

Evaluation of pharmacists' knowledge in emergency preparedness and disaster management

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Abstract

Background: Emergency preparedness and disaster management are global phenomena that have a significant impact on the economy and healthcare system. Pharmacists have assumed additional responsibilities in the wake of emergencies and disasters that are beyond their training curricula. Some research highlighted the need for pharmacists to assume these responsibilities in the cause of emergency and disaster. *The objective* of this study is to evaluate pharmacists' knowledge in relation to emergency preparedness and disaster management.

Method: A descriptive cross-sectional survey was carried out from April to August 2020, on selected pharmacists from different areas of practice in Kaduna/Nigeria. Participants were evaluated using a self-reported questionnaire which consisted of 15 knowledge questions that were distributed online using pharmacists' social-media platforms. The questionnaire was adapted from previous studies and was validated by the team of expert using face validation and pre-tested.

Main outcome: The majority of pharmacists have good knowledge of emergency preparedness and disaster management.

Results: The online poll received 102 respondents, and their knowledge was evaluated by rating respondents out of 15 questions. 55%, 40%, and 5% scored good, fair, and poor knowledge respectively. At $p < 0.05$, there was a relationship between knowledge score and years of practice experience, level of education, and area of practice. 44% reported being taught emergency, with the majority at the undergraduate level. 78% of respondents have never participated in drills or workshops.

Conclusion: Pharmacists demonstrated good knowledge of basic emergency and disaster terms, they do, however, need to be more conversant with other emergency areas, which necessitates more training and drills.

Keywords: pharmacy; pharmacists; pharmacist knowledge; emergency preparedness; disaster management; public health; COVID-19; pandemic

Introduction

Disaster is an abrupt ecological disturbance of the normal functioning of a community or society which leads to clinical, economical and societal consequences that will require the need for external assistance^[1] This phenomenon can be a natural occurrence such as flooding, drought, earthquake or disease outbreak or man-made such as terrorism or warfare. Preparing for possible occurrences of a disaster entails the concept of emergency preparedness. In 2009, Below *et al.* described Public health emergency preparedness as “the capability of the public health and healthcare systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities”.^[2]

In a disaster situation, to ameliorate human suffering and loss of life there is a significant need for healthcare. The International Pharmaceutical Federation (FIP) recognise that, Pharmacists are well-trained healthcare professionals capable of assisting in times of disaster depending on an individual pharmacist's scope of practice, competence and expertise and their role within the healthcare system.^[3]

In 2016, FIP developed a document where it highlighted two major roles for Pharmacists in disaster management that involve preparedness for the possibility of disasters and responding to emergency situations according to pharmacist expertise to help the population receive the best healthcare possible.^[4]

Due to the acute nature of emergencies and disasters, and the need for immediate response; FIP suggest pharmacists assume responsibilities based on their expertise and legal responsibilities including planning, developing guidelines, non-traditional services (such as first responder, first aid, triage and immunization), search and rescue, responding to a pandemic, rehabilitation, recovery and clearing phase, reconstruction and rehabilitation etc.^[4]

There are instances where pharmacists are reported to assume non-traditional responsibilities. In 2013, Ford *et al.* report that Canadian Pharmacists assumed a primary healthcare role during the acute respiratory syndrome (SARS) epidemic because many hospitals were closed.^[5] Pharmacists were also involved in the 2009 influenza pandemic (H1N1) in regulatory affairs at the Centre for Disease Control and Prevention

for public health emergency preparedness and response as cited by Bhavsar et al.^[5] Other instances include September 11, 2001 attacks in New York City, where Pharmacists assisted in Cardiopulmonary Resuscitation (CPR), trauma management, and triage at the World Trade Centre site during the medical response^[5] and in Portugal, pharmacists assumed the role of triage where they assessed patients symptoms and recent history of travel and/or contact with confirmed or suspected COVID-19 cases and assigned them to different categories of interventions.^[6] Nigeria is currently facing a wide range of disaster challenges including flooding, disease outbreaks (such as Lassa fever and COVID-19), banditry and terrorism.^[7]

Pharmacists may be the first to notice or report an outbreak. Several emerging infectious diseases begin with non-specific generalized symptoms mimicking other common illnesses such as a cold, for which patients may seek self-treatment at their local pharmacy.

