

Practice of Standard Safety Measures among Nursing Personnel at Tertiary Mental Health Institute, North-East, India

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ABSTRACT

Background: Health care-associated infection (HAI) is a serious problem that deeply impacts patient safety and is a major cause of patient morbidity and mortality. Adherence to standard safety measures while performing procedures and related infection control measures is a part of nurses responsibility as it protects patients and health care workers from transmission of health-care associated infections. Assessing practice of standard safety measures while performing nursing procedures is immensely important so that necessary changes can be brought to enhanced quality nursing care.

Methodology: The study adopted an observational descriptive research design. The setting of the study was the Tertiary Mental Health Institute, North-East, India. The sample of the study consisted of the thirty eight (38) nursing personnel who performed the total 150 procedures i.e. 30 times of each five domains (waste disposal, intramuscular injection, intravenous injection, hand-washing, aseptic wound dressing). Convenience sampling technique was used.

Result: Finding showed that all the nursing personnel followed proper waste disposal practice but partially adhere to standard safety measures while administering intramuscular and intravenous injections. Whereas practice on standard safety measures while performing hand washing and aseptic wound dressing were less than average.

Conclusion: The present study highlights the importance of in-service education on standard safety measures by incorporating new guidelines

of nursing procedures based on evidence based practices. In-service education brought changes in the performance level as it is showed that the nursing personnel who had earlier received in-service education on Bio-medical waste management from the institute followed satisfactory waste disposal practice.

Keywords: Standard safety measures, nursing personnel

INTRODUCTION

Medical treatment is intended to save life and improve health, and all health workers, especially nurses as the most populated healthcare workers who spend the most time with the patients, have a responsibility for patient safety and to prevent transmission of health-care associated infections. Adherence to standard safety measures while performing procedures and related infection control measure is a part of responsibility of the nurses as it protects patients and health workers from transmission of health-care associated infections and ensures safety.

Health care-associated infection (HAI) is a serious problem that deeply impacts patient safety and is a major cause of patient morbidity and mortality. It also prolongs the length of stay in health-care settings and increases medical costs.^{1,2} It is an infection occurring in a patient in a hospital or other health care facility in which the infection was not present or

incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.³

One of the most recurrent themes with regards to the prevention of nosocomial infections in hospital has been the issue of hand washing among medical personnel. It is considered as one of the most effective infection control measure. One study on hand hygiene compliance in India among different health care workers found that hand hygiene compliance before and after patient or environment contact among doctors, nurses and ancillary staffs were 66%, 62% and 54% respectively. And also found that nurses followed hand hygiene steps in 56%, doctors in 69% and ancillary staff in 51% of the times.⁴

Despite the push for evidenced-based practice, many nursing practices are deeply rooted by tradition. Overuse of injections and unsafe practices are still common in developing and transitional countries. Literature review and regional estimates of use of injections in healthcare settings worldwide, 2000 showed that in the 10 other regions, the annual ratio of injections per person ranged from 1.7 to 11.3. Of these, the proportion administered with equipment reused in the absence of sterilization ranged from 1.2% to 75.0%. Reuse was highest in the South East Asia region "D" (seven countries, mostly located in South Asia), the eastern Mediterranean region "D" (nine countries, mostly located in the Middle East crescent), and the western Pacific region "B" (twenty two countries).⁵

Another study showed that knowledge on washing hands before giving injection was 45.6% but when it comes to practice it was observed only among 18.2%; Similarly knowledge on use of hub-cutter after giving injection was found to be 33.9% but when practice of using hub-cutter was observed, it was only 20.5%; Knowledge on safe disposal of used syringes was 53.8% but the practice was found to be poor

(21.7%). Similarly knowledge on use of color coded bags according to guidelines was 65.8% but when practice was observed it is poor (20.6%).⁶ Although, there is an increased global awareness among health professionals about the biomedical waste hazards and also appropriate management techniques but the level of awareness in India is found to be unsatisfactory.^{7,8,9} It is also revealed in one of the study that there is lack of knowledge and awareness of biomedical waste management even among health workers. This has led to the poor practice of biomedical waste handling and management, hence exposing themselves and the public in general to health and environment hazards.¹⁰

Increasingly, mental health nurses are expected to base their clinical practice on evidence based knowledge and many of the practice traditions that have passed between generations of nurses must now be examined within this scientific context. Since 2000, there has been an increasing debate on what is best practice for the administration of intramuscular injections particularly in relation to site selection, needle size and technique. Weight gain associated with second generation long acting antipsychotics influences the site and needle size for effective medication delivery. One study showed a continued higher usage of the dorsogluteal site was also reported in 2012 contrary to the recommendations in the current research for the ventrogluteal site.¹¹

Furthermore, some literature also suggests that nurses' knowledge in wound dressing is insufficient to perform practice^{12,13}. One study on an examination of nurses' practices when performing aseptic technique for wound dressings showed that not all nurses in the sample applied a 'simple aseptic technique'¹⁴.

