

Assessment of Infection control knowledge and Attitude related to Needle stick Injuries among nursing staff

Hayam Hamada Abd El Razek¹, Awatef Abd El Razek Mohamed²,
Safaa Mohamed Abd El Rahman³, Inshrah Roshdy Mohamed⁴

1 - Bsc of Nursing , Beni suif University hospital

2- Community of Health Nursing department, Faculty of nursing – Minia University

3- Nursing Administration , Faculty of nursing – Minia University

4- Medical Surgical Nursing ,Faculty of nursing – Minia University

Abstract

Background: The Needle stick Injuries (NSI) are among the incidents which risk the safety of health care workers in the hospital and healthcare setup. Health care professionals (HCP) are at greater risk of exposure to the blood and body fluids. Hepatitis B virus (HBV) transmission rate by NSI is estimated to be around 33.3%, followed by Hepatitis C virus 3.3% and HIV 0.3%. **Aim of the study:** assess of infection control knowledge, attitude and resources related to needle stick injuries among nursing staff. **Research design:** Descriptive research design was used in this study. **Setting:** This study will be conducted at Beni suif University Hospital. **Sample:** includes all nurses in four critical care units in the hospital N= (68). **Tool:** three tools were used in the current study. First tool : knowledge regarding needle stick injury , second tool :Attitude of nurses toward needle stick injures and third tool : hospital resources. **Results:** the participated nurses had good knowledge and negative attitude toward needle stick injury and there are correlation between knowledge and their attitude and availability of hospital resources with needle stick injury . **Conclusions:** This study accentuates that there was significant correlation between knowledge and each of attitude and availability of hospital resources with needle stick injury .**Recommendation:** in-service training program for staff nurses about standard of infection control precautions. Healthcare institutions should apprise themselves of developments in hospital resources and safety devices, e.g. needle-less technology and reduce risk within their organization or modify work practices that pose a needle stick injury hazard to make them safer.

Key wards: Attitude, Knowledge, Needle stick injuries, staff nurses.

Introduction

Health care professionals (HCP) are in greater risk of exposure to the blood and body fluids. Blood borne pathogens are transmitted through accidental needle and/or sharps injury especially Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human Immunodeficiency Virus (HIV) (1). Health care workers (HCWs) who are in contact with needles and other sharps during their clinical activities can be exposed to blood and other body fluids through needle stick injuries (NSIs) (2). In developing countries, Occupation health and safety is not given priority regarding needle stick Injuries (3).

The World Health Organization has estimated that exposure to sharps in the workplace accounts for 40 % of infections with HBV and HCV and 2-3% of HIV infections among health care workers. All categories of workers in the healthcare setup are at risk of NSI, which include doctors, nurses, laboratory personnel, housekeeping workers and biomedical waste handlers Among health care professional's nurses and surgeons, are at higher risk to blood borne. (3).

Needle stick injury (NSIs) include injury from all types of sharps instruments for example needle ,lancet ,scissors and so on (4) Bblood-borne infections have serious consequences, including long-term illness, disability and death, and often accompanied by a considerable and long-lasting emotional impact. (5) Needle stick injury (NSIs) represent an important source of morbidity and economic costs in the healthcare environment. Every year, hundreds of thousands of health care workers (HCWs) are at risk of

occupationally acquired blood-borne diseases as the result of NSIs.(5) The economic burden of these injuries cannot be ignored.

Currently the cost of the post exposure management is borne by the health care administration, which includes Laboratory investigations, counseling and prophylactic treatment (6). Because of the financial burden many effective interventions to combat needle stick injuries have been suggested time-to-time like the recommendations to prevent improper needle manipulations, education, and provision of sharps containers and introduction of safety engineered device (7). Knowledge of prevention of needle stick injuries especially universal precaution is important to decrease the prevalence of needle stick injuries. “Nurses who were not attended any training of prevention and management of needle stick injuries were significantly greater risk of sustaining the injuries compared with those who had attended some kind of training”(4)

Aim of the study:

To assess infection control knowledge, attitude and resources related to needle stick injury among nursing staff.

