International Journal of Community Medicine and Public Health
Allaqband UF et al. Int J Community Med Public Health. 2017 May;4(5):1737-1743
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20171794

Original Research Article

A study on knowledge regarding different aspects of injection safety among injection providers at different levels of health care

Uroosa Farooq Allaqband*, Anjum B. Fazili, Rohul Jabeen Shah, Ab. Majid Ganai, Walied K. Balwan, Feroz Wani

Department of Community Medicine, Sher-i- Kashmir Institute of Medical Sciences, Soura, Srinagar. Jammu and Kashmir, India

Received: 21 March 2017
Revised: 14 April 2017
Accepted: 15 April 2017

***Correspondence:**
Dr. Uroosa Farooq Allaqband,
E-mail: uroosafarooq58@gmail.com

ABSTRACT

Background: Estimates suggest that at least 50% of the world's injections administered each year are unsafe, particularly in developing countries. Unsafe injection practices put patients and healthcare providers at risk of infectious and non-infectious adverse events, sound knowledge of healthcare providers is vital to break the chain of blood borne diseases transmission caused by unsafe injection practices.
Methods: Cross sectional observational questionnaire based study was carried out amongst 152 injection providers of 40 healthcare facilities of two districts of Kashmir valley (one rural and one urban) selected purposively. Results are summarised and presented in the form of tables and chi (x^2) test was used for test of association with statistical significance set at p-value of less than 0.05.
Results: In this study out of 152 injection providers, majority (81.57%) were in the age range of 21-40 years and 74.3% were females. 43.4% of the participants were FMPHWs, 30.9% were nurses and 13.8% pharmacists. Overall 65.8% and 67.1% of injection providers had correct knowledge regarding WHO definition of safe injection and infections transmitted by unsafe injections respectively. Majority (90.8%) were aware about the biomedical waste management rules.
Conclusions: We conclude that over all the knowledge of different aspects of injection safety was good among the participants except the poor knowledge ofpost exposure prophylaxis and disposal of injection related waste despite the use of color coded bags at the sites of waste generation.

Keywords: Injection providers, Safe injections, Biomedical waste

INTRODUCTION

Injection is a skin piercing procedure performed with a syringe and needle to introduce a substance for prophylactic, curative or recreational purposes. Injection is one of the most common health care interventions globally.[1] It is estimated that globally 16 billion injections are administered each year. The majority (90%-95%) of these injections are administered for curative purposes. Prophylactic injections (Immunization) accounts for around 5% of all injections.[2] Estimates suggest that at least 50% of the world's injections administered each year are unsafe, particularly in developing countries. A majority of curative injections have been judged to be unnecessary, ineffective or inappropriate.[3] Also in some countries of South-East Asia the proportion of unsafe injections is 75%.[4] Unsafe injections can transmit bacterial, viral and parasitic (malaria) infections.[5]

WHO defines a safe injection as one that does not harm the recipient, does not expose the healthcare worker to any avoidable risks and does not result in any waste that is dangerous to the community.[6] Every day while caring for patients health care workers are at risk of getting exposed to blood borne pathogens potentially resulting in infections such as HIV, Hepatitis B and Hepatitis C. These exposures, while preventable, are often as being a part of their job. It is estimated that every year 13 lac new deaths (3 lacs in India) are attributed to unsafe injections. Global estimates arrived at by using mathematical models have suggested that unsafe injections account for 33% of new hepatitis B virus (HBV), 42% of new hepatitis C (HCV) and 2% of new HIV infections.[7] This will pose a burden of 9.2 million disability adjusted life years (DALYS) between 2000 and 2030.[8]

As we are aware, that any practice is determined by level of knowledge, so the injection practice prevalent among injection providers will be in turn determined by their level of knowledge. The present study was therefore taken up with the objective to assess the knowledge regarding different aspects of injection safety among injection providers at different levels of health care.

METHODS

A cross sectional observational questionnaire based study was carried out amongst 152 injection providers of 40 healthcare facilities of two districts of Kashmir valley (one rural and one urban) selected purposively. The study period was of 6 months from May 2015 - October 2015. A prefabricated validity tested questionnaire was used to gather the requisite information. The questionnaire was divided into two parts. The first part consisted of questions on general characteristics of injection providers including age, gender, designation, post-qualification experience in giving injections, hepatitis B vaccination status and training on injection safety. The second part contained questions on assessment of knowledge of injection providers on different aspects of injection safety.

