Disaster Medicine and Public Health Preparedness

www.cambridge.org/dmp

How to Best Prepare Pharmacy Students for Disaster Management: A Qualitative Study

Chairun Wiedyaningsih PhD, Akhmad Kharis Nugroho PhD, Niken Nur Widyakusuma MSc and Septimawanto Dwi Prasetyo MSc

Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia

Original Research

Cite this article: Wiedyaningsih C, Nugroho AK, Widyakusuma NN, Prasetyo SD. How to best prepare pharmacy students for disaster management: A qualitative study. *Disaster Med Public Health Prep*. **17**(e319), 1–8. doi: https://doi.org/10.1017/dmp.2022.289.

Keywords:
disaster management; pharmacy students; preparedness; competency

Correspondence author: Chairun Wiedyaningsih, Emails: chairun_wied@ugm.ac.id, farmasi@ugm.ac.id

Abstract

Objective: This study explores the opinions of academic and practicing pharmacists about ways to prepare pharmacy students for disaster management to enable them to optimize their role in disaster health management.

Methods: Semi-structured individual interviews were conducted for data collection from April through June 2021. The research participants were 9 pharmacists who were involved in disaster management. The interview guide was developed following a comprehensive literature review on disaster management. Data were analyzed using thematic analysis.

Results: The main themes identified are knowledge of health and disaster management, specific skills in disaster management, positive attitudes toward involvement in disaster management, and appropriate behavior in the face of a disaster, as well as personal readiness and training to achieve competence and readiness. Participants mentioned that special training in soft skills, especially communication and problem-solving, is essential for students.

Conclusion: Disaster-specific competencies and personal readiness through training can prepare pharmacy students for disaster management. Soft skills such as communication and problem-solving must be the highest priority.

Introduction

Disasters are serious disruptions to the functioning of a community that are beyond its capacity to cope, using its own resources. Disasters and the emergencies they entail occur in diverse situations in both sparsely populated rural and densely populated urban regions, as well as in situations involving natural and manmade hazards. Apart from the ongoing coronavirus disease 2019 (COVID-19) pandemic, natural disasters are a common threat in Indonesia, owing to its geographical position on the Ring of Fire and location at the boundaries of 3 tectonic plates.[1] During disasters, pharmacists may function as first-line responders at the site of the event. They are expected to assist in emergency care for displaced victims in the health system, as observed during the COVID-19 pandemic.[2,3] Several studies have mentioned the need to increase the number of pharmacists who are prepared to deal with disaster situations by exposing pharmacy students to emergency preparedness concepts through education and training.[4–8] Evaluation based on the learning module on the role of pharmacists in disaster management has indicated the need for mass triage simulation programs for emergency situations.[8,9] Students equipped with the knowledge and skills required for disaster management can show superior responses in disaster situations. Therefore, it is necessary to investigate the opinions of academic and professional pharmacists regarding what pharmacy students need to prepare for future efforts in disaster management based on their experience.

Methods

Setting

The study was conducted online using the Zoom video meeting platform with academic and professional pharmacists in Indonesia. The interviews were scheduled according to the participants' preferences.

Design and reporting

This exploratory study adopted a qualitative design to gain insight into the research objective. To follow a standard reporting process, COREQ statements were used.[10]

Participants

The participants were academic or practicing pharmacists who had played active roles in disaster management situations, either as resource persons at disaster-related scientific forums or

© The Author(s), 2023. Published by Cambridge University Press on behalf of Society for Disaster Medicine and Public Health, Inc.

had been involved in handling disasters at disaster sites. Participants were selected via purposive sampling to achieve maximum variability. Key informants were initially identified by teams of resource persons known to be competent in the topic and who had played active roles in various disaster management activities. Of the identified informants, 3 were academic lecturers with whom the research team had worked prior to the commencement of the study. Snowball sampling was then used to reach other individuals with experience in disaster response. Unwillingness to participate in the study was considered an exclusionary criterion. Participants were invited through private WhatsApp messages or emails to the institutions, and subsequently, they were informed of the study's objectives.

Interview methods

Individual semi-structured interviews were conducted in June 2021. The interview questions were developed following a comprehensive literature review to determine the relevant themes targeted during the interviews. Participants shared with researchers their experiences and knowledge about disaster management. Considering the impact of the COVID-19 pandemic, some interview questions were related to the Indonesian government's response toward COVID-19 disaster prevention. Each Zoom interview session included only a single participant and the research team. The interviews involved open-ended questions to obtain in-depth information related to the research objectives. The interviews lasted approximately 60 – 90 minutes and were recorded. The research team comprised 1 professor, 1 associate professor, and 2 assistant professors of pharmacy studies with prior experience in qualitative research during their careers as academic lecturers. The research team evaluated results of interview before continuing to the next interview to ascertain whether enough data had been collected to draw conclusions, and any further data collection will not produce value-added insights All researchers took turns as interviewers and facilitators during each interview session.

