Patient Safety & Quality Improvement Journal
http://psj.mums.ac.ir
PSQI

Observance of the Standard in Safe Injection: a Survey in the Inpatient Units of Eight Teaching Hospitals

Salah addin Asadi[1] (MSc); Ali Shargh[2] (MD); Saeed Husseini Barghazan[3] (MSc Student); Jamal Eftekhari[4] (MSc); Morteza Arab-Zozani[5]* (PhD Candidate)

1. Nabi-akram Hospital, Oshnavieh, West Azerbaijan, Iran.
2. Healthcare Director of West Azerbaijan, Iran.
3. Center for Scientific Research, Faculty of Health, Tehran university of Medical Sciences, Tehran, Iran.
4. Accreditation Expert Group,West Azerbaijan, Iran.
5. School of Management and Medical Informatics, Iranian Center of Excellence in Health Management, Tabriz University of Medical Sciences, Tabriz, Iran.

ARTICLEINFO

Article type:
Original Article

Article history:
Received: 26- June-2016
Accepted: 17- July -2016

Keywords:
Inpatient unit
Observance of the standards
Safe injection
Teaching hospitals

ABSTRACT

Introduction: Safe injection is a kind of injection that not hurts the one who receives service, not injures the providers and its leftovers won't make harm or damage to the society and environment. The purpose of this study was to investigate the rate of the observance of the standards with safe injection in the inpatient unitsof teachinghospitals in Tabriz.

Materials and Methods: In this cross-sectional study, 399 samples were estimated. Samples were selected randomly as clusters from each hospital and inpatient units and data were gathered in all three working shifts.The data collection tools used in this study was a checklist which itsreliability has been proved. Data were analyzed by using the SPSS 21 and were reported by relevant analytic and descriptive statistics.

Results: 73.4%of subjects were woman. 63.90%of people in the past year have been passed the course related to infection and safe injections.The observance of the standardsofsafe injection in "preparation phase", "during the injection" and "after injection"was64.84%, 58.95%,and 63.95%,respectively,which had in fairly good condition. The total mean of the observance of the standards with safe injection in inpatient unitof teaching hospitals was 62.32%. There was a significant relationshipbetweenthe observance of the standardsand age, level of education, educational course and work experience($p \leq 0.05$).

Conclusion: Performing the retraining programs in injections and nosocomial infections, employing people with work experiences in teaching hospitals, providing individual protection equipment such as glasses and mask, educations about hand washing, providing and using auto disable syringes and safety boxes and immunizing the staffs against hepatitis B and C can be the most important actions in doing safe injection.

▶ ***Please cite this paper as*:**
Asadi S, Shargh A, Husseini Barghazan S, Eftekhari J, Arab-Zozani M, et al. Observance of the Standard in Safe Injection: a Survey in the Inpatient Units of Eight Teaching Hospitals. Patient Saf Qual Improv. 2016; 4(4):460-464.

Introduction

Health is one of the most important issues thathave been the consideration of human being from the beginning of time, and the governments try to provide a condition for health so that people can get maximum benefits of health level with equitable distribution(1).

One of the responsibilities of all health organizations is diseases management. It is obvious that management system should be designed and implemented according to diseases, facilities, needs and sources(2).

Hospitals in the health system have animportantroleand drastic responsibility(3). These centers acting in tasks which are vital and providing and ensuring the society health needs, their proper and reliable work(4). Also,hospitals are centers which are using diagnostic, curative, sanitary, educational and researching facilities in order to promoting the health status of patients, and provide welfare and safety for their patient and staffs(5).

***Corresponding Author:** Morteza Arab-Zozani, School of Management and Medical Informatics, Iranian Center of Excellence in Health Management, Tabriz University of Medical Sciences, Tabriz, Iran. Email: Arab.hta@gmail.com

Patient safety is one of the main components in the quality of health service, and it is about to avoid any damage or injury to the patient during the providing health service(6). Health cares are indispensably along with risks of threatening the safety of patient.