Ethical clearance was obtained from the Institutional Ethics Committee (IEC). Besides this, proper permission was sought from the Director SKIMS/Director Health Services Kashmir/Principal GMC Srinagar (as applicable) for carrying out the study in different health institutions falling within their jurisdiction. Written informed consent was taken from the Head of each facility. Confidentiality was maintained at all times during the course of the study.

Data analysis

Results were summarised and presented in the form of tables and chi (x^2) test was used for test of association with statistical significance set at p-value of less than 0.05.

RESULTS

All the injection providers who consented to be a part of this study gave a response rate of 100%. Out of 152 injection providers, majority (81.57%) were in the age range of 21-40 years with female preponderance of 74.3%, 43.4% were FMPHWs, 30.9% were nurses and 13.8% pharmacists. 65.8% of the injection providers had work experience up to 10 years. 42.8% of injection providers were vaccinated against HBV and 14.5% had received training on injection safety (Table 1).

Table 2 depicts the equal distribution of injection providers by type and level of facility in both rural and urban districts of Kashmir valley. 152 injection providers were selected from total of 40 health facilities.

Response of injection providers regarding their knowledge about different aspects of injection safety as per the type of facility is shown in Table 3. 72.4% of injection providers in government and 59.2% in private health facilities had correct knowledge regarding WHO definition of safe injection. 61.8% of injection providers in government and 72.4% in private had correct knowledge regarding infections transmitted by unsafe injections. Likewise, regarding viability of HBV on contaminated surface 9.2% injection providers in government and 5.3% in private where aware. 32.9% in government and 35.5% private had correct knowledge regarding use of sharps container. Regarding the type of needle to be used for injecting children, segregation of injection waste, methods of ensuring injection safety and biomedical waste management rules only 43.4%, 31.6%, 57.9% and 88.2% in government and 56.6%, 30.3%, 53.9% and 93.4% in private had correct knowledge, respectively. The injection providers who had correct knowledge regarding reuse prevention syringes were 53.9% in government and 55.3% in private. 14.5% of injection providers in government and 25.0% in private health care facilities had correct knowledge about the guidelines regarding post exposure prophylaxis. As depicted in Table 3 the difference with regard to none of the knowledge parameters was statistically significant as per the type of facility.

Table 4 depicts the knowledge of injection providers in different aspects of injection safety on the basis of level of facilities. 8 (33.3%) injection providers in primary and 92 (71.9%) in secondary/tertiary health care facilities had correct knowledge about the WHO definition of safe injection. Similarly 13 (54.2%) of injection providers in primary and 89 (69.5%) in secondary/tertiary health care facilities had correct knowledge regarding infections transmitted by unsafe injections. Regarding the viability of HBV on contaminated surface 2 (8.3%) of injection providers in primary and 9 (7%) in secondary/tertiary had correct knowledge. Eight (33.4%) of injection providers in primary and 44 (34.4%) in secondary/tertiary were aware about the level at which the sharps containers are sealed. Regarding the type of needle to be used for

injecting children, segregation of injection waste, methods of ensuring injection safety and biomedical waste management rules 12 (50%), 3 (12.5%), 14 (58.3%) and 21 (87.5%) of injection providers in primary health care facilities and 64 (50%), 44 (34.4%), 71 (55.5%) and 117 (91.4%) in secondary/tertiary health care facilities had correct knowledge, respectively. Injection providers, who had correct knowledge, about reuse prevention syringes where 13(54.2%) in primary and 70 (54.7%) in secondary / tertiary health care facilities. About guidelines regarding post-exposure prophylaxis 2 (8.3%) of injection providers in primary and 28 (21.9%) in secondary/tertiary health care facilities had correct knowledge. Only significant difference in the knowledge of injection providers in primary and secondary/tertiary health care facilities were found regarding the definition of safe injection as per WHO, which was statistically highly significant (p=0.000).

Table 1: Distribution of injection givers by general characteristics.

