



The role of community pharmacists in natural disasters: Experiences from the 2023 Türkiye earthquakes

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ABSTRACT

Objective: On 6 February 2023, a series of earthquakes struck the south-eastern region of Türkiye. The aim of this research is to identify the challenges and experiences of community pharmacists who were first-degree victims of the earthquake during and after the earthquake in providing health services.

Methods: Phenomenological design, one of the qualitative research methods, was used in the study. In-depth interviews were conducted with 15 individuals who were both first-degree earthquake victims and community pharmacists.

Results: Qualitative data were analyzed with the MAXQDA 2020 program and three main themes were created. It was determined that community pharmacists did not prepare despite knowing about seismic hazards. Following the disaster, a number of difficulties arose, such as drug safety issues, risky behaviors, and the physical destruction of pharmacies. It was noted that some community pharmacists could not return to normal processes on the date of the research.

Conclusions: Continuing pharmacy services without interruption during disasters is of global importance. Before the disaster, training should be organized for community pharmacists on their roles in disasters, medication management, and providing health care. Community pharmacists should take part in crisis management committees and contribute to drug supply chain planning. The roles of community pharmacists in risk reduction, preparedness, response, and recovery phases should be determined, and strategic actions should be developed for pre- and post-disaster periods.

Research in Context

(1) What is already known about the topic?

Community pharmacists are important in protecting public health and providing public health services. Community pharmacies become an important part of the health system in disasters and the services they provide are vital. As a critical component of the health system, community pharmacists manage medication management and logistics during and after disasters.

(2) What does this study contribute to the existing literature?

This research reveals the difficulties faced by community

pharmacists, who are the first degree victims of earthquakes, as community pharmacists in earthquake regions. Studies investigating community pharmacist experiences during disasters are very few, thus making an important contribution to the literature.

(3) What are the policy implications

Health policies specific to the stages of risk reduction, preparedness, mitigation, and recovery for community pharmacy in disaster management need to be developed.

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1. Background

Natural phenomena such as earthquakes, volcanic activity, landslides, and other similar events, which occur as a consequence of seismic movements of the earth's crust, have the potential to cause significant disruption and damage to human settlements [1]. In the aftermath of a disaster, the affected community may endure a range of losses, including physical, economic, and social damage [2]. The provision of public services in the region affected by the disaster may be impeded, particularly in regard to health services, which may become challenging to deliver [3,4].

In the aftermath of a disaster, in addition to providing essentials such as shelter and sustenance, there is a need to address a range of health-related requirements [5]. In the event of a disaster, access to medicines for the elderly, children, and disabled individuals who require uninterrupted treatment is provided by community pharmacists [6,7]. Chronic patients whose homes are rendered unusable or are forced to leave their homes after a disaster leave behind their medicines and other medical needs [8]. In the event of a disaster, even when not physically harmed by the earthquake, victims' ability to access essential medications is crucial for their survival [7].

As a fundamental element in the provision of healthcare in a nation, community pharmacists bear a significant responsibility for safeguarding public health [9,10]. Although pharmacies are commercial entities, the healthcare services they provide are of a public nature [11]. In the context of a crisis environment in which disasters and emergencies are a prominent feature, community pharmacies represent a crucial component of the health system. The services they offer are of vital importance in such circumstances [12]. Studies indicate challenges in defining the roles and responsibilities of pharmacists in disaster preparedness, during and after disasters [6,13,14]. In the study conducted by McCourt et al., it was discovered that nearly half of the participating pharmacists expressed a lack of preparedness for potential disasters [15]. In a separate study conducted by Nour et al., it was determined that pharmacists exhibited a moderate level of preparedness for a potential disaster scenario [13]. In the study conducted by Schumacher et al. on the preparedness of healthcare professionals in the context of the ongoing pandemic, it was emphasized that the management of drug safety, supply, and logistics processes was well-organised, and that pharmacists played a significant role in the provision of patient care [14]. In a qualitative study conducted by Austin and Gregory, the utilisation of technology, the expeditious adoption of institutional and professional guidance, the implementation of appropriate workplace timing methods and practices, and the provision of personal protective equipment are crucial factors that contribute to individual resilience. It is therefore evident that the readiness of pharmacists to respond effectively to disasters hinges on the availability of the aforementioned resources [16]. According to a study conducted after the earthquake in Japan, focusing on the difficulties faced by pharmacists during disasters, drug supply is very important in terms of pre-disaster preparedness [17]. A study investigating disaster preparedness of community pharmacists in India highlights the importance of pre-disaster education [18]. In a study conducted on pharmacists working during the Covid-19 pandemic in Brazil, the level of education was found to have a positive effect on preparedness [19]. In a study investigating the experiences of pharmacists who volunteered to work in the field during the earthquake, it was emphasised that expanding the clinical responsibilities of pharmacists and training them in wound care, immunisation, and prescribing was very important according to the experiences of the participants [8]. A study conducted in the United States reported that pharmacists with previous disaster experience thought they should take more active roles in disasters and emergencies [20]. In the study conducted after Hurricane Katrina, it was determined that pharmacists provided services such as triage, vaccination, basic medical check-ups and wound care counselling, and undertook many other tasks [21].