Possibility of risks means happening an unpleasant event or losing a part of natural life.

Especially,injection as a powerful mean for curing the diseasesis considered in developing countries(7).

Patients feel that if an injection being used in their therapy, then they will believe that they have been received a good health service (8). Safe injection and using its methods and principalsis the main way of preventing the diseases transition(1). According to the world health organization's definition, Safe injection is a kind of injection that not hurts the one who receives service, not injures the providers and its leftovers won't make harm or damage to the society and environment(9). As regards to the world health organization mathematic models which has been done in developing countries in 2000, 21 million new cases of hepatitis B (32 %of new cases), 2 millionof new cases of hepatitis C (40% of new cases) and 260000 new cases of HIV (5% of new cases) related to the unsafe injections (9, 10). Affection of blood borne infection among health centers staffs caused 4.4%ofHIV, 39%of HBV and HCV. In 1996 the incidenceof new cases of hepatitis C arising from unsafe injection was higher than the 40% of allcases of this disease. Thus, standard techniques and methods of injection, can assure safety of staffs and patients (11, 12). The ultimate goal of health service is saving life and increasing the level of patient's health. Healthcare staffs are responsible for the observance of the standard in injection process and its obligation can due to decreasing risk of transmission of infections in health services(13, 14).Therefore, our goal of conductingthis study is to investigate the rate of the observance of the standards with safe injection in the inpatient unitsof teaching hospitals in Tabriz, Iran.

Materials and Methods

Subjectthe observance of the standards for safe injection were assessed through a cross-sectional study design. Research population of this study was all injectionshave been done by nurses in inpatient unitsof teaching hospitals inTabriz city during2014. We use cluster sampling from teaching hospitals of Tabriz city (7 hospitals).Among the hospitals with same practiced one of them was selected randomly. Then from each hospital one inpatientunit was chosen randomly and samples analysis was done in all three work shifts. According to the previous similar studies and Cochran formula-, 384 cases of injection were selected as sample.For easy division between hospitals and working shift,399 injections were analyzed.In general 7 hospitals were studied that 57 cases from each hospital and 19 cases from each work shifts were studied (d=0.5, z=1.96, p= 0.5). Data gathering was done in studycontextand by a researcher and a nurse expert as a research assistant in all three working shifts ininpatient unit of selected hospitals. The data collectiontool was a derivative checklist from instructions of safe injection of ministry of health and world health organization(15). the first part of this checklist includes demographic information (such as age, gender, level of education, workexperience, history of retraining courses ininfection and safe injection, serving section and the studied hospital), second section includes 37 item including the observance of the standardin the preparation phase of injection, during injection and after injection. The validity of the checklist approvedby Shiva et al(16).CVI and CVR of this tool have been estimated 0.95 and 0.97 respectively. Also its reliabilityhas been assessedand the Spearman brown indexand Wkendal index was 0.958 and 0.847respectively (20). After gathering data, the data were entered to SPSS-21. At last analyzing of data were done by usingdescriptive statistics(mean and SD), independent T-test and ANOVA.Ethical considerations such as confirming the honesty in research, recording and reporting the valid and accurate information, privacy and keeping the information of the studied hospitals, treating without bias with research data, respecting all beliefs and faiths of samples and voluntarily participating of all participantsin the study, should be supervised.

Results

73.4%of participants were women and 26.6% was men. The most frequent age group was31-35 with 135 members (33.8%)and the least was in 20-25 age group with 39 members (9.8%). the demographic characteristicof participants have displayed in table 1.

Table1: Demographics of enrolled subjects

Demographic		Frequency	%
Gender	Male	106	73.4
	Female	293	26.6
Age	20-25		9.8
	26-30	51	12.8
	31-35	135	33.8
	36-40	100	25.1
	41-45	74	18.5
Educational level	ADN	79	19.8
	BSN	272	68.2
	MSN	48	12
Job experience	Under 10 years	167	41.9
	10-20 years	182	45.6
	20-30 years	50	12.5
Retraining course	Yes	255	63.9
	No	144	36.1

The total rate of the observance of the standards was 62.32±8.82 which has the maximum rate in preparation phase (64.84±12.8). Also7th hospital generally has the maximum rate of the observance of the standards

(72.4%) and the firsthospital (57.13%)has the minimum rate among the studied hospitals (Figure1).