Keeping the above facts in view the researcher has found that there is low adherence of standard safety measures while practicing procedures among nursing personnel. Also, so far no research study on practice of standard safety measures while

performing nursing procedures was found in the north-eastern region of India. Meanwhile, this study of this kind will act as a guide for more studies to be done. So the researcher felt the need of conducting the present study as it will help in finding out the practice of standard safety measures while performing nursing procedures among nursing personnel so as to enhance safety for both patient and nursing personnel by preventing hospital acquired infection and other procedures related complications.

MATERIALS AND METHODS

A quantitative, non-experimental research approach was used and the research design selected for the study was observational descriptive research design. The study was conducted in Tertiary Mental Health Institute, North-East India. The sample of the study consisted of the thirty eight (38) nursing personnel as per inclusion and exclusion criteria who performed the total 150 procedures i.e. 30 times of each five domains (hand-washing, intramuscular injection, intravenous injection, aseptic wound dressing and waste disposal). The researcher adopted convenience sampling technique.

DESCRIPTION OF THE TOOL

The structured tool on adherence of standard safety measures among nursing personnel consisted of two parts, first part socio-demographic data sheet and the second part observational practice checklists. The tools were developed by the researcher through the textbooks, journals, literature reviews and with the experts opinion. The tools used for data collection were:

Part- A: Socio-demographic data sheet

Part-A consisted of 6 items pertaining to socio demographic variables of the subjects such as age, gender, marital status, professional educational qualification, years of clinical experience and attended any in-service education programme like seminar, workshop on standard safety measures.

Part-B: A self-structured practice checklists

Part-B comprised of an observational checklists of five domains in order to observe the practice on standard safety measure while performing hand washing, intramuscular injection, intravenous injection, aseptic wound dressing and waste disposal. Separate checklists were prepared for each five domain.

The checklists for hand-washing practice, intramuscular injection practice, intravenous injection practice, aseptic wound dressing practice and waste disposal practice consisted of items having 13, 17, 15, 17 and 3 respectively. The checklists consisted of two options either yes or no. The respective maximum score of hand washing was 13, intramuscular injection was 17, intravenous injection was 15, aseptic wound dressing was 17 and waste disposal was 3. Item number 12 of intramuscular injection checklist was a negative statement. The nature of the scoring was- for positive statements the scoring was 1 for "yes" and 0 for "no" but for the negative statements the scoring was 0 for "yes" and 1 for "no".

The reliability of the tool was established by using the formula Cohen's kappa inter-rater. The result of reliability was found to be 1.

PROBLEM ENCOUNTERED DURING PILOT STUDY

The pilot study was carried out on 7 nursing personnel working at Tertiary Mental Health Institute, North-East India and found difficulty to observe all the five domains i.e. waste disposal, intramuscular injection, intravenous injection, hand-washing and wound dressing collectively from one individual nursing personnel. The researcher found hindrance to observed all the five domains from one individual nursing personnel, as most of the nursing personnel worked collaborate in a shared manner with the other on-duty nursing personnel. Another problem encounter was

procedures like wound dressing, intramuscular and intravascular injections were not performed very frequently in the psychiatric set-up like other acute hospital set-up.

And for this reason, the method of data collection was changed. So, it was decided to collect 150 procedures on five domains (i.e. 30 times observation for each domain) from the sample size that fulfilled total requirement. At the end of the study it appeared total 38 subjects to complete the required observation.

DATA COLLECTION PROCEDURE

After the ethical committee clearance, formal permission was taken from the concerned authorities prior to the collection of information. Researcher assistance were trained on the correct procedures of the above mention five domains and explained about the difficulties that may arise for the observer and the strategies to counter them. Prior to the observation, medicine round book and nurses round book were checked for the timing of medication to be administered and doctors prescription for wound dressing. Based on this information, observations were made from the nursing personnel during the day shifts (both morning and evening shifts) from 8.00 a.m. to 7p.m. The data collection procedure was carried out for 2 months and 4 days from 26th October to 30th December 2015. Obtained data was converted into numeric data and, the average and item-wise percentage of the five observations was calculated. The data was compiled in a master datasheet and analysis was done using SPSS 16.