In Türkiye, community pharmacists are permitted to engage in

professional activities on behalf of organisations that are affiliated with the Turkish Pharmacists Association (TEB) and have established provincial branches [12]. Pharmacies that have been established with the financial backing of community pharmacists operate in accordance with the standards set forth by TEB and in compliance with the relevant legal requirements [12]. In general terms, although pharmacies appear to be profit-oriented businesses, they are nevertheless required to maintain uninterrupted operations for the benefit of public health [14]. Consequently, in contrast to other commercial enterprises, it is compelled to guarantee uninterrupted service in the event of disasters and emergencies [22,23]. Pharmacists have important roles and responsibilities in disaster prevention, preparedness, response, and recovery processes [6]. Moreover, in disasters and emergencies, pharmacists are an important resource in maintaining health care by providing drug therapy and effective disaster response [24,25]. It has been reported that community pharmacists were able to provide basic services in response to the recent Covid-19 pandemic and played important roles during disasters [26–29]. In this context, pharmacy services in disasters have become an important issue. Community pharmacy in disasters is a critical part of the health system consisting of pharmacists who undertake the roles of management of drugs and medical equipment management and drug stock management before disasters and who carry out the coordination and delivery of needed drugs and medical supplies to the affected communities in disaster situations [30,31]. It is anticipated that pharmacies will be required to provide uninterrupted access to medical products in order to meet the needs of individuals with chronic diseases, those who require home care, those who have been diagnosed with cancer, and are undergoing long-term treatment, and other health-related needs [32,33].

In Türkiye, significant damage was caused by the earthquakes that occurred in Kahramanmaraş on 6 February 2023. Additionally, pharmacies were among the structures that were destroyed or rendered inoperable as a result of these seismic events. The aim of this research is to identify the challenges and experiences of community pharmacists who were first-degree victims of the earthquake in providing health services during and after the event. It is anticipated that this study will facilitate the identification of the challenges encountered by pharmacists in the pre-, during-, and post-earthquake periods, thereby ensuring the continued availability of medicines to patients and providing guidance on the risk reduction for future disasters.

2. Methods

In this study, the researchers utilized a qualitative research method known as phenomenological design [34,35]. In the research, the Transcendental Phenomenology pioneered by Husserl was adopted [36]. Phenomenological design is a methodology that aims to gain a comprehensive understanding of the lived experiences of individuals [37,38]. In this study, the interview method was selected as one of the data collection tools, as it allows for the acquisition of in-depth information on the selected topic. A semi-structured interview form was utilised to facilitate this process [39]. The literature data were analyzed to create the semi-structured interview form. In creating the semi-structured interview form, it was sent to experts working in the fields of Disaster Management (3 people), Health Policy (2 people), Public Health (2 people), and Pharmacy (3 people). Experts evaluated the questions sent (for research suitability), and the interview form was finalized in line with the suggestions. The interview form sent to the experts included 12 questions. Based on expert opinions, the number of questions was updated to 10 and the semi-structured interview questions were finalized.