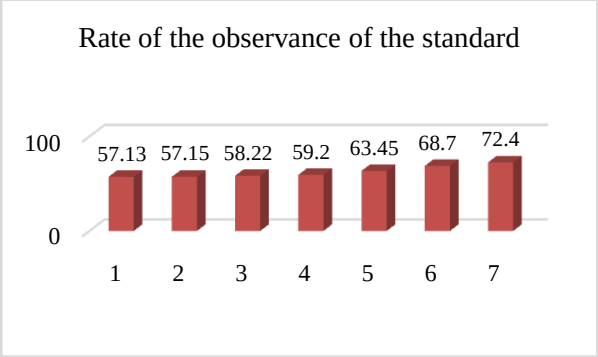

Figure1: Rate of the observance of the standard in studied hospitals

The rate of the observance of the standards in different phases of injection in inpatient units and in each studied hospitals, has been displayed in table 2.

Table2: Total rate of the observance of the standard at different stages in all hospitals

Phase Hospital	Preparation (Mean±SD)	during the injection (Mean±SD)	after injection (Mean±SD)	Total (Mean±SD)
1	59.01±11.15	52.42±8.61	60.91±10.01	57.13±5.26
2	57.20±12.46	54.84±11.28	59.79±10.30	57.15±8.23
3	64.32±10.38	53.29±8.59	58.38±10.22	58.22±7.34
4	61.29±12.22	58.14±10.56	58.52±7.21	59.20±6.95
5	66.08±11.75	57.64±11.70	67.83±9.67	63.45±9.06
6	73.15±11.00	65.20±5.66	68.71±6.02	68.70±4.92
7	72.83±11.04	71.13±6.20	73.48±4.89	72.40±4.19
Total	64.84±12.80	58.95±11.13	63.95±10.17	62.32±8.82

For testing the relationship between the rate of the observance of the standards and demographic variables, independent T-test and ANOVA have been used (The p-value in $\alpha \leq 0.05$ is significant). Summary of the Results have been shown in table 3.

Table3: Statistical analysis by demographic variables

Demographic variables		Mean± SD	P-value
Gender	Male	62.23±9.21	0.900
	Female	62.35±8.69	
Age	20-25	57.44±9.36	0.000
	26-30	57.72±7.57	
	31-35	61.74±8.70	
	36-40	64.54±7.97	
	41-45	66.11±8.05	
Job experience	>10	57.84±8.11	0.000
	10-20	64.67±7.81	
	20 >	68.75±7.25	
Work shift	Morning	61.55±8.58	0.471
	Afternoon	62.71±8.64	
	Night	62.70±9.24	
Educational level	ADN	62.57±8.43	0.002
	BSN	61.54±8.91	
	MSN	66.32±7.95	
Retraining course	Yes	63.91±8.62	0.000
	No	59.51±8.50	

Discussion

Total meanrate of the observance of the standards in inpatient unitswas 62.32±8.82% which demonstratesthe fairly good rate of safe injections by nurses. Kerret alshowed thatthe score of the observance of the standards in neurology department of was66.3%,which was matched with our study results(17).Esmailet alshowed that the providerswere less knowledgeableabout safe injection and Education was the most effective factor in improving their knowledge (18). This finding contrastwith our study.Ismael et alreported that the observance of the standards were in good situation in urban areaswhich in comparison with our study the rate of the standards was higher(19). The reason for this finding includes the higher quality of procedures and facilities. In the other study that conducted by Okwenet al the observance of the standards has been reported weak(20). The reasons werereusing the syringes because of the lack of syringes and safe facilities. This resultwasn't matched with our study.According to the table 2 the average standards of safe injection in preparation phase of injection (includes washing hands before injection, considering all injection tools about fracture, expiration date and stain) in inpatientunitswere 64.84±1.80, which shows the almost fairlygood rate of the observance of the standards on safe injection, which is done by nurses. Jalaliniaet alreported 49.4% for the observance of the standards in preparation phase which there is less than our study results(21). Of course they had some similarity with our study such as inattention tohand washing by most of the nurses before doing injection.