Validity and reliability of research findings

To support the study's confirmability and credibility, all transcripts and findings were shown to participants to check whether they were consistent with their actual experiences and opinions. The findings then were discussed within the research team who brought different perspectives of data interpretation. The research team members mutually agreed on the themes obtained from the interviews.

Data analysis

A combination of manual and software (NVivo) techniques were used in data analysis. The research assistant listened to the recordings and transcribed them verbatim. The transcripts were imported in NVivo12® software (QSR International, Burlington, MA, USA). The transcripts were then read through several times by the first author (CW) to identify the meaning units from the text. Other researchers (NNW, SDP, AKN) and CW then condensed the meaning units and gave names with codes sorting the data into categories; The whole organizing process was supported and facilitated by NVivo12® software (QSR International, Burlington, MA, USA). Content analysis was performed on the data in Indonesian before the data was translated to English. The process of synthesizing theme was inductive and depended on the judgement of the authors through many discussions. Each theme presented in the results was supported by quotations. The quotations were not literally translated word-for-word, but parts of the quotations that were unnecessary or repetitious were excluded and indicated with an /. . . ./. Additions to words were placed in square brackets to facilitate understanding of the quotation.

Results

Of the 11 selected participants, 2 refused to participate. 2 men and 7 women between the ages of 35 and 59 years participated in individual interviews (Table 1). All 9 participants had graduated, namely: 2 professors, 2 PhD holders, 4 masters, and 1 pharmacist. The undergraduate was chosen because he had already fulfilled a critical and complementary role during various disaster situations in affiliation with various institutions. 7 participants had experienced and held strategic and operational positions in disaster management, while the other 2 were involved as resource persons in various scientific meetings related to disaster management.

6 main themes related to what pharmacy students needed to prepare for disaster management were identified, namely: (1) knowledge of health and disaster management, (2) specific skills in disaster management, (3) positive attitudes toward involvement in disaster management, (4) appropriate behavior in the face of a disaster, (5) personal readiness, and (6) training to achieve competence and readiness. The 4 themes of knowledge, skills, attitudes, and behaviors form the competency framework. In addition to competencies, the study demonstrated that personal readiness is required to prepare students in disaster management. Training was also a theme identified in this study; training is a strategic program required to achieve the desired competencies and readiness. The 6 themes, main categories, and their sub-categories are shown in Table 2. Knowledge of disasters, specific drug management, communication, and problem solving are themes that are often conveyed in interviews. Illustrative quotations from participants are shown under each of the main themes, categories, and sub-categories to help explain these findings.

Theme 1: Knowledge of health and disaster management

The theme knowledge of health and disaster management was a principal theme identified from data analysis. It included 4 main categories: (1) Concepts and practices of disaster management, (2) Medicine and health care during disasters, (3) Specific theoretical knowledge of pharmacy, and (4) Applied knowledge of pharmacy. According to participant experiences, pharmacy students involved in disaster management should already understand the basic concepts pertaining to disasters and the disaster management guidelines of the Ministry of Health. Furthermore, they stated that pharmacy students must equip themselves with knowledge of medications and their management. This is the foundational competence of pharmacists. During a disaster, this knowledge must be adapted to disaster conditions.

Concepts and practices of disaster management

'The important thing, of course, is to have an understanding about the disaster itself" [Participant 4]

'Know the terrain first because there are so many types of disasters.' [Participant 8]

'The terms pre-, during, and post-disaster/. . . / also need to be understood.' [Participant 2; 7]

Medicines and health care during disasters

'Ministry of Health guidelines related to disaster management contain details about the disaster types and the possibilities of emerging diseases and existing drug packages.' [Participant 7]

https://doi.org/10.1017/dmp.2022.289 Published online by Cambridge University Press

Table 1. Participant characteristics

No	Age (years)	Gender	Highest qualification	Position in institution	Descriptions of participants related to disaster management
1	50	Female	PhD	Board of directors, member at hospital	- Actively involved in COVID-19 Response Acceleration Task Force - Person in Charge of Innovation at SONJO (a humanitarian movement that focuses on helping people who are vulnerable and at risk of being affected by disasters)
2	46	Male	PhD	Chairman of the regional board of the Indonesian Pharmacist Association	- Experienced and plays an active role in organizing and coordinating pharmacists involved in disaster management
3	48	Female	Professor	Deputy Dean at Faculty of Pharmacy	- Active as a resource for courses related to disaster management
4	53	Female	Professor	Head of the Postgraduate Program in Pharmacy	- Active as a resource for courses related to disaster management
5	35	Male	Postgraduate candidate		- Volunteer in various disaster organizations
6	43	Female	Master's degree	Head of Pharmacy Installation at a hospital	- Head of Medicine, Logistics, and Food Unit in the Emergency and Disaster Service
7	59	Female	Master's degree	Hospital pharmacist	- Experienced in coordinating the management of various types of disasters, especially in the pharmaceutical sector
8	34	Female	Master's Degree	Academic lecturer	- Volunteer with experience in managing various types of disaster situations
9	35	Female	Master's degree	Pharmacist at Dept. of Health, Ministry of Health	- Actively involved in disaster management, especially in the procurement of medicines and medical devices

