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SANITARIAN WORKERS' COMPLIANCE ON THE MEDICAL WASTE TREATMENT PROCEDURE: STUDY IN HEALTH CENTERS OF METRO MUNICIPALITY AND CENTRAL LAMPUNG REGENCY

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ABSTRACT: The sanitarian worker's compliance on fulfiling the guidline on medical waste treatment until nowadys have not yet been elucidated especially for whom employed in the district health care centres. Thi issue was come to be extreemly important in relation to their duties include to manage the hazardeous and toxic waste produce by district health care centre (puskesmas). The aim of this research was to develop a model of sanitarian's worker compliance on the procedure for medical waste management. Ordinal Logistic Regression was aplied as the postulat which respon variable was $[Y]_i$ that scored by *0, 1,* or *2* as represents for *non, fair,* or *high* compliant respectively to follow the precedure of managing the materials of hazardous an toxic waste. The predictor variables were included of age, gender, and knowledge sanitarian workers acompanied with of the performance of the facility, licency holding, and the survilience. Data were collected by interviewing and observing of 22 puskesmas owened by the Authorities of Metro and Central Lampung Municipalities. The result sugested that: (1) The Model was realiable for predicting the complience of the sanitarian workerwer's complience by the 6 predictor variables, (2) The sanitarian workers. compliance (*a*) were not affected by age, gender, or the licence holding, but (*b*) were reduce significaly by merely 0,09 (P-value=0.025), (*c*) by 0,18 (P-value=0.062), by 0.07 (P-value=0.064) with their knowlege achievement, the quality of puskesmas' facilities, and the supervion performace respectively.

*Keywords***:** *compliance, sanitarian, medical waste, hazardeous and toxic material guide line*

1. INTRODUCTION

The district's health care center (Puskesmas) as a first-level health service facility that provides basic health services based on Republic of Indonesia Government Regulation number 47 of 2016 concerning health service facilities. The center must be available at least one unit for each district. As a basic health service facility, the Puskesmas become a place of pooling of various diseases as well. These centers, therefore, produce some medical waste, include the hazardous and toxic material. a side effect of these services.

Medical waste produce by Puskesmas activities, could bring some risks on the environment and the community sanity. The risk more intensely exposed to

sanitarian workers or everyone who close and touch the waste. Because every district has a Puskesmas, where each Puskesmas produces medical waste, which means that every sub-district is a producer of medical waste, the impact on the community and the environment is very high. Especially if the Puskesmas in this case the medical waste manager and the Puskesmas leader are not compliant in managing medical waste.

The impact of medical waste on health and society occurs at every stage of waste management, from generation to collection, to the final management stage of medical waste (Ngambut, 2017). Exposure to health service waste can result in illness or injury to health workers, patients, visitors and the community around the health facility environment, which allows the risk of spread of diseases including infectious diseases such as hepatitis, diarrhea, measles and influenza. Unfortunately the management of medical waste in health care facilities such as Puskesmas is still below professional standards because managing and disposing of medical waste does not comply with applicable regulations (Yuwono et al, 2017).

Based on the Minister of Environment and Forestry Regulation number 56 of 2015 concerning Procedures and Technical Requirements for the Management of Hazardous and Toxic Waste from Health Service Facilities, B3 waste management arising from health service facilities includes the following stages: 1. Reduction and sorting of B3 Waste; 2. B3 waste storage; 3. Transportation of B3 waste; 4. Hazardous Waste Management; 5. burial of B3 waste; and 6. Landfill B3 waste. Waste management generated at Puskesmas is conducted by Puskesmas sanitarians in accordance with Ministry of Health regulation no 32/2013. Sanitarians as medical waste managers must really know and understand the laws and regulations relating to the management of Puskesmas medical waste as well as existing SOPs so that adverse effects do not occur. Knowledge or cognitive is a very important domain for the formation of action. Behavior that is based on knowledge and awareness will last longer than behavior that is not based on knowledge and awareness (Widiartha, 2012).

Besides knowledge, the important thing in the management of medical waste is a supporting device in the waste management process, namely the facilities, facilities and infrastructure used for these activities. Although the determination of the entire tool must consider aspects of budget availability, number of visits and various other technical considerations. (Fadhli, 2013). In the process of management, there is often a negligence committed by sanitarians, and therefore supervision is needed

both from the leadership of the Puskesmas as an internal supervisor and from the relevant offices for supervisors from external parties.

Metro Municipality as a Municipality with a population of 160,729 (BPS in 2016), with an area of 68.74 km2 is a small Municipality with a fairly dense population with 5 districts and has 12 Puskesmas. Of the 12 existing Puskesmas, it generates quite a lot of medical waste and is spread in each district. Because in one district there are 2-3 Community Health Centers. Central Lampung with a population of 1,271,566 people (BPS in 2017) consists of 28 districts and has 38 health centers. With an area of 4,789.82 km^2. With medical waste produced, without being managed properly, it will have a negative impact on the community around the Puskesmas and especially the waste management itself.

