 2017).

Purpose of the Study and Research Questions

The purpose of this study is to evaluate the preparedness of preservice teachers in preschool education, elementary school mathematics, and science education for disasters such as the coronavirus, earthquakes, fires, and floods. The study examines their understanding of these disasters and the precautionary measures they take. The research questions and sub-questions that drive the study are as follows.

1. What are the views of preservice teachers on the coronavirus?
    - According to preservice teachers, what distinguishes the coronavirus from other viruses?
    - According to preservice teachers, how does the coronavirus spread?
    - Which resources do preservice teachers use to acquire information about the coronavirus?
    - What social measures do preservice teachers believe need to be taken against the coronavirus?
    - What individual precautions against the coronavirus are taken by preservice teachers?
    - Why do preservice teachers get tested for the coronavirus?
    - What are the symptoms of the coronavirus in preservice teachers?
2. What are the views of preservice teachers on earthquakes?
    - How aware are preservice teachers of earthquake disasters?
    - How would preservice teachers behave in a potential earthquake?
    - Which resources do preservice teachers use to acquire information about earthquakes?
3. What are the views of preservice teachers on fires?
    - How aware are preservice teachers of fire disasters?
    - How would preservice teachers behave in a potential fire?
4. What are the views of preservice teachers on floods?
    - How aware are preservice teachers of flood disasters?
    - How would preservice teachers behave in a potential flood?
    - How would preservice teachers behave after a potential flood disaster?

Methods

This study is a product of a project supported within the scope of the TUBITAK 2209-A University Student Research Projects Support Program. The research method used in the study was a descriptive survey model.

Participants

This study involved 512 preservice teachers from three departments in a Turkish university: preschool education, elementary school mathematics, and science education. There were 174 students from preschool education, 167 from elementary school mathematics, and 171 from science education. The distribution across academic years was fairly even, with 148 first-year, 106 second-year, 132 third-year, and 126 fourth-year students (see Table 1).

Data Collection

In the project proposal, various events, such as the coronavirus pandemic, earthquakes, fires, and migration, were identified as disasters people experience, but experts in the content analysis study expressed concerns regarding the classification of migration as a disaster in all cases. Based on the experts' suggestion, migration

was replaced by floods. The survey underwent review by four faculty members, three of whom specialize in science education and one in special education and educational programming. The survey was modified according to the opinions and suggestions of the experts. The questionnaire was then digitized using Google Forms, and the necessary permissions were obtained from the institution where the data was collected. The survey was distributed to students digitally via a provided link. It was administered to first-year, second-year, third-year, and fourth-year students enrolled in preschool education, elementary school mathematics, and science education programs. Their viewpoints on the subject matter were gathered. Data for this study was collected during the spring semester of the 2020–2021 academic year. The survey consisted of 70 questions, some of which offered multiple-answer options, and students were given the opportunity to provide alternatives beyond the provided choices by selecting the "other" option.

Data Analysis

The data collected from the survey were analyzed using descriptive statistical methods. Frequencies and percentages were calculated for each question to understand the distribution of responses. A thematic analysis was carried out based on the students' responses. The responses were read multiple times to identify recurring themes. These themes were then coded and categorized. The results of the analysis were interpreted in the context of the study's objectives. The preparedness, precautionary measures, and perceptions of preservice teachers for different disasters were evaluated separately. Throughout the analysis, the data were handled with care to ensure the privacy and confidentiality of the participants. All responses were anonymized and used solely for the purposes of this research. The insights derived from this analysis form the basis for the discussion and recommendations in the following sections.

Results

A total of 512 preservice teachers from the departments of preschool education, elementary school mathematics, and science education participated in this study. The distribution of preservice teachers based on their school year and department of attendance is presented in Table 1.

Table 1. *Distribution of Preservice Teachers by School Year and Department*

Department	1st year	2nd year	3rd year	4th year	Total
Preschool education	50	33	55	36	174
Elementary school mathematics	49	43	37	38	167
Science education	49	30	40	52	171
Total	148	106	132	126	512

Of the preservice teachers, 34% were studying in the preschool education department (n = 174), 32.6% in elementary school mathematics (n = 167), and 33.4% in science education (n = 171). Regarding academic year, 28.5% of the preservice teachers were in their 1st year (n = 148), 21.5% in their 2nd year (n = 106), 26% in their 3rd year (n = 132), and 24% in their 4th year (n = 126). The majority of the preservice teachers, 82.2%, were female, while 17.8% were male. Analysis of the responses to the questions regarding each specific disaster follows.