'Triage is not only for earthquakes or Mount Merapi eruptions. Even for COVID-19, triage is important to sort out which patients [COVID-19 patients] can be in the village shelter, which need to be taken to the hospital, or to the ICU, for example.' [Participant 1]

Specific theoretical knowledge of pharmacy

'Pharmacists are like that; they are mainly involved in drug handling, storage, delivery to patients, counseling, and so on.' [Participant 4]

'So, the SOP (standard operating procedure) for students was to prepare medicines and logistics and then report on drugs that will be held or those that have been given to the community.' [Participant 8]

'Here, we are dealing with logistics, so how to ensure in terms of logistics that the pharmacy is sufficient to provide all health services.' [Participant 9]

Applied knowledge of pharmacy

'If we receive medication aid, we have to observe carefully which drugs can be accepted and which drugs cannot.' [Participant 7]

'Counseling during a disaster situation may be a little different in terms of the points that must be emphasized.' [Participant 4]

Theme 2: Specific skills in disaster management

The participants emphasized the importance of soft skills, including communication, problem-solving skills, open-mindedness, knowledgeability, organizational skills, and survival skills. Learning soft skills was the most widely mentioned competency among interviewees. Communication and various issues related to problem-solving were the skills most frequently discussed by participants. Although students have completed courses related to soft skills, their practice of these skills appears to be limited.

Communication

'Communication skills come first. Communication/. . . /so we must also be smart to listen, to map out what they ask for, and provide solutions.' [Participant 6]

'Communication skills refer not only to counseling but also communication with people outside our field.' [Participant 1]

Problem-solving skills

'Keep them (drugs) from getting wet (during a flood disaster) and choose drugs that really won't get wet or protect them from getting wet.' [Participant 8]

'Sometimes, we feel confused when there is inadequate medical equipment and supplies. For example, medicine bottles, etc., so we must be creative, /. . . /. That's part of the challenge too.' [Participant 2]

'For poisoning, there is no antidote/. . . / modification was required/. . . /to solve the poisoning problem.' [Participant 3]

'Students can also invite speakers and work with resource person(s) to create podcasts or other news dissemination programs.' [Participant 4]

Open-mindedness

'We should be open-minded, but we (pharmacy students) are too afraid of doing something wrong, to go out of the corridor, or to think out of the box.' [Participant 3]

Knowledgeability

'Update knowledge and also actively follow the development of problems and their solutions.' [Participant 7]

'Before I go, I usually google the health problems related to the disaster first, about what words they (based on culture) often say.' [Participant 6]

Organizational skills

'We have to be able to play teamwork roles, it is also important apart from the initial provisions.' [Participant 3]

'COVID-19 is the most visible; leaders should be healthy individuals.' [Participant 1]

https://doi.org/10.1017/dmp.2022.289 Published online by Cambridge University Press

Table 2. Themes, main categories, and sub-categories

Theme	Main categories	Sub-categories: Frequency	Number of respondents who indicated the sub-categories at least once
Knowledge of health and disaster management	Concepts and practices of disaster management	Knowledge about various types of disasters and areas with disaster threats	9
		Stages of disaster: pre-, during, and post-	2
		Knowledge of organizational management	2
	Medicine and health care during disasters	Diseases that often arise during disaster emergencies	5
		Triage	4
	Specific theoretical knowledge of pharmacy	Basic knowledge of therapy management	5
		Specific drug management during disaster emergencies	9
		Theories in drug counseling	3
	Applied knowledge of pharmacy	Drug counseling	4
		Drug packaging in unit dose dispensing	2
		Specific drug and medical devices management during emergencies and disasters	5
		Pharmaceutical documenting in disasters	2
Specific skills in disaster management	Communication	Communication with other professionals and community	8
	Problem-solving skills	Creative thinking: innovation and idea formulation	9
		Filter for misleading health information	1
		Thinking fast in solving problems	3
	Open-mindedness	Thinking outside the box	2
		Multidisciplinary thinking	2
	Knowledgeability	Updating knowledge	2
	Organizational skills	Playing a role in teamwork	4
		Leadership	2
		Self-confidence	2
		Cooperation	4
		Collaboration	4
		Responsiveness	3
	Survival skills	Survival skills	3
Positive attitude toward involvement in disaster management	Empathy	Empathy in responding to disasters	5
	Altruism	A calling to help disaster victims	3
	Passion	Passion for disaster response	2
Appropriate behavior in the face of disaster	Responsible behavior	Responsible behaviors	3
	Caring behavior	Actions concerned with the well-being of a disaster victim	1
Personal readiness	Physical readiness	Adaptability	4
		Resilience	8
	Mental readiness	Stress management	5
	Family readiness	Family readiness	3
Training to achieve specific competence and readiness through various methods and forum	Professional organization	Familiarity with organizational skills	1
		Disaster management training organized by professional organizations	3
	Study club/ university student organizations	Improving organizational skills and teamwork ability	3
		Internship at health institutions	1
		Active in students' organization to improve soft skills	1
		Inter-professional Education (IPE) study club	2
	Community service programs	Accustomed to various cultures and field conditions	3
		Training students with empathy	1