In summary, Pharmacists have assumed additional responsibilities during disasters and emergencies to ameliorate human suffering, however, little or no research has been carried out in Nigeria on Pharmacists' knowledge and role especially in the wake of emergencies and disasters.

This study aimed to evaluate the knowledge of pharmacists on emergency preparedness and disaster management (ED) in Kaduna state, Nigeria.

Method

Study design

A cross-sectional survey was conducted from April to August 2020.

Study site

This study was conducted in Kaduna metropolis, Kaduna state Nigeria, covering practicing pharmacists within Kaduna state. A study reported in 2016 by Oseni and Oseni reported that; data obtained from the National Population Commission (NPC) and Pharmacists Council of Nigeria (PCN) on Pharmacists distribution in Nigeria, showed that Kaduna state has a total of 395 active registered Pharmacists as of 2016. The distributions were; community 175, hospital 47, industrial 3, academia 13, Administrative and Regulatory 11, NYSC 117 and unemployed Pharmacists 29.^[8]

Study population

The study involved all pharmacists within Kaduna/Nigeria that consented to participate.

Sampling method

Convenience sampling was used to recruit pharmacists using pharmacist-only social media platforms with a targeted recruitment of ≥ 100 . This method was previously used by Nofal et al., 2018 for a similar study.^[9]

Study tool

The questionnaire was developed by the authors. To the best of our knowledge, no previous research had been conducted on pharmacists' knowledge with regard to ED in Kaduna/Nigeria. The pool of questions was adapted from previous studies of similar work^[9-11] undertaken in other countries and including pharmacists and other healthcare professionals. The research team critically analyzed, rephrased and selected the questions to

Table 1 Demographics characteristics of respondents (n = 102).

Demographics	n (%)
Age, years	
18–25	13 (12.7)
26–35	51 (50.0)
36–45	19 (18.6)
46–55	17 (16.7)
56–70	2 (2.0)
Gender	
Female	44 (42.3)
Male	58 (55.8)
Educational level (highest completed)	
B.Pharm	58 (58.9)
D.Pharm	2 (1.9)
M.Sc.	29 (27.9)
MDRM	1 (1.0)
MPH	1 (1.0)
Ph.D	11 (10.6)
Area of practice	
Academia	27 (26.0)
Administrative	6 (5.8)
Community	25 (24.0)
Hospital	38 (36.5)
Industry	1 (1)
Marketing	1 (1)
Non-Governmental Organization	2 (2)
Public Health	1 (1)
Work experience, years	
0–5	55 (52.9)
6–10	21 (20.2)
11–15	9 (8.7)
16–20	12 (11.5)
≥ 21	5 (4.8)
Number of emergency or disaster attended	
None	54 (51.9)
Once	9 (8.7)
Twice	13 (12.5)
Numerous	26 (25)

B.Pharm, Bachelor of Pharmacy; D.Pharm, Doctor of Pharmacy; MDRM, Master's degree in Disaster Risk Management; MPH, Master's Degree in public Health

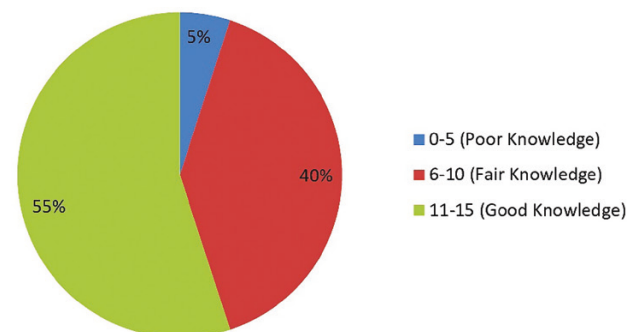


Figure 1 Aggregate knowledge score of respondents.

meet the study objectives and context. The questionnaire underwent face validation and was evaluated for content design, length, readability and comprehension by the team of supervisors before it was distributed. It consisted of two sections: section A covered demographics such as age, sex, area of practice, highest qualification and number of emergencies attended; section B consisted of 15 knowledge questions for evaluating pharmacists' knowledge (see [Supplemental Material](#) for a copy of the questionnaire).

