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## Research Article

# Knowledge of nurses about safety measures during the use of injections in public hospitals in Pakistan

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## Abstract

**Aim:** Injection safety has over the years become important in view of the many diseases that are transmitted through unsafe injection practices. The objective was to assess the knowledge and practice of injection safety by nurses in Tertiary Care Hospitals (Bolan Medical Complex, Sandmen Provincial Hospital, and Fatima Jinnah Chest and General Hospital) in Quetta City, Pakistan.

**Methods:** A descriptive cross-sectional study was carried out. A structured questionnaire was the tool for data collection. All the nurses (358) who gave their consent in the Tertiary care hospitals were studied. Data were analyzed using SPSS version 16. The study was conducted from January 2023 till August 2023, it took eight months to complete.

**Results:** The mean age of the respondents was  $28.84 \pm 8.6$  years. The knowledge of injection safety among the respondents was adequate (84.6%) while their safety practice was found to be good (68.2%). Knowledge was significantly influenced by the age, sex, and years of experience of the nurses. One hundred and twelve (31.0%) detached needles and two hundred and sixty-two (73%) respondents recap the used needles regularly and sometimes respectively.

**Conclusion:** This study showed that the knowledge of injection safety was encouraging among the nurses in Tertiary care hospitals of Quetta City but their practice of injection safety was adequate. There is a need for these hospitals to organize regular training workshops and symposia.

## Introduction

Injection safety which is an essential constituent of infection prevention and control has over the years become important in view of the many diseases that are transmitted through unsafe injection practices. The WHO defines a safe injection as one that is given using appropriate equipment and does not harm the recipient, does not expose the provider to any avoidable risks, and does not result in waste that is dangerous for other people [1,2]. WHO estimates that annually 16 billion injections are given in developing and transitional

countries, with an annual mean of 1.5 injections per person per year. However, institutionalized children, persons who are ill or hospitalized, including those infected with HIV, are often exposed to 10 – 100 times as many injections [3]. About 90% – 95% of injections are therapeutic while 5–10% are given for immunization [4]. It has been shown that between 70% and 99% of these injections are unnecessary, while at least 50% are unsafe in 14 of 19 countries in five developing world regions with data [3–7]. Injuries from sharp devices have been associated with the transmission of more than 40 pathogens, including Hepatitis B Virus (HBV), Hepatitis C Virus (HCV),



Human Immunodeficiency Virus (HIV), hemorrhagic fevers, malaria, and tetanus, thereby increasing the risk and burden of infectious diseases [1,8,9].

It is estimated that 9.18 million disability life-adjusted years (DALYs) will be lost between the years 2000 and 2030. However, interventions implemented in the year 2000 for the safe and appropriate use of injections could reduce the burden of injection-associated infections by as much as 96.5% (8.86 million DALYs) for average annual costs of 905 million dollars [1,10].

The areas of error will be analyzed and rectified in the future. Hence, the relevance of conducting this study is manifold in solving the shortcomings in our healthcare system. We conducted this study to assess the level of adherence to adult IM injection administration protocol by HCP of CHK, Pakistan [11]. The nature and extent of unsafe injection practices, the burden of blood-borne viral illness attributable to unsafe injection practices, and the factors contributing to these practices are summarized, and possible strategies for promoting injection safety are discussed [12].

Bolan Medical Complex Hospital, Sandmen Provincial Hospital, and Fatima Jinnah Chest Hospital Quetta play a vital role in healthcare provisions for the natives of Baluchistan. In such settings, the nurses are exposed to a lot of sharps as they are primarily responsible for the administration of parenteral medications including some intravenous drugs as well as minor surgical procedures like wound suturing and episiotomies. This study was therefore set out to assess the injection safety practices of the nurses in these hospitals to provide background data on their knowledge and practice of injection safety as well as provide a basis for planning necessary interventions that will help to promote and strengthen injection safety practices in the hospitals and hosting communities.