In the research, the purposive sampling method was utilised [40,41]. Individuals who had undergone comparable experiences were identified through purposive sampling, whereby participants were selected for interviews. Furthermore, the participants were recruited from authorized centres in each province, which are affiliated with community

pharmacists. In the cities most severely affected by the earthquake, the branches of TEB in Kahramanmaraş and Hatay were contacted, and the contact details of community pharmacists who had volunteered to participate in the study were obtained through these branches. Before starting the interviews, the purpose of the research, the fields in which the researchers work, and the CVs (curriculum vitae) of the researchers were explained to the individuals. After the introductions, appointments were scheduled for the interview. Interviews were conducted by reaching out to individuals at the appointed time and date. Participants trusted the researchers and felt comfortable sharing their experiences. Telephone and video interviews were conducted with the participants in a manner that fostered a sense of trust.

Prior to the commencement of the in-depth interview, the participants provided verbal consent and were informed that they could withdraw from the study at any point. A semi-structured interview form based on the existing literature was used to pose questions to the volunteer participants, and their responses were recorded as audio only [8,34,36]. Approval for this research was obtained from Trabzon University Social and Human Sciences Scientific Research and Publication Ethics Committee (QUT no. 2024-5/1.7)

The inclusion criteria of the study are; having firsthand experience of the earthquake, living in Hatay and Kahramanmaraş provinces, and being a community pharmacist. The exclusion criteria of the study are; not experiencing the earthquake, not volunteering for the study, not living in Hatay or Kahramanmaraş provinces. Participant confirmations were obtained, and quotes were directly provided in the findings section to ensure credibility in the research. To ensure research reliability, the entire research process and data reporting were clearly articulated. Expert opinions were taken into account in the creation of the research form, and the interviews were recorded. In-depth interviews, with an average duration of 375 min, were conducted with 15 community pharmacists who were primary victims of the 2023 earthquakes. Research data were collected between July and September 2024. The interviews were concluded because of data saturation. Participants were coded as K1-K15 to anonymize them.

The research data were analysed in accordance with the following research questions:

- What is the awareness and preparedness status of community pharmacists before the earthquake?
- What challenges do community pharmacists face in the post-disaster recovery process?
- What roles do community pharmacists, who are the first degree victims of the earthquake, play in disasters, and what difficulties do they face?

In this framework, the individual interviews were transcribed, coded with MAXQDA 2020 software, and analyzed through thematic interpretation. Content analysis and descriptive analysis were performed. A relational analysis was conducted between the variables. The research data were analyzed within the framework of the role of community pharmacists in disasters [30]. The reporting of the study was done according to the criteria in the Consolidated Checklist (COREQ) [42].

3. Results

This research was designed to investigate the experiences of community pharmacy pharmacists in the context of an earthquake disaster. To this end, three distinct themes were identified (Table 1).

Theme 1: Pharmacists’ risk knowledge and preparation for the pre-earthquake process

The theme was analyzed in four categories: earthquake risk information, behaviour of not taking precautions against earthquake risks, lack of disaster preparedness, earthquake insurance. These categories are presented visually in Fig. 1.

In the context of the pre-disaster period, the opinions of pharmacists

Table 1
Themes and sub-themes of community pharmacy pharmacists’ experiences in the context of an earthquake disaster.

Themes	Categories (Sub-themes)
Theme 1: Pharmacists’ risk knowledge and preparation for the pre-earthquake process	• Earthquake risk information • Behaviour of not taking precautions against earthquake risks • Lack of disaster preparedness • Earthquake insurance
Theme 2: Tasks undertaken and difficulties encountered during the earthquake	• Tasks undertaken • Exposure to physical damage • Engaging in risky behavioural actions • Initiative of community pharmacists • Problems in drug safety, supply and cold chain • Lack of coordination between the public administration and pharmacists
Theme 3: Failure to resume the standard process in the post-earthquake period and lessons learned	• The involvement of volunteers in carrying out activities • Drug storage behavior of citizens • The coping capacity of community pharmacists • Lessons learned