2. RESEARCH METHOD

This research was conducted from August 2018 to August 2019 in two districts namely Metro Municipality and Central Lampung Regency. Using qualitative research methods, with a sample of Metro Municipality Puskesmas as many as 6 Puskesmas and 16 Puskesmas from Lampung Tengah District, interviews were then conducted using a questionnaire to determine the level of sanitary compliance of the Puskesmas and the variables that affected the level of compliance. The response variable (Yi) is in the form of an ordinal variable, that is, if sanitarians are very compliant in managing medical waste at the Puskesmas given a score of 2, obediently given a score of 1, and non-compliant is given a score of 0.

Estimating variables used are (X_{ih}), among others: sanitarian age, gender (women are given a score of 1 and 0 if other), level of knowledge (both given a score of 2, enough is given a score of 1, and less given a score of 0), ownership of facilities and infrastructure facilities Puskesmas (both given a score of 2, enough given a score of 1, and less given a score of 0), ownership of permits related to environmental management, and supervision carried out both by the leadership of the puskesmas and supervision by external parties such as the Office of the Environment or the Office of Health on waste management carried out by the sanitarian Puskesmas. In a more concise manner, Table 1 presents estimator variables, symbol assignments, in the model and scores for the qualitative opportunity models in this study.

Table 1.

Predictive variables (predictors) symbolization and scoring in the model

	Variable Predictor	Symbol	the Scoring Model of Values and Units
1	Age	[AGE]	year
2	Gender	[GEND]	= 1 if female, = 0 if other
3	Knowledge	[KNW]	= 2 if good, = 1 if enough, = 0 less
4	Waste Treatmen Facilites	[FACT]	= 2 if good, = 1 if enough, = 0 less
5	Licence for waste treatment	[PRMT]	= 1 if present, = 0 if other
6	Supervision	[SURV]	= 1 if present, = 0 if other

The we propoed the postluat model of ordinal logistic regression as the folowing:

$$\text{Ln} \frac{[P(y=1)]}{[1-P(y=1)]} = \beta_0 + \beta_1 + \beta_2 [AGE]_i + \beta_3[GEND]_i + \beta_4[KNW]_i + \beta_5[FAC]_i + \beta_6[PRMT]_i + \beta_7[FAC]_I + \beta_7[SURV]_i + \epsilon_i$$

Note:

Ln = $^e log$, with e = 2,718281 (*natural number*)
Where [P(y=1)] was the chance y=0, 1, or 2
         [1-P(y=1)] was the chance to fail
β_0, β_1 = Intersep
β_2, β_7= Model Parameter
ϵ = galat (*error*)

Optimization of model parameters using Minitab Version 16. With a goodness test of fit against the model using the Gald Test with a confidence level of 5% and 10%.

3. RESULTS AND DISCUSSION

The Model Obtained

Based the optimation parameters model, we obtained the Gald test with Loglikelyhood = - 11.859with P=0.000. This implied that the good fit of the model is very good. This claim was proved by the P=0.001, meaning that if modeling reapeted as many as 1.000 there would be only 1 time the result missed. This is also means the 6 predictor vaiables are very realible to forcase the level of compliance of the sanitarian workers. We then could expressed the model as the following

$$Ln \frac{[P(y=1)]_i}{[1-P(y=1)]_i} = \begin{array}{l} 3.2135+ 6.2279-0.0459[AGE]_i -1.0799[GEND]_i -2.3831[KNW]_i \\ 0.7224[FACT]-0.5062[PRMT]-2.68544[SUVR] \end{array}$$

The Effect of Inpendent Variables on the Compliance

The results of parameter analysis with qualitative opportunity ordinal regression are presented in Table 2. In table 2 it can be seen that the parameter value *constant [ß1]* = 0.93 with *P-value* = 0.352 and *constant [ß2]* = 1.65 with *P-value* = 0.099 . Which means that if some variables do not change (for example amended by a policy), then the sanitarian opportunity to comply with medical waste management is very small even though the value is positive. This means that in order for sanitarians to be obedient in managing Puskesmas medical waste in accordance with laws and regulations, it is necessary to change several variables by conducting certain policy interventions, for example by providing specialized training in medical waste management, better fulfillment of facilities, facilities and infrastructure, conducting supervision by providing reward and punishment for waste management, and other policies that can result in better waste management in Puskesmas.

Tabel 2.
The results of the optimization of the parameters of each variable along with the *Odds Ratio* in the ordinal regression qualitative probability model of the level of sanitarian compliance

No	Predictor Variable	Symbol	Coef.	*P-value*	Odds Ratio
1)	Constant 1	-	3.2136	0.352	-
2)	Constant 2	-	6.2279	0.099	-
3)	Age	[AGE]	0.0458615	0.594	1.05
4)	Gender	[GEND]	-1.07985	0.397	0.34
5)	Knowledge	[KNW]	-2.38310	0.025	0.09
6)	Waste Treatmet facilities	[FACT]	-1.72244	0.062	0.18
7)	Licence for waste treatment	[PRMT]	-0.506189	0.695	0.60
8)	Supervision	[SURV]	-2.68544	0.064	0.07

The Effect of Sanitarian Age Variables

Of the 22 sanitarians managing the Puskesmas waste, there was a positive increase for sanitarians aged around 1.05 years older than sanitarians aged younger in managing Puskesmas waste. So it was concluded that older sanitarians tend to be better at managing the medical waste of their Puskesmas compared to younger sanitarians. This can be proven by the value in the predictor in table 2. Namely ß3 = 0.52; *P-value* = 0.594 and *Odds Ratio* = 1.05.