Coronavirus

A total of 21 multiple-choice questions on the survey address the coronavirus. These questions examine various aspects of the topic, such as the distinctions between the coronavirus and other viruses, its transmission, available means of communicating relevant information, preventive measures taken at both

individual and societal levels, the rationale behind coronavirus testing, symptoms associated with the virus, and the projected duration of the pandemic. The responses to these questions can be found in Table 2.

Table 2. *Preservice Teachers' Perceptions of the Coronavirus*

Question category		*f*
Difference between coronavirus and other viruses	Rapid contagion	328
	More lethal	196
	Mutating	178
	Harmful to the body	158
Spread	By inhalation	365
	By contact	337
	Through people	283
	Through food	60
	Through animals	25
Notifications	Social media	420
	TV or radio	348
	Spouse, friend, relative	78
	Newspaper	40
Social measures	Curfew	321
	Enforcing penalties for individuals who do not follow the rules	296
	Restricting access to crowded places	285
	Restricting travel	283
Reasons for testing for coronavirus	Being in contact with people who tested positive	57
	Experiencing coronavirus symptoms	52
	Feeling anxiety, fear, or worry	25
	Belonging to a high-risk group	11
	Working in a crowded environment	9
Symptoms of the virus	Fatigue, exhaustion	263
	Fever	224
	Loss of taste	220
	Loss of smell	204
	Headache	200
	Cough	197
	Muscle pain	178
	Back pain	163
	Backache	123
	Diarrhea	62
	Vomiting	52
Anticipated pandemic duration	Cannot guess	127
	1 year	127
	3–5 years	91
	6 months	60
	More than 5 years	39
	3 months	9
	A few weeks	4

Individual measures	Wearing a mask	488
	Carrying cologne, disinfectant	419
	Avoiding leaving the house as much as possible	414
	Washing hands frequently	399
	Washing clothes more often	313
	Taking frequent showers	301
	Avoiding eating out	218

Of the preservice teachers, 64.1% (*n* = 328) believed that the coronavirus spreads rapidly and that this sets it apart from other viruses. This was followed by it being more lethal (*n* = 196), mutating (*n* = 178), and harmful to the body (*n* = 158).

Of the preservice teachers, 71.3% (*n* = 365) believed that the coronavirus spreads through inhalation. This was followed by contact (*n* = 337), humans (*n* = 283), food (*n* = 60), and animals (*n* = 25).

Of the preservice teachers, 82% (*n* = 420) stated that they rely on social media for coronavirus notifications. This was followed by watching TV or listening to the radio (*n* = 348), getting information from their spouse, friend, or relative (*n* = 78), and reading newspapers (*n* = 40). Additionally, only 18.8% (*n* = 96) of the preservice teachers found the coronavirus notifications sufficient; 46.5% (*n* = 238) found them partially sufficient, and 34.8% (*n* = 178) found them insufficient.

Of the preservice teachers, 62.7% (*n* = 321) indicated that if they had a say at the state level, they would implement measures to prevent the spread of the coronavirus such as declaring a curfew. This was followed by enforcing penalties for individuals who do not follow the rules (*n* = 296), restricting access to crowded places (*n* = 285), and imposing travel restrictions (*n* = 283). Additionally, 60.4% (*n* = 309) of the preservice teachers reported a change in their daily public transportation preferences after the epidemic.

Of the preservice teachers, 89.6% (*n* = 459) stated that they individually comply with measures taken against the coronavirus, but only 6.1% (*n* = 31) fully comply with the measures. Additionally, 47.3% (*n* = 242) believe that the rules are only partially followed by individuals in their society. Of the test group, 60.5% (*n* = 310) consider themselves to be sufficiently aware of the coronavirus, while 30.1% (*n* = 154) consider themselves to have partial awareness.

Of the preservice teachers, 80.7% (*n* = 413) stated that they had not taken a coronavirus test, while only 19.3% (*n* = 99) had taken a test. At the same time, 62.9% (*n* = 322) also stated that either they themselves or a relative had tested positive for coronavirus. The preservice teachers who had taken a coronavirus test mentioned the following reasons: being in contact with people who tested positive (*n* = 57), experiencing coronavirus symptoms (*n* = 52), feeling anxiety, fear, or worry (*n* = 25), belonging to a high-risk group (*n* = 11), and working in a crowded environment (*n* = 9).