regarding their awareness of the earthquake risk, the absence of precautions against such risks, and the lack of disaster preparations, including earthquake insurance, were evaluated. Concurrently, the pharmacists underscored the absence of guidance on disaster awareness from the public administration and the TEB, which they identified as a crucial need. K6 stated that he did not make disaster preparations as follows: *“Even though I knew it was an earthquake zone, I never thought that such a disaster would happen. It is particularly difficult to understand until you experience it. Thus, there was no precautionary measure before the earthquake. The pharmacy did not even have insurance”*. K8 expressed his opinions regarding knowledge of earthquake risks and the lack of precautions as follows: *“I knew the area was at risk of earthquakes before the earthquake, but I didn’t think it could be such a devastating earthquake. If I had known, I would have at least prepared. Before the earthquake, I had no knowledge of the structural risk of the building where my pharmacy was located. I didn’t even try to find out”*.

Evaluation of the relational analysis of risk knowledge and preparedness among pharmacists, in the context of the pre-earthquake process, reveals that understanding earthquake risk influences two key behaviors. Creating an earthquake insurance policy, which plays a pivotal role in disaster risk reduction and transfer, and forming behaviors that contribute to a state of preparedness in the event of an earthquake (Fig. 1). Despite the availability of information regarding the risk of earthquakes, it has been observed that individuals do not adopt a proactive approach to disaster preparedness and insurance. Conversely, the data indicated that those participants did not take any precautions against the risk of earthquakes. The thickness of the lines in the figure indicates the frequency of the relationship between the categories. As the line thickness decreases, the relationship between the lines weakens.

Theme 2: Tasks undertaken and challenges encountered during the disaster

This topic was evaluated in seven categories: tasks undertaken, exposure to physical damage, engaging in risky behavioural actions, initiative of community pharmacists, problem in drug safety, supply and cold chain, and lack of coordination between public administration and pharmacists.

It was observed that community pharmacists took on the tasks of establishing a pharmacy area in the field hospital, setting up mobile pharmacies, and meeting the needs of citizens for medicines during the disaster. Due to physical damage to their pharmacies, some of the participants continued their activities by purchasing containers. Married participants continued to work in the earthquake zone after relocating

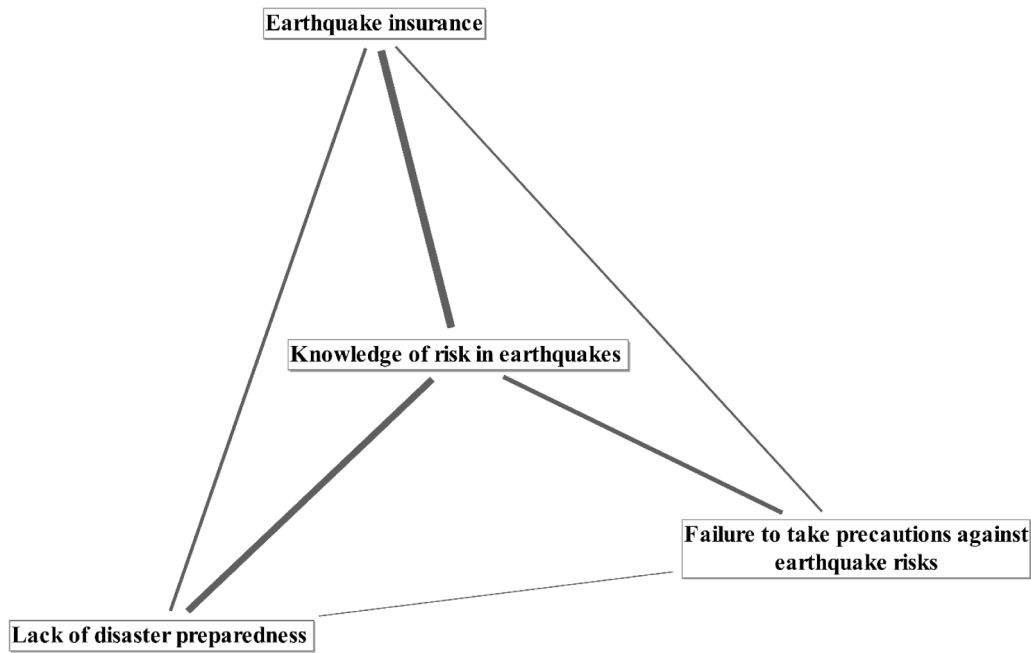


Fig. 1. Relational analysis of pharmacists' risk knowledge and preparation for the pre-earthquake process categories.