Characteristics		N	%
Age (in years)	<20	4	2.6
	21-30	71	46.7
	31-40	53	34.9
	41-50	20	13.2
	51-60	4	2.6
Gender	Male	39	25.7
	Female	113	74.3
Healthcare provider (designation)	Nurse	47	30.9
	Laboratory Technician	2	1.3
	Dentist	16	10.5
	FMPHW	66	43.4
	Pharmacist	21	13.8
Post-qualification experience (in years) in giving injections?	<1	13	8.6
	10-Jan	100	65.8
	20-Nov	28	18.4
	21-30	9	5.9
	>30	2	1.3
Hepatitis B vaccination status	Vaccinated	65	42.8
	Unvaccinated	87	57.2
Training on injection safety	Received	22	14.5
	Not received	130	85.5

Table 2: Distribution of injection providers by type and level of facility.

Type of facility										
District	**Government**				**Private**				**Total**	**%**
	Level of facility				**Level of facility**					
	Primary		**Secondary/Tertiary**		**Primary**		**Secondary/Tertiary**			
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Srinagar	6	25	32	25	6	25	32	25	76	50
Anantnag	6	25	32	25	6	25	32	25	76	50
Total	12	50	64	50	12	50	64	50	152	100

Table 5 depicts the knowledge of injection providers in health care facilities of rural and urban districts of Kashmir valley. Correct knowledge among injection providers regarding WHO definition of safe injection, infections transmitted by unsafe injections, viability of HBV on contaminated surface and level at which the sharps container are to be sealed, 56 (73.7%), 55 (72.4%), 4 (5.3%) and 30 (39.5%) in rural and 44 (57.9%), 47 (61.8%), 7 (9.2%) and 22 (28.9%) in urban health care facilities, respectively. Regarding type of needle used for injecting children, segregation of injection waste and methods of ensuring injection safety 42 (55.3%), 17 (22.4%) and 48 (63.2%) of injection providers in rural and 34 (44.7%), 30 (39.5%) and 37 (48.7%) in urban health care facilities had correct knowledge, respectively. Injection providers who had correct knowledge regarding biomedical waste management rules, reuse prevention syringes and guidelines regarding post-exposure prophylaxis 73 (96.1%), 45 (59.2%) and 10 (13.2%) in rural and 65 (85.5%), 38 (50.0%) and 20 (26.3%) urban health care facilities, respectively. Regarding knowledge among injection providers of two districts, only two

parameters segregation of injection waste and biomedical waste management rules were statistically significant with (p=0.035) and (p=0.046), respectively.

Table 3: Knowledge of injection providers on different aspects of injection safety by type of facility.

Correct knowledge regarding		Total		Type of facility				
		N	%	Government		Private		p-value
				N	%	N	%	
Definition of safe injection as per WHO	Yes	100	65.8	55	72.4	45	59.2	0.123
	No	52	34.2	21	27.6	31	40.8	
Infections transmitted by unsafe injections	Yes	102	67.1	47	61.8	55	72.4	0.226
	No	50	32.9	29	38.2	21	27.6	
Viability of HBV on contaminated surface	Yes	11	7.2	7	9.2	4	5.3	0.533
	No	141	92.8	69	90.8	72	94.7	
Use of sharps container	Yes	52	34.2	25	32.9	27	35.5	0.864
	No	100	65.8	51	67.1	49	64.5	
Type of needle to be used for injecting children	Yes	76	50	33	43.4	43	56.6	0.144
	No	76	50	43	56.6	33	43.4	
Segregation of injection waste	Yes	47	30.9	24	31.6	23	30.3	0.86
	No	105	69.1	52	68.4	53	69.7	
Methods of ensuring injection safety	Yes	85	55.9	44	57.9	41	53.9	0.743
	No	67	44.1	32	42.1	35	46.1	
Biomedical waste management rules	Yes	138	90.8	67	88.2	71	93.4	0.4
	No	14	9.2	9	11.8	5	6.6	
Reuse prevention syringes	Yes	83	54.6	41	53.9	42	55.3	0.87
	No	69	45.4	35	46.1	34	44.7	
Guidelines regarding post exposure prophylaxis	Yes	30	19.7	11	14.5	19	25	0.153
	No	122	80.3	65	85.5	57	75	
Total		152	100	76	100	76	100	

Table 4: Knowledge of injection providers in different aspects of injection safety by level of facility.