Preservice teachers who had tested positive for coronavirus or whose relatives had tested positive reported experiencing or observing the following symptoms: fatigue, exhaustion (*n* = 263), fever (*n* = 224), loss of taste (*n* = 220), loss of smell (*n* = 204), headache (*n* = 200), cough (*n* = 197), muscle pain (*n* = 178), back pain (*n* = 163), backache (*n* = 123), diarrhea (*n* = 62), and vomiting (*n* = 52).

Of the preservice teachers questioned, 24.8% (*n* = 127) believed at the time that the coronavirus pandemic would continue for another year, while the same percentage (*n* = 127) could not predict its duration. These alternatives were followed by the time frames of 2 years (*n* = 112), 3–5 years (*n* = 91), 6 months (*n* = 60), more than 5 years (*n* = 39), 3 months (*n* = 9), and a few weeks (*n* = 4).

Of the preservice teachers, 92.2% (*n* = 472) stated that they had taken individual precautions against the coronavirus. Of the test group, 95.9% mentioned taking individual precautions, the most common measure being wearing a mask (*n* = 488). This is followed in descending order by carrying cologne and disinfectant, at 82.3% (*n* = 419); avoiding leaving the house as much as possible, at 81.3% (*n* = 414); washing hands frequently, at 78.4% (*n* = 399); washing clothes more often, at 61.5% (*n* = 313); taking frequent showers, at 59.1% (*n* = 301); and avoiding eating out, at 42.8% (*n* = 218). Additionally, 48.5% (*n* = 247) of the preservice teachers believe the measures they have taken against the coronavirus are sufficient, while 40.3% (*n* = 205) find them partially sufficient, and 11.2% (*n* = 57) believe the measures they have taken are insufficient.

Earthquake

The preservice teachers were asked 19 multiple-choice questions regarding earthquakes. These questions assess the individuals' earthquake consciousness/awareness, their behavior in a possible earthquake, and where they obtain earthquake notifications. The answers to these questions are provided in Table 3.

Table 3. *Preservice Teachers' Perceptions of Earthquakes*

Question category		*f*
Earthquake consciousness/awareness	Participating in an earthquake drill	446
	Knowing the location of a nearby health institution	342
	Being aware of the earthquake zone in the area where they live	331
	Knowing if their building is earthquake resistant	317
	Receiving training on what to do in case of an earthquake	239
	Knowing the location of the nearest assembly area	233
	Investigating the earthquake resistance of a house before buying or renting	220
	Checking if their building is earthquake resistant	151
	Living in a house built according to earthquake regulations	139
	Preparing an earthquake kit	115
	Saving money for emergencies	113
	Having earthquake insurance	105
	Preferring to live in a detached house	91
Behavior in a possible earthquake	Forming a life triangle	423
	Sitting next to a column or beam	131
	Running to loved ones	129
	Hiding under a table	105
	Trying to evacuate the building	74
	Lying on the ground	16
Notifications	Social media	446
	TV or radio,	384
	Spouse, friend, relative	84
	Newspapers	54

Of the preservice teachers, 84.6% (*n* = 433) reported having experience with earthquakes. Among them, 75.6% (*n* = 387) stated that no one in their immediate vicinity was affected by the earthquakes.

While only 20.5% (*n* = 105) of the preservice teachers said they were fully aware of the earthquake, 45.9% (*n* = 235) stated that they were partially aware. Additionally, 68.2% (*n* = 349) of the preservice teachers believed that the society they lived in lacked sufficient awareness of earthquakes, while 27.3% (*n* = 140) believed that it had partial awareness. In terms of earthquake preparedness, 66.8% (*n* = 342) of the test group knew of a nearby health institution they could easily reach in the event of an earthquake, 64.6% (*n* = 331) were aware of the earthquake zone they resided in, 45.5% (*n* = 233) knew the location of the nearest earthquake assembly area, and 61.9% (*n* = 317) knew whether the building they lived in was earthquake resistant.

Only 21.1% (*n* = 108) of the preservice teachers reported taking individual precautions against earthquakes, while 30.9% (*n* = 158) stated they took partial precautions. Moreover, 57.8% (*n* = 296) of the preservice teachers admitted to being unprepared for a possible earthquake, and 79.7% (*n* = 408) believed that the country they lived in was also unprepared.