RESULT

The study result showed that majority 34.2% of the nursing personnel belonged to the age group 36-40 years of age, 21.1% belonged to the age group 26-30 years, 18.4% belonged to the age group 31-35 years, 15.8% belonged to the age group 20-25 years and 10.5% belonged to the age group 41-45 years. With

respect to gender majority 92.1% were female and 7.9% were male, majority 71.1% were married and 28.9% were unmarried. In the distribution of sample according to educational qualification majority 47.4% completed their post basic diploma course, 36.8% completed their GNM course and 15.8% completed their BSc. (N) course. On the basis of clinical experience majority 42.1% were having clinical experience between 11-15 years, 36.8% were having clinical experience less than 5 years, 13.2% were having clinical experience between 5-10 years and 7.9% having clinical experience between 16-20 years. The majority 57.9% attended some kind of in-service education programme on standard safety measures whereas 42.1% of them did not attend any kind of in-service education programme on standard safety measures.

Table 1: Distribution of mean, SD and range scores of the nursing personnel practice for waste disposal, N=30

Domain	Minimum	Maximum	Mean	SD	Range
Waste disposal	3	3	3	0.000	0-3

The data presented in table 1 showed the mean and S.D. scores were 3 ± 0.000 and range score resulted to 0-3.

100% of the nursing personnel destroyed the used needle after administering injection, disposed the used needles, syringes, ampoules, needle caps, syringe wrappers, and alcohol swabs immediately in the appropriate containers after administering injection, 100% discarded the soiled swabs in an appropriate container.

Table 2: Distribution of mean, SD and range scores of the nursing personnel while administering intramuscular injection, N=30

Domain	Minimum	Maximum	Mean	SD	Range
Intramuscular injection	12	16	13.70	0.837	0-17

The data presented in table 2 showed the mean and S.D. scores of 13.70 ± 0.837 and range score of 0-17. The nursing personnel who followed the safety measures in correct steps were found as minimum 12 and maximum as 16 out of total score 17.

100% of the sample assessed for any contraindication for administering

intramuscular injection, used the syringe and needle from a sterile unopened packet or fitted with caps, selected appropriate injection site, cleaned the skin before administering injection, inserted the needle into the muscle at an accurate angle, destroyed used needle, disposed the used syringes and other wastes in an appropriate containers, washed hands after the procedure and did complete charting.

Only 10% of the sample washed hands before preparation of injection, 96.7% of them prepared injection on a visibly clean dedicated table or tray, 100% of them did not used gloves before administering intramuscular injection, 36.7% of them tap the injection site gently after injection and 30% of them recap the used needle.

Table 3: Distribution of mean, SD and range scores of the nursing personnel while administering Intravenous injection, N=30

Domain	Minimum	Maximum	Mean	SD	Range
Intravenous injection	11	14	12.67	0.758	0-15

The data presented in table 3 showed the mean and S.D. scores of 12.67 ± 0.758 and range score of 0-15. The nursing personnel who followed the safety measures in correct steps were found as minimum 11 and maximum as 14 out of total score 15

100% of sample assessed for contraindication for IV injection, cleaned the patients skin before the injection, palpate the venipuncture site after skin preparation, took the device from a sterile unopened packet with caps, injected the medication slowly in the vein at an angle of 15 degree when back flow of blood seen in the syringe, destroyed the used needles, disposed the used needles, syringes, ampoules, needle caps, syringe wrappers, and alcohol swabs immediately in the appropriate containers and did complete charting.

89.1% of the sample explained about the procedure to the patient, 19.8% of them washed hands before preparing an injection, 95.7% of them prepared the injection on a visibly clean dedicated table or tray.

100% of the sample did not wear a new pair of gloves before the injection, 89.1% of them washed their hands after procedures and 69.3% disinfected or sterilized the used articles.

Table 4: Distribution of mean, SD and range scores of the nursing personnel performing hand washing technique, N=30

Domain	Minimum	Maximum	Mean	SD	Range
Hand-washing	5	8	5.93	1.015	0-13

The data presented in table 4 showed the mean and S.D. scores of 5.93 ± 1.015 and range score of 0-13. The nursing personnel who followed the safety measures in correct steps were found as minimum 5 and maximum as 8 out of total score 13.

100% of the sample wet hands with water before applying soap, applied enough soap to cover all hand surfaces, rub palm to palm, rinse both hands thoroughly with water and nurse dried the hands properly.

