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Original Research Article

An epidemiological study on knowledge, attitude and practice of injection safety among health care personnel in a tertiary care hospital of Tripura

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ABSTRACT

Background: Injection is considered as one of the key procedures of drug delivery all over the world. Unsafe injection practices are very common in countries like India. This study was aimed to assess knowledge, attitude and practice of injection safety in a tertiary care hospital of Tripura.
Methods: A cross-sectional study was conducted among 300 participants including staff nurses, operation theater (OT) assistants and laboratory technicians of Tripura Medical College and Dr. BRAM Teaching Hospital, Hapania; who were primarily involved in routine injection practices related to patient care from January 15th to February 14th 2018. Data was collected using a self-administered questionnaire and analyzed using SPSS version 16.0.
Results: Majority (77%) of the participants in this study belonged to 18 to 25 years age group and were females (71.3%); mostly were nurses (88%), followed by OT assistants (6.3%) and laboratory technicians (5.7%) respectively. Good injection safety practices were reported by majority of the participants (67.3%). Higher mean age with knowledge of injection safety, nurses as compared to others and probational work experience than permanent were found to have significant association with safe injection practices of the participants.
Conclusions: Even though study findings showed good practice related to injection safety among the health care personnel like similar other studies in this country, still improvement is required to fulfil the gap in knowledge and attitude of the health care providers to keep unsafe injection to the minimum level.

Keywords: Hospital, Injection, Nurses, Safe, Tripura

INTRODUCTION

Safe Injection Global Network (SIGN) defines a safe injection as, "the injection that does no harm to the recipient, does not expose the health worker to any risk and does not result in waste that is dangerous for the community".[1] Based on definition the above mentioned were identified as three criteria for safe injection. It is well known that injection is one of the key health care procedures used globally for administration of medicines. Even though so much of advancement in clinical medicine, unsafe and over-use of injections are not uncommon in developing countries.[2]

Breaks in safe injection practices coupled with overuse of injections may expose the recipients, health care workers, or the community to several troubles including life menacing infections. Common infectious agents are-HBV, HIV, HCV, some bacterial infection, which create a major problem related to unsafe injection practice.[3] Worldwide unsafe medical injections lead to 40% cases of hepatitis C, 32% hepatitis B, and 5% human

immunodeficiency virus (HIV) infections each year.[4] Unsafe injection practices are also prevalent in India.[5,6] Recently, Epidemiology Network in India has estimated that of the total 3-6 billion injections used each year, two-thirds were unsafe and had the potential to transmit blood-borne infections.[7]

In a study done in a tertiary hospital of West Bengal on nursing staff showed that, 60% of the nursing personnel maintained correct procedure during giving injection; while sterile gloves are used by only 3.7% nurses.[8] While opening glass ampoules, injuries to injection providers can occur which may cause infections.[7] In a study conducted in Kashi district, Nepal, almost half of the injection providers observed used only cotton/gauge while breaking an ampoule to protect their finger.[9]

Proper disposal of waste that generated after injection is another important issue. According to Biomedical Waste (Management and Handling) Rules 1998, needles, syringes should disposed by disinfection (chemical treatment/ autoclaving/ microwaving and mutilation/ shredding).[10] Government of India has made a provision for treating biomedical waste at outside the health facilities through Common Bio-medical Waste Treatment & Disposal Facility (CBMWTDF) with the collaboration of private sector.[11]

The present study was aimed to assess the knowledge, attitude and practice of injection safety and factors associated, among health care personnel in a tertiary care hospital of Tripura. A high prevalence of needle stick injury in the same setting found in a previous study further demanded the present study with an overall aim to find out the lacunae in the current practices.[12]

METHODS

An institutional based cross sectional study was conducted among the health care personnel {nursing staffs, operation theater (OT) assistants and laboratory technicians, who are mainly involved in injection practices routinely excluding doctors} of Tripura Medical College & DR. BRAM Teaching Hospital, Hapania, West Tripura. Study was conducted for a period of one month, January 15th to February14th 2018.