Survival skills

'Yes . . . . knowledge of survival skills.' [Participant 8]

'Volunteers must be able to survive in any condition.' [Participant 7]

Theme 3: Positive attitude toward involvement in disaster management

Participants stated that a positive attitude toward disaster management should be actively encouraged among students. In addition to

https://doi.org/10.1017/dmp.2022.289 Published online by Cambridge University Press

the need for training related to disasters, the involvement in community programs is crucial for pharmacy students to build a positive attitude and appropriate behavior in their disaster responses. Some statements by participant on the issues related to Theme 3 are as follows:

Empathy

'Empathy is required. How one can increase one's empathy cannot be taught but rather it happens through exposure.' [Participant 1]

'We must look for gaps for which we can provide help, but empathy is number 1.' [Participant 3]

'Hopefully there will be a sense of empathy/ . . . /he is willing to carry out service and share in any form.' [Participant 2]

Altruism

'This means that we need to make students aware that service is purely human (altruism) and not for anything specific.' [Participant 1]

'The souls of such (altruists) might complement each other.' [Participant 2]

Passion

'At least someone has that passion/ . . . /. He has the spirit of disaster response/ . . . /. If there is a disaster, he will come.' [Participant 4]

'It's because of passion from the beginning.' [Participant 5]

Theme 4: Appropriate behavior in the face of disaster

Disasters can cause fatalities and sudden escalations in individuals who require care from medical professionals. In addition to the positive attitude needed during disaster management, in the recovery phase, when the victim has the burden of an incurable health condition, health professionals must exhibit responsible behavior. Responsible and caring behavior is the main category found in this theme.

Responsible behavior

'We serve the community and the hospital; we must work sincerely. We work so that all people can be served.' [Participant 9]

'We guarantee that the medicine is stored safely and will not be lost.' [Participant 5]

Caring behavior

'For example, students need to know not (should behave) to throw chemicals into the sink. That's also part of their care for the environment.' [Participant 3]

Theme 5: Personal readiness

Pharmacy students must be primed for the challenges associated with disaster management. Thus, their readiness to effectively function is critical. Personal readiness means being ready for emergencies or disasters at anywhere and anytime. Personal readiness needed to be able to optimize performance and be fit at any disasters site. The participants emphasized the importance of personal readiness, including physical, mental, and family readiness.

Physical readiness

'So, the first aspect is physical, yes, for sure, because in a disaster, usually everything is not perfect, right?' [Participant 7]

'Maybe that's what drained a lot of our energy there.' [Participant 2]

Mental readiness

'The condition is stressful, right, stressed, so/ . . . /have to be ready for that.' [Participant 7]

'They must be mentally prepared and ready for any kind of location because it will be different.' [Participant 8]

Family readiness

'My mama said, 'do what you can to help as many people as possible.' [Participant 5]

'My mother is paranoid if my father is not there.' [Participant 8]

Theme 6: Training to achieve competence and personal readiness

Even though students have received courses related to soft skills, some participants stated that the practice of skills still appears to be limited. The results emphasize that apart from basic knowledge of pharmacy, training was needed to achieve competence and personal readiness. Training through participation in various organizations can familiarize pharmacy students with understanding different cultures and educational backgrounds, as well as the boundaries and responsibilities thereof. Participants believed that getting used to problem-solving in professional and extracurricular student organizations could be a learning tool for acquiring a comprehensive range of skills and how to behave in disaster management. This theme comprised 3 main categories: professional organizations, study club/ student university organizations, and community service programs. Some participant statements on the issues related to Theme 6 are as follows:

Professional organizations

'The Mer-C organization is already clearly established, / . . . / just put them into Mer-C or any agency that makes them collaborate.' [Participant 1]

'The American soldier came with 4 sacks of medicine, give or take, filled with medicine and medical devices. Then, the Chinese also brought aid, though the instructions were written in Kanji and couldn't be read.' [Participant 6]

'If you have never been exposed to or involved in an organization, it is rather difficult to interact.' [Participant 3]

'From IAI (Indonesian Pharmacist Association), we have ATB (Disaster Response Pharmacists), who have a forum that collaborates with BNPB (National Board for Disaster Management).' [Participant 2]

Study clubs/ university student organizations

'Usually accompanied by existing lecturers and often carried out by Piogama or Klinika (a kind of faculty study club), I think such action is quite useful.' [Participant 4]

'At the student level, there is something called ISMAFARSI (a kind of faculty study club). I think they also have programs related to it all.' [Participant 2]

'Being involved in a group of studies or student organizations will speed up the adaptation process.' [Participant 3]

Community service programs

'They must be exposed to certain rules and ideas. For example, that participating in the service program is mandatory for students.' [Participant 3]

'Must be exposed, for example . . . to service/ community services/is mandatory for students, for example.' [Participant 1]

https://doi.org/10.1017/dmp.2022.289 Published online by Cambridge University Press

Discussion

The participants of the study believed that students should have knowledge of health and disaster management, including disaster concepts, disaster health management, and knowledge of topics in pharmacy studies. Notably, this study shows that pharmacy students must gain proficiency in triage, as a field of knowledge. In the event of an incident with mass casualties, the health professions must implement effective triage as critical care resources become scarce. The accuracy and efficiency of triage contribute to timely medical treatment and superior patient outcomes.[11] Therefore, appropriate knowledge and training for triage in disaster situations is essential and should be prepared for by pharmacy students.

All participants agreed that specific knowledge of pharmacy management is an essential competency, such as drug storage to prevent damage by fire, flood, or unsafe water, and the use of temperature-sensitive drugs when refrigeration is temporarily unavailable. Activities related to the logistics of medicines, including data entry and the listing and distribution of medicines to disaster victims and their documentation, require volunteers who understand or have backgrounds in pharmacy. Drug handling, storage, and delivery to patients in the form of packages, and counseling on the use of drugs are pharmacist activities that are regularly conducted during disasters. A participant stated that when distributing medicines during the 2006 Yogyakarta earthquake, the process was made more difficult and, at times, had to be done again when she was assisted by non-pharmaceutical personnel. Therefore, acquiring knowledge is an effective way to manage disaster effects.

This study provides insight into the importance of pharmacy undergraduate education to develop students' knowledge, considering the fundamental values and principles of drug management in disaster areas. Therefore, despite all the advancements in pharmacy curricula, certain knowledge areas still need to be explored further. This is also indicated by Rajesh *et al.*, who highlighted the need for curriculum changes for effective integration of various sectors for disaster management, particularly in developing nations, which exhibit a definite scarcity of resources.[12] Furthermore, a study conducted by Santos *et al.* also suggested that health and nursing schools should provide students with diversified education, enhancing their knowledge in multiple fields.[13]

This qualitative study has described the importance of improving soft skills for students in disaster management. Extracted categories highlight communication and problem-solving skills as important aspects of these skills. Communication skills usually draw limited attention in university syllabi.[14] According to participant interviews, communication is a key soft skill that requires frequent application and review during campus classes. Communication ability is required not only for fellow health professionals but also for other professions and society. The skills needed to care for patients in disaster situations can be different than in routine settings. Students should participate in patient counseling, interviewing, and educational sessions, as well as collaborative work with other health care providers.[15]

During the COVID-19 pandemic, much misleading information, especially medical news, has been deliberately spread through social media without fact verification. Some people have difficulty finding reliable sources and guidance when they need it. Therefore, various efforts are needed to ensure that everyone has access to accurate information.[16] Since engagement in medical volunteering during the COVID-19 pandemic can be regarded as a risk-taking activity. Therefore, a participant suggested that in handling the COVID-19 disaster, pharmacy students could play a role in straightening information on social media. Students can help deal with problems related to misinformation by making podcasts and other broadcasts with a trusted source under the guidance of their educators. The present study shows that problem-solving training is essential.

As future healthcare professionals, pharmacy students should possess appropriate knowledge, skills, behavior, and positive attitudes in response to emergencies or disasters. Various factors could affect health professionals and students' willingness to respond to disasters. The factors that influenced Australasian emergency nurses to attend to their workplace during a disaster were the type of disaster, individual demographic factors, family factors, and the workplace itself.[17]

A study of 169 Korean nurses found that respondents expressed the highest willingness to work in response to a landslide disaster.[18] In contrast, they reported the lowest willingness and competency for human-caused radioactive terrorism. The current study found that a positive attitude toward disaster management should be actively encouraged among pharmacy students. According to Choi and Lee,[18] the provision of well-organized disaster preparedness and response training programs could enhance a positive attitude in terms of willingness to respond during a disaster. A positive attitude toward people affected by a disaster is useful in bringing about positive changes in behavior.

Participants acknowledged that pharmacy students must have specific personal readiness, including physical, mental, and family readiness. Readiness is willing to do something and ready to go, because of preparedness to act immediately. Work without adequate rest and changes in eating and sleeping habits are common during disasters and emergencies. Many people find it extremely difficult to tolerate work pressures and stress, work in harsh conditions, and have the physical ability to deal with disaster victims. Thus, students must be mentally prepared and highly willing to be involved, take risks, and be ready for all kinds of disaster situations because these are usually extraordinary circumstances. Several studies about disaster medicine preparedness and readiness among health care profession students.[7,19–21] A study in Pakistan among healthcare profession students found that students' levels of readiness to practice were moderate.[19] Kang *et al.*[22] realized that additional mental health services and training should be available to at-risk medical rescuers and groups to ensure that they are adequately prepared for relief efforts and to maintain their mental health after assistance in disaster relief. Certain traits, such as adaptability and flexibility, are important because these traits increase students' adaptability in chaotic situations and when experiencing a high level of stress. Thus, being prepared can reduce fear, anxiety, and losses that accompany disasters. Providing this preparation before disasters occur can promote the ability and willingness of pharmacy students to work during disasters.

Pharmacy students need to be prepared to overcome the complexity of health problems caused by a disaster. They are obligated to have the requisite knowledge, positive attitude, and practice towards disaster to be ready and prepared. Study results emphasize that apart from basic knowledge of pharmacy, training was needed to develop and increase specific knowledge and skills that relate to specific competency. To fulfil their role in dealing with disasters, pharmacists must attain and maintain essential competencies to population health needs. Thus, it is very important to identify the competencies required for pharmacy students to enable them to work effectively in disaster management. Competence is perceived as the capacity of individuals to perform specific tasks and roles to the expected standards in a given context or

https://doi.org/10.1017/dmp.2022.289 Published online by Cambridge University Press

profession.[23,24] Thus, it involves the integration of practical and theoretical knowledge, as well as personal, and social qualities within a broadly defined occupational field.[25] Competencies embrace knowledge, skills, attitude, and behaviors in order to support their effective and persistent performance.[26,27] Competency frameworks for training or education is widely used in the health professions, including pharmacy.[28–30] In the context of the ever-changing roles of pharmacists, the use of competency frameworks could aid in ensuring consistent quality pharmacy training. Since in emergency situations during disaster, pharmacist played a critical role in the effective use of medicine provided for disasters, drug dispensing, and consultation as well as good teamwork.[31] Communication skills and coordinates care among members of the healthcare team are also the basic competencies needed for optimal care.[32] WHO also emphasized that all hospital personnel, including volunteers must have the knowledge, positive attitude, and readiness to practice towards disaster.[33] Thus, acquiring competency and personal preparedness through training are effective means to manage the effects of disasters. By training, pharmacy students could become qualified and proficient in doing specific purpose relate to disaster managements.

Selection of learning methods is important in increasing competence and personal readiness to deal with disaster situations. A wide range of training models have been developed.[21–23] According to the participants, pharmacy students deployed in disaster areas, could be expected to have more opportunities to be involved in various organizations activities. Student membership within professional organizations are key components to advancing the profession of pharmacy. Engaging students in professional organizations during school may contribute to the establishment of professional traits.[34] Student organizations foster the acquisition of knowledge and the application of soft skills such as problem solving, time management, and communication. Students who experience participating in extracurricular activities led to more positive self-perceptions of leadership traits including confidence, honesty, optimism, persistence, and responsibility than for students who were not involved in those organizations.[35] Community-based training is a strategy that gives students an opportunity to deal with real health problems in natural settings. Students who willingly contribute to community service learning programs may acquire several benefits, including enhanced social skills, improved community consciousness and a greater desire to help others. The training based community engagement has given an opportunity for the students to get close to the local community and increase in the level of academic performance, life skills, civic, and social responsibility and personal development of the students.[36] Furthermore, exposing students to community engagement can help to intentionally integrate theory and practice.[37] Service learning, which integrates community services into coursework, can promote the civic growth of students in unique and powerful ways.[38] Therefore, having experience in professional and university organizations, as well as community services, will speed up the process of pharmacy students' blending, coordinating, and collaborating with health volunteers, and other team members in disaster management.

Limitations

This study collates the results of studies conducted in specific cultural and educational contexts. Although 2 of the research team members had previously completed a disaster management course, the presence of the other interviewers helped with detecting the risk of bias and enhancing the rigor of the data. A problem with snowball sampling is that participants' social networks are not random. Initial subjects tend to nominate people they know well. Therefore, the use of this technique can result in biased samples. The relatively small sample size limits the general applicability of the results. However, selection of participants having various types of disaster experience assisted in ensuring the broad applicability of the findings to the context of preparing pharmacy students for involvement in disaster management in Indonesia and other countries.

Conclusion

Health professionals' involvement in disaster management requires careful preparation according to their competencies. Students should be trained and prepared long before they join a disaster management team. The current study explores the preparation that pharmacy students need for improving their contributions to disaster situations. The research findings show that knowledge of health and disaster management, specific skills in disaster management, positive attitudes toward involvement in disaster management, and appropriate behavior in the face of a disaster are essential aspects of disaster-specific competencies required in pharmacy students assisting in disaster management in addition to personal preparedness. Students should improve their soft skills to effectively provide disaster care. Involvement in various organizations could help students achieve competence and personal readiness. These findings can serve as a guide for designing courses to prepare pharmacy students for disaster management.

Acknowledgements. This work was supported by the Faculty of Pharmacy, Universitas Gadjah Mada. The authors are grateful to all research participants for sharing their knowledge and experiences, and to Chintya Gilang Ghaisani for her valuable verbatim transcripts.

