

## Occupational Safety Practice of Hazardous Health-care Waste Management in Bengkulu City

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### Abstract

**Background:** Facing many patients while the workers were limited prompted health workers to make a quick decision regarding health-care waste. High workload pressured health workers and put them at risk of getting diseases than others, especially diseases from medical waste that they took care. Besides, as health workers, they should be clean from bacteria or viruses that can transmit diseases to their patients. This research aimed to investigate the factors associated with occupational safety practice of hazardous health-care waste management in Bengkulu City. **Method:** This cross-sectional study used a stratified random sampling technique to select 230 respondents who work as health workers to respond to a questionnaire interview. The data were analyzed using multivariate logistic regression to find the association between the outcomes and the independent variables. **Results:** The prevalence of poor occupational safety practice of hazardous health-carewaste management was 35.21 % (95% CI = 29.27-41.66). The factors significantly associated with occupational safety practice of hazardous health-care waste management were; gender (p-value < 0.001), department/unit (p-value < 0.001), knowledge (p-value < 0.001), and spirituality (p-value < 0.001). **Conclusion:** gGender, department/unit, knowledge, and spirituality were associated with occupational safety practice of hazardous health-carewaste management in Bengkulu City.

**Keywords:** spirituality; knowledge; occupational safety practice; hazardous health-carewaste management.

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### 1. Introduction

Hazardous health-care waste is waste from medical services that can be infectious and toxic. WHO global assessment reported that high-income countries have the highest percentage of health-care waste or up to 0.5 kg per patient every day. Health-care waste made up 58% of the total waste in the world. Health workers were the easiest group to get infected by diseases from hazardous health-care waste than other workers or 30% more at risk [1]. Indonesia's statistic board reported that hazardous health-care waste has been increasing in volume, especially Bengkulu [2]. Meanwhile, the ratio of patients and health workers was unbalanced. The number of patients were too many to handle. Thus, the limited-time and energy of health workers was the main problem. It prompted them to take simpler action that were efficient and effective in treating and caring for the patient. Although, they could keep their energy, sometimes they had to deal with a surge of patients. Hence, they forgot to use protective equipment when they made physical contact with hazardous

waste. This condition made them more fragile and at high risk of being infected with disease. If health workers get infected with disease from hazardous waste, they can spread it to their patients, spurring another problem in health care. Not all hospitals in low- and middle-income countries have adequate waste area, especially private hospitals. This problem poses a risk to health workers and makes them more vulnerable to get infected with diseases from hazardous medical waste.

## 2. Method

The research was conducted by following a cross-sectional design. Samples were determined using a stratified random sample. The probability proportional to size was used to calculate the number of married young women in nine hospitals in Bengkulu City. This research involved 230 health workers as the participants who were surveyed using questionnaire. The research result was occupational safety practice of hazardous health-care waste management. The research result was divided into three groups, namely good, moderate and poor practice. The mean variables of research were knowledge, attitude and spirituality. Using Likert scale, these variables were further divided into three groups, namely good, moderate and poor. This research recruited 230 people as the respondents. The inclusion criteria for respondents were health worker (nurse, public health, doctor, etc.) with more than one year working experience and willing to be respondent. The exclusion criteria was free from complicated disease. The analyses were divided into three-step as a univariate model to show the percentage of every variable, logistic regression and multiple logistic regression to investigate the factors that had a relationship with occupational safety practice of hazardous health-care waste management. All analyses were carried out using Stata version 13.0.

## 3. Results and Discussion

### 3.1 Result

The results obtained indicate that of 124 respondents, most of the respondents were aged between 25 and 30 years (41.67%). More than half of the total respondents (60%) were women. The majority of respondents were muslim (50%) and a lot of respondents came from other ethnics (37.83%). In terms of educational stage, a moderate percentage of respondents had magister degree (38.26%). Then, almost half of the respondents had the length of employment  $\geq 10$  years (49.13%). A great percentage of respondents have never had a training of hazardous waste management (91.30%) and medical/surgical department made up 20% of total respondents. Almost half of the respondents had poor knowledge (44.35%), others had moderate attitude (37.83%) and good spirituality (82.61%) got the highest percentage. The result showed that almost half of them had poor occupational safety practices of hazardous waste management. It means that the prevalence of poor occupational safety practice of hazardous waste management was still high. More details can be seen in Table 1.

**Table 1.** Demographic Characteristics of Respondents

Characteristic	n	%
Age (years)		
<25	53	25.98
25-30	85	41.67
$\geq 31$	66	32.35
Gender		
Men	92	40
Women	138	60
Religion		
Muslim	115	50
Catholic	41	17.83
Protestant	55	23.91
Buddhist	11	4.78
Hindu	8	3.48
Ethnics		
Rejang ethnic	44	19.13