Research Question:

Is there a relationship between nurse's knowledge, attitude and resources and occurrence of needle injuries?

Research design:

A descriptive design was utilized to achieve the aim of the current study.

Setting:

The current study was conducted in Beni suif University hospital at four different critical units. (Intensive care unit - cardiac care unit- pediatric care unit- neuro surgery care unit and the capacity of beds in this are (15, 12, 10,10) respectively . Intensive care units are located in third floor. It consists of two rooms; each one contains 7 beds and another 8 beds .However, cardiac care unit is located in the fifth floor. It consists of one room it contains 12 beds. Another ICU pediatric care unit is located in the fifth floor It consists of one room it contains 10 beds. neuro surgery care unit is located in the first floor It consists of one room it contains 10 beds.

Sample:

The subjects of this study consisted of a convenient sample of all staff nurses was worked (on duty) in critical units (2016), the total nurses number . (68) was classified as following, (Intensive care unit (n=20) -cardiac care unit(n=18)- pediatric care unit(n=15) -neuro surgery care unit(15). According to Inclusion criteria staff nurses who has previous -not attended or trained in ICU sessions in all qualifications .

Tool of data collection:

Data were collected through three tools:

First tool: knowledge regarding needle stick injury.

It divided into two parts:

1stpart: Socio –demographic data sheet:

Demographic data sheet to get information about personal data it prepared by the researcher as nurses age, gender, years of experience, level of education etc.....

2ndpart: It's was adopted from Fayaz (2014) (8) to assess knowledge about infection control related to needle stick injury consisted of closed ended questions. This part contains (23) items were rated on 2-point (true, false) with scoring (yes = 1, no = 0) such as: Nurses educational and training conditions, etc..... The total score of this scale classified into three results based on the following:

Low knowledge	Less than 60%
Moderate knowledge.	60 - 80 %
High knowledge.	More than 80 %

Second tool: Items were adopted from HajAli (2009) (9). To assess attitude of nurses toward needle stick injures during their work Items were It contains (23) items It include ranking 1-3 (every time=3, sometimes=2, never=1).

The total score of this scale classified into two results based on the following:

Positive Attitude	More than 75 %
Negative Attitude	Less than 75 %

Third tool: Items was adopted from Tayabe (2015) (10). The items designed to collect data about the hospital resources the used it consisted of closed ended questions in the options of(true, false) and. It contains (14) items with scoring (Yes = 1, no = 0).

Validity

Study tool was reviewed by five experts in the field of this study at (Minia University , Faculty of Nursing administration and community nursing two expertise in the administration department and three in community nursing department to examine the content validity. Modifications were done according to the panel judgment on the clarity of sentences, appropriateness of content. Based on experts comments and recommendations of thesis supervisors minor changes had been made in the questionnaire.

Reliability

The tool was designed in it is final format and tested for reliability by using, cronbach's alpha coefficient test (0.96, 0.71 and 0.68) respectively.

Pilot study

A pilot study was carried out on 10% (7) nurses in a selecting setting to evaluate the applicability & clarity and feasibility of the study tool and to estimate the time needed for filling the tool .The pilot study sample was included in the study sample because no modification done in the study tools .

Study duration:

The current study was conducted by preparing of different data collection tools, in addition obtaining formal paper agreement which was taken in duration one month before conducting the study. The researcher started data collection by using three tools .The total data collections were collected cover a period of six months from the beginning of May 2016 to October 2016. The researcher acts his collection of study data through daily basis in break time duration and make sure of the responses and check that all items were answered. It took about (20-30minute) in each secession. The researcher done two sessions in the week, the session covered from two to three nurses in every area.

Ethical consideration:

A written initial approval obtained from the research ethical committee in the Faculty of Nursing, Dean of Nursing Faculty the director of Beni Suif University. and agreement from Egypt academic for research center and technology. Participants in this study who voluntary participate were informed about the purpose, procedure of the study and the right to withdraw from the study at any time without any rationale. Oral consent was obtained from the Participants after reading all details .confidentiality and anonymity of each subject was ensured through coding of all data and protecting the obtained data.