Authors contribution. Chairun Wiedyaningsih conceived the idea for the study. Akhmad Kharis Nugroho provided professional advice in the field of research policy. Chairun Wiedyaningsih, Niken Nur Widyakusuma, and Septimawanto Dwi Prasetyo developed the protocol. All authors carried out the study and analyzed the results. Chairun Wiedyaningsih produced the first draft of the paper, and all the other authors read and contributed to the manuscript.

Ethical considerations. Ethical approval was obtained from the Medical and Health Research Ethics Committee (MHREC), Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada-DR Sardjito General Hospital, Indonesia, (Reference number: KE/FK/0305/EC/2021) on April 14, 2021. All participants were informed about the aims and methods of the study. They were guaranteed that their names would remain confidential in any reports of the study.

References

1. Centre for Excellence in Disaster Management and Humanitarian Assistance. *Indonesia Disaster Management Reference Handbook*; 2015.
2. **Aburas W, Alshammari TM.** Pharmacists' roles in emergency and disasters: COVID-19 as an example. *Saudi Pharm J SPJ Off Publ Saudi Pharm Soc.* 2020;28(12):1797-1816. doi: 10.1016/j.jsps.2020.11.006
3. **Hamid H, Masood RA, Khalid W, Saqlain M, Tariq H, Munir MU.** Emerging pharmacy services; recommendations for emergency care of COVID-19 pandemic in low and middle-income countries. *Pak J Pharm Sci.* 2020;33(4):1735-1738.