Sample size

A total sample size of 300 was calculated using the formula, $N=4pq/l^2$ (N=minimum required sample size, p=prevalence, q=1–p, l=precision). Here p was considered as 60% and l=10% absolute precision and additional 10% was taken as non-response rate.[8]

Inclusion criteria

Inclusion criteria were study subjects who gave their consent to participate in the study; study subjects who were available during survey.

Exclusion criteria

Doctors, medical students, interns and nursing students posted in different departments during the time of survey were excluded from the study.

Sampling procedure

Samples were selected randomly from all departments concerned among those who were available on the days of data collection until the required sample size was achieved.

Study tool

A predesigned, pretested, semi structured self-administered questionnaire was used to collect the required information. The questionnaire consisted of two parts, first part having questions related to socio-demographic variables of the participants and second part consisted of questions related to knowledge, attitude and practices of injection safety.

Data analysis

The collected data was entered in Statistical package for the Social Sciences (SPSS Inc. SPSS for Windows, Version 16.0. Chicago) and represented in percentages with appropriate tables. Chi square test was done to find out factors affecting knowledge, attitude and practice of injection safety of the participants ($p < 0.05$ was considered as significant). Individuals scoring more than mean were considered having good knowledge, attitude and practice respectively.

Informed consent

A well explained written consent was collected from all the participants before commencement of the study.

RESULTS

Table 1 reveals majority (77%) of the participants belonged to 18 to 25 years age group and females were (71.3%). Among the healthcare personnel the present study included mostly the Nurses (88%), followed by OT assistants (6.3%) and laboratory technicians (5.7%) respectively. Almost similar proportion of the staffs were probational (≤2 years) and permanent (>2 years) in job experience in this study.

Table 2, 3 and 4 shows frequency distribution of different variables related to knowledge, attitude and practice of injection safety of the study participants. Table 5 reveals average knowledge and attitude but good practice by majority of the participants (67.3%) regarding injection safety.

Table 6 shows significant association of knowledge with mean age of respondents (p<0.001). Similarly occupation and work experience were also found to have significant association with knowledge and practice of injection safety in the present study.

Table 1: Background information of the study participants (n=300).

Variables	Frequency (n)	Percentage (%)
Age (in years)		
18 to 25	231	77.0
26 to 33	49	16.3
34 to 41	12	4.0
42 to 50	8	2.7
Total	300	100.0
Gender		
Male	86	28.7
Female	214	71.3
Total	300	100.0
Occupation		
Nurse	264	88.0
Lab technicians	17	5.7
OT assistants	19	6.3
Total	300	100.0
Work experience (in years)		
Less than or equal to 2 years	163	54.3
More than 2 years	137	45.7
Total	300	100.0

Table 2: Frequency distribution on knowledge of injection safety (n=300).

Items	Frequency (n)	Percentage (%)
Heard about three criteria for safe injection		
No	53	17.7
Yes	247	82.3
Total	300	100.0
Not true about safe injection		
Injection that does not harm the recipient	76	25.3
Does not expose the provider with any avoidable risk	27	9.0
Result in dangerous waste for the community	29	9.7
Injection can be reused	105	35.0
None of the above	63	21.0
Total	300	100.0
Awareness of the complications of unsafe injection		
Yes	258	86.0
No	42	14.0
Total	300	100.0
Commonest complication of unsafe injection (n=258)		
HIV	144	55.8
Hepatitis	82	31.8
Syphilis	4	1.5
Others	28	10.9
Total	258	100.0
Knowledge of post-exposure prophylaxis following unsafe injection		
Yes	244	81.3
No	56	18.7
Total	300	100.0

Continued.