Of the test group, 87.1% (*n* = 446) had participated in earthquake drills, 46.7% (*n* = 239) had received training on what to do in case of an earthquake, and 43% (*n* = 220) had checked to see if their houses were earthquake resistant before buying or renting them. When choosing a home, 36.1% (*n* = 185) had considered earthquake resistance, whereas 28.8% (*n* = 148) had prioritized price, and 26.5% (*n* = 136) prioritized proximity to school or work. Of the test group, 44% (*n* = 151) had had their buildings checked for earthquake resistance, and 40.5% (*n* = 139) preferred to live in houses built according to earthquake regulations. Additionally, 33.5% (*n* = 115) had prepared an earthquake kit, 32.9% (*n* = 113) had saved money for emergencies, and 26.5% (*n* = 91) had taken the precaution of living in a detached house.

While 32.2% (*n* = 134) of the preservice teachers believed the measures they took against earthquakes to be useful, 46.6% (*n* = 194) considered them partially useful, and 21.2% (*n* = 88) believed the measures would not be useful.

Of the preservice teachers, 82.6% (*n* = 423) stated that they would form a life triangle in the event of an earthquake, while 25.6% (*n* = 131) would seek shelter next to a column or beam, 25.2% (*n* = 129) would prioritize rescuing their loved ones, 20.5% (*n* = 105) would hide under a table, and 14.5% (*n* = 74) would attempt to evacuate the building.

Of the preservice teachers, 87.1% (*n* = 446) received earthquake notifications from social media, 75% (*n* = 384) received them from TV or radio, 16.4% (*n* = 84) received them from spouses, friends, and relatives, and 10.5% (*n* = 54) received them from newspapers.

Fires

The preservice teachers were asked 14 multiple-choice questions regarding fires. These questions aimed to assess their level of fire consciousness/awareness and to gather information about their behavior in the event of a possible fire. The corresponding answers to these questions can be found in Table 4.

Table 4. *Preservice Teachers' Perceptions of Fires*

Question category		*f*
Fire consciousness/awareness	Knowing the phone number to call in case of fire	500
	Knowing the health institution that they can easily reach	326
	Knowing fire escape routines at school	342
	Having a fire extinguisher in the building where they reside	191
	Knowing how to use a fire extinguisher	184
	Getting fire training	168
	Having a fire escape in the building they live in	75
	Having a fire extinguisher at home	71
	Making the right item design (especially candles, lighting)	63
	Regular maintenance of electrical installations	60
	Using the right material	47
	Installing a smoke alarm	36
	Having fire insurance	32
	Making an evacuation plan	12
Behavior in a possible fire	Calling the fire brigade	483
	Moving away from the fire area	293
	Trying to extinguish the fire with blankets, sand, etc.	274
	Fighting a fire with a fire extinguisher	270
	Fighting a fire with water	138

Of the preservice teachers, 89.6% (n = 459) had no prior experience with fire, and 80.3% (n = 411) had taken no precautions against a possible fire. Just over half, 52.3% (n = 268), indicated that they were unsure about what to do in the event of a fire. Although 47.7% (n = 244) stated that they knew what to do in case of a fire, only 19.7% (n = 101) declared that they had taken precautions against fires.

Preservice teachers were aware of or had taken the following important fire safety measures: the emergency telephone number to call in case of a fire (n = 500), the availability of nearby health institutions (n = 326), the presence of a fire escape routes in their schools (n = 342), the existence of fire extinguishers in the building where they reside (n=191), knowledge of how to use a fire extinguisher (n = 184), participation in fire training programs (n = 168), the presence of fire escapes in their buildings (n = 75), possession of fire extinguishers at home (n=71), adherence to proper item design (especially candles, lighting, etc.) (n = 63), regular maintenance of electrical installations (n = 60), use of appropriate materials (n = 47), installation of smoke alarms (n = 36), having fire insurance (n = 32), and creating evacuation plans (n = 12).

Preservice teachers stated that in case of a possible fire, they would call the fire brigade (n = 483), move away from the fire area (n = 293), attempt to extinguish the fire with blankets, sand, etc. (n = 274), use a fire extinguisher (n = 270), or use water (n = 138) in their efforts to intervene.