## Methodology

This study was aimed at assessing the knowledge and injection safety practices among nursing staff of tertiary care hospitals of Quetta. The present study was a cross-sectional study. In research, a cross-sectional study (also known as cross-sectional analysis, transversal studies, or prevalence study) is a type of observational study that involves the analysis of the data collected from a population, or a representative subset, at a specific point in time that is cross-sectional data [13]. This descriptive, cross-sectional study was carried out in all three tertiary care hospitals of Quetta (Bolan Medical Complex Hospital, Sandmen Provincial Hospital, and Fatima Jinnah Chest and General Hospital) These hospitals complement the tertiary and secondary health facilities in rendering healthcare services to the people of Baluchistan, Quetta. In the above-mentioned healthcare setting, 480 questionnaires were distributed during this time period and only 358 agreed to participate in the study, that is why we selected 358 nurses of either gender, age 16 years and above.

## Ethical approval

The study was conducted in consideration of ethical standards approved by the Ethical Committee of Pakistan.

The study does not contain any ethical violations. This study contains three basic consent forms for the entire study. The first consent form contains the authorization for conducting the current study from the Royal Bolan College of Nursing, Quetta, Pakistan.

## Inclusion and exclusion criteria

All those Nurses who agreed to participate and were rendering services in afore mentioned Hospitals of Quetta. The volunteers signed an informed consent form prior to entering the study having an age of 16 and above. Those who did not agree to participate in the study were excluded.

## Study tool

A questionnaire adapted from the WHO injection safety assessment tool was used to collect both quantitative and qualitative information such as socio-demographic data of the nurses and their knowledge and practice of injection safety. Six questions were used to assess the respondent's knowledge while eight questions were used to assess their practice of injection safety. The Questionnaire was prepared in English language then translated into Urdu language with the help of experts from the Faculty of Pharmacy by using the standard translating procedures. The scoring system for the safety practice of injection of the respondents is Poor safety = Respondents having  $4 \geq$ , and Good safety = Respondents having  $<4$ . The scoring system for the knowledge of respondents on injection is Adequate Knowledge = Respondents having  $3 \geq$ , and Poor Knowledge = Respondents having  $<3$ .

## Results

### Socio-demographic characteristics

Table 1 shows the percentage and frequencies of the demographic characteristics of respondents, a total of 490 questionnaires were distributed and 358 were returned so the response rate is 73.06%. The mean age of respondents is 28.84. The major age group which responded was from 26 to 35 years they are about 150 (41.9%), and 13 (3.6%) respondents were above 46 years and up to 55 years.

There were 311 (86.9%) respondents that were female which makes the majority of the population. Also, 172 (48.0%) have been practicing for less than 1 year as a nurse and 106 (29.0%) as a staff nurse, only 10 (2.8%) were working as a trainee.

The majority of respondents who participated were from Bolan Medical Complex making a population of 235 (65.6%) which makes the maximum frequency of participation while the remaining are from Sandmen Provincial Hospital and Fatima Jinnah Hospital.

### Injection safety practices

Table 2 shows the percentage and frequency of the safety practices of respondents. According to the table, 313(87.4%) respondents administer injections routinely when a question is asked whether they wash their hands before and after injection 30(86.6%) regularly wash before and after injection, 301(84.1%)



cover their wounds before start of the work. 213(59.1%) said they never detach needles after use. When a question is asked about the sterilization of the syringes 267(74.6%) said they regularly sterilize.