Statistical analysis:

Data entry and statistical analysis were done using a Statistical Package for Social Science (SPSS) version (16). Data were presented using descriptive statistics in the form of frequencies and percentages, mean and standard deviations. Cronbach alpha reliability test was calculated to assess the reliability of the developed tool through their

internal consistency. Probability (p-value) is the degree of significance and if it less than $P < 0.05$ was considered significant, the smaller the p-value obtained, the more significant is the result (*), less than 0.001 was considered highly significance (**) and the correlation coefficient was done by using Spea Spearman rank correlation.

Results

Table (1): Socio-demographic characteristics of the study sample (n=68).

Socio- demographical Data	N	Percent
Age		
>30 year	51	75.0
30-60 year	17	25.0
Mean + SD	1.25 + 0.43	
Sex		
Male	10	14.7
Female	58	85.3
Marital Status		
Married	29	42.6
Single	39	57.4
Qualification		
Institute	31	45.6
Diploma	16	23.5
Baccalaureate	21	30.9
Experience		
>8 year	42	61.8
9-16 year	20	29.4
17-25 year	6	8.8
Previous exposures Sharp injury		
Yes	58	85.3
No	10	14.7
Frequency of sharps injury		
1-8	46	67.6
9-15	7	10.3
16-21	5	7.4
22-30	2	2.9
Never	8	11.8

Table (1) Revealed that more than three quarter (75%) of participating nurses were at age > 30 years (mean+ SD 1.25 + 0.43) and high percent of them were females (85.3%). As regarding to marital status it was founded that more than half (57.4%) of participating nurses sample were a single. Nearly half (45.6%) of nurses were graduated from

nursing institute which more than half of the participating nurses their experiences less than or equal 8 years constituted (61.8)% .,As regard previous sharps injury of participating nurses results revealed that most of them (85.3%) had exposed to previous sharps injuries

Figure (1) Frequency distribution of the studied nurses for their total knowledge's (N=68).

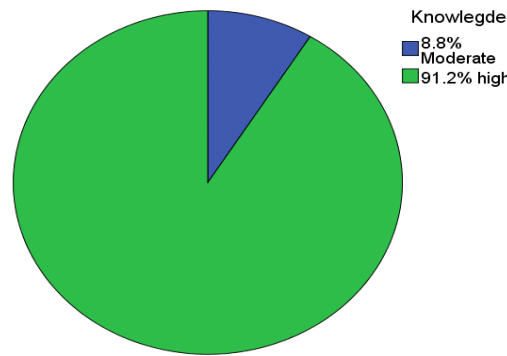


Figure (1) illustrated that the (91.2%) of nurses have high percent regarding total knowledge about needle-stick injuries.

Figure 2: Distribution of the studied nurse's responses to attitude questionnaire as it's appearing in percentage.

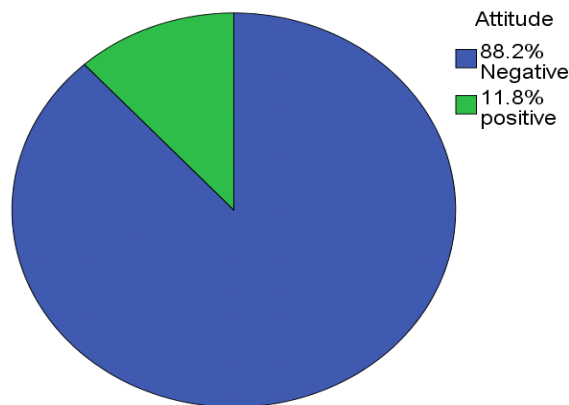


Figure (2) illustrated that (88.2%) of nurses had a negative attitude toward needle-stick injuries.