Only 25.6% (n = 131) of the preservice teachers stated that fires were promptly and effectively handled in their country; 59.2% (n = 303) believed that fire interventions in their country were partially effective.

Floods

The preservice teachers were asked 16 questions regarding floods. The responses to these questions can be found in Table 5.

Table 5. *Preservice Teachers' Perceptions of Floods*

Question category		*f*
Flood consciousness/awareness	Considering the possibility of flooding when purchasing/renting a house	251
	Monitoring the precipitation patterns and intensities in their region	169
	Having flood insurance for their house	102
	Familiarizing themselves with flood warning signs	49
Actions during a potential flood	Keeping a safe distance from electrical sources	424
	Seeking higher ground	422
	Finding a secure location to hold on to	312
	Exiting a vehicle if inside one	193
	Placing barriers in front of windows and doors	192
Actions after a potential flood	Checking for gas and electricity leaks	435
	Assisting survivors, particularly the elderly, infants, and disabled individuals who require special attention	398
	Assessing and addressing building damages	376
	Requesting authorities inspect sewage systems, tanks with harmful bacteria, and wastewater systems	375
	Gradually draining floodwaters from the residence to minimize further structural damage	356
	Conducting a loss assessment for insurance claims	328
	Using waterproof shoes and battery-powered flashlights for building inspections	322
	Avoiding consumption of leftover food (including canned food) during the flood	277

Only 6.6% (n = 34) of the preservice teachers reported having experienced a flood disaster themselves, but 13.5% (n = 69) had relatives who had experienced a flood disaster.

Only 7% (n = 36) of the preservice teachers believed they were fully aware of the possibility of a flood, while 36.3% (n = 186) believed they were partially aware of it. Additionally, 67.6% (n = 346) of them believed that the society they live in is not adequately aware of the possibility of a flood.

Regarding protection from a possible flood, 20.5% (n = 105) of the preservice teachers believed they could be fully protected, while 52.3% (n = 268) believed they could be partially protected. Only 10% (n = 51) of the preservice teachers knew what to do after a flood, and 29.7% (n = 152) had partial knowledge.

Only 5.1% (n = 26) of the preservice teachers reported being prepared for a possible flood; 9.6% (n = 49) indicated they knew what to do in case of a flood, and 34.2% (n = 175) stated they had partial knowledge of what to do in a flood disaster.

Preservice teachers do take into consideration the possibility of flooding when buying or renting a house (n = 251) and some insure their houses against flood disaster (n = 102). Some monitor the precipitation areas and

densities of their region (n = 169), and a comparatively small number (n = 49) report awareness of flood warning signs.

While 10.7% (n = 55) of the preservice teachers stated they did not know what to do to protect themselves from floods, 47.5% (n = 243) stated they had partial knowledge of what to do. A significant number (n = 424) mentioned staying away from electricity sources and seeking higher ground (n = 422). Others reported the need to find a secure location (n = 312), to exit a vehicle if they are inside one (n = 193), and to place obstacles in front of windows and doors (n = 192) as potential actions in case of a flood.

Of the preservice teachers surveyed, 48.4% (n = 248) reported the absence of flood warning signs or systems in their settlements, while 47.9% (n = 245) stated they were unsure if any were present in their area. Preservice teachers highlighted several precautions to take after a flood, such as checking for gas and electricity leaks (n = 435); providing assistance to survivors, elderly individuals, infants, and disabled people who require special attention (n = 398); assessing damage to buildings (n = 376); inspections of sewers, germ-infested tanks, and wastewater systems by authorities (n = 375); gradually emptying floodwater from residences to minimize further damage to buildings (n = 356); conducting loss assessments for insurance purposes (n = 328); using waterproof shoes and battery-powered flashlights for building inspections (n = 322); and avoiding the consumption of leftover food, including canned food (n = 277).

Discussion and Recommendations

The purpose of this study was to examine how preservice teachers perceive and prepare for disasters such as coronavirus, earthquakes, fires, and floods. Understanding the opinions of preservice teachers and their preparedness for these disasters is important, not only for them but also for the entire population in addressing potential problems related to disasters. This study focused on preservice teachers at a single university in Turkey who were studying preschool education, science education, and elementary school mathematics.