Data collection

The online questionnaire hyperlink (using Google survey) was distributed to pharmacy social media platforms (Whatsapp and Facebook).

Data analysis

Data collected were transferred into a Microsoft excel sheet and exported into a Statistical Package for Social Sciences version 22 (IBM SPSS Version 22). Categorical and Quantitative variables were summarised using descriptive analysis. Chi-square was used to compare independent categorical variables with knowledge scores, *P*-value was considered statistically significant at <0.05 .

Adopting Nofal *et al.* (2018), each question was coded for correct answer = 1 and incorrect answer = 0. Participants that scored 10–15, 9–5 and 4–0 were categorised as having good, fair and poor knowledge respectively.^[9] Data collected from pretesting were not utilised in the final result.

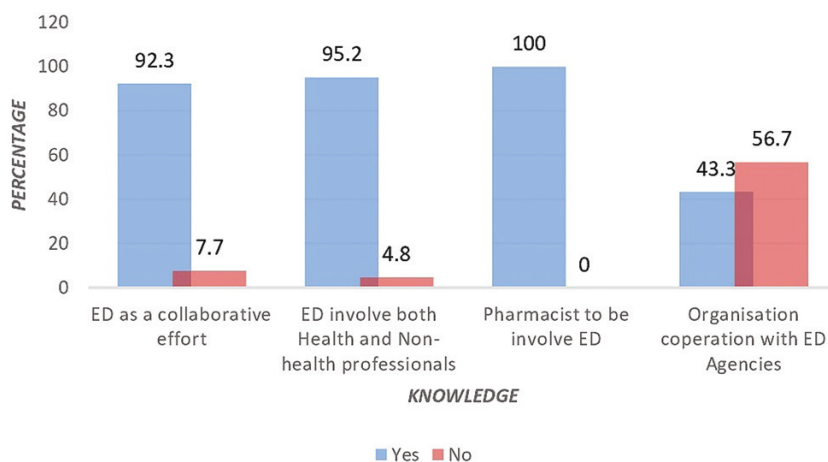


Figure 2 Pharmacists knowledge on emergency and disaster.

Table 2 Chi-square analysis of association, pharmacists knowledge scores with demographic variables ($n = 102$)

Demographic variables		Knowledge scores			P-value
		0–5 score	6–10 score	11–15 score	
Educational level (highest completed)	B.Pharm	3(5%)	24(41%)	31(53%)	$<.001^*$
	D.Pharm	0(0%)	1(50%)	1(50%)	
	Masters	0(0%)	12(39%)	19(61%)*	
	Ph.D.	0(0%)	4(36%)	7(64%)*	
Area of practice	Hospital	1(3%)	13(34%)	24(63%)*	$<.001^*$
	Community	0(0%)	13(52)	12(48)	
	Others	2(5%)	15(39%)	22(56%)	
Work experience	0-5 years	3(6%)	24(44%)	28(50%)	$<.001^*$
	6-10 years	0(0%)	11(52%)	10(48%)	
	11-15 years	0(0%)	3(33%)	6(67%)*	
	16-20 years	0(0%)	2(17%)	10(83%)*	
	21 and above	0(0%)	1(20%)	4(80%)*	
Number of emergencies attended	None	1(2%)	28(52%)	25(46%)	$<.001^*$
	Once	1(11%)	2(22%)	6(67%)*	
	Twice	0(0%)	5(39%)	8(61%)	
	Numerous	1(4%)	6(23%)	19(73%)*	
Gender	Male	3(5%)	23(40%)	32(55%)	$<.001^*$
	Female	0(0%)	18(41%)	26(59%)*	

*Significant difference at *P*-value of <0.05 .

Ethical Approval of the study was obtained from the Health Research Ethics Committee (HREC) of Kaduna State Ministry of Health, Kaduna state Nigeria (REF: MOH/ADM/744/VOL.1/970).

Results

A total of 104 pharmacists attempted and 102 completed the online questionnaire. The demographic characteristics of respondents are summarized in Table 1.

Pharmacists Knowledge

Just over half of the (56; 55%) respondents had good knowledge of what an emergency is while 40% (41) and 5% (5) had fair or poor knowledge respectively (Figure 1).

Chi-square analysis of association showed the relationship between independent variables and the knowledge score. The association was observed among pharmacists with M.Sc. degrees, with a total of 32 responders, 19 scorings 11–15, and 12 scorings 10 or below ($P < 0.05$) than pharmacists with B. Pharm ($P < 0.001$). Better scores were also associated with pharmacists who practiced in a hospital compared to those in community pharmacies ($P < 0.001$). Furthermore, pharmacists who had attended a greater number of emergencies ($P < 0.001$) (see Table 2) also had more knowledge.

Almost all participants (101/102; 99%) agreed that Pharmacists should be involved in emergency and disaster management (Figure 2). However, 58 (56.7%) of the respondents' organisations reportedly did not have any link with disaster-related agencies (see Table 3).

When respondents were questioned on whether they had received any training on emergency and disaster planning, the majority (57/102; 55.9%) said that they had not (see Figure 3). Of the 45 (44.1%) that had received some training this was split between undergraduate level (37/102; 36.3%) and postgraduate (30/102; 29.3%) (see Figure 4); and (22/102; 22%) trained in their facility (Figure 5) with area of practice (Table 4).

Discussion

In this study, the majority of the participants had good knowledge with regard to basic emergency and disaster terms which was associated with pharmacists work experience, level of education and number of emergencies attended. Hospital pharmacists performed better than their community counterparts.

Table 3 Pharmacists knowledge on emergency and disaster (n = 102)

Knowledge questions	Yes	No
Have you ever been taught about disaster or emergency?	45	57
Have you ever performed a disaster or emergency drills/workshop in your facility or city?	22	80
A disaster management is an integral collaborative action of different agencies	96	4
A disaster management include both a health and non-health professionals	99	3
Pharmacists should be involve in emergency and disaster management	101	1
Does your organisation have cooperation with disaster-related agencies?	45	56

The limitations of this study include; online survey was the only medium used to fill in the questionnaire to restrict human contact due to COVID-19 pandemic. This is believed to have influenced the number of respondents and limited the survey to pharmacists that have access to the internet and are using the social media. Since there was no standard emergency operational plan that is specific to pharmacists in Nigeria, the authors utilized previous studies to develop the questionnaire.

The fact that the majority of the pharmacists had good knowledge with regard to basic emergency and disaster knowledge, may have been linked to the ongoing COVID-19 pandemic that had prompted the widespread dissemination of emergency and disaster information to both healthcare and

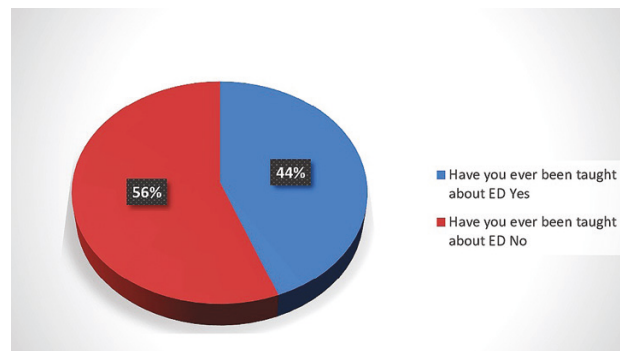


Figure 3 Percentage of pharmacists that were taught emergency and disaster.

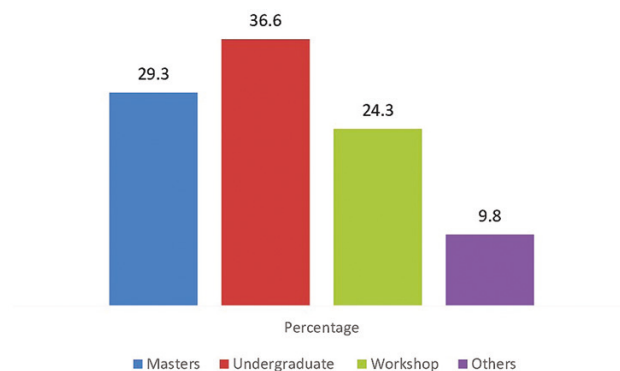


Figure 4 Level at which pharmacists were taught emergency and disaster.

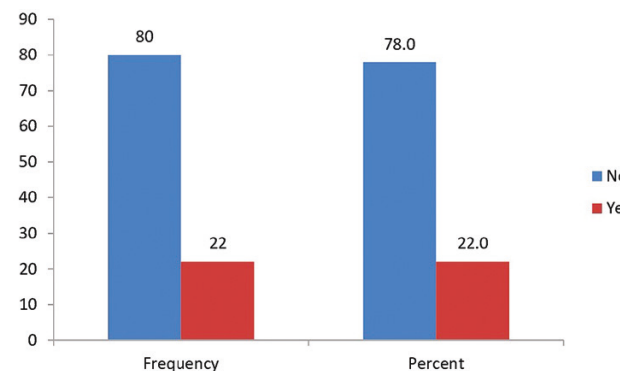


Figure 5 Have you ever performed a disaster or emergency drill/workshop in your facility or city?

Table 4 Crosstabulation of area of practice/have you ever performed a disaster or emergency drill or workshop in your facility or city? (*n* = 102)

		Have you ever performed a disaster or emergency drill or workshop in your facility or city?		
		No	Yes	Total
Area of practice	Academia	24	3	27
	Administrative	4	2	6
	Community	19	6	25
	Hospital	30	8	38
	Industry	1	0	1
	Marketing	0	1	1
	NGOs/public health	1	2	3
	Others (not mentioned)	1	0	1

none healthcare professionals. Before the pandemic, Habte *et al.* conducted a study in Ethiopia on healthcare professionals in 2018 and found that pharmacists had a low level of knowledge.^[11] However, another post-pandemic study on pharmacists by Zeenny *et al.* (2020) reported that 90% of hospital pharmacists have good knowledge of emergency.^[12]

There were significance differences in knowledge scores as compared with educational levels, area of practice, experience and number of emergencies attended as shown in Table 2. Participant with higher level of education had higher knowledge scores; pharmacist in hospital also had better scores as compared with community pharmacists. Furthermore, participant who had attended several emergencies had better scores compared with participants who had not. Study carried out in Yemen on medical professionals also showed that postgraduate participants responded better to knowledge questions.^[10] This can be explained due to a lack of ED training in undergraduate pharmacy school; most ED programs are delivered at postgraduate level. Pharmacists appear to be more knowledgeable with years of experience, probably because they become aware of other responsibilities and have more exposure with experience. Naser and Saleem (2018) also highlighted in their study, limited exposure may have hindered the knowledge performance of newly graduated participants.^[10] Another study conducted in Medina Saudi Arabia on nurses with less than ten years of experience reveals poor knowledge.^[13] Participants in the hospital may perform better because of access to ED training for hospital staff in general. Another reason might be majority of ED researches are normally carried out in the hospitals as compared with community pharmacy settings.

Conclusion

The result of this study showed that pharmacists have good knowledge of ED, which is associated with level of education, years of experience, number of emergency attended and area of practice.

However, there is need to develop a comprehensive pharmacists specific ED curriculum for inclusion of ED courses into pharmacists' curriculum at both undergraduate and postgraduate level. Training and drills are also required to improve pharmacists role in ED especially at community level. Furthermore, further research is essential in the development of competency/evidence-based ED curricula for pharmacists at various levels of education.

Funding

No financial assistance was received for the purpose of this study.

Conflict of Interest

None declared.

Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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