their families to a safe area. It was observed that pharmacists tended to engage in risky behaviors during the disaster, particularly when trying to save medicines and supplies. Pharmacists engaged in risky behaviors to retrieve medications and supplies from collapsed or damaged buildings. Some community pharmacists took the initiative to provide services on their own. Sharing their views on drug safety, supply, and cold chain issues, the participants expressed their expectations from the public administration and concerns about the deterioration of cold chain drugs and the looting of those. On the other hand, pharmacists stated that they are able to follow up with patients through the system they use, and that they distribute medicines free of charge. Difficulties in this process included lack of electricity in mobile pharmacies, lack of internet access, and difficulty in finding medicines after dark. The other most emphasized category in this theme is the lack of coordination between the public administration and pharmacists. Opinions were expressed that some medicines and supplies were sent in an uncontrolled manner, that those truly needed were not sent, and that the Ministry of Health is an important actor, could not ensure coordination with pharmacists in this process. Additionally, it was noted that some

medicines were distributed by non-pharmacists and that there was no guidance from the state.

When the results of the relational analysis of the tasks performed and difficulties encountered during the disaster were evaluated, it was found that the lack of coordination interacted with other categories (Fig. 2). It shows that while the participants exhibited the behavior of creating mobile pharmacies and continuing their activities, they felt an intense lack of internal coordination, which caused problems in drug safety, supply, and the cold chain. The lack of contingency plans among community pharmacists is another important factor that affects coordination. It can also be evaluated as the ability of community pharmacists, who are intrinsically motivated, to take initiative continuing their activities.

It was observed that community pharmacists took on the tasks of setting up a pharmacy area in the field hospital, setting up mobile pharmacies, and meeting the needs of citizens for medicines during the disaster: K6 "In order for the mobile pharmacy to start operating as soon as possible, we worked in an organized way with friends in the region and created shelves from briquettes and boards for the beginning".

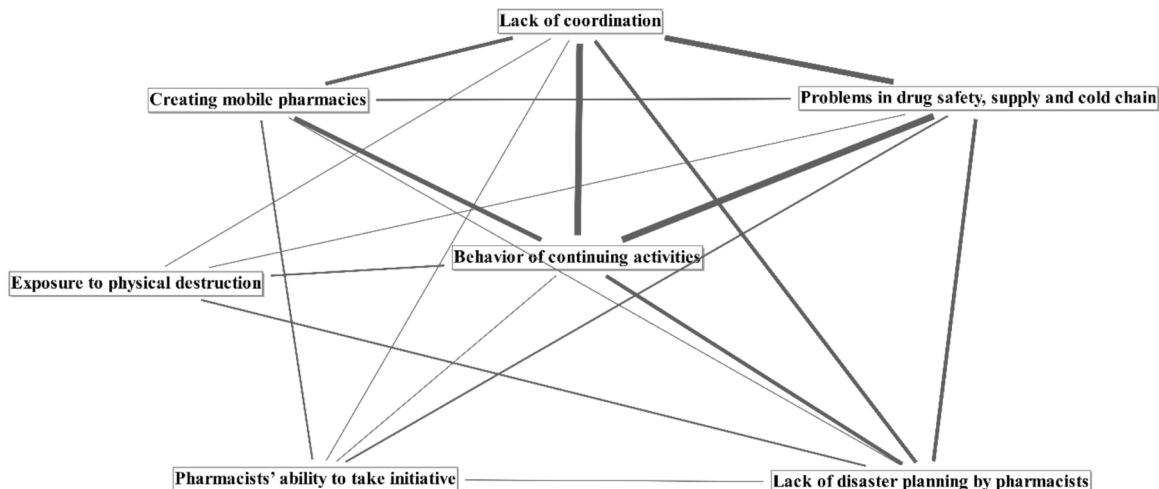


Fig. 2. Relational analysis of the tasks performed and difficulties encountered during the disaster.

