

Assessment of Knowledge and Attitude towards First AID among Pharmacy Students and Graduates

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ABSTRACT

Background: Pharmacists are often available as frontline healthcare providers and can be involved in medical emergencies, where first-aid care is urgently needed. The information about first-aid preparedness among pharmacy students and graduates is scanty.

Purpose: To evaluate the level of first-aid education and attitudes among pharmacy students and graduates and establish the factors related to the first-aid preparedness.

Methods: The cross-sectional online survey was performed by a structured, validated questionnaire. Data were analyzed using descriptive statistics, chi-square tests, Spearman correlation and ANOVA.

Findings: A total of 102 participants included in the study with a mean score of 11.69±5.85. On the whole, 36.3% expressed poor knowledge, 30.4% moderate knowledge and 33.3% good knowledge. There was a variation in knowledge among emergency areas, with a higher score in burn management and a low score in the care related to seizures. The majority of participants had positive attitudes towards first aid (74.5%), and also a high level of support in the inclusion of first-aid training in the pharmacy curriculum and the acknowledgment of their role in emergency-care. The level of knowledge had a significant relationship with gender ($p=0.018$), and a weak, non-significant correlation between knowledge and attitude scores ($r=0.162$, $p=0.104$).

Conclusions: Pharmacy students and graduates showed positive attitudes, but moderate first-aid knowledge and lack of critical emergency-care competencies. The incorporation of periodically reinforced, competency-based and structured first-aid training into pharmacy curricula could help to increase patient safety and emergency preparedness. To enhance generalizability, larger multicenter studies are justified.

Keywords: Attitude of Health Personnel, Cardiopulmonary Resuscitation, Cross-Sectional Studies, Education, Pharmacy, Emergency Medical Services, Patient Safety

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1. INTRODUCTION

First aid is defined as instant treatment given to people who are either injured or fall ill without the presence of a professional medical treatment. Proper first-aid treatments can be life-saving, prevent additional damage, decrease complications, and enhance recovery¹. Since injuries, acute medical emergencies, and disasters are still playing a major role in the morbidity and mortality rates worldwide², the first-aid competency is now an

indispensable part of the emergency preparedness and the population health. In low and middle income countries where people might have to wait before accessing healthcare services, timely first-aid treatment may be important in saving preventable mortalities and morbidities³.

In spite of its acknowledged significance, research performed in different nations has indicated insufficient amounts of first-aid knowledge and applied abilities in

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healthcare students and trainees^{4,5}. The gaps have been established in the areas that are critical like cardiopulmonary resuscitation (CPR), bleeding control, fracture management, and other rudimentary emergency care procedures⁵⁻⁷. Despite the overall positive attitudes towards first-aid training, knowledge gaps, confidence, and practical competence imply that the existing educational methods might not be sufficient to ensure that future healthcare practitioners can effectively react to an emergency scenario^{4,5}. The results show that first-aid competencies should be evaluated and reinforced within the professional training regularly^{6,8}.

Pharmacists are the most readily available health workers and they are also used as the initial contact with clients seeking some healthcare advice⁹. They are no longer just dispensing medications but also counseling patients, promoting their health, triaging them, providing emergency assistance, and engaging in community health and disaster-response efforts^{9,10}. Pharmacists can meet injured, allergic, poisoned patients, patients with cardiovascular emergencies, and other acute health issues in the community, which may necessitate urgent care or referral. This leads to the increased acknowledgment of the importance of proper first-aid knowledge and favorable attitude to emergency care as critical skills in the modern pharmacy practice^{11,12}.

Despite the growing importance of the role of pharmacists in emergency preparedness and patient safety, there is scanty research assessing the first-aid knowledge and attitudes of pharmacy students and graduates.

Prior research has been predominantly done on the medical and nursing students and very little has been done on the pharmacy learners and early-career pharmacy professionals¹³. Moreover, the differences in the curricula, exposure to education, and the possibilities of practical training can affect readiness to handle the emergency cases, especially in the environment with limited resources.

The evaluation of first-aid knowledge and attitudes among pharmacy students and graduates is hence significant in determining the educational gaps, preparation to act in case of an emergency, and inform educational curriculum^{6,13}. The design and implementation of specific educational interventions that will bolster the first-aid skills and increase the role of pharmacists in patient safety and community-based healthcare can be supported by such evidence^{12,13}.