### Knowledge of respondents regarding injections

Table 3 shows the frequency and percentage of respondents regarding knowledge of injections. When a question was asked about blood-borne diseases due to unsafe injections 173 (48.3%) respondents agreed while 143 (39.9%) agreed strongly, on a question about the discard of needles 244 (62.6%) strongly

**Table 1:** Socio-demographic profile of the respondents.

Parameters	Frequency	Percentage (%)
<b>Age group</b>		
16 to 25 years	144	40.2
26 to 35 years	150	41.9
36 to 45 years	51	14.2
46 to 55 years	13	3.6
<b>Gender</b>		
Male	47	13.1
Female	311	86.9
<b>Current position</b>		
Matron	70	19.6
Staff Nurse	106	29.6
Nurse	172	48.0
Trainee	10	2.8
<b>Name of Institution</b>		
BolanMedical Complex	235	65.6
Sandmen Provincial Hospital	94	26.3
Fatima Jinnah Chest Hospital	29	8.1
<b>Area of Practice.</b>		
Cardiac	111	31.0
Peads	152	42.5
ENT	95	26.5
<b>College from where you get Qualification?</b>		
Sandmen Nursing School	71	19.8
Bolan Nursing School	179	50.0
Others	34	9.5
Not yet	74	20.7
<b>Year of obtaining Nursing qualification?</b>		
1981 to 1990	16	4.5
1991 to 2000	66	18.4
2001 to 2010	137	38.3
2011 till date	65	18.2
Not yet	74	20.7
<b>How many years have you been in Practice?</b>		
< 1 year	194	54.2
1 to 5 years	87	24.3
6 to 10 years	54	15.1
11 to 20 years	23	6.4

**Table 2:** Percentage and frequency of Injection safety practices of the respondents.

Questions	Sometimes N (%)	Regularly N (%)	Never N (%)
Do you administer injections Routinely?	39 (10.9)	313(87.4)	6(1.7)
Do you use gloves when administering injections?	88(24.6)	255(71.2)	15(4.2)
Do you wash your hands before and after administration of Injections?	45(12.0)	310(86.6)	3(0.8)
Do you cover your wounds if any, before the start of work?	43(12.0)	301(84.1)	14(3.9)
Do you Recap the needle after use?	39(10.9)	262(73.2)	57(15.9)
Do you Detach the needle after use?	33(9.2)	112(31.3)	213(59.5)
Do you sterilize syringes?	43(12.0)	267(74.6)	48(13.4)
Do you reuse sterilized syringes?	28(7.8)	79(22.1)	251(70.1)

**Table 3:** Percentage and frequency of knowledge of respondents regarding injections.

Questions/Items	Agree N (%)	Strongly agree N(%)	Disagree N(%)	Strongly disagree N(%)
Can unsafe injections cause blood-borne diseases?	173(48.3)	143(39.9)	2(0.6)	40(11.2)
Two-handed Recapping is a safe practice?	120(33.5)	170(47.5)	55(15.4)	13(3.6)
Are contaminated sharps harmful to the community?	134(37.4)	177(49.4)	5(1.4)	42(11.7)
Should we discard the used syringes and needles in waste Boxes?	113(31.0)	244(62.6)	8(2.2)	13(3.6)
Are people at risk of wrong injections?	131(36.6)	184(51.4)	7(2.0)	36(10.1)
	Yes		No	
Do you know the method of final syringe disposal?	356(99.4)		2(0.6)	

agreed. 170 (47.5%) strongly agreed that two-handed re-capping is a good practice. 184 (51.41%) said people are at risk of wrong injections at the end when respondents were asked about their knowledge of final syringe disposal 356 (99.4%) said yes they are aware about final syringe disposal.

### Scoring

Table 4 shows the score of the injection safety practices of the respondents, the table shows that 244 (68.2%) exercise good practices while the remaining proportion shows poor safety practices, it shows that there is overall satisfactory practice but there is a need to improve practice of safety to patients.

### Score of knowledge of respondents on injection

The table below shows the knowledge of respondents, according to table 303 (84.6%) who have adequate knowledge of injections, it prevails that our nurses in tertiary care hospitals have knowledge enough to practice safely consequently it may minimize the risk of diseases due to unsafe injections (Table 5).

### Discussion

Overall our study depicts that there is an adequate knowledge of injections and their safety practices, and almost all the safety measures are being exercised to ensure the life

**Table 4:** Representing the score of safety practice of injection of the respondents.

Items in questionnaire	Frequency N = 358	Percentage (%)
Poor safety	114	31.8
Good safety	244	68.2
Total	358	100.0

Note: Poor safety = Respondents having 4≥, Good safety = Respondents having <4.

