

ISSN : 2321-9602



# Indo-American Journal of Agricultural and Veterinary Sciences



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## Training in occupational health and safety as an intervention for improving the safety practices of female health officers in public clinics

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### ABSTRACT

The Public Health Center is a facility where police, patients, and visitors may be exposed to risks to their health and safety on the job. By adopting safety practices, businesses may greatly reduce their employees' exposure to danger on the job. K3 training is one sort of intervention that has been shown to increase safe behavior. Workplace risk assessments serve as the basis for interventions.

The purpose of this research is to determine whether or not K3 training improved the operational procedures, PPE use, equipment and tool use, and work posture of officers at the public health center in Wolasi, South Konawe Regency.

This study used a participant-observational approach to determine possible risks. A quasi-experiment with a pre-and post-test, one-group design is utilized to evaluate the efficacy of K3 training. Twenty participants were selected at random using a purposive sampling method to create the sample.

The findings revealed that of the possible dangers, 5 were classified as low risk, 12 as medium, and 18 as high. Wilcoxon signed rank test findings indicated a statistically significant relationship between compliance with established operating procedures ( $p = 0.000$  0.05), PPE usage ( $p = 0.000$  0.05), and tool and equipment utilization ( $p = 0.003$  0.05). There was no appreciable change in how people stood while working. Officers at the Wolasi public health facility did show improvements in their safety behavior in the areas of operating procedures, PPE usage, and tool and equipment handling after receiving occupational safety and health training. Officers at the public health facility are reminded of the need of adhering strictly to standard operating procedure. The public health center should organize a K3 team to monitor the execution of occupational safety and health measures and to disseminate Ministerial Order 52 of 2018.

*Keywords: Potential hazards; safety behavior; health workers; K3 training.*

### 1. INTRODUCTION

A public health facility is a high-risk workplace for many people: employees, patients, family members, volunteers, and members of the surrounding community. Physical, chemical, biological,

ergonomic, psychological, and occupational accidents are all possible threats to workers' health and safety at a public health facility.

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There are more than 59 million people working in health care institutions across the globe, and they face a wide range of complicated health and safety dangers every day [2]. Researchers in Iran found that 84.8% of occupational injuries among staff were attributable to needles in a survey of 182 entry-level healthcare professionals in the city of Bahar [3]. This is corroborated by a study by Fani et al. (2010), which found that 74.4% of dental poly at public health centers in the Banyumas regency failed to properly store (unsafe) sharp items, putting them at danger of injury from a needle.

Workers at public health centers are putting themselves and their patients at danger by engaging in unsafe practices. Needlestick injuries, which may lead to hepatitis and HIV, are among the risks faced by healthcare workers.

The WSH Council (2014) lists operating procedures, PPE usage, work posture, and the use of tools and equipment as examples of safe behaviors in the workplace. Workers' actions contribute to workplace hazards such as injuries and diseases. For this, we may thank Heinrich's notion that "human failures" account for 73 percent of all workplace mishaps. Heinrich classified the issue further, asserting that 88% of all accidents, injuries, and illnesses were caused by worker mistake, i.e. risky conduct [4]. Injuries sustained by health care personnel owing to risky activity were reported by 21% of those polled in a descriptive study conducted over the last year [5].

Management intervention is the first level of integrated safety interventions [6], with technological and human intervention making up the second. There is widespread agreement that training is an integral part of any effort to reduce risks in the workplace. For targeted intervention on safety behavior, accurate risk assessment is crucial [7].

Twenty-four public health centers serve South Konawe's twenty-five districts. Nineteen out of twenty-one (79.2%) public health centers do not have K3-compliant buildings or infrastructure, as mandated by Ministry of Health Regulation 75/2014. The Minister of Health's Regulation No. 52 of 2018 further emphasizes the need of incorporating occupational safety and health considerations into the administration of health care facilities and infrastructure. Inadequate building and infrastructure maintenance may lead to injuries ranging from mild to deadly (Indonesian Ministry of Health, 2018).

According to the South Konawe Regency Health Office's (2019) latest report, out of a total of 487 checked health care providers at the public health facility, 19 (3,9%) tested positive for Hepatitis. The majority of hepatitis cases in South Konawe were found among health care personnel at the Wolasi public health clinic. The topic of possible dangers is established in the Wolasi public health center, and the impacts of K3 training on safety behavior are discussed in terms of the aforementioned implementation processes, PPE usage, work posture, tools, and equipment. Created an intervention strategy based on the results of a risk analysis. Furthermore, this research aims to evaluate the impact of K3 training on safety behavior in terms of implementation processes, PPE usage, work posture, and the use of tools and equipment.

## **2. MATERIALS AND METHODS**

### **2.1 Research Type**

This research was conducted at public health center Wolasi South Konawe Regency, Southeast Sulawesi Province in February - April 2020. The type of research used was descriptive observation with a passive participatory design and quasi-experimental with a pre test post test one group design.

### **2.2 Population and Sample**

The population consisted of all health workers at public health center Wolasi, namely 35 people. A sample of 20 people were selected by purposive sampling who met the inclusion criteria, namely hepatitis screening, direct contact with patients, using syringes / sharp objects, risk of exposure to patient substances and requiring personal protective equipment.

### **2.3 Data Collection Technique**

The data were collected using an observation checklist consisting of two parts, namely the first part consisting of data on the identification of potential hazards for training materials and the second part consisted of a checklist for the safety behavior of officers when carrying out an injection action.

### **2.4 Data Analysis**

Hazard identification data was processed using hazard potential identification, risk assessment and risk control based on

Regulation of the Minister of Health Number 52 regarding K3 in health care facilities.

## 2.5 Intervention

Training programs were designed and implemented by the researcher to improve safety behavior skills of health workers regarding occupational safety and health. The training materials and pocket books provided were based on the development results of the introduction of potential hazards carried out by the researcher and literature studies and revised by 2 experts in the field of K3 and public health. The training was carried out 1 day for 10 JPL with training materials focusing on K3 in health care facilities, potential hazards and control of potential hazards at public health center Wolasi. Meanwhile, to control the intervention for 30 days, a pocketbook was given every week with book material focusing on implementation procedures, personal protective equipment, work positions and equipment and supplies when performing injection procedures.

## 3. RESULTS

Table 1 Assessment of the potential hazards of seven rooms at public health center Wolasi by identifying potential hazards, risk assessment, and risk control. All rooms were equipped with potential hazards. There were potential physical, chemical, biological, psychosocial, ergonomic, and occupational hazards at public health center Wolasi. It should be processed with details of 5 potential hazards in low risk category, 12 potential hazards in medium risk category and 18 potential hazards in high risk category.

Table 2 The distribution of public health center officers was dominated by the age group of 20-29 years, amounting to 13 people (65%), all respondents were 20 women (100%), the type of workforce were more than 13 midwives (65%) and the distribution of working years (<4 years). ) were more, namely 14 people (70%).

Table 3 The effects of K3 training on actions based on implementation procedures. The statistical test results obtained p value (0.000 <0.05), which means that there is a significant effect of occupational health and safety training (K3) on the action based on the procedure for implementing officers at public health center Wolasi.

Table 4 The effects of K3 training on actions based on the use of personal protective equipment, staff at public health center Wolasi.

The results of the statistical test showed that the p value (0.000 <0.05, means that there is a significant effect of occupational safety and health training on K3) on the use of personal protective equipment for officers at public health center Wolasi.

Table 5 The effects of K3 training on actions based on work posture, staffs in public health center Wolasi showed the results of statistical tests obtained p value (0.164) > 0.05, meaning that there is no significant effect of occupational safety and health training on the work position of officers at the Wolasi's public health center.

Table 6 The effects of K3 training on actions based on the tools and equipment of officers at public health center Wolasi showed that the statistical test results obtained p value (0.03 <0.05,) which means there is a significant effect of occupational safety and health training on K3 on the use of tools and equipment of officers at public health center Wolasi.

## 4. DISCUSSION

The results on the hazard potential at public health center Wolasi showed that Emergency room (UGD), general clinic, dental clinic, KIA & MTBS, immunization, laboratory and low, medium and high risk, so it is necessary to carry out risk control efforts. There were physical, chemical, biological, psychosocial, ergonomic, and occupational hazards potential at public health center Wolasi with details of 5 potential hazards for low risk category, 12 potential hazards in medium risk category and 18 potential hazards for high risk category. After the introduction of potential hazards by identifying potential hazards, conducting risk assessments and recommending risk controls, the researcher then conducted a literature study related to the training to be carried out. Then based on the introduction of potential hazards and a study of the literature, the researcher developed training materials and pocket books. Tsutsumi et al (2009) stated that training conducted based on the results of a risk assessment can improve safety behavior.

The results showed that there was a significant effect on safety behavior in the aspect of action based on implementation procedures, use of personal protective equipment, tools and equipment. Safety behavior is influenced by antecedents and consequences [8]. Improving safety behavior requires self-awareness efforts by conducting socialization or training as an antecedent. Training is the main way to prevent injuries and keep health workers from carrying out health efforts [9]. The success of safety

behavior interventions by providing educational programs in the form of training can also be seen in research conducted by Bijani et al . [10] where there is an effect of training on the safety behavior of nurses, namely 24 nurses (40%) were exposed to needle stick injuries before the intervention, and the number decreased to 9 nurses (15%) after the intervention.

Officer safety behavior in changes after intervention was action based on implementation procedures that focus on safe injection procedures. This research is in line with research Mamashli et al. [11] who stated that there is an effect of training ( $p < 0.05$ ) on safe injection procedures for nurses. Health care facilities require a standard operating procedure (SOP) for each step or procedure for injection procedures. Although there are standard operating procedures for safe injection in health care facilities, however Foda et al. [12] and Van et al. [13] found that only a small group of nurses performed the injection procedure safely. The

results of the observations of the researcher were officers who after carrying out the injection would put the syringe indirectly into its disposal, therefore this could pose a risk of work accidents [14].

In this study, there was a significant effect of K3 training on actions based on the use of personal protective equipment (masks, gloves, and aprons) during injection. This is in line with research Sari et al. [15] who stated that there is an effect of training ( $p < 0.05$ ) on nurses' behavior in using personal protective equipment. However this research was not in line with Van et al. [16] who said that there was no effect of training on the behavior of using gloves and glasses over time ( $p > 0.05$ ). The results of the researchers' observations were that officers did not feel comfortable wearing masks, as well as aprons, so this was also a risk factor for being exposed to aerosols in the workplace.

**Table 1. Distribution of characteristics of officers at public health center Wolasi**

Variable	Type of Respondents	
	n	%
<b>Age Group</b>		
20 – 29 yrs	13	65
30 – 39 yrs	4	25
40 – 49 yrs	2	10
≥ 50 yrs	1	5
<b>Sex</b>		
Male	0	0
Female	20	100
<b>Type of Workforce</b>		
Doctor	2	10
Nurse	4	20
Midwife	13	65
Health Analysis	1	5
<b>Work period</b>		
< 4 yrs	14	70
≥ 4 yrs	6	30

**Table 2. The effect of occupational safety and health (K3) training on actions based on the officer implementation procedure at public health center of Wolasi**

Implementation Procedures	Statistical value					
	n	Mean	SD	Min	Max	P Value
Pre test	20	49,2	16,3	28,5	85,7	0,000
Post test	20	78,5	17,6	28,5	100	

Source: Primary Data 2019; Test: Wilcoxon Signed Ranks Test

**Table 3. The effect of occupational health and safety training (K3) on actions based on the use of personal protective equipment (PPE) for officers at public health center of Wolasi**

Personal protective equipment	Statistical value					
	n	Mean	SD	Min	Max	P Value
Pre test	20	40,0	22,0	25,0	100	0,000
Post test	20	90,0	12,5	75,0	100	

Source: Data primer 2019; Test: Wilcoxon Signed Ranks Test

The statistical test results of the effect of K3 training on actions based on work posture showed ( $p = 0.164 > 0.05$ ), meaning that there is no significant effect of K3 training on actions based on work posture. The results of observations and interviews with the researcher, there were officers who felt that the current position was fine and felt comfortable thus the presence of K3 training within a month had no significant effect on actions based on work posture.

Ergonomics training plays a big role in creating safety behaviors. Training makes workers to possess the correct skills to work ergonomically,

therefore workers feel comfortable doing their jobs. However, [17] after the training, the health workers at public health center Wolasi still often perform non-ergonomic work positions when providing services to patients. Manual lifting, awkward positions and slouching increase the risk of back problems for health workers [18]. However, this study was not in line with Salah et al. [19] which showed that the implementation of body mechanics training ( $p < 0.05$ ) increased safety behavior, thus it was positively correlated with the intensity of back pain in nurses.

**Table 4. The effects of occupational safety and health (K3) training on the work posture of officers at public health center of Wolasi**

Work Posture	Statistical value					
	n	Mean	SD	Min	Max	P Value
Pre test	20	58,2	23,8	33,3	100	0,164
Post test	20	68,2	25,3	33,3	100	

Source: Primary Data 2019; Test: Wilcoxon Signed Ranks Test

**Table 5. The effects of occupational safety and health (K3) training on the use of tools and equipment for officers at public health center of Wolasi**

Tools and Equipment	Statistical value					
	n	Mean	SD	Min	Max	P Value
Pre test	20	54,9	19,5	33,3	100	0,003
Post test	20	79,9	19,9	33,3	100	

Source: Primary Data 2019; Test: Wilcoxon Signed Ranks Test

Training is the main way to prevent injuries and keep health workers from carrying out health efforts (Republik Indonesia, 2014). Not performing recapping techniques when injecting is a safety behavior that has increased after

intervention. In line with Miner et al. [20] who stated that there is an effect of training ( $p < 0.05$ ) on recapping techniques among health workers in Nigeria. Swe et al. [21] explained that as much as 50.3% of health workers in Malaka use the syringe

recapping technique.

The availability of an adequate supply of equipment and disposable supplies at the health care facility is a must and also the provider ensures that staffