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Investigating the Factors Influencing the Behavior of Health Care Workers for Needle Stick Injury (NSI)

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Abstract

Aim: Injury from needle is one of the main ways of transmitting blood diseases in the medical staff. Prevention and reduction of such diseases' side effects have been emphasized by the Health Ministry.
This study aimed to investigate factors influencing the behavior of the Elam city medical staff when working with sharps instruments.

Methods: In a cross-sectional study, using a census method, all healthcare staff working in the health centers of Abdanan Dehloran city (total n=66) after providing written informed consent were enrolled. Data were gathered by a questionnaire. After verifying the validity and reliability, the data were collected, and analyzed using SPSS19 and descriptive statistics, Chi-square and t-test.

Findings: 59% of the participants were male; 80% were married; 62% had academic educations, and 47% worked in the nursing and injection sections. The mean scores of knowledge and attitude of the participants were 3.1±1.38 and 1.7±4.1, respectively, and just 13.4% of the subjects had not reported control tests and injury events.

Conclusion: Knowledge, attitudes and practices of the medical staff of injuries from sharp objects are not desirable. it seems that empowering the staff through theoretical and practical training is proper solution in this regard.

Keywords: Personal factors, Behavior, Injury from sharp objects

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Introduction

Needle Stick Injury (NSI) is caused by the entrance of a medical sharp instrument contaminated with blood or body fluids, health officials the body [1]. This is a very common injury [2], and more than 20 diseases can be spread through injury by sharp objects; the most important of them are Hepatitis B, Hepatitis C, and HIV [3-5]. The risk of HIV transmission to healthcare workers in the event of damage resulting from sharp objects is 0.3%, and the probability of transmission of Hepatitis B is 30% and Hepatitis C 3%.

Annually, hundreds of thousands of people are injured due to sharp objects into deadly diseases such as Hepatitis B, Hepatitis C and HIV infection [4]. According to the information published by the World Health Organization (WHO), 40% of Hepatitis B and C among the healthcare workers around the world are caused by exposure [6]. Most researchers suggest avoiding injury from sharp objects as the best and most effective way to protect healthcare workers against infectious disease transmission [7]. Risk of blood-borne viruses and preventing NSIs, high costs of treatment and many patients capability leads to the principle that is called standard precautions [8]. Standard precautions to prevent the spread of infection are very important so that the health service providers should be informed of the latest scientific advances and to identify the sources and ways of infection control and patient care [9]. Several studies have been so far done to identify the factors leading to the damage caused by sharp objects, and individual factors, device, treatment and management have been found to be involved in this regard [10].

In most developing countries, epidemiology of diseases caused by occupational exposure to blood borne diseases due to the staff insufficient training or lake of enough care, is unclear, and in some cases treat people carelessly; even the patients do not follow treatment protocol [11]. Although about 90% of NSIs occur in the developing countries, there is only a few studies in these countries [12]. Since the damage caused by sharp objects and individual risk factors have not been studied in Elam's medical personnel, the researchers sought to review individual factors affecting the behavior of Elam medical staff on injuries from sharp objects and based on that, if necessary, suggest intervention measures to help improve the safety of employees, and reduce the incidence of complications and problems caused by NSIs.

Materials and Methods

This cross-sectional study was conducted in 2014. The city of Dehloran and Abdanan was chosen as a representative of Ilam province. Using census, all healthcare staff working in

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the health centers covered by the healthcare networks in the city (total n=66) were enrolled. The research tool was a questionnaire adopted from knowledge (10 questions) consisting of informing the participants about the definition of the NSI, the first action after NSI, cap putting safe, knowing the proper materials to wash the injury site after NSI, prophylaxis after NSI in different conditions, the time required for the experiment after NSI, and the participants' attitudes toward the use of gloves, reporting, and hepatitis B vaccination. The responses to these questions were rated on the Likert scale from "never" to "a lot". Thus the achievable span of scores was 1 to 5. The demographic information such as age, gender, marital status, formal education, behavior assessment, there were five questions. Using the self-reported behavior check lists, incidence of injury from sharp objects and performance after the occurrence of the injury during the 6 months prior to the study were measured. Method of scoring the behavior in question was zero and one. Score one to the correct behavior and zero to the incorrect one. The content and face validity of the questionnaire were verified by a panel of experts. The questionnaire was developed after studying books and similar publications, and summing up the themes from the interviews. Then and for further modification and correction, it was submitted to 11 professors, field experts and professionals in health education. The internal consistency was measured using Cronbach's alpha coefficient, which was confirmed with a score of 0.90. After collection, the data were entered into SPSS software (version 19). Statistical tests of, Pearson & Spearman's t-test and $\chi 2$ were applied. The significance level was 0.05.

Results

In this study, the subjects' mean age was 34 +6.24 years. The most age group was 30-34 years, and 59.9% of the participants were female. 45.46% of the subjects had a history of training on injury from sharp objects, and 33.83% of the participants had more than a year of training at will (Table 1).