Coronavirus

The global coronavirus pandemic has profoundly impacted lives, including those of the preservice teachers we surveyed and their families. They, like others across the globe, have experienced physical symptoms such as fatigue, fever, loss of taste and smell, and muscle pain. The majority of these teachers view the virus as more contagious and lethal than other viruses, recognizing its capacity to mutate and inflict damage.

The COVID-19 pandemic resulted in major changes to cultural attitudes and behavior. Protective measures, such as mask-wearing, frequent handwashing, social distancing, and the use of sanitizers, have become integral to everyday life. The long-term impacts of handwashing on water scarcity have become a corollary concern. The pandemic also altered transportation choices, with a shift towards private vehicles over public transport, potentially leading to an increase in carbon emissions. Despite these changes, only half of the preservice teachers surveyed are confident in the sufficiency of their personal preventive measures, with the others deeming them only moderately effective. There is also divided opinion among preservice teachers about the public's compliance with these measures. Many believe that the implementation of stricter enforcement measures, such as curfews, travel restrictions, and penalties for non-compliance, may be necessary.

There is also a widespread belief among the respondents that the public lacks awareness about the virus and that the information provided is insufficient. Even though social media, TV, and radio are their primary sources of information, they acknowledge the potential for inaccuracies in these channels. The study highlights the urgent need for accurate information and scientifically backed measures to combat the

devastating effects of the pandemic. It reveals that preservice teachers, like most people, were caught off guard by the pandemic, basing their responses on personal understanding rather than scientific evidence. As the scientific community continues to debate the trajectory of the pandemic, access to precise information is vital to prevention and to providing preservice teachers with the tools they need to guide their students effectively during these challenging times.

Earthquake

A significant percentage of preservice teachers reported firsthand experience with earthquakes, although their immediate environments remained largely unscathed. Despite this exposure, only about a fifth had taken personal precautions against earthquakes, and more than half confessed to a lack of readiness for such an event. This unpreparedness extended to their perceptions of their country's disaster readiness, which most deemed inadequate. Their knowledge of earthquakes stems primarily from sources like social media, television, radio, family, friends, and newspapers.

While approximately half of the preservice teachers felt somewhat informed about earthquake preparedness, they felt their society's overall awareness was lacking. They were conscious of living in an earthquake zone, knew the location of the nearest assembly area, and were aware of whether their building was earthquake resistant. In the event of an earthquake, their responses would typically include forming a life triangle, remaining close to columns and beams, contacting loved ones, seeking shelter under a table, and evacuating the building.

In relation to their living situations, earthquake resistance factored into their decisions when purchasing or renting a property. They had undergone training for earthquake preparedness, had participated in drills, and ensured their building was certified for earthquake resistance. A preference for well-constructed houses was noted, along with individual precautions such as choosing to live in a detached house. They also assembled earthquake kits and saved money for emergencies. However, they saw these measures as only partially effective.

Earthquakes pose a significant threat to life and property, which can be mitigated by cultural preparedness. Research by Sözcü (2021) revealed a lack of emergency and disaster kits in the homes of high school students in Turkey. These students did not act on their knowledge about earthquake preparedness, were unaware of designated safe gathering places, and lacked a family earthquake plan. Furthermore, families often failed to consider the importance of emergency exits when choosing a home, resulting in obstructed exits and potential safety hazards. Sözen's (2019) study showed that while undergraduate students in Turkey had a general understanding of earthquake zones and their associated dangers, the education they received at university was not enough to fully equip them for the realities of an earthquake. The study underscored the need for supplemental training, disaster conferences, and evacuation drills in universities and dormitories, in order to maintain a state of alertness.

Innovative solutions, such as three-dimensional educational computer games (Yılmaz İnce & Sancak, 2022), offer promising avenues for educating individuals across various age groups about earthquake preparedness. Mohadjer et al. (2010) showed that involving middle school students in Tajikistan in scientific activities related to earthquakes enhanced their understanding and application of relevant scientific concepts and terminology.

Fire

A significant number of preservice teachers in our survey revealed their lack of experience and preparedness for fire-related incidents. Despite lacking knowledge of what actions to take during a fire, they asserted their familiarity with various fire safety measures. They have ensured that they are equipped with necessary

information, such as knowledge of emergency phone numbers and accessibility of health institutions within their locality. They have also ensured that their schools are equipped with fire escapes and that their apartments are outfitted with fire extinguishers, and they are familiar with how to use them. Moreover, they have received fire safety training and have taken further precautions, such as installing fire escape ladders in their buildings, owning fire extinguishers at home, and ensuring that electrical installations and furniture do not pose fire hazards. They have gone the extra mile by using appropriate materials, installing smoke alarms, securing fire insurance, and formulating evacuation plans for fire emergencies.