Thus, the purpose of this study was to evaluate knowledge and attitudes of pharmacy students and graduates related to first aid. The results are supposed to give support to the evidence in the form of curriculum improvement, professional training programs and policy formulation to enhance first-aid preparedness in the pharmacy field.

2. RATIONALE OF THE STUDY

First-aid competence is an essential skill for pharmacists, who frequently serve as accessible frontline healthcare

providers and may encounter medical emergencies requiring immediate intervention^{1,9,12,13}. Despite the importance of first aid in patient safety and emergency preparedness, evidence suggests that pharmacy students often exhibit gaps in practical knowledge, confidence, and readiness to manage emergency situations^{4-6,14}. Assessing first-aid knowledge and attitudes among pharmacy students and graduates is therefore important to identify educational needs, evaluate preparedness for emergency response, and support curriculum enhancement^{6,11,13,15}. This study aimed to assess first-aid knowledge and attitudes among pharmacy students and graduates, evaluate knowledge of common emergency procedures, examine attitudes toward providing first aid, and explore associations with socio-demographic characteristics.

3. MATERIALS AND METHODS

A descriptive, cross sectional survey was carried out for a period of 6 months by using online survey. The study subjects were the students of pharmacy program (B. Pharmacy, PharmD, M. Pharmacy) and community pharmacists who were willing to participate and complete the questionnaire to the study.

This participation was voluntary, and only questionnaires that were completed were included in the analysis; designed and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies¹⁶.

When the population was in proportion to the estimated adequate level of first aid knowledge, calculating the sample size was done using Cochran's formula^{14,17} for proportion estimation with 95% confidence level and 5% error margin from the previous research.

The number of the participants selected for this study was a minimum of 410 with adequate consideration for possible non-response. Stratified random sampling method was used to its recruitment so that the representation of various educational and professional categories was adequate enough.

Data were obtained with a structured questionnaires self administered creating it from an exhaustive survey of the literature modeled after previously validated questionnaires^{1,5,6,14}. There were three sections to the questionnaire. The first section was comprised of some of the socio-demographic questions like age, gender, educational qualification, year of study, occupation, first aid training before, first aid certification and number of times handled emergency situation. The second section assessed first-aid knowledge through objective questions on the various aspects of first-aid, cardiopulmonary resuscitation, basic life support, bleeding and fractures treatment, burns, poisoning, treatment of snakebites, seizures and treatment of anaphylactic and other common medical emergencies. Incorrect or unknown answers were awarded 0 points each and a correct answer was awarded a point. Knowledge scores were categorized as poor (<50%), moderate (50–74%), or good (≥75%). The third

section focused on perceptions of attitudes towards first aid as measured by five-point likert scale items of perceptions of confidence, willingness to provide first aid, importance of professional responsibility and importance of the first aid training. This reflected a more positive attitude towards the practice of First-aid with higher scores.

The expert panel of subject matter experts was formed to content validate the questionnaire and the necessary changes were made depending on their suggestions. Subsequently, the clarity and comprehensibility of the instruments, as well as feasibility, was assessed during a small pilot test with a few students from the Faculty of Pharmacy. Counseling using feedback derived from the pilot testing was used to develop the final questionnaire^{18,19}.

The ethical approval was acquired from the Institutional Ethics Committee before data collection. The validated and published questionnaire was developed as an online survey and distributed in the academic and professional network. Participants were instructed about their purpose in the study, and what they could expect from the study, and was asked to sign an electronic informed consent form before answering the questions in the questionnaire. Anonymisation of responses and export into statistical package for analysis.

Appropriate statistic software was used to analyze the data. Descriptive calculations of study findings and

variables were made as percentages and frequencies, and mean and standard deviation. Chi square test was used for testing association between categorical variables. A p value < 0.05 was considered as statistically significant²⁰, and rank correlation analysis by Spearman-coefficient and ANOVA test for differences in means.