The mean knowledge and attitude score of the participants 3.1 ± 1.38 and 17 ± 1.4, respectively (Table 2). The results showed the knowledge and attitude score in women was 3.15 ± 1.4 and 16.5 ± 3.9, respectively, which were higher than men. The statistical analysis showed no significant effect of gender on the knowledge (p=0.32) and attitude (P=0.39) f the participants. The knowledge score of the participants who had previously received training was (3.4±1.5) was higher than in the untrained group (2.7±1.2).

While the attitude score of the untrained group (15.2 ± 3.7) was lower than that of the trained people (17.2 ± 3.8).

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Statistical analysis showed no significant relationship between the previous training on the mean knowledge (p=0.28) and attitude scores (p=0.63) (Table 3).

Table 1: Frequency distribution and percentage of specifications of participants in the study (n=66)

		Frequency	
		N	**%**
Sex	Male	26	39.4
	Female	39	59.09
Education	High school dropout	5	7.57
	Diploma	20	30.31
	Diploma and higher	41	62.12
Marital status	Married	53	80.3
	Never married	12	18.18
Service location	Being on duty	5	7.58
	Laboratory	12	18.18
	Nursing and injections	31	46.97
	Fight disease	18	27.27
Vaccination against Hepatitis B	Yes	52	78.79
	No	2	3.03
	Incomplete	12	18.18
Receiving training	Yes	30	45.46
	No	34	51.52
	Unanswered	2	3.02

Table 2: Distribution of injury from sharp objects based on demographic variables

Variables		**Once injury**	**p-value**	**Twice injury**	**p-value**
Sex	Male	9	0.32	2	0.394
	Female	8		1	
Receiving training	Yes	8	0.283	0	0.003
	No	9		3	
Service location	Being on duty	2	0.54	1	0.30
	Laboratory	6		0	
	Nursing and injections	4		0	
	Fight disease	5		2	
Education	High school dropout	1	0.55	1	0.04
	Diploma	7		1	
	Diploma and higher	9		1	

Table 3: Summary of the respondents' knowledge and attitudes about injury by sharp objects based on demographic variables

Variables		**Knowledge Mean±SD**	**p-value**	**Attitudes Mean±SD**	**p-value**
Sex	Male	2.85±1.4	0.32	15.7±3.9	0.394
	Female	3.15±1.4		16.5±3.9	
Receiving training	Yes	3.4±1.5	0.283	17.2±3.8	0.63
	No	2.7±1.2		15.2±3.7	
Service location	Being on duty	2.5±1.3	0.54	15±2.6	0.30
	Laboratory	3±1.6		15.8±4.7	
	Nursing and injections	2.9±1.07		17±3.8	
	Fight disease	3.2±1.7		14.8±3.9	
Education	High school dropout	2.7±3.5	0.55	16.7±4.9	0.88
	Diploma	2.7±1.35		15.6±4.1	
	Diploma and higher	6.3±1.4		16.7±3.4	

People working in the diseases control office had the highest knowledge score (3.2 ± 1.7)

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and the lowest scores of attitude (14.8 ±3.9). The highest score of attitude belonged to the workers in the nursing and injection units with 17 ± 3.8. In addition, the ANOVA test showed no significant relationship between occupation and the score of knowledge (p=0.54) and attitudes (p=0.3). The participants with diploma and higher had the highest score of knowledge (3.3±1.4), and the participants with lower qualification of Diploma had the highest score of attitude (16.7±4.9) (p=0.54). No significant relationship was observed between the educational status of the participants and their knowledge (p=0.55) and attitude scores (p=0.85).

In practice review, only 3 patients (13.4%) had been acted to perform clinical test and reporting the injury to the authorities. The most important reason for the lack of reporting the injury was underestimating the event (Tables 4, 5). The results showed that in a period of 6 months prior to the study, 20 out of 23 of employees had the experiment of injuries. In other words, almost 87 % of the participants have suffered from injuries due to sharp objects. The injury in men, trained people, employed, singles, disease control personnel's, and those with an associate degree was more than other groups. The statistical test did not show a significant relationship between gender and service location in patients with more than one injury (Table 3).

Table 4: Affected individuals within 6 months after the occurrence of the injury

The number of injury		Proper functioning		Malfunctioning	
		N	%	N	%
23 cases	Controlled trial	3	13.04	20	86.96
	Vaccination	2	8.7	21	91.3
	Report to fighting disease	3	13.4	20	86.96
	Consultation with a experts	1	4.35	22	95.65

Table 5: Reported causes of injuries by sharp objects by the affected individuals

The number of injuries not reported	Causes not reported	Frequency	(percent)
20 cases	Trivialize	9	(45%)
	Not believing in prophylaxis	6	(30%)
	Tracking the heavy cost	2	(10%)
	Inappropriate service	2	(10%)
	Not confidence	1	(5%)