Interestingly, despite their self-professed lack of practical experience, over fifty percent of respondents expressed confidence in their country's ability to address fire incidents in an effective and timely, albeit partial, manner. They also have a clear action plan for fire emergencies, which includes calling the fire brigade, distancing themselves from the fire, and attempting to extinguish it, using various methods such as blankets, sand, fire extinguishers, and water.

Floods

The experiences and understanding of flooding among respondents reveal a concerning lack of preparedness. Most have never personally encountered a flood, leading to a knowledge gap in disaster readiness. This is reflected in community preparedness, with the majority of these preservice teachers perceiving their communities as unprepared for such scenarios. While some believe they have the means to protect themselves during a flood, this belief is not backed by comprehensive knowledge. Their understanding of post-flood actions is particularly limited. Only a small proportion of respondents felt adequately prepared or equipped with the necessary knowledge to handle the aftermath of such an event.

The preservice teachers indicated that they practice several measures for flood protection, including evaluating flood risks when choosing a home, insuring homes against floods, keeping an eye on regional precipitation patterns, and paying attention to flood warnings. Nevertheless, the respondents' comprehension of these protective measures remains incomplete. Their strategies for handling an actual flood situation include avoiding electricity, seeking higher ground, gripping fixed objects, leaving vehicles, and sealing their homes.

The existence of flood warning systems in their communities is another area of uncertainty. Half of the preservice teachers stated that no such systems existed in their communities. In the aftermath of a flood, they emphasized the importance of checking for gas and electrical leaks, aiding vulnerable individuals, assessing building damage, inspecting sewage and wastewater systems, and gradually draining floodwaters to prevent further damage. They also highlighted the need to avoid flood-contaminated food, to use waterproof footwear and battery-operated flashlights, and to evaluate damage for insurance claims.

The impact of floods extends beyond immediate physical destruction. These natural disasters disrupt access to essential services such as education and healthcare, and they interfere with food and clean water supplies. Additionally, floods can contribute to the spread of diseases, as they have been found to cause a spike in malaria cases, as evidenced by the research of Kaur et al. (2020).

Recent studies shed light on the effects of natural disasters on student performance and readiness. A study noted that without special attention, students affected by disasters were disadvantaged, underscoring the importance of such policies. Interestingly, no link was found between self-reported impairment and performance outcomes, and students earning lower grades were not more likely to request special consideration (Collings et al., 2018). Additional research highlights the significant role of demographic and cultural factors in children's coping strategies during disasters. This underlines the importance of incorporating these factors into support services for young people (Powell et al., 2019).

The need for disaster preparednes and the means to achieve it have received considerable scholarly attention in recent years. A large study in the southwestern United States explored students' views on disaster readiness and found that those with more disaster experience felt better prepared. However, students' perceptions of threats and concerns about future disasters varied, indicating the need for enhanced research and improvements in disaster readiness studies (Tkachuck et al., 2018). A study in Indonesia concluded that using e-modules in blended learning for disaster management discourse significantly boosted students' disaster readiness, particularly for topics such as floods, earthquakes, and COVID-19. This suggests the potential use of blended learning for other related skills, including communication and collaboration (Sumarmi et al., 2021). Finally, a recent study in Turkey highlighted the positive impacts of a nursing and management disaster education program, improving students' overall beliefs in disaster readiness, their confidence in disaster response, and their psychological resilience (Yildiz & Yildirim, 2022).

Implications

Overall, the study's results underscore the need for comprehensive disaster education for preservice teachers that integrates knowledge of various types of disasters into their broader educational program. The study demonstrates that educators should be conversant with sound disaster preparedness theory derived from accurate information and scientifically backed measures. It also underscores the importance of equipping preservice teachers with the practical tools and knowledge they need to guide their students effectively during the challenges presented by natural disasters. This includes training in preventive measures, emergency response, and recovery efforts, which differ according to the type of disaster. Moreover, the study suggests the need for stricter enforcement measures and disaster readiness at a community level, including the development of effective warning systems, disaster response protocols, and community education programs.

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