Onestudy in Pakistan showed that 58.2%of providers weren't vaccinated against hepatitis B, which compared with our study results that only a few nurses were vaccinated against hepatitis B(22).

The average rate of the observance of the standards during the injection phase in inpatient unitswas 58.95±11.13% which shows fairly goodsituation. In addition,the average rate of the observance of the standards after injection phase in inpatient unitswas63.95±10.17%which shows afairlygood rate situation.In contrast with our results, Liet alreported that 78.1% of nurses use recapping, despite the fact thatin our study majority of nurses were refusing doing the recap after injection (17).

Based on the table 3, the rate of the observance of the standards had a significant relationshipwith some variables suchas age (P=0.000), education level (P=0.002), educational course(P=0.000) and workexperience (P=0.000), and the relationship between gender (P=0.90) and work shift (P=0.471) wasn't significance. In contrast with our study, in Jalalinia's study, there was a significantrelationship between gender and the rate of the observance of the standards (P=0.002)(21). Unlike this, Wilburnet al showed that there wasn't any relationship between demographic variablesand the rate of the observance of

the standards(23). As well as Choiet al has not observed any significantrelationship between doctors and nurses in using of safe methods in injection(24).

Conclusion

In Conclusion, the rate of the observance of the standards on safe injection in inpatient units has been estimated 62.32%. The rate of the observance of the standardsin preparation, during injection and after injection phases were 64.84, 58.95 and 6395% respectively. hand washing, using alcohol pads during breaking the vials, using appropriateprotection tools in injection, using auto-disable syringes and standard safety boxes, were the matters which there were not as much of attention to them. The highestand the least rate of the observance of the standardsrelated to the 7th hospital with average 72.40% and the 1th hospital with average 57.13, respectively.

due to the importance of performing the retraining programs in the field of safety injections and nosocomial infections, employing individuals with higher workexperiences in educational hospitals, providing individual protection tools such as glasses and mask during the injection, healtheducation in handwashing and amplificationits importance, providing and using of auto-disable syringe and standard safety boxes and vaccinating staffs against hepatitis B and C can be one of the most important actions for increasing the rate of the observance of the standard insafe injections. In general, doing interventionalstudies in order to improve this process, and additionally, according to the results of this study, doing some researches with reference to solving existent problems, investigating the elements affecting standards in safe injection and monitoringthe rate of the observance of the standards in both urban and rural health centers are the most important and practical factors in order to developing the safe injection process.

Acknowledgments

The researchers would like to thank all hospital managers for permitting access to their administrative information and cooperating with researchers.