Some of the participants continued their activities by purchasing containers due to physical damage to their pharmacies: K7 “There were cracks in the walls, and cabinets and windows were broken. Cold chain medicines deteriorated due to power outages, electrical appliances were subsequently damaged due to power irregularities”.

It was noted that some of the community pharmacists began to provide services on their own initiative. Participant views on this category are as follows: K8 “After the earthquake, I ensured the safety of my family and although aftershocks continued in the building where my pharmacy was located, I tried to enter the building and continue to supply medicines as much as I could”.

Participants who shared their views on drug safety, supply, and cold chain problems also expressed their expectations regarding the public administration, along with concerns about the deterioration of cold chain drugs and drug looting. Participants expressed their views on the looting of medicines as follows: K1 “Drug security, especially narcotics theft”. K7 “Our biggest problem was security. Due to the absence of law enforcement from the very first day, problems such as looting of pharmacies, theft, robbery, and assault of some of our colleagues were our priority”.

Opinions on the deterioration of cold chain medicines and the supply of medicines were expressed as follows: K1 “It was very difficult to store medicines and cold chain materials”.

Pharmacists reported that they are able to follow up with patients through the system they use and distribute medicines free of charge. Difficulties in this process include the lack of electricity and internet access in mobile pharmacies, and difficulty finding medicines in the dark.

The other most emphasized category in this theme is the lack of coordination between the public administration and the pharmacists. It was expressed that some medicines and supplies were sent in an uncontrolled manner, that medicines and supplies were really needed were not sent, that the Ministry of Health, an important actor, could not ensure coordination with pharmacists in this process, that some medicines were distributed by non-pharmacists, and that there was no guidance from the administration. Participant views on the lack of coordination are as follows: K2 “We managed the process ourselves as pharmacists; there was no guidance from the state”. K8 “A large number of materials were sent from various locations without oversight. Although necessary and unnecessary materials could have been more organized, we loaded these unnecessary materials back on trucks and sent them back to their source. It would have been better if they ensured this process and organization. However, the state has been inadequate in this process”.

Theme 3: Failure to return to business as usual in the post-disaster period and lessons learned

This theme was evaluated in four categories: The involvement of volunteers in carrying out activities, drug storage behavior of citizens, the coping capacity of community pharmacists, lessons learned.

The main points emphasized by the pharmacists in the post-disaster response and pre-recovery processes included that the activities were successfully carried out with the support of volunteers, and that these volunteer teams were at the forefront of delivering medicines to citizens. It was noted that some of the community pharmacists could not return to the normal process, even during the interview period. It was observed that some participants felt angry, and blamed their colleagues (other pharmacists) for leaving the earthquake zone. Participants stated that some citizens had a habit of storing drugs during the period services were provided. It has been observed that the continuation of services in the post-earthquake period was due to the efforts of pharmacists. Some participants who worked in the field after the earthquake expressed opinions on the involvement of pharmacists in the creation of disaster plans. Within the framework of this theme and subthemes, community pharmacists played important roles after the earthquake, and it was observed that they should be included in disaster management.

The relational analysis shows that, in evaluating the relationship between categories related to the inability to recover in the post-disaster context and the lessons learned, volunteer support comes to the fore (Fig. 3). It has been shown that the support of volunteers affects the coping capacity of community pharmacists in the process. there is a significant relationship between the importance of disaster plans and lessons learned. Through their experiences, people emphasized the importance of disaster preparedness plans and the administration being ready to respond to disasters.

Participants stated that some citizens had drug storage behavior during the period, when they provided services. Participant views on this category are as follows: K9 “What caught my attention was that citizens asked for boxes of the same medicine. For example, I gave painkillers, but people asked for 4 to 5 additional boxes. However, if they needed it later, we would give it to them without charging a fee”.

In light of the lessons learned by the participants in the field after the earthquake, some commented on the involvement of pharmacists in the creation of disaster plans. Participant views on this category are as follows: K5 “People in charge of disasters need to be trained. People who will work on emergency duty need to be trained. Pharmacists can be asked for help in a disaster”. K9 “There was chaos, and no one knew what to do or how to handle it. I think measures and initiatives should be taken to ensure that pharmacists are prepared for disasters”.

