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Multivariate Analysis of the Occurrence of Needlestick Injuries on the Nurses at X Hospital in Makassar

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ABSTRACT

Needlestick Injuries (NSI) and sharps injuries are often experienced by nurses. This research aimed to find out the factors related to the incident of needlestick injuries (NSI) on the nurses at Ibnu Sina Hospital, Makassar. The study was analytical observational using the cross sectional study approach. The Samples were chosen using the proportional stratified random sampling technique with the total sample of 107 respondents. The collected data include age, sex, years of services, education level, employment status, enabling factors, reinforcing factors and NSI incident. The data were analyzed using the Chi-Square test for bivariate analysis and logistic regression test for the multivariate analysis. The research results indicated that 66.4% of the respondents were 20 to 29 years old, 73.8% were non-permanent employees, and 61.7% had adequate enabling factors. There was a significant correlation between the age ($\rho = 0.011$), employment status ($\rho = 0.006$) and enabling factor ($\rho = 0.047$) with NSI incident on the nurse at Ibnu Sina Hospital, Makassar. The result of the multivariate analysis revealed the most closely related employment status with the value $\rho = 0.009$. Thus, the employment status was very influential on the incident of NSI, because most employees at Ibnu Sina Hospital, Makassar were non-permanent employees.

Keywords: Needlestick injury, age, employment status, enabling factors.

INTRODUCTION

Needlestick Injuries (NSI) and sharps injuries are often experienced by nurses. Nurses have the highest prevalence of injury among healthcare workers. Research Jaber & Farideh¹ said that the age, gender, length of <2 years and significant education with NIS in 97 health workers at a teaching hospital in Iran. Research carried out in June and December 2014 at 168 randomly selected nurses who served in different wards at the University Hospital of Shiraz, Iran said that the majority injuries occur puncture needles on the morning shift (57.8%) and the cause is 41.4% because recap

needles after use (recapping needles). There is a 60.2% not report NSI with severe clinical reasons (46.7%) and the perception of the risk of infection is low (37.7%). Factors that significantly affect NSI are sex, occurred on the morning shift, work hours per week and the number of shifts per month shift².

Research in December 2014 in four hospitals of Southeast Ethiopia Bale zone of 362 randomly selected health workers. Nearly 6 out of 10 injuries (58.7%) were not reported. The main reason not report the injury is time constraints (35.1%), a sharp object causing injury is not used in any of the patients (27.0%), patients have no injuries source of infectious diseases (20.3%) and lack of knowledge that NSI and sharps injuries should be reported (14.9%). Half of health workers who were injured have sought medical treatment on their own initiative. Respondents with low pay six times more likely to report occurrence of NSI compared to respondents with high salaries³

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Number of accidents at the Hospital of Gadjah Mada (UGM) still exceeds the target of zero accident (no accident). Most accident classification by type of injury was in contact with needles and other sharp objects (69.6%), according to the cause by a portable work equipment (69.9%). Shift occurred in the morning (69.6%) in the work unit Pharmacy / Sterilization and there were 26.1% in the emergency department⁴.

Research conducted at the paramedics on duty in the emergency room, hospitalizations, ICU, operating rooms and clinical laboratories Rumkital Dr. Midiyato S Tanjung Pinang November to December 2012 the dominant factor related to adherence to SOPs paramedics and universal precautions significant program with the reinforcing factors, enabling factors and factors of perception⁵.

Factors that cause workplace accidents are very diverse, especially the incident of NSI. There are several instances of workplace accidents are never reported include NSI. Therefore, this study aims to analyze correlation between age, gender, education level, length of employment, employment status, enabling factors, reinforcing factors to the onset of NSI at Ibnu Sina Hospital in Makassar.

MATERIALS AND METHOD

Research sites

Research conducted at Ibnu Sina Hospital, Makassar in operating rooms, emergency departments, nursing and ICU. Starting from 24 April to 24 May 2017.

Population and Sample

The population was all nurses working at Ibnu Sina Hospital in Makassar amounted to 157 people. A sample of 112 nurses who work in emergency departments, operating rooms, patient wards and ICU selected by proportional stratified random sampling method with a sample selection of the population is not homogeneous and stratified proportional. Samples that meet the inclusion and exclusion criteria were 107 people.

Data collection

After obtaining permission to conduct the study, researchers identify and approach potential respondents to explain the purpose and benefits of their participation, as well as guarantee the confidentiality of prospective

respondents. Collecting respondents who selected and according to the inclusion and exclusion criteria, to explain about informed consent and how to fill out the questionnaire, and then distributed the questionnaire to be filled. Collecting the questionnaire after complete.

Data analysis

Univariate analysis to describe of variables in general. Bivariate analysis to see some of the great associated between the independent variables of individual factors, occupational factors, enabling factors and factors reinforcing with the dependent variable (Needle stick Injury). Multivariate analysis to see independent variables most associated with the dependent variable.

RESEARCH RESULT

Characteristics of Respondents

Table 1 shows that the respondent most female sex as much as 84.1% or 90 respondents. Age of the most respondents in the range 20-29 years 66.4% or 71 respondents. Most work period on working life of > 3 years employment 82.2% or 88 respondents and the most respondents in the operating room space by 15% or 16 respondents. Most respondent employment status is not fixed employment as much as 73.8% or 79 and is the highest level of undergraduate education level, amounting to 60.7% or 65 respondents.

Distribution of Needlestick Injuries (NSI)

In Table 2 shows as much as 62.6% or 67 respondents experienced of NSI. There is a 55.1% or 59 respondents had experienced NSI 1-2 times. There is a 47.8% or 32 respondents had NSI when the afternoon shift. Respondents experienced NSI when recapping syringes practice as much as 41.8% or 28 respondents. There is a 55% or 33 respondents did not report NSI because of the possibility of infection is low.

Distribution Factors Enabling and Reinforcing factors

Table 3 shows the factors enabling adequate as much as 61.7% or 66 respondents and the reinforcing factors were adequate as much as 62.6% or 67 respondents.

Respondent Characteristics relationship on the incident of NSI

Based on bivariate analysis with test Chi-Square in Table 4 variables significantly to NSI events were age ($\rho = 0.011$), employment status ($\rho = 0.006$) and $\rho = 0.047$ enabling factor.

The most variable associated on the incident of NSI

The test results of multivariate logistic regression in Table 5 shows that the employment status variables ($\rho = 0.009$) most associated with the incidence NSI.

Table 1: Distribution Characteristics of Respondents at Ibnu Sina Hospital in Makassar 2017

Characteristics of respondents		Sum	
		n = 107	%
Gender	Man	17	15.9
	Woman	90	84.1
Age	20-24 years	18	16.8
	25-29 years	53	49.6
	30-34 years	24	22.4
	35-39 years	12	11.2
Years of service	2-3 years	19	17.8
	> 3 years	88	82.2
Employment status	Non-Permanent Employee (NPE)	79	73.8
	Permanent Employee (PE)	28	26.2
Level of education	School of Nursing Education (SNE) / Diploma III (DIII)	42	39.3
	Bachelor	65	60.7
Room	Floor 2 Aisyah	9	8.4
	Floor 2 Aminah	8	7.5
	Floor 3 Assifaa	10	9.3
	Floor 3 Assafii	14	13.1
	4th floor	15	14
	5th floor	11	10.3
	ICU	14	13.1
	IGD	10	9.3
	OK	16	15

Source: Primary Data, 2017

Table 2. Distribution of Respondents Based on the Indicator NSI at Ibnu Sina Hospital in Makassar 2017

Indicators NSI	Sum	
	n	%
NSI (n = 107)		
Yes	67	62.6
No	40	37.4
Total NSI (n = 107)		
0 (never)	40	37.4
1-2 times	59	55.1
3-4	4	3.7
> 5 times	4	3.7
Shift (n = 67)		
Morning shift	18	26.8
Afternoon shift	32	47.8
Night shift	4	6
All shift	9	13.4
Approaching the morning to the afternoon shift change	2	3
Approaching the morning to the evening shift change	2	3
Working practices (n = 67)		
Recapping syringe	28	41.8
Implementation injection	15	22.4
Handling of specimens	4	5.9
Transfer equipment	6	8.9
Collisions with other workers	5	7.5
Improper disposal	9	13.4
Report NSI (n = 67)		
Yes	7	10.4
No	60	89.6
Reasons for not reporting NSI (n = 60)		
Fear discrimination	1	1.7
Not knowing how to report an incident NSI	20	33.3
Heavy workload	6	10
Possible lower incidence of infection	33	55
Shame on friend	0	0

Source: Primary Data, 2017

Table 3 Distribution of the Factors Enabling and Reinforcing Factors on the Nurses at Ibnu Sina Hospital Makassar 2017

Characteristics of respondents		Sum	
		n = 107	%
Enabling factors	Inadequate (score <2.5)	41	38.3
	Adequate (value> 2.5)	66	61.7
Reinforcing factors	Inadequate (score <6.5)	40	37.4
	Adequate (value> 6.5)	67	62.6

Source: Primary Data, 2017

Table 4 Relationship Characteristics of Respondents to the incident of NSI to the Nurses at Ibnu Sina Hospital in Makassar 2017