References

1- Drucker E, Alcabes PG, Marx PA. The injection century: massive unsterile injections and the emergence of human pathogens. The Lancet. 2001;358(9297):1989-92.
2- Dolan SA, Felizardo G, Barnes S, Cox TR, Patrick M, Ward KS, et al. APIC position paper: safe injection, infusion, and medication vial practices in health care. American journal of infection control. 2010;38(3):167-72.
3- Assiri A, McGeer A, Perl TM, Price CS, Al Rabeeah AA, Cummings DA, et al. Hospital outbreak of Middle East respiratory syndrome coronavirus. New England Journal of Medicine. 2013;369(5):407-16.
4- Shepperd S, Lannin NA, Clemson LM, McCluskey A, Cameron ID, Barras SL. Discharge planning from hospital to home. Cochrane Database Syst Rev. 2013;1.
5- Calfee DP. Crisis in hospital-acquired, healthcare-associated infections. Annual review of medicine. 2012;63:359-71.
6- Aiken LH, Sermeus W, Van den Heede K, Sloane DM, Busse R, McKee M, et al. Patient safety, satisfaction, and quality of hospital care: cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. Bmj. 2012;344:e1717.
7- Brokensha G. The hollow needle: inappropriate injection in practice. Australian Prescriber. 1999;22(6).
8- Reeler A, Hematorn C. Injection practices in the third world. World Health Organization, Geneva(Unpublished document WHO/DAP/948. 1994.
9- Gyawali S, Rathore DS, Shankar PR, Kumar KV. Strategies and challenges for safe injection practice in developing countries. Journal of pharmacology & pharmacotherapeutics. 2013;4(1):8.
10- Averhoff FM, Glass N, Holtzman D. Global burden of hepatitis C: considerations for healthcare providers in the United States. Clinical Infectious Diseases. 2012;55(suppl 1):S10-S5.
11- Soltani J, Amjadi MJ. Safety of a Trivalent Inactivated Influenza Vaccine in Health Care Workers in Kurdistan Province, Western Iran; A Longitudinal Follow-up Study. Iranian journal of medical sciences. 2014;39(2 Suppl):218.
12- Lavanchy D. Hepatitis B virus epidemiology, disease burden, treatment, and current and emerging prevention and control measures. Journal of viral hepatitis. 2004;11(2):97-107.
13- Bairami F, Ghorbanpoor M, Bairami A, Mostofian F. Assessment of Patient Safety Friendly Hospital Initiative in Three Hospitals Affiliated to Tehran University of Medical Sciences. Journal of Patient Safety & Quality Improvement. 2016;4(1):334-9.
14- Arab Zozani M, Amery H, Jafari A. The Role of Health Technology Assessment in Evidence-Based Decision making and Health Policy: A review study. Journal of Health Administration. 2014;17(57):99-112.
15- Mostoufian F. Safe Injection Guideline IMoH, Office for hospital management and clinical excellence. 2009. available at: http://www.tamin.ir/file/file/34551.
16- Shiva F, Sanaei A, Shamshiri AR, Ghotbi F. Survey of needle-stick injuries in paediatric health personnel of 5 university hospitals in Tehran. JPMA-Journal of the Pakistan Medical Association. 2011;61(2):127.

17- Li L, Li Y, Long Y, Zhou Y, Lu J, Wu Y. [Experimental intervention study of safe injection in basic-level hospitals in Hunan by medical staff]. Zhong nan da xue xue bao Yi xue ban= Journal of Central South University Medical sciences. 2013;38(7):748-53.
18- Ismail N, Aboul Ftouh A, El Shoubary W, Mahaba H. Safe injection practice among health-care workers in Gharbiya Governorate, Egypt. 2007.
19- Ismail A, Mahfouz M, Makeen A. Injection Safety among Primary Health Care Workers in Jazan Region, Saudi Arabia. The international journal of occupational and environmental medicine. 2014;5(3 July):441-155-63.
20- Okwen MP, Ngem BY, Alomba FA, Capo MV, Reid SR, Ewang EC. Uncovering high rates of unsafe injection equipment reuse in rural Cameroon: validation of a survey instrument that probes for specific misconceptions. Harm Reduct J. 2011;8(4).
21- Jalalinia F, Zakeri-moghadam R, Kazem nejhad A. survey in safe injection by hospital nurses. Hayat. 2006;12(1):35-45.
22- Janjua N. Injection practices and sharp waste disposal by general practitioners of Murree, Pakistan. JOURNAL-PAKISTAN MEDICAL ASSOCIATION. 2003;53(3):104-10.
23- Wilburn SQ, Eijkemans G. Preventing needlestick injuries among healthcare workers: a WHO-ICN collaboration. International journal of occupational and environmental health. 2004;10(4):451-6.
24- Choi JH, Lee JA, Ki HK. Survey for safe injection in a hospital in Korea. Journal of Microbiology, Immunology and Infection. 2015;48(2):S141.