13.3% of them rub right palm over left dorsum with interlaced finger and vice versa, 20% of them rub palm to palm with finger interlaced, 3.3% of them rub backs of the fingers to opposing palms with finger interlocked and rub fingertips on palm for both hands and 50% of them rub both wrists in rotational manner.

100% of the sample did not rub rotationally of left thumb clasped in right palm and vice versa, and did not follow all the 7steps of hand-washing before and after procedures

Table 5: Distribution of mean, SD and range scores of the nursing personnel performing aseptic wound dressing, N=30

Domain	Minimum	Maximum	Mean	SD	Range
Aseptic wound dressing	9	14	11.43	1.431	0-17

The data presented in table 5 showed the mean and S.D. scores of 11.43 ± 1.431 and range score of 0-17. The nursing personnel who followed the safety measures in correct steps were found as minimum 9 and maximum as 14 out of total score 17.

100% of the sample did not collected the necessary equipment both clean and sterile articles before the procedure and did not place waterproof pad or mackintosh under the client before the procedure. Also

100% of them did not wear gloves before performing wound dressing, 30% of them washed hands before performing the procedure where 26.7% of them cleaned the wound from center to periphery discarding the used swabs after each stroke. 66.7% of the sample dried the wound with dry swabs thoroughly after cleaning the wound and 56.7% of them disinfected or sterilized the used articles.

Also, 90% of the sample applied dressing, 96.7% of them washed hands after the procedures and 100% of them discarded the soiled swabs in an appropriate container and did complete charting.

DISCUSSION

The study was conducted to observe the practice of standard safety measures on five domains i.e waste disposal, intramuscular injection, intravenous injection, hand-washing and aseptic wound dressing among nursing personnel working at Tertiary Mental Health Institute, North-East India.

Practice of proper waste disposal

In respect to the waste disposal practice, the nursing personnel followed satisfactory waste disposal practice. The satisfactory performance can be co-related with the in-service education the nursing personnel received from the institute. The institution conducted regular in-service education on Bio-medical waste management. The finding of the present study supported by Mir et al¹⁵ who found higher level of awareness and attitudes as well as practices among staff nurses regarding biomedical waste management except for the injury report which was as low as 30%.

Practice of standard safety measure while performing intramuscular injection

In respect to intramuscular injection, the nursing personnel were found to be partially adhere to standard safety measure while administering intramuscular injection.

The finding of the present study was supported by a study conducted by Naik et al¹⁶ who found all of the subject knew that gloves should be wore during injection procedure but only (35 %) were actually wearing it. Only 6 (15 %) of participants knew that gloves should be wore for both personal and patient safety. Around 65 % of the participants felt that needle should not be recapped after giving injection but 50 % were actually found to be recapping it. The percentage of needle stick injury among nurses came to be 65%.

Practice of standard safety measure while performing intravenous injection

In respect to intravenous injection, the nursing personnel were found to be partially adhere to standard safety measure while administering intravenous injection.

It was found in the present study that 100% of nursing personnel did not wear a new pair of gloves before administering intravenous injection. This finding was supported by the study conducted by Paul et al¹⁷ who found that only 3.7% nurses wore sterile gloves before administering intravenous injection.

Practice of standard safety measure while performing hand-washing

In respect to hand-washing practice, not all the nursing personnel followed the proper steps of hand-washing technique. It was found low adherence of hand hygiene.

The present finding of the study was supported by Sakihama et al¹⁸ who found hand hygiene adherence in Japanese teaching hospitals was low, even lower than reported mean values from other international studies. In a total of 3545 health care worker-patient observations, appropriate hand hygiene practice was performed in 677 (overall adherence, 19%; 95% confidence interval, 18%-20%). Subgroup rates of hand hygiene adherence were 15% among physicians and 23% among nurses.

The finding of the present study was also supported by the study conducted by

Novoa et al¹⁹ on evaluation of hand hygiene adherence in a tertiary hospital. Low adherence of hand hygiene was found in the study.

Practice of standard safety measure while performing aseptic wound dressing

In respect to aseptic wound dressing, the practice on standard safety measure while performing aseptic wound dressing by nursing personnel was less than average.

The finding of the present study supported by the study conducted by Bree-William and Waterman¹⁴ found that not all nurses in the sample applied a simple aseptic technique.

CONCLUSION

The present study highlights the importance of in-service education on standard safety measures by incorporating new guidelines of nursing procedures based on evidence based practices. In-service education brought changes in the performance level as it is showed that the nursing personnel who had earlier received in-service education on Bio-medical waste management from the institute followed satisfactory waste disposal practice.

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