Items	Frequency (n)	Percentage (%)
Not a route of injection		
IM	3	1.0
IV	5	1.7
Subcutaneous	3	1.0
Oral	272	90.7
Do not know	17	5.7
Total	300	100.0
The angle of intramuscular injection		
45º	27	9.0
90º	259	86.3
15º	0	0
180º	0	0
Do not know	14	4.7
Total	300	100.0
The angle of intradermal injection		
45º	103	34.3
90º	14	4.7
15º	162	54.0
180º	7	2.3
Do not know	14	4.7
Total	300	100.0
The angle of subcutaneous injection		
45º	140	46.7
90º	31	10.3
15º	115	38.3
180º	2	0.7
Do not know	12	4.0
Total	300	100.0

Table 3: Frequency distribution on attitude of injection safety (n=300).

Items	Frequency (n)	Percentage (%)
Recommendation of needle to be kept on top of the vial to withdraw additional dose		
Yes	166	55.3
No	64	21.3
No response	70	23.3
Total	300	100.0
Recommendation of use of syringe taken from unopened packet always		
Agree	182	60.7
Disagree	99	33.0
No response	19	6.3
Total	300	100.0
Injection safety measures are protective		
Agree	271	90.3
Disagree	2	0.7
No response	27	9.0
Total	300	100.0
Safe injection technique should be used in our hospital		
Agree	269	89.7
Disagree	13	4.3
No response	18	6.0
Total	300	100.0

Continued.

Items	Frequency (n)	Percentage (%)
We should dispose sharp waste in a puncture proof container		
Agree	254	84.7
Disagree	9	3.0
No response	37	12.3
Total	300	100.0

Table 4: Frequency distribution on practices of injection safety (n=300).

Items	Frequency (n)	Percentage (%)
Always use gloves while administering injection		
Yes	148	49.3
No	152	50.7
Total	300	100.0
Always clean the injection administration site		
Yes	271	90.3
No	29	9.7
Total	300	100.0
Always destroy used needle with a needle shredder		
Yes	259	86.3
No	41	13.7
Total	300	100.0
Always discard syringe after giving injection		
Yes	280	93.3
No	20	6.7
Total	300	100.0
Segregation of sharp wastes		
Yes	248	82.7
No	52	17.3
Total	300	100.0
Washing of hands, before administering injection		
Yes	263	87.7
No	37	12.3
Total	300	100.0
Rubbing of injection site, after giving an injection		
Yes	228	76.0
No	72	24.0
Total	300	100.0
Object used for breaking an ampoule		
Manually	104	34.7
Gauge	20	6.7
Ampoule breaker	125	41.7
Others	51	16.9
Total	300	100.0
Discarding of needle after giving an injection		
Punctured proof container	203	67.7
Plastic bag	75	25
Other places	22	7.3
Total	300	100.0

Table 5: Frequency distribution table of qualitative distribution of knowledge, attitude and practice of the participants (n=300).

Characteristics	Poor (≤ mean score)	Good (> mean score)
Knowledge	158 (52.7%)	142 (47.3%)
Attitude	154 (51.3%)	146 (48.7%)
Practice	98 (32.7%)	202 (67.3%)

Table 6: Association of socio-demographic variables with knowledge, attitude and practice of the respondents.