Characteristics of respondents		Occurrence NSI				Sum		ρ
		Yes		No		N=107	%	
		n	%	n	%			
Gender	Man	13	76.5	4	23.5	17	100	$\rho = 0.311$
	Woman	54	60.0	36	40.0	90	100	
Age	20-29	51	71.8	20	28.2	71	100	$\rho = 0.011$
	30-39	16	44.4	20	55.6	36	100	
Years of service	New	13	68.4	6	31.6	19	100	$\rho = 0.753$
	Long	54	61.4	34	38.6	88	100	
Employment status	NPE	56	70.9	23	29.1	79	100	$\rho = 0.006$
	PE	11	39.3	17	60.7	28	100	
Level of education	SNE / Diploma III	28	66.7	14	33.3	42	100	$\rho = 0.623$
	Bachelor	39	60.0	26	40.0	65	100	
Enabling factors	Adequate	36	54.5	30	45.5	66	100	$\rho = 0.047$
	Inadequate	31	75.6	10	24.4	41	100	
Reinforcing factor	Adequate	44	65.7	23	34.3	67	100	$\rho = 0.523$
	Inadequate	23	57.5	17	42.5	40	100	

Source: Primary Data, 2017

Table 5 Results of Multivariate Analysis Variable Influencing to the incident of NSI to the Nurses at Ibnu Sina Hospital in Makassar 2017

Variables	B	SE	Wald	df	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Employment status	1,223	0.468	6.828	1	0.009	3.396	1,357	8.497
Enabling factors	0.841	0,455	3,205	1	0.073	2,257	0.926	5.502
Constant	-1388	.390	12.655	1	0,000	.250		

Source: Primary Data, 2017

DISCUSSION

This research results obtained Chi Square test, variable employment status has a significant relationship to NSI, with values obtained $\rho = 0.006$. These results are also in accordance with multivariate analysis obtained by value $\rho = 0.009$. It is known that Ibnu Sina Hospital in Makassar more nurse status of temporary employees (non-permanent, fixed fees and prospective employees)

3 compared to nurses permanent employee status. NSI is one of the most important issues in terms of health and safety in health services, especially for nurses. NSI can cause blood-borne 6 infectious diseases, especially HIV that causes AIDS, hepatitis B and hepatitis C. The risk of infection after exposure to infected blood varies by bloodborne pathogens. Injury can occur at any stage of its use, demolition or disposal.

12 Research in the Department of General Surgery, Albany Medical Center, Albany, New York by Choi et

al (2016), said that 55% of respondents had a history NSI, a surgical nurse more frequently reported NSI than surgeons with reason patients who were at risk of infection are low and no time reporting (65%) and fear of punishment. In this study as much as 62.6% or 67 respondents experienced NSI. There are 59 respondents (55.1%) said they had experienced NSI (2012 to 2016) as much as 1-2 times and reporting on events NSI just as much as 7 respondents (10.4%) while that did not report the incident of NSI 60 respondents (89.6%) citing lower chance of infection as much as 33 respondents (55%). NSI occurred on the afternoon shift as much as 32 respondents (47.8%) and at the time recapping of syringes by 28 respondents (41.8%).

Research at the University Hospital Shiraz Iran NSI produce very high prevalence (66%) occurred in the morning shift, working practices recapping the needle, the injection device type, working hours / week and the frequency shift of the shift / month is a major factor related to NSI Jahairi et al.,² Research in the hospital Gadjah Mada in 2015 said the accident classification majority (69.6%) were injured due to needlestick and sharps⁴. Research in Iran showed a relatively high NSI prevalence among health workers, especially at a young age and nurses who rarely attend training Age categories experienced NSI 20-29 years which included the young age. Usually young nurses tend to work in a hurry or are not careful so it tends to hurt. This study is in line with research Gholami et al⁶, which is a significant age category 20-29 years ($p = 0.001$) and the incidence NSI. Responden more employment status not continue to have NSI. Temporary staff at Ibnu Sina Hospital was included in three (3) groups: non-permanent employees, salaries and prospective employees remain with the facilities provided are also different. This study is in line with research Jangjaer et al⁷ the University Hospital of Taiwan that 21.28% NSI events tend to occur during dental nurse intern (Temporary staff) with the skills and clinical experience is still low. Amira & Awobusuyi⁸ Research, said that the tenure of > 3 years of significant events NSI to nurses in Nigeria Hemodialysis Unit.

Research on hospital nurse in Bale Zone of Ethiopia by Bekele et al, said that there are (60%) of nurses had low salaries experiencing NSI and reported the incident. Which includes categories enabling factor is the hospital rarely do training in universal precautions, some nurses who have long working lives only attended 1-2 times training. This is in line with research Helmut et al⁹ which

says that education NSI the number of reported events NSI. Hospitals rarely provide a copy of the SOP for each medical action. Hospitals provide personal protective equipment (PPE) gloves but usually respondents do not wear it because it considers that it is common medical procedures done and the risk of infection is low¹⁰⁻¹².

CONCLUSIONS AND RECOMMENDATIONS

Employment status ($p = 0.009$) are the factors that most influence to the incident of NSI on the nurses at Ibnu Sina Hospital Makassar. Ibnu Sina Hospital should conducted precautions training and reporting of NSI way for nurses on a regular basis.

Conflict of Interest: Authors declare no conflict of interest within this research and publication

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