Table (2): Distribution of the studied nurses for availability of hospital resources (N=68)

Sources Availability	Adequate		Inadequate	
	N	%	N	%
1-presence Current curriculum provides enough information on Infection control.	58	85.3	10	14.7
2-presence Infection Control Team	66	97.1	2	2.9
3-presence Enough Staff in the department	6	8.8	62	91.2
4-Available written protocol for prompt reporting of needle stick injury	32	47.1	36	52.9
5-Available hand disinfectants in every patient's room	53	77.9	15	22.1
6-Available Posters	32	47.1	36	52.9
7-Available disposal containers Location (in close proximity to work area	60	88.2	8	11.8
8-Available supply disposable equipment such syringes to all patients.	55	80.9	13	19.1
9-Available personal protective equipment such as gloves, gown.	54	79.4	14	20.6
10-Available HBV Vaccine	18	26.5	50	73.5
11-Availability of sharps with safety features such as a needle that retracts after use	14	20.6	54	79.4
12-Presence enough safety boxes	24	35.3	44	64.7
13-Available Waste disposal in incinerators or transport of site.	32	47.1	36	52.9
14-Available Incentives for Training to participate in workshops on infection control	27	39.7	41	60.3

Table 2 : illustrated that nearly all (97.1%) of nurses had adequate infection control team, also more than three quarter (80.9%) of nurses had adequate disposable supplies equipment's such syringes to all patient ,while

nearly three quartets (73.5%) of nurses had inadequate HBV vaccine and also more than three quarters (79.4%) of nurses suffered from availability of sharps with safety features such as that retracts after use.

Table (3) : correlation of each knowledge, Attitude of the studied nurses and resources available in the hospital.

variable		knowledge	Attitude	Resources
knowledge	p	1	0.025	0.295
	r		0.842	0.015*
Attitude	p	-	1	0.203
	r			0.096*
resources		-	-	1

Table (3): there was appositive fair correlation between nurses knowledge and hospital resources in which r = 0.015*.

Discussion

This study showed that most of the participants were in the age group less than or equal 30 year (mean 1.25 + 0.43) which they work in the intensive care units, these age for nurses with limited experience in special care for patients in ICUs and cause increase risk rate of needle stick and sharps injuries . This finding was similar with the result of Sharma et al. (2010) (11) who assess the knowledge and attitude of health care workers about the NSSIs at tertiary care cardiac hospital for health care workers (HCWs) , Karim etal (2015) (12) who Assessment of nurse knowledge regarding needle prick injuries and its risks at Erbil hospitals for health care worker, they reported that maximum participants in their research were in the age group of 20-30 years. Also this finding is agreement with Lihan et al. (2013) (13) .who assess Long working hours in increase the risk of sharp and needlestick injury in nurses and said that most common factors that increase the risk for needle stick and sharps injuries are the age which less than twenty-four years, less than four years of nursing work experience, working in the surgical intensive care unit. while current study results not agree with Balouchi et al (2015) (14) who assess Prevalence, causes and preventive of Needle Sticks injuries among nurses in Kerman (south of Iran)and reported that most age range of 18 to 52 years .

According to the current study results, the majority of participants were female this may be due to the higher number of female nurses like to be work as a nurse this is consistent with a study conducted by Balouchi et al (2015) (14) , Shokouh et al (2015) (15) who assess knowledge and practice of healthcare workers in relation to injuries caused by needles and viral diseases transmitted in this way in Army Hospital and stated that the most participants were female, but not consistent with the study conducted by Joneidi J(2008) (16) who Evaluate the frequency of Exposure to Medical Sharp Devices and investigate the risk factors among Nurses at Military University Hospital Karim et al (2015) (12) ,stated that the most participants were male, because most of the female nurses were not agree to conduct the study.

As regards marital status for study sample results found that more than half among study sample was a single.

This finding is agreement with that, Labrague, Rosales, Tizon (2012) (17) who assessed the knowledge and degree of compliance regarding standard precautions among student nurses in a government university in Samar, Philippines and found the great majority of their studied sample single. On another hand the study incongruent with the current study conducted by Bekele T(2015) (18) who determine the lifetime and past one year prevalence of needle stick and sharps injuries and factors associated with the past one year injuries among hospital healthcare workers in Bale Zone ,Southeast Ethiopia and mention that more than half of the respondents were married at the time of data collection,

As for study participant qualification results revealed that less than half among participants their educational level were graduated from nursing institute this finding disagree with Hossine etal (2015) (19) who identify the standard precaution and the Incidence of Needle Stick Injury Among nurses working in Maternal and Child Health Centers during Children vaccination in El-Minia Governorate and illustrated that all nurses 100% had a secondary school degree.