4. Discussion

Earthquakes that occurred in Türkiye caused serious problems that affected the infrastructure of the cities, the building stock, and the lives of the citizens. The earthquake also had a significant impact on pharmacies, which play a vital role in the country's health system. In alignment with the findings of our study, it is evident that despite

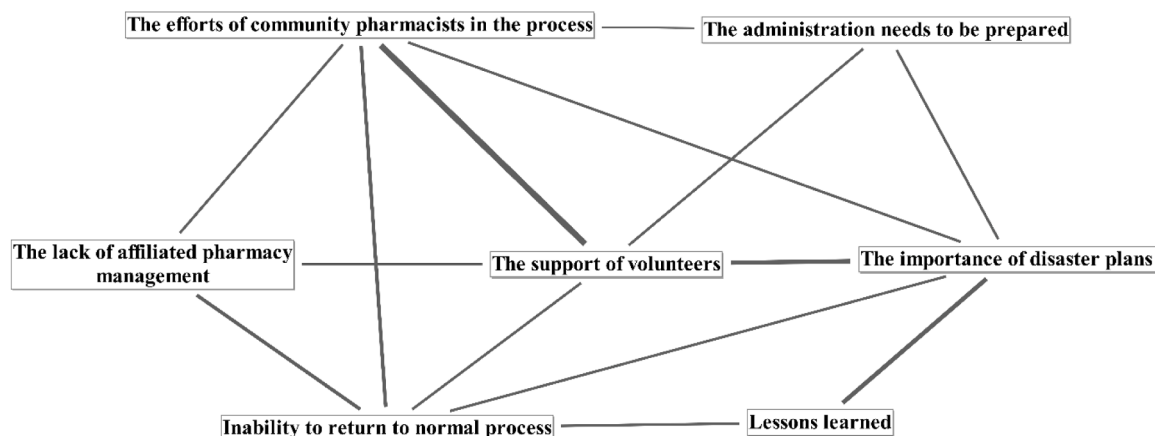


Fig. 3. Relational analysis between the categories related to the inability to return to the normal process in the post-disaster process and the lessons learned.

awareness of the risk posed by the region where the earthquake occurred, pharmacists demonstrate a deficiency in preparedness for disasters. In various studies on this topic, it has been demonstrated that pharmacists lack the requisite level of preparedness for disasters, both in terms of their attitudes and actions [13,15,33]. The study conducted by Ozeki and Ojima on pharmacists who received training in disaster management showed an enhanced awareness of disaster preparedness [43]. When the recent studies on pharmacists' preparedness for disasters are examined, it is seen that they are mostly focused on logistics and medical supplies during the Covid-19 pandemic [29,32]. In a study conducted with 1323 community pharmacists in Saudi Arabia, it was highlighted that community pharmacists provide important support in the fight against the Covid-19 pandemic. It is also emphasized that it is vital for community pharmacists to have a high level of knowledge/-awareness regarding the spread of the disease [44]. Pharmacists' preparedness for all types of disasters requires further scientific investigation. For this reason, initiatives such as planning and legislative regulation that aim to enhance awareness and implement policies for this purpose are necessary. When the studies on pharmacists' disaster preparedness are evaluated in general, they emphasize the need to clearly reveal the roles and responsibilities of pharmacists in disasters.