4. **McCourt E, Singleton J, Tippett V, Nissen L.** Disaster preparedness amongst pharmacists and pharmacy students: a systematic literature review. *Int J Pharm Pract.* 2020;n/a(n/a). doi: 10.1111/ijpp.12669
5. **Monk G, Pradhan S.** Pharmacy schools should be involved in disaster preparedness planning at the local and state levels. *Am J Pharm Educ.* 2019; 83(1):6968. doi: 10.5688/ajpe6968
6. **Pincock LL, Montello MJ, Tarosky MJ, Pierce WF, Edwards CW.** Pharmacist readiness roles for emergency preparedness. *Am J Heal Pharm AJHP Off J Am Soc Heal Pharm.* 2011;68(7):620-623. doi: 10.2146/ajhp090659
7. **Pate A, Bratberg JP, Robertson C, Smith G.** Evaluation of a Tabletop Emergency Preparedness Exercise for Pharmacy Students. *Am J Pharm Educ.* 2016;80(3):50. doi: 10.5688/ajpe80350
8. **Hannings AN, von Waldner T, McEwen DW, White CA.** Assessment of emergency preparedness modules in introductory pharmacy practice experiences. *Am J Pharm Educ.* 2016;80(2):23. doi: 10.5688/ajpe80223
9. **Montana M, Mathias F, Rathelot P, Lacroix J, Vanelle P.** Development and evaluation of an elective course of pharmacist's roles in disaster management in France. *J Educ Eval Health Prof.* 2019;16:19. doi: 10.3352/jeehp.2019.16.19
10. **Tong A, Sainsbury P, Craig J.** Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Heal care J Int Soc Qual Heal Care.* 2007;19(6):349-357. doi: 10.1093/intqhc/mzm042
11. **Timbie JW, Ringel JS, Fox DS, *et al.*** Systematic review of strategies to manage and allocate scarce resources during mass casualty events. *Ann Emerg Med.* 2013;61(6):677-689.e101. doi: 10.1016/j.annemergmed.2013.02.005
12. **Rajesh G, Binnal A, Pai MB, Nayak SV, Shenoy R, Rao A.** Insights into disaster management scenario among various health-care students in india: a multi-institutional, multi-professional study. *Indian J Community Med Off Publ Indian Assoc Prev Soc Med.* 2020;45(2):220-224. doi: 10.4103/ijcm.IJCM_104_19
13. **Santos PAF, Rabiais ICM, Berenguer SMAC, Amendoeira JJP.** Undergraduate nursing students' competencies in disaster scenarios: from educational needs to curricula regulation. *Rev Enferm Ref.* 2021;5(6): e20131.
14. **Cavaco AM.** What should pharmacists keep in mind to communicate with patients more effectively: some key concepts for everyday use. *J Malta Coll Pharm Pract.* 2017;23:13-16.
15. **McDonough RP, Bennett MS.** Improving communication skills of pharmacy students through effective precepting. *Am J Pharm Educ.* 2006; 70(3):58. doi: 10.5688/aj700358
16. **Nasir NM, Baequni B, Nurmansyah MI.** Misinformation related to COVID-19 in Indonesia. *J Adm Kesehat Indones.* 2020;8:51-59. doi: 10.20473/jaki.v8i0.2020.51-59
17. **Arbon P, Ranse J, Cusack L, *et al.*** Australasian emergency nurses' willingness to attend work in a disaster: a survey. *Australas Emerg Nurs J.* 2013;16(2):52-57. doi: 10.1016/j.aenj.2013.05.003
18. **Choi HS, Lee J-E.** Hospital nurses' willingness to respond in a disaster. *J Nurs Adm.* 2021;51(2):81-88. doi: 10.1097/NNA.0000000000000974
19. **Gillani AH, Mohamed Ibrahim MI, Akbar J, Fang Y.** Evaluation of disaster medicine preparedness among healthcare profession students: a cross-sectional study in Pakistan. *Int J Environ Res Public Health.* 2020;17(6):2027. doi: 10.3390/ijerph17062027
20. **Hermann S, Gerstner J, Weiss F, *et al.*** Presentation and evaluation of a modern course in disaster medicine and humanitarian assistance for medical students. *BMC Med Educ.* 2021;21(1):610. doi: 10.1186/s12909-021-03043-6
21. **Kim EA, Kim HR, Kim B.** Factors influencing medical and nursing students' willingness to care for COVID-19 patients in South Korea: a cross-sectional study. *BMC Med Educ.* 2022;22(1):161. doi: 10.1186/s12909-022-03229-6
22. **Kang P, Lv Y, Hao L, *et al.*** Psychological consequences and quality of life among medical rescuers who responded to the 2010 Yushu earthquake: a neglected problem. *Psychiatry Res.* 2015;230(2):517-523. doi: 10.1016/j.psychres.2015.09.047
23. **Biemans H, Nieuwenhuis L, Poell R, Mulder M, Wesselink R.** Competence-based VET in the Netherlands: background and pitfalls. *J Vocat Educ Train.* 2004;56(4):523-538. doi: 10.1080/13636820400200268
24. **Weigel TM, Mulder M, Collins K.** The concept of competence in the development of vocational education and training in selected EU member states. *J Vocat Educ Train.* 2007;59(1):65-85. doi: 10.1080/13636820601145549
25. **Brockmann M, Clarke L, Méhaut P, Winch C.** Competence-based vocational education and training (VET): the Cases of England and France in a European perspective. *Vocat Learn.* 2008;1(3):227-244. doi: 10.1007/s12186-008-9013-2
26. **FIP Education Initiatives**. A global competency framework for services provided by pharmacy workforce. Published online 2012.
27. **Boahin P, Hofman WHA.** Perceived effects of competency-based training on the acquisition of professional skills. *Int J Educ Dev.* 2014;36:81-89. doi:10.1016/j.ijedudev.2013.11.003
28. **Gruppen LD, Mangrulkar RS, Kolars JC.** The promise of competency-based education in the health professions for improving global health. *Hum Resour Health.* 2012;10(1):43. doi: 10.1186/1478-4491-10-43
29. **Udoh A, Bruno-Tomé A, Ernawati DK, Galbraith K, Bates I.** The effectiveness and impact on performance of pharmacy-related competency development frameworks: a systematic review and meta-analysis. *Res Soc Adm Pharm.* 2021;17(10):1685-1696. doi: 10.1016/j.sapharm.2021.02.008
30. **Batt AM, Tavares W, Williams B.** The development of competency frameworks in healthcare professions: a scoping review. *Adv Heal Sci Educ.* 2020;25(4):913-987. doi: 10.1007/s10459-019-09946-w
31. **Nakura H.** Role of pharmacists in disaster medicine: required knowledge and skills. *Yakugaku Zasshi.* 2014;134(1):3-6. doi: 10.1248/yakushi.13-00185-1
32. **Ayuba SB, Danjuma A, Nassa YG, Joseph I, Matthew AW, Micheal SN.** Role of the nurse in emergency preparedness: a survey of secondary health facilities in Northern, Nigeria. *World J Prev Med.* 2015;3(3):54-60. doi: 10.12691/jpm-3-3-2
33. **World Health Organization (WHO)**. *Hospital preparedness for epidemics.* 2014:76.
34. **Bradford D, Watmore P, Hammer D, Warholak TL.** The relationship between self-reported professionalism and student involvement in pharmacy organizations at one college of pharmacy: an exploratory analysis. *Curr Pharm Teach Learn.* 2011;3(4):283-289. doi: 10.1016/j.cptl.2011.07.010
35. **Smith LJ, Chenoweth JD.** The contributions of student organization involvement to students' self-assessments of their leadership traits and relational behaviors. *Am J Bus Educ.* 2015;8(4):279-288. doi: 10.19030/ajbe.v8i4.9422
36. **Selvaratnam D.** Do student volunteers benefit from community engagement? *Asian Soc Sci.* 2013;9. doi:10.5539/ass.v9n8p123
37. **Nuuyoma V, Munangatire T, Nghiweni N.** Nursing students' experiences of community-based learning in an undergraduate programme at a Namibian University. *Int J Africa Nurs Sci.* 2022;17:100458. doi: 10.1016/j.ijans.2022.100458
38. **Bringle RG, Steinberg K.** Educating for informed community involvement. *Am J Community Psychol.* 2010;46(3-4):428-441. doi: 10.1007/s10464-010-9340-y