Correct knowledge regarding		Total		Level of facility				
		N	%	Primary		Secondary/Tertiary		
				N	%	N	%	p-value
Definition of safe injection as per WHO	Yes	100	65.8	8	33.3	92	71.9	
	No	52	34.2	16	66.7	36	28.1	0
Infections transmitted by unsafe injections	Yes	102	67.1	13	54.2	89	69.5	0.217
	No	50	32.9	11	45.8	39	30.5	
Viability of HBV on contaminated surface	Yes	11	7.2	2	8.3	9	7	0.685
	No	141	92.8	22	91.7	119	93	
Sharps container should be sealed when it is filled up to the following level	Yes	52	34.2	8	33.3	44	34.4	0.921
	No	100	65.8	16	66.7	84	65.6	
Type of needle to be used for injecting children	Yes	76	50	12	50	64	50	1
	No	76	50	12	50	64	50	
Segregation of injection waste	Yes	47	30.9	3	12.5	44	34.4	0.051
	No	105	69.1	21	87.5	84	65.6	
Methods of ensuring injection safety	Yes	85	55.9	14	58.3	71	55.5	0.971
	No	67	44.1	10	41.7	57	44.5	
Biomedical waste management rules	Yes	138	90.8	21	87.5	117	91.4	0.465
	No	14	9.2	3	12.5	11	8.6	
Reuse prevention syringes	Yes	83	54.6	13	54.2	70	54.7	0.962
	No	69	45.4	11	45.8	58	45.3	
Guidelines regarding post exposure prophylaxis	Yes	30	19.7	2	8.3	28	21.9	0.166
	No	122	80.3	22	91.7	100	78.1	
Total		152	100	24	100	128	100	

Table 5: Knowledge of injection providers in different aspects of injection safety by area (Rural/Urban).

Correct knowledge regarding		Total		District				p-value
		N	%	Rural		Urban		
				N	%	N	%	
Definition of safe injection as per WHO	Yes	100	65.8	56	73.7	44	57.9	0.06
	No	52	34.2	20	26.3	32	42.1	
Infections transmitted by unsafe injections	Yes	102	67.1	55	72.4	47	61.8	0.226
	No	50	32.9	21	27.6	29	38.2	
Viability of HBV on contaminated surface	Yes	11	7.2	4	5.3	7	9.2	0.533
	No	141	92.8	72	94.7	69	90.8	
Sharps container should be sealed when it is filled up to the following level	Yes	52	34.2	30	39.5	22	28.9	0.231
	No	100	65.8	46	60.5	54	71.1	
Type of needle to be used for injecting children	Yes	76	50	42	55.3	34	44.7	0.256
	No	76	50	34	44.7	42	55.3	
Segregation of injection waste	Yes	47	30.9	17	22.4	30	39.5	0.035
	No	105	69.1	59	77.6	46	60.5	
Methods of ensuring injection safety	Yes	85	55.9	48	63.2	37	48.7	0.102
	No	67	44.1	28	36.8	39	51.3	
Biomedical waste management rules	Yes	138	90.8	73	96.1	65	85.5	0.046
	No	14	9.2	3	3.9	11	14.6	
Reuse prevention syringes	Yes	83	54.6	45	59.2	38	50	0.328
	No	69	45.4	31	40.8	38	50	
Guidelines regarding post exposure prophylaxis	Yes	30	19.7	10	13.2	20	26.3	0.066
	No	122	80.3	66	86.8	56	73.7	
Total		152	100	24	100	128	100	

DISCUSSION

In this study majority of injection providers were between 20-40 years (81.6%) of age, which was in accordance with the study conducted by Kaphle et al in which 68.2% injection providers belonged to 20-24 years but in contrast to a study conducted by Bhargo et al in which only 10 (33.3%) of injection providers belonged to 20-40 years.[9,10] In our study most of the injection providers were females 113 (74.3%), which was consistent with the studies done by Kulkarni et al in which 58 (82.86%) of injection providers were females and Sanjeev et al in which 117 (67%) of health care providers belong to female gender.[11,12] Also in a study conducted by Bhargo et al 100% health care providers were females.[10]