Discussion

More studies should be in the field of injury from sharp objects to explore the environmental factors affecting the incidence and prevalence of injury, and less attention is paid to assess individual factors (knowledge

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and attitudes) participants. The high incidence of injury rate among different treatment groups could indicate the need for special attention to knowledge and attitudes and the influencing factors among the employees in the areas of health. In this study, the mean knowledge score of the participants had a poor score, and in Mohammad Nejad et al.'s study, the participants had adequate knowledge about NSI [13]. In addition, our findings are similar with the results Hussein Shokoh et al. [14] and Ghadmgahi et al. [15] where 70.1% of the participants had weak and moderate knowledge, respectively. The participants' knowledge score in Golafrouze et al.'s study was also lower in the pre-intervention, and they were only able to gain knowledge about 6 scores out of the 21 scores. While in India, 78.4% of the participants had basic knowledge about their safety and precautions [16]. In this study, women with knowledge score 3.15±1.4 could gain average knowledge scores better than male participants. However, statistical analysis showed no effect of gender on the knowledge of the participants. Rakhshani et al. [17] and Gholami et al. [18] also did not find a significant correlation between sex and NSI.

The mean score of knowledge gained by previously educated people (3.4±1.5), was higher than that of the untrained subjects. While the mean scores of trained people (15.2 ± 3.7) was lower than that of the untrained group. Statistical analysis showed no significant differences on the knowledge and attitude of the participants on respect of training in this study. The reason could be the result of training received by 83.33% of the participants over the last year. In the studies of Golafroz et.al. [19] and Pasyar [20], intervention training caused to improve the participants' knowledge scores.

Staff on duty with the average knowledge score of 2.5±1.3 had the lowest scores among the participants in this study, whose, 100% of them were under graduated. On the other hand, all the participants working on the office of control diseases had the highest average knowledge score of 3.2±1.7. This might be due to the kind of submitting services such as registration of injured cases and having contact with them.

The results showed that the staff on duty to combat disease had the lowest attitude scores. The lower attitude of the staff on duty can be attributed to their inadequate knowledge and the educational level almost the all were under graduated. But it seems to need more study to explore the reason of inadequate attitude of the health workers. The results showed that 71.12% of the participants have correct definition of NSI, and 31.28% knew the correct way of cap securely. 49.48% of NSI's knew the first step; washing and controlling bleeding from the wound. While only 3.03% of

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the participants knew how to wash wound. In Mohammadnejad's study [13], 96.9% of the nursing staff and in Rakhshani et al.'s study [17], only 20.2% of those affected used to wash their hands after injury. In Mohammadnejad's study [13], it appeared that higher education was effective in improving behavior. While, 72.73% of the samples' answer to the questions about prophylaxis after NSI was wrong, and 19/68% did not know the time of the experiment.

Regarding the mean of attitude scores of the participants in this study, 17±4.1 was moderate, The mean of attitude scores of women in the study was higher. Also the mean of attitude scores of nursing staff was higher than other workers; this funding was also true in the bachelor's degree in education. In Golafroz study [19], the mean of attitude scores of the participants was high, and the pre-intervention participants were able to gain about 52 score out of 60 scores.

Precautions and safety principles of Siddique study [16] showed that the attitude of participants was low, which is consistent with the results of this study. The number of injuries among men and untrained individuals were more than trained women. While those who had suffered more than once, did not receive training.

The statistical analysis showed no significant association between gender and history of education. Of course the difference between the number of people who were injured twice and those who had no history of education was statistically significant ($p<0.05$). In Lotfi's study [12], not attending the courses was identified as the second risk factor of NSI. The findings showed that 85% of people working in disease control office and those who completed diploma degree had been affected. In this study, there was no statistically significant relationship between the occupation and injury from sharp objects, which is similar to the study of Rakhshani [17]. Also the results showed no statistically significant relationship between the qualification and injury from sharp objects, which is in line with the study by Gholami et al. [18]. Furthermore, the large number of injuries among the workers in disease control office can be associated with low attitude scores in this group.

In this study, the practice of injured participants after NSI was inappropriate. In which less than 15% did clinical test and report the injuries to the authorities and less than 5% vaccinated their self and have had a consultation with a specialist. In the current study, the underestimation damage by 45% was the most important cause of underreporting the injuries. In Azadi's study [21] in Tehran, 36% of the people had not reported the injury, the second reason of not reporting the injury (29.2%) was related to

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under estimation of being infectious.

The better results in reporting of injuries in Azadi's study [21] was due to the implementation of the nursing education. In Nazmieh study [22], only 23.6% of the patients had an injury report, and 97% had reported the injuries orally.

Conclusion

Individual factors (knowledge and attitudes) had directly affected the performance of health workers participated in this study, so that their knowledge and attitudes about injury from sharp objects was weak. Emphasis on empowering the employees by theoretical and practical training along with implementation of strict guidelines on self-care can be a good way to solve this problem and reduce its consequences.

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