According to nurse's experiences more than two thirds of the participating nurses their experiences less than or equal seven years these correlate with age and new graduate, this is consistent with a study conducted by Bekele Tet (2015) (18). Who mention that seven out of ten (72.6%) health care workers (HCWs) had five years and below work experience.

Regarding to previous exposures to sharp injury current study results found that the majority of participating nurses exposed to sharp injury this due to the higher number of invasive interventions on ICUs units and lack of experiences and no up dating of safty training or practice . this agree with the study done by Lihan et al. (2013) (13) who illustrated that the percentage of nurses experiencing needlestick injuries during the year professionals' time was seventy-nine percent.. This current results not consistent of Arafa (2013)(20) who study the possible work-related morbidities among street sweepers and waste collectors emphasizing on the occupational risks they are exposed to and the preventive measures at Beni –suif ,Egypt and reported that the number of injured health care workers (HCWs) (47.5%) . Similar observation was also reported by Moges(2010)(21) who assess the Prevalence of needle-stick injuries and associated factors among health care workers at Hawassa town, south Ethiopia, and stated that , the reasons

for higher needle-stick injuries among young people could be lack of experience and skill on the job and many workers began work at an early age and often without safety training. Moreover current results were similar with the study of HCW from the hospital at Alexandria Hanafi et al (2011)(22) who mention that the prevalence of NSIs reported considerably higher (85.3%) Finally current study results revealed that the frequency number of episode of needle stick injury among studied sample was noticed that 67.6% which exposed from one to sex episode of needle stick injury . this study consistent with study conducted by Afridi (2013)(23) who assess the proportion of NSIs and their associated factors among HCWs and also identify the areas in which preventive efforts might be directed to protect against this occupational hazard in Tertiary Care Hospitals in Pakistan and reported that Amongst them, up to 27% workers had it once, while nearly 73% have suffered the injury twice or multiple times. While this result disagree with Jahangir(2016)(24) who assess Needle Stick Injuries and their Related Safety Measures among Nurses in a University Hospital, Shiraz, Iran and mention that ,frequency number of episode of needle stick injury among studied sample was noticed exposed to one episode of needle stick injury as 30% .

The majority of the studied sample was had high knowledge's regarding to needle stick injury, 91,2% this due to the most of them receiving educational training on infection control recently from a year , this result supported to Kariem et al, (2015) (12) who showed that the most of nurses had good knowledge regarding the needle stick injuries . While another study done by Shah et.al., (2016)(25). disagree with current study revealed that knowledge of health care workers about the risks associated with needle stick injuries and use of preventive measures was inadequate ,also Siddique et al., (2012) (26) who assess the knowledge, attitude and practices amongst health care workers on needle stick injuries amongst health care providers in the Departments of Holy Family Hospital , revealed that inadequate knowledge amongst health care workers about the risk associated with needle-stick injuries , lack of use of preventive measures and regarding risks and hazards associated with NSI is inadequate.

In the area of attitude of the studied sample, it has been found that the majority of participating sample had negative attitude despite them had good knowledge regarding needle stick injury the causes may be related to no present regular supervision on the staff during their practice no hospital police for implement of punishment or motivation for the staff, This result disagree with the Salekar et al and Pavithran (2015) (27). Who assess the knowledge, attitude, practice, and prevalence of NSIs and SIs among dental professionals in a dental college at Bangalore and has been noticed that the participants of the studied had a positive attitude about NSI precaution. This may be due to the good awareness about the blood-borne diseases that could be spread through these injuries . in the same line result with the study done by Haggai , (2009) and Bhargava (2013) (28) who assess healthcare workers' needle-stick injury (NSI) knowledge, attitudes and practices (KAP) in a tertiary care hospital for health care workers (HCWs) and reported that the attitude scores were best