In this study 66 (43.4%) of injection providers were FMPHWs, which was in contrast to the studies conducted by Kaphle et al where 147 (66.8%) of injection providers were staff Nurses and Kulkarni et al in which maximum injection providers were GNM 42 (60%).[9,11] 65.8% of injection providers in the current study had a work experience of 1- 10 years which was consistent with a study conducted by Onyemocho et al where 76 (55%) of injection providers had work experience of 1-10 years but was in contrast to the studies conducted by Kulkarni et al in which (52.86%) injection providers had experience of 1-5 years and Kaphle et al in which maximum injection providers had experience of 0-4 years (83.2%).[9,11,13] A study conducted by Bhargo et al also showed contrasting results regarding work experience of injection providers where 40% had >10 years' experience.[10]

In our study only 42.8% of injection providers were immunized against Hepatitis B. This was lower as compared to the studies conducted by Kaphle et al, Gurung et al and Siddique et al where 76.8%, 82.3% and 82.7% of injection providers respectively were immunized.[9,14,15] In our study only 22 (14.5%) of injection providers were trained in different aspects of injection safety. However in studies conducted by Chill et al and Choudhary et al 58.33% and 27% of injection providers respectively were trained in injection safety.[16,17] 65.8% injection providers had correct knowledge regarding WHO definition of safe injection in this study. Similar findings were observed in a study done by Onyemocho et al where 65.2% injection providers knew about correct definition of safe injection.[13] However in a study conducted by Kulkarni et al, 24.2% of the injection providers knew the correct WHO definition of safe injection.[11]

Majority (90.8%) of the injection providers in our study had correct knowledge about biomedical waste management rules which is in line with a study conducted by Mathur et al where 91.7% of the injection providers were aware of the rules and was in contrast to a studies conducted by Bathma et al and Ismail et al where only 54.5% and 3.33% of injection providers were aware about biomedical waste management rules,

respectively.[18-20] Regarding segregation of waste in color coded bins only 30.9% of injection providers had correct knowledge in this study which was much less than the results revealed in studies conducted by Garapati et al, Mathur et al and Kulkarni et al where 65.8%, 93.3% and 92.8% of injection providers were aware, respectively.[11,18,21]

In this study 67.1% of injection providers had correct knowledge regarding infections transmitted by unsafe injections. Similar results were found in a study conducted by Kulkarni et al where 91.4% of injection providers had correct knowledge regarding the same. This was in contrast to the findings of a study conducted by Kaphle et al where only 39.5% of injection providers had correct knowledge regarding infections transmitted by unsafe injections.[9,11] In this study only 19.7% of injection providers had correct knowledge regarding PEP which was in contrast to the studies conducted by Koria et al and Kaphle et al where the proportion of injection providers having correct knowledge regarding PEP was 86.7% and 37.7% respectively.[9,22]

CONCLUSION

Based on above observations it was concluded that over all knowledge of viability of HBV on contaminated surface, level at which the sharps container are to be sealed after, segregation of injection waste and guidelines regarding post exposure prophylaxis was less; whereas knowledge of definition of safe injection as per WHO, infections transmitted by unsafe injections, method of ensuring injection safety, biomedical waste management rules and reuse prevention syringes was good. Even though color coded bags were seen at majority of waste generation sites but knowledge of disposal of injection related waste was poor.