In the aftermath of the earthquake, pharmacists had to take the initiative to distribute medicines to the extent of their capacity to cope with the situation, engaging in risky behaviours and experiencing problems with public administrations. In the study conducted by Rasheed et al., the roles of pharmacists in meeting health needs in disasters and crisis situations requiring humanitarian aid were determined. These roles are: planning and purchasing of pharmaceuticals and related supplies, monitoring and evaluation of the stocks received, establishing the drug supply system, carrying out pharmacovigilance activities and monitoring the supply chain for any infiltration of sub-standard and falsified medicines, ensuring rational use of medicines, etc. [45]. In the bush fire that occurred in Tasmania in 2018/2019 and affected a wide area, the problems experienced by the pharmacists working in the field were found to be similar to those in our study: communication difficulties, operational difficulties due to power outage, legal problems, and storage and logistics problems of medicines [46]. In the study conducted with 126 pharmacist participants at the World Association for Disaster and Emergency Medicine's event in Toronto, Canada, in 2017, it was determined that the most important barrier preventing pharmacists from being prepared for disasters is the uncertainty of pharmacists' roles in disasters [6]. Research in the literature and our study findings confirm that there are many problems that prevent the continuation of pharmacy services after disasters. It is important to conduct regular activities to ensure that pharmacists are prepared and aware of their role in protecting public health in any type of disaster they may encounter. Also, it seems that pharmacists may experience long-term power outages after disasters, making it necessary to create environments that ensure the safe storage of medicines. For pharmacies, which are a very important component of health systems, to continue providing services after a disaster, it may be useful for each pharmacist to have an emergency plan, for all employees to be informed about these plans, and for the emergency plans to be transparently inspected by the organizations to which pharmacists are affiliated.

It is well known that the effects of the earthquake are still being felt in the region. Even some of the pharmacies are still operating out of tents. It is painfully clear that many of the preparations that were not made before the disaster have considerably slowed subsequent recovery processes. Lessons should be learned from the devastation, and adverse situations should be addressed. Mitigation measures for the future should be implemented in a realistic and effective manner. There is a paucity of academic literature on the disaster preparedness and response capacity of community pharmacists in Türkiye. It is imperative to integrate community pharmacies in disaster management policies, determine the roles of pharmacists in risk reduction, preparedness, response, and recovery stages, and design strategic actions both before and after

disasters. In this context, our study may inform future research and contribute to the development of policies. Legal measures are needed to ensure that pharmacists are prepared for disasters. To reduce the problems that may be experienced in the post-disaster period, it is necessary to clearly determine how pharmacies will provide services in the local and national disaster response plans of countries.

4.1. Limitations

We conducted our research with pharmacists currently living in Kahramanmaraş and Hatay provinces. Since life in the region affected by the earthquake has not yet fully returned to normal, the limited accessibility to people can be expressed as a limitation of the study. A key strength of our research is its status as one of the first studies to clearly identify the problems and deficiencies experienced by community pharmacists after a major earthquake.

5. Conclusion

Disruption of services provided by community pharmacists during disasters can be considered a fundamental public health problem. It shows that there are serious legal and managerial shortcomings regarding disaster preparedness, especially for the continuation of pharmacy services in Türkiye. In order for pharmacies to continue their activities, the necessary standards need to be improved.

The challenges encountered in the provision of medicines and medical supplies in the aftermath of the earthquake serve to illustrate the vital importance of such support and co-operation processes. The functionality of pharmacies in the aftermath of a disaster has significant implications for public health and disaster management strategies. The uninterrupted sustainability of pharmacy services in disaster situations is of great importance on a global scale. While the specifics of community pharmacy services may differ from country to country, it is crucial to assess the potential shortcomings in pharmacy provision during disasters, drawing insights from experiences of previous earthquake events. Based on this inference, the roles and responsibilities of pharmacists in disasters should be clearly stated by pharmaceutical organizations at national and international levels and these regulations should be included in the health policies of countries. Pharmacists should take part in crisis management committees and contribute to drug supply chain planning. Pharmacists should prepare for real crisis situations by regularly participating in disaster drills. Critical drugs and medical supplies should be stored in advance for use in disaster areas. Alternative logistics plans should be created to ensure that drug supply continues in disaster situations. Digital health systems should be used to prevent loss of patient information during a disaster. A special communication system should be developed for uninterrupted information flow between pharmacists and healthcare providers. Training should be organized for the community pharmacy on medication management and access to healthcare services before a disaster. Moreover, it is important to develop strategies to mitigate the risks that could hinder pharmacies from delivering services, due to extreme weather events which are likely to become more frequent due to climate change.

CRedit authorship contribution statement

Samet Dinçer: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Fatma Gündüz:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization. **Ezgi Atalay:** Software, Investigation, Formal analysis. **Galip Usta:** Writing – review & editing, Supervision, Resources. **Sare Peçe Göktaş:** Writing – review & editing, Supervision, Data curation.

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