for nurses. Results from current study offer an interesting insight into the availability of hospital resources most nurses agreed that there are curriculum provides enough information on Infection control and Infection Control Team, hand disinfectants, disposal containers disposable gloves were readily available in their work area, These findings are similar to stud done by Smithi etal (2010) (29) who investigate the interactions between safety climate, psychosocial issues and Needlestick and Sharps Injuries (NSI) among nurses in Japan with the study conducted by Gershon (2013) (30), who assess the relationship between hospital safety climate and employee compliance with safe work practices and incidents of workplace exposure to blood and other body fluids in dustrial setting. Who reported that 94% disposable gloves were readily available, 95% agreed that a health and safety manual was available. This study incongruent with current result conducted by Afridi (2013) (23)who assess the proportion of NSIs and their associated factors among HCWs and also to identify the areas in which preventive efforts might be directed to protect against this occupational hazard in Tertiary Care Hospitals in Pakistan and reported that availability of sharp disposable containers in hospitals as reported by only 10% of HCWs in this study. Similarly, very low statistics were reported for the availability of infection control guidelines and use of gloves. In the same line with a study from Pakistan Aslam et al.,(2010) (31) who estimate the frequency of needle stick injuries (NSI) among health care workers (nurses, student nurses and paramedical staff) in public hospitals of Karachi and also reported the very low use of gloves and other Protective equipment.

On another hand, according to current study result found that there are shortage of staff in each department which the majority of nurses stated that not having enough nursing staff in the department due to increase of beds in all critical units and opening of another three critical units in the hospital with the same number of nurses may be a risk factor for work load and exposure of NSI. regarding of vaccination the study showed that there are lack of adequate vaccine which only thirty-two percent of the healthcare workers had received vaccination ,which was similar to the study conducted by Afridi (2013) (23) who mention that the percentage of vaccine was 33.2%. Another study agree with current study conducted by, Di Giuseppe et al. (2011) (32) who revealed that HBV vaccine was not available to the healthcare workers studied. As reported by, wicker,s (2012) (33) who investigate the frequency and causes of needlestick injuries in a German university hospital and Seham A. Abd El-Hay (2015) (34). Who assess the effect of educational program on knowledge and practice of undergraduate nursing students toward prevention of needle stick and sharp injuries during clinical training to undergraduate nursing students at in Dammam University at Hafr Al Batin Governate, KSA. They found that the nursing staff were generally well covered by hepatitis B vaccination The finding was not supported by Efstathiou et al. (2011) (35) who examines the extent of Cypriot nurses' compliance with the main aspects of Standard Precautions and explores the possible associations with the nurses' characteristics and reported that the majority of nurses had been vaccinated against Hepatitis B virus (HBV) . There was significant correlation between

occurrence of needle stick injury and knowledge regarding infection control and needle stick injury and each of attitudes and availability of hospital resources. This result not consisted with Bhargava (2013)(28) . Which explore that the exposure to NSI does not correlate with HCW knowledge and attitudes? Ironically, most HCWs experiencing NSI have higher knowledge and attitude scores.

Conclusion

This study accentuates that the majority of studied sample have high knowledge and low attitude regarding needle-stick injuries and there was significant correlation between knowledge and each of attitude and availability of hospital resources with needle stick injury

Recommendations

- Continuous education for staff nurses about importance of application of standard infection control precautions and ensure that HCW are properly trained regard the safe use and disposal of needles .
- Healthcare institutions should apprise themselves of developments in safety devices, e.g. needle-less technology and reduce risk within their organization or modify work practices that pose a needle stick injury hazard to make them safer.
- All HCW must be immunized against HBV, unless immunity to HBV as a result of natural infection or previous immunization has been established.
- Promotion of safety awareness and encouragement of reporting and timely follow up of all needle sticks injury in the work environment.
- It is also necessary to establish a monitoring system for NSIs at a hospital level.

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