Characteristic	n	%
Basemah ethnic	20	8.70
Lembak ethnic	18	7.83
Muomuko ethnic	17	7.39
Pekal ethnic	12	5.22
Serawai ethnic	13	5.65
Kaur ethnic	7	3.04
Eggano ethnic	12	5.22
Other ethnics	87	37.83
Education		
Diploma	8	3.48
Bachelor	134	58.26
Magister	88	38.26
Length of employment (years)		
< 10 years	117	50.87
≥ 10 years	113	49.13
Training of hazardous waste management		
Ever	20	8.70
Never	210	91.30
Department/unit		
Others	53	23.04
Pediatric	56	24.35
ICU	38	16.52
Emergency	34	14.78
OR	3	1.30
Medical/surgical	46	20
Knowledge		
Good	71	30.87
Moderate	57	24.78
Poor	102	44.35
Attitude		
Good	75	32.61
Moderate	87	37.83
Poor	68	29.57
Spirituality		
Good	190	82.61
Moderate	25	10.87
Poor	15	6.52
Safety Care Practice		
Good	109	47.39
Moderate	40	17.39
Poor	81	35.21

Variables with the highest association with occupational safety practice of hazardous waste management were moderate-poor of spirituality (Crude PR = 8.47; Adj. PR = 17.05; 95% CI = 3.91-74.46;  $p < 0.001$ ) followed by emergency department/unit (Crude PR = 8.32; Adj. PR = 16.29; 95% CI = 3.02-87.84;  $p < 0.001$ ), and poor knowledge (Crude PR = 5.99; Adj. PR = 12.11; 95% CI = 3.81-38.44;  $p < 0.001$ ). More details can be seen in Table 2.

**Table 2.** Multivariate Analysis Results

Variabel	n	%	Crude PR	Adjusted PR	95% CI	p-value
<b>Gender</b>						<0.001
Men	58	63.04	1	1		
Women	23	16.67	0.17	0.11	0.04-0.31	
<b>Department/unit</b>						<0.001
Others	4	7.55	1	1		
Pediatric	16	28.57	8.76	20.6	4.26-99.63	
ICU	31	81.58	76.67	717.62	77.73-6625.31	
Emergency	11	32.35	8.32	16.29	3.02-87.84	
OR-Medical / surgical	19	38.78	8.76	30.23	6.04-151.22	
<b>Knowledge</b>						<0.001
Good	8	11.27	1	1		
Moderate	22	38.60	65.15	78.98	17.75-351.54	
Poor	51	50	5.99	12.11	3.81-38.44	
<b>Spirituality</b>						<0.001
Good	61	32.11	1	1		
Moderate - Poor	20	50	8.47	17.05	3.91-74.46	

### 3.2 Discussion

Previous studies have stated that the main cause of anemia in Indonesia is a lack of knowledge about anemia which results in a high rate of anemia. Therefore, it is necessary to carry out educational activities regarding anemia, the dangers of anemia and prevention so that the prevalence of anemia among adolescent girls can be suppressed [10]. One of the causes of the high prevalence rate of anemia is the unhealthy diet of adolescents. Lack of knowledge about anemia causes unhealthy adolescent eating patterns, resulting in bad attitudes and behavior in term of health [11].

This study aimed to find the factors associated with occupational safety practice of hazardous health-care waste management in Bengkulu City, Indonesia. The findings revealed that moderate-poor spirituality was the highest variable in correlation with occupational safety practice of hazardous waste management, followed by emergency department/unit, and poor knowledge.

Estimation of hazardous health-care waste in Indonesia rose to 296, 86 ton per day with 30% risk of health workers getting infected. Hazardous health-care waste has increased by 50% lately [2]. It means that the opportunity or the risk prevalence to get infected among health workers is increasing.

A good practice is the key that can influence patient's perceptions on management service quality [3]. Patients do not trust hospital with a bad reputation of occupational safety practice because it risks their health [4]. Moreover, it is possible for them to be infected with other diseases [5]. Nurses' adherence to occupational safety practices of hazardous waste management is the key to keep the health of health workers and patient's beliefs [6]. Besides, working overtime was not good and increase the risk to get infected for health workers whose job is dealing with hazardous health-care waste [7].

Gender could be the predictor of immune system. In general, women are more fragile than men. A previous study reported that women living near waste area of hospital were more at risk from birth defects [8]. Another research also found that gender was associated with HCW segregation practice with AOR: 1.70 [9].

Each department of hospital had different function and duty. However, it does not mean that some departments are not related to the risk of disease from hazardous health-care waste. Previous research found that housekeeping department was more at risk to be infected with disease from health-care waste [10]. Knowledge is crucial in proper waste management, particularly the knowledge to protect one's self from hazardous health-care waste. Previous study found that health workers who had poor knowledge was more at risk to experience the harmful effects from inadequate health-care waste management [11].

Nurses' spirituality is the belief related to their emotion and their job to provide a service to the patient. Previous research found that belief was associated with medical waste disposal practice [12]. Compared to previous studies in Indonesia, this research used interview to gather the data. The quantitative method can be considered conservative. Although the study related to occupational safety practice of hazardous waste management is still lacking, several studies have investigated the association between moderate-poor spirituality, emergency department/unit, poor knowledge, and occupational safety practice of hazardous health-care waste management [13-15].

This research was conducted in the form of a survey at all hospitals in Bengkulu City with health workers as the respondents. Examining all 10 regencies in Bengkulu City is beyond the scope of this study. Therefore, this research does not represent all hospitals in Bengkulu Province.

#### 4. Conclusion

Gender, department/unit, knowledge, and spirituality were associated with occupational safety practice of hazardous health-care waste management in Bengkulu City. The hospital should provide training to the nurse to treat the hazardous waste appropriately. It can help the hospital build nurses' awareness of the hazardous waste effects, especially their health and patient health.

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