**Table 5:** Knowledge score group of the respondents.

Response	Frequency N = 358	Percentage (%)
Poor knowledge	55	15.4
Adequate knowledge	303	84.6
Total	358	100.0

Note: Adequate Knowledge = Respondents having 3≥ Poor Knowledge = Respondents having <3.

and safety of patients. This is expected considering the mean duration of training as a nurse and the fact that older nurses would probably be working in a government-owned health facility with better remuneration. Females constituted the overwhelming majority of respondents because nursing has remained predominantly a female-dominated profession with very limited male involvement. The knowledge of injection safety was found to be adequate in this study. However, the specific knowledge of infections that could result from unsafe injection practices, especially HIV and HBV infections. This is consistent with the study in Ilorin, Nigeria in which fifty-eight percent had knowledge of diseases transmissible by needle stick injury [6,14,15]. The older nurses having better knowledge of injection safety and practice may be attributed to the fact they are more likely to attend seminars and workshops related to younger ones. The respondents had a better degree of practice in injection safety. Although better knowledge is a major contributor to the practice of injection safety in tertiary care hospitals of Quetta, there is adequate knowledge among nurses regarding injections. It is likely that the incurable nature of HIV/AIDS and its attendant stigma may force health workers to be more careful when handling sharps without necessarily having detailed knowledge of the definition of injection safety which formed the basis for determining the knowledge of injection safety. The practice of regular hand washing with water and soap by a majority of the nurses was quite encouraging [16]. This finding is consistent with the Ilorin study where none of the respondents were observed wearing gloves regularly during immunization sessions but different from the study in Morocco where gloves are used among a low percentage of the nurse population [17]. However, there is a quite satisfactory practice of gloves as a safety measure in my area of study. It is worrisome to note that a minor proportion detaches needles after use. The availability of hospital consumables such as disposable gloves may limit the use of such by the respondents especially in developing countries. It is indeed a good practice that the majority re-use the sterilized needles all the time after use while fewer do so sometimes. This practice of recapping and detaching needles by some of the respondents increases the risk of needle stick injuries [18,19]. The majority of them

only washed their hands with soap before and after injection. This study revealed that the knowledge of injection safety was adequate among the nurses in Tertiary care Hospitals of Quetta City also their practice of injection safety was quite encouraging [20]. It is therefore recommended that regular training workshops on injection safety should be organized by these hospitals to improve the knowledge of injection safety among their nurses; it will further improve the practices. Also, the hospitals should develop facility protocols on post-exposure prophylaxis for their employees in line with the national policy on injection safety and the workers educated on the actions to take following accidental needle stick injury [21-23]. This will greatly minimize the risks to healthcare workers developing blood-borne infections and other hazards associated with needle stick injuries.

The study might have a limited sample size, which may not be representative of all nurses working in public hospitals across Pakistan. This can affect the generalizability of the findings. The participants in the study may not have been randomly selected, potentially leading to selection bias. If certain types of nurses were overrepresented or underrepresented, it could impact the study's findings. As the study used a cross-sectional design, it might provide a snapshot of nurses' knowledge only at a specific point in time. Long-term trends and changes in knowledge over time may not be adequately captured. The study's findings may not account for regional variations in public hospitals across Pakistan, as safety measures and nurse training could differ by location.

## Conclusion

The sketched study unveiled a considerable mass of facts and figures that the nurses practicing in tertiary care hospitals of Quetta adhere to adequate injection safety practices. Following conclusion has been drawn based on the discussion of the study regarding the knowledge and injection safety practices of nursing staff of the major three tertiary care hospitals of Quetta that there is adequate knowledge and practice in all three hospitals, the reason behind that is mostly nurses of these hospitals have good experience as they have been working there for a long time period.

(ANNEXURE)

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