Variables	Knowledge		Attitude		Practice	
	Poor	Good	Poor	Good	Poor	Good
Age						
<Mean	96 (32.0%)	116 (38.7%)	101 (33.7%)	111 (37.0%)	66 (22.0%)	146 (48.7%)
≥Mean	62 (20.7%)	26 (8.7%)	53 (17.7%)	35 (11.7%)	32 (10.7%)	56 (18.7%)
P value (95% CI)	<0.001 (<0.001 - <0.001)*		0.47 (0.31 – 0.57)		0.379 (0.227 – 0.418)	
Gender						
Male	50 (16.7%)	36 (12.0%)	38 (12.7%)	48 (16.0%)	28 (9.3%)	58 (19.3%)
Female	108 (36.0%)	106 (35.3%)	116 (38.7%)	98 (32.7%)	70 (23.3%)	144 (48.0%)
P value (95% CI)	0.229 (0.141 – 0.251)		0.116 (0.075 – 0.127)		0.980 (0.547 – 1.000)	
Occupation						
Nurse	129 (43.0%)	135 (45.0%)	134 (44.7%)	130 (43.3%)	81 (27.0%)	183 (61.0%)
Lab tech	16 (5.3%)	1 (0.3%)	9 (3.0%)	8 (2.7%)	4 (1.3%)	13 (4.3%)
OT assistant	13 (4.3%)	6 (2.0%)	11 (3.7%)	8 (2.7%)	13 (4.3%)	6 (2.0%)
P value (95% CI)	0.001 (<0.001 – 0.010)*		0.827 (0.824 – 0.902)		0.002 (<0.001 – 0.010)*	
Work experience						
Probational	103 (63.2%)	60 (20.0%)	84 (28.0%)	79 (26.3%)	68 (22.7%)	95 (31.7%)
Permanent	55 (18.3%)	82 (27.3%)	70 (23.3%)	67 (22.3%)	30 (10.0%)	107 (35.7%)
P value (95% CI)	<0.001 (<0.001 - <0.001)*		0.940 (0.516 – 1.000)		<0.001 (<0.001 - <0.001)*	

*denotes significant p values from Chi square test (p<0.05).

DISCUSSION

This present study was done on 300 healthcare personnel working in Tripura Medical College & Dr. BRAM Teaching Hospital, where mean age of participants was 24.18±5.799 years and majority were females (71.3%). By occupation most of them were Nurses (88%), followed by OT assistants (6.3%) and laboratory technicians (5.7%). Almost similar proportion of the staffs were probational (≤2 years) and permanent (>2 years) in their work experience. Similar studies were conducted by Sahu D et al.[13] in Chhattisgarh in 2015 among 62 nurses and Chaudhury et al in Darjeeling in 2016.[15]

In the current study, majority of the participants were aware of the three criteria of safe injection and of the complications of unsafe injection as well (86%). Majority (81.3%) also had knowledge about the post exposure prophylaxis in case of accidental exposure. These findings correlate to the study conducted in Andhra Pradesh in 2010, where about 84% of the participants had the aforesaid knowledge.[16] Similar results were also found in the study conducted by Rehan et al in a tertiary care hospital of New Delhi and the study by Ashish Naik et al.[17,18] among health care workers in urban health centres of Surat city. Although, study conducted by Karthik et al among nursing students of a tertiary care hospital of Chennai, Tamil Nadu, showed only 56% had knowledge of injection safety among the participants.[19]

This study showed good practices regarding injection safety among majority (67.3%) of the health care personnel whereas their knowledge and attitude in this regard were equivocal. This should be an area of serious concern even though practices related to appropriate disposal of injection materials was very poor (27.7%) in various other studies.[16] Where almost half of our study participants used gloves while giving injections a similar study at Darjeeling revealed no similar practices.[15]

The present study also showed higher mean age (p value <0.001), occupation as nurse (p value 0.001) in comparison with OT assistants and laboratory technicians and probational work (≤2 years of experience) (p value <0.001) were significant predictors of good knowledge and latter two variables also as predictors of good practice (p value 0.002 and <0.001 respectively) of injection safety among the participants. No previous study results were found in this context. Further qualitative research would be helpful for in depth knowledge of the predictors of knowledge and practice of injection safety for future benefits.

From the above discussion it can be concluded that even though practices regarding injection safety was good among the study population, there was ample scope for improvement in the knowledge and attitude of the staffs in this regard. Moreover, OT assistants and Laboratory technicians were significantly lacking on their knowledge and practice with comparison to nursing staffs regarding injection safety and there should be plan for further sensitization and training of them especially on open vial policy.

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