Recommendation

Dissemination of information, education and communication (IEC) materials and behavior change campaigns targeting patients and injection providers is recommended and Continuing education on universal precautions and steps in safe injection practices are recommended. Re-orientation training / sensitization of injection providers at periodic intervals should be done. Strict monitoring to carry out hub-cutting, disinfection of used syringes and needles, use of color coded bins for final disposal of injection related waste according to the guidelines.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. WHO fact sheet. Safety of injections: A brief background. 1999: 23.
2. WHO guideline on the use of safety-engineered syringes for intramuscular, intradermal and subcutaneous injections in health care settings. WHO; 2015: 5.
3. Simonsen L, Kane A, Lloyd J, Zaffran M, Kane M. Unsafe injections in the developing world and transmission of blood-borne pathogens: A review. Bull WHO. 1999;77:789-800.
4. IPEN Study Group. Injection practices in India. WHO South-East Asia J Public Health. 2012;1(2):189-200.
5. Kane A, Lloyd J, Zaffran M, Simonsen L, Kane M. Transmission of hepatitis B, hepatitis C and HIV through unsafe injections in the developing world: model- based regional estimates. Bull World Health Org. 1999;77:801-7.
6. WHO best practices for injection and related procedures tool kit. March 2010.
7. WHO. Safe Injection Global Network. Advocacy Booklet. Available at: http://www.who.int/injection_safety/sign/sign_advocacy_booklet. 2011. Accessed on 5 June 2016.
8. Hauri AM, Armstrong GL, Hutin YJF. The global burden of disease attributable to contaminated injections given in health care settings. Int J STD AIDS. 2004;15:7-16.
9. Kaphle HP, Poudel S, Subedi S, Gupta N, Jain V, Paudel P. Awareness and Practices on Injection Safety among Nurses Working in Hospitals of Pokhara, Nepal. Int J Med Health Sci. 2014;3(4):301-7.
10. Bhargo L, Tiwari R, Jain S, Yuwane P, Rajpoot MB, Tiwari S. A study to assess injection practices at different levels of health care facilities in district Gwalior, M.P. India. Int J Res Med Sci. 2014;2(3):1020-5.
11. Kulkarni RS, Giri PA, Gangwal PR. Injection Safety: Knowledge and Practices among Nursing Personnel in Tertiary Care Teaching Hospital of Marathwada Region of Maharashtra, India. Arch Community Med Public Health. 2016;2(1):18-21.
12. Sanjeev R, Kuruvilla S, Subramaniam R , Prashant PS, Gopalakrishnan M. Knowledge, attitude, and practices about biomedical waste management among dental healthcare personnel in dental colleges in Kothamangalam: A cross-sectional study. Health Sciences. 2014;1(3):1-12.
13. Onyemocho A, Anekoson JI, Pius EO. Knowledge and Practice of Injection Safety among Workers of Nigerian Prison Service Health Facilities in Kaduna State. Am J Public Health Res. 2013;1(7):171-6.
14. Gurung NS, Paudel K, Pun CB. Needle stick injuries among health care workers in a tertiary care teaching hospital, Pokhara, Nepal. J Gandaki Med Col. 2010;3(1):47-50.
15. Siddique K, Mirza S, Fizza S, Anwar T.I, Malik A.Z. Knowledge, attitude and practice regarding needle stick injuries amongst health care workers. Pakistan J Surg. 2008;24(8):243-8.

16. Shill MC, Fahad MB, Sarmistha S, Dev S, Rufaka HK, Ashish K. D. Injection practices at primary healthcare units in Bangladesh: Experience at six Upazilla health complexes. Aus Med J. 2011;4(1):26-42.
17. Chowdhary AK, Roy T, Faroque AB, Bachar SC, Asaduzzaman M, Nasrin N. A comprehensive situation assessment of injection practices in primary health care hospitals in Bangladesh. BMC Public Health. 2011;11:779.
18. Mathur V, Dwivedi S, Hassan MA, Misra RP. Knowledge, Attitude and Practice about biomedical waste management among healthcare personnel: A cross-sectional study. Indian J Community Med. 2011;36(2):143-5.
19. Bathma V, Likhar SK, Mishra MK, Athavale AV, Agarwal S, Shukla US. Knowledge assessment of hospital staff regarding biomedical waste management in a tertiary care hospital. National J Comm Med. 2012;3(2):197-200.
20. Ismail IM, Kulkarni AG, Kamble SV, Boker SA, Rekha R, Amruth M. Knowledge, attitude and practice about bio-medical waste management among personnel of a tertiary health care institute in Dakshina Kannada, Karnataka. Al Ameen J Med Sci. 2013;6(4):376-80.
21. Garapati S, Peethala S. Assessment of knowledge and practices on injection safety among service providers in east Godavari district of Andhra Pradesh. Indian J Comm Health. 2014;26(3):259-63.
22. Koria B, Lala MK. A study of knowledge, attitude and practice of hepatitis-B infection among the laboratory technicians in the civil hospital, Ahmedabad, Gujarat. Health line. 2012;3(1):63-5.

Cite this article as: Allaqband UF, Fazili AB, Shah RJ, Ganai AM, Balwan WK, Wani F. A study on knowledge regarding different aspects of injection safety among injection providers at different levels of health care. Int J Community Med Public Health 2017;4:1737-43.