4. RESULTS

4.1 Participant Characteristics

One hundred and two pharmacy students and graduates took part in the research and all questionnaires were filled and put on the final analysis (Table 1) gives a summary of baseline characteristics of the participants. Most of the respondents (51.0 percent) were in the age group of 18-22 years and in the study population 54.9 percent were males. The highest occupational group (54.9), was represented by B. Pharmacy students, and then PharmD students (23.5%), M. Pharmacy students (11.8%), and practicing pharmacists/graduate (9.8%). On first aid training, 73.5% of the individuals replied that they had prior training of some sort with 29.4% undergoing formal certified training, 23.5% informal training and 20.6% self directed training. They were 26.5% without any prior training on first aid training. Moreover, 59.8 percent of the respondents had already experienced a medical emergency, 38.2 percent said that they have given first aid and 21.6 percent said they have seen an emergency but have not taken any action.

Table 1: Baseline characteristics of the participants

Characteristic	Category	n (%)
Age Group (years)	18–22	52 (51.0)
	22–27	41 (40.2)
	28–35	6 (5.9)
	>35	3 (2.9)
Gender	Male	56 (54.9)
	Female	46 (45.1)
Occupation Status	B.Pharm Student	56 (54.9)
	Pharm.D Student	24 (23.5)
	M.Pharm Student	12 (11.8)
	Practicing Pharmacist/Graduate	10 (9.8)
Previous First Aid Training	Formal certified training	30 (29.4)
	Informal training	24 (23.5)
	Self-studied	21 (20.6)
	No training	27 (26.5)
Previous Medical Emergency Exposure	No exposure	41 (40.2)
	Witnessed emergency but did not provide first aid	22 (21.6)
	Provided first aid during emergency	39 (38.2)

4.2 Knowledge and Attitudes Towards First Aid

The overall average knowledge level score was 11.69 with a standard deviation of 5.85 i.e. the first aid knowledge level of the participants was moderately high (Table 2). The scoring criteria that were given resulted in 36.3 ($n = 37$) had poor knowledge, 30.4 ($n = 31$) moderate knowledge and 33.3 ($n = 34$) had the good knowledge. Domain-specific evaluation demonstrated that there is a

significant difference between the first aid competencies. The highest and lowest percentages of correct answers were 76.5% and 69.6, respectively in the electrical burn management and seizure management, respectively.

The general attitude by all the participants towards first aid was positive and the mean attitude was 27.8/4.6. In general, 74.5% ($n = 76$) of them had positive attitudes, 20.6% ($n = 21$) had neutral attitudes, and 4.9% ($n = 5$) had

negative attitudes. Most of the participants (82.4% and 83.3% respectively) supported the idea of introducing the pharmacy course to the first aid training and the knowledge of the role of pharmacists in providing first aid in emergency situations. Besides, regarding first aid

administration (73.5 percent), and, CPR administration (75.5 percent), three-quarters claimed to be confident about it. Nevertheless, 64.7% of the respondents provided concerns about the legal ramifications that could arise because of administering first aid.

Table 2. Knowledge and Attitudes toward First Aid among Participants (n = 102)

Domain	Item	n (%) / Mean $\pm$ SD
Knowledge Level	Poor	37 (36.3)
	Moderate	31 (30.4)
	Good	34 (33.3)
Knowledge Score	Mean $\pm$ SD	11.69 $\pm$ 5.85
Knowledge Domains (Correct Responses)	Initial response to an unresponsive victim	60 (58.8)
	Adult CPR compression-to-ventilation ratio	48 (47.1)
	CPR compression rate	56 (54.9)
	Road traffic accident management	55 (53.9)
	Bleeding control	51 (50.0)
	Fracture management	68 (66.7)
	Thermal burn management	62 (60.8)
	Electrical burn management	78 (76.5)
	Chemical poisoning management	53 (52.0)
	Drug overdose management	51 (50.0)
	Snakebite first aid	60 (58.8)
	Electrical shock management	63 (61.8)
	Choking management	60 (58.8)
	Seizure management	71 (69.6)
	Recognition of heat stroke	44 (43.1)
	First aid for heat stroke	77 (75.5)
	Drowning and CPR sequence	41 (40.2)
	Chemical eye injury management	68 (66.7)
	Epistaxis (nosebleed) management	60 (58.8)
	National emergency helpline number	66 (64.7)
Attitude Level	Positive attitude	76 (74.5)
	Neutral attitude	21 (20.6)
	Negative attitude	5 (4.9)
Attitude Score	Mean $\pm$ SD	27.8 $\pm$ 4.6
Positive Attitude Statements	First aid training should be included in pharmacy curriculum	84 (82.4)
	Pharmacists have a responsibility to provide first aid	85 (83.3)
	Willingness to provide first aid during emergencies	73 (71.6)
	Confidence in performing first aid	75 (73.5)
	Comfort in performing CPR	77 (75.5)
	Need for refresher training programs	84 (82.4)
	Concern about legal consequences while providing first aid	66 (64.7)