The Effect of Gender Variable

The gender of the Puskesmas waste management has an effect on the level of compliance in Puskesmas medical waste management, although it has a negative

meaning, namely sanitarians with male sex tend to be better in managing the Puskesmas medical waste. In female sanitarians, the management of Puskesmas medical waste is 0.34 of men. This is indicated by its *Odds Ratio* = 0.34 and *P-value* = 0.39. In this case, it can be seen that the management of sanitary Puskesmas medical waste is better if carried out by male sanitarians. In this context it seems that men are more free in managing medical waste and determining their decision to seek information about waste management.

The Effect of Sanitarian Knowledge Variables

Sanitarian knowledge in managing Puskesmas medical waste effects its behavior and compliance in the management of medical waste generated at its Puskesmas. But it is negative in the sense that if sanitarians better understand the rules and SOPs on waste management, then compliance in waste management is 0.09 times less compliant than sanitarians with 0.09 times the knowledge below. With *Odds Ratio* = 0.09 and *P-value* = 0.39.

Compliance should be in line with the knowledge possessed, so that the behavior exhibited by someone who has good knowledge will be interpreted as the results will be according to applicable standards. The sanitarian non-compliance of the Puskesmas in the management of medical waste which is associated with better knowledge but with lower compliance is possible because of the effect of reward and punishment as well as lack of supervision.

The Effect of Facilities, Facilities and Infrastructure Variables owned by the Puskesmas

Facilities, supporting facilities and infrastructure owned by the Puskesmas in managing medical waste also effect the management of medical waste carried out by sanitarians. For Puskesmas with better facilities, facilities and infrastructure, it turns out to have a lower level of compliance, which is 0.18 times compared to Puskesmas with lower facilities, supported facilities and infrastructure (*Odds Ratio* = 0.18) with *P-value* = 0.062.

The effect of the completeness of facilities, supported facilities and infrastructure owned by Puskesmas with this level of compliance shows that sanitarians whose Puskesmas have better facilities and infrastructure tend to manage medical waste poorly. Completeness of facilities and infrastructure owned by the Puskesmas should make sanitarians easier in managing medical waste generated at the Puskesmas.

Effect of Community Health Center Environmental Permit Variable

Environmental permits owned by Puskesmas have a 0.60 times lower effect on the level of compliance in medical waste management with an *Odds Ratio* = 0.60 and

a *P-value* = 0.695. Based on PP no. 101 of 2014, all health service facilities must have a permit for environmental management which means that Puskesmas or other health service facilities are able to manage their environment in accordance with applicable regulations. So with the environmental permit that is owned, it states that the Puskesmas medical waste manager has the capability in environmental management of the impacts that may occur in the operation of a Puskesmas with waste which is a negative side effect of the health services provided.

Effect of Monitoring Variables on Puskesmas Medical Waste Management

Survey of 22 Puskesmas, the results show that Puskesmas, in this case the management of medical waste, which is given both internal and external supervision has a 0.07 times lower effect than Puskesmas that is not given supervision with *Odds Ratio* = 0.07 and *P-value* = 0.064. In the implementation of Puskesmas medical waste management, supervision is needed. This supervision can be carried out internally, namely supervision conducted by the head of the Puskesmas on the management of medical waste, as well as supervision from relevant agencies or external oversight. The lower effect of supervision on sanitarian noncompliance in medical waste management has a tendency that supervision that is not carried out routinely does not have a better effect. With routine supervision, it will be possible for changes in behavior and compliance in the management of Puskesmas medical waste.

4. CONCLUSIONS
The result sugested that:

(1) The model was realiable tool for predicting the complience of the sanitarian worker by the 6 predictor variables as the following

$$\text{Ln} \frac{[P(y=1)]_i}{[1-P(y=1)]_i} = 3.2135 + 6.2279 - 0.0459[\text{AGE}]_i - 1.0799[\text{GEND}]_i - 2.3831[\text{KNW}]_i \\ 0.7224[\text{FACT}]_i - 0.5062[\text{PRMT}]_i - 2.68544[\text{SUVR}]_i$$

(2) The sanitarian workers compliance (*a*) were not affected by age, gender, or the licence holding, but (*b*) were reduce significantly by merely 0,09 (P-value=0.025), (*c*) by 0,18 (P-value=0.062), by 0.07 (P-value=0.064) with their knowlege achievement, the quality of puskesmas' facilities, and the supervion performace respectively.

5. RECOMENDATION
It is recomend that conduct further research to validate the model for others regencies *i.e.*: North Lampung, South Lampung, West Lampung, Pesawaran, Tulang Bawang, Way Kanan, Pring Sewu,Tanggamus, Pesisir Barat, Tulang Bawang Barat.

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