4.3 Factors Associated with Knowledge and Attitudes Towards First Aid

Table 3 gives a summary of the variables that relate to first aid knowledge and attitudes. As the chi-square test has indicated, gender was significantly correlated with the level of knowledge ($\chi^2 = 7.998$, $df = 2$, $p = 0.018$) and the level of knowledge was relatively high among female participants, in comparison with male participants. On the other hand, there was no significant correlation between age ($p = 0.206$), past status of first aid training ($p = 0.169$),

past experience of medical emergencies ($p = 0.689$) and categories of knowledge.

The rank correlation analysis by Spearman showed that there is a weak positive correlation between the knowledge and attitude scores ($r = 0.162$); the relationship is not found to be statistically significant ($p = 0.104$). The results of the ANOVA test revealed that the difference of means of knowledge score was significant under the various categories of training ($F = 3.207$, $p = 0.016$). Individuals who had never received any form of previous training or any type of self-directed training as well as

those who had never received any type of informal training scored higher in terms of the mean knowledge

score as compared to individuals who had received a form of certified training.

Table 3. Factors associated with First Aid Knowledge and Attitudes among Participants

Analysis	Findings	Statistical Results
Age Group vs Knowledge Level	No significant association between age and knowledge category	$\chi^2 = 8.462$, $df = 6$, $p = 0.206$
Gender vs Knowledge Level	Female participants demonstrated comparatively higher knowledge levels	$\chi^2 = 7.998$, $df = 2$, $p = 0.018^*$
Previous First Aid Training vs Knowledge Level	Knowledge categories did not differ significantly across training groups	$\chi^2 = 11.626$, $df = 8$, $p = 0.169$
Medical Emergency Involvement vs Knowledge Level	No association observed between emergency exposure and knowledge level	$\chi^2 = 2.252$, $df = 4$, $p = 0.689$
Knowledge Score vs Attitude Score	Weak positive correlation	$r = 0.162$, $p = 0.104$
Training Status vs Mean Knowledge Score	Formal training: 9.10 ± 5.34 ; Informal training: 12.75 ± 5.12 ; Self-study: 12.81 ± 4.87 ; No training: 13.15 ± 5.44	$F = 3.207$, $p = 0.016^*$

5. DISCUSSION

This research paper has assessed first-aid retention and attitudes of pharmacy students and graduates, which indicated average levels of total knowledge and largely positive attitudes towards emergency care. Equivalent trends have been documented among healthcare learners, in which positive attitudes and knowledge gaps were often concomitant in their emergency-care competencies and knowledge²¹⁻²⁴. Despite the high level of agreement on the importance of first aid and its role in pharmacy education, significant differences were reported across domains of knowledge. Burn and seizure management competency was the best and CPR related procedures and drowning management competency was poor. Gender became the sole significant predictor of level of knowledge with no significant associations with age, previous first-aid training as well as previous exposure to an emergency. Also, knowledge and attitude scores correlated only weakly which indicates that positive perceptions do not necessarily convert into sufficient knowledge^{23,24}.

The presence of a moderate level of knowledge and positive attitudes underlines an ongoing mismatch between the perceived preparedness and the real preparedness.

With pharmacists becoming more and more the visible frontline health care workers who can provide patient triage, health promotion, and emergency response services^{22,23}, gaps in the basic life-saving interventions are especially troubling. CPR and basic life support are very time-sensitive skills that demand quick identification, decision-making, and response²⁵⁻²⁷. The poorer performance in these areas could be due to either a lack of practical exposure, reinforcement of emergency-care principles or degradation of the initially gained knowledge over time^{28,29}. Better performance in the domain of burn and seizure management could either be a result of more emphasis in the curriculum or more exposure to such conditions during pharmacy education.

The current results are in line with the past research studies among medical, nursing, pharmacy, and allied health students, who, in general, reported moderate first-aid knowledge despite having positive attitudes toward emergency response²¹⁻²⁴. The similar gaps in CPR related competencies are also consistent with the prior studies in resuscitation education research, showing overall low levels of knowledge and skills in the respondents despite positive attitudes towards responding to an emergency^{30,31}.

The overwhelmingly positive attitudes recorded in the current research are also in line with those found in the literature indicating that the role of pharmacists in emergency care is highly supported among healthcare students³²⁻³⁴. The look of high percentage of participants in the study who identified the role of pharmacists in emergency care is also similar to the previous literature that showed a substantial backing of first-aid education among healthcare students³²⁻³⁴.

Another interesting observation was that there was no significant correlation between previous first-aid training and the level of knowledge. This is counterintuitive, but other studies have reported similar observations in the past²²⁻²⁴. The fact that the average scores of knowledge in each type of training differ significantly is further indicative that the effectiveness and continuity of training might be more critical than the mere completion of a certification program.

The insignificant and weak association between knowledge and attitudes supports the difference between cognitive competence and attitudinal readiness. Although positive attitudes can increase the motivation to participate in emergency response, their presence should not be viewed as confirmation of sufficient competency^{23,24}, which is why the inclusion of objective assessments of emergency-care knowledge and practical skills should be considered in the pharmacy education programs¹⁴.

By assessing first-aid preparedness in pharmacy students and graduates in parallel, the study can offer a broad evaluation of first-aid preparedness in the pharmacy

education setting, as this student population remains underrepresented in the research of emergency-care preparedness^{33,34}. The study will also aid in the review of the limited amount of evidence on the topic of first-aid preparedness among pharmacy students and graduates, a group that has not been sufficiently represented in emergency-care preparedness studies despite opining clinical role of pharmacists. This critical knowledge gap even with positive attitudes indicates a significant area of education gap that needs specific action.

These results have a number of implications to pharmacy education and practice. This type of training (first-aid and basic life support training) should be implemented on a longitudinal basis within pharmacy education through competency-based educational programs that synthesize didactic instruction, simulation-based learning, formal assessment of skills, and periodic recertification^{25,28}. In particular, the training on CPR, basic life support, and other high-acuity emergency scenarios that require immediate intervention should be addressed by educational programs in regard to legal and ethical issues related to first-aid providing^{31,32}.

There are a few limitations which one should consider in interpreting the findings. The cross-sectional design disallows causal finding, possible recall and social desirability bias with self-reported responses. There was a lack of objective measurement of actual practical first-aid performance; consequently, real competency might not be equal to documented knowledge. Notably, the sample size calculated was 410, but only 102 full responses were received. This small sample could have diminished the statistical power, the propensity of Type II error, and the generalizability of the results. Moreover, the survey approach via the Internet could have biased the selection, selecting only those interested in emergency-care issues more strongly.

Future research needs to use bigger multicentre samples, assess the practical first-aid competence with simulation-based measures or objective structured clinical examinations, and assess the long-term efficacy of curricular and training measures. It also requires longitudinal studies to establish factors that can affect knowledge retention and maintenance of skills over time²⁸.

6. CONCLUSION

In conclusion, the attitudes of pharmacy students and graduates were positive, but the first-aid knowledge was only moderate, and the critical life-saving skills were deficient. These results argue against the inclusion of disorganized, knowledge-based, and reinforced periodically first-aid training in pharmacy practicing courses to enhance emergency preparedness, patient safety, and the broadening clinical role of pharmacists.

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CONFLICTS OF INTERESTS (IF ANY)

There are no conflicts of interest.

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ABBREVIATIONS

AHA: American Heart Association; CPR: Cardiopulmonary Resuscitation; ERC: European Resuscitation Council; FIP: International Pharmaceutical Federation; SD: Standard Deviation; STROBE: Strengthening the Reporting of Observational Studies in Epidemiology; BLS: Basic Life Support; ANOVA: Analysis of Variance; CI: Confidence Interval; SDGs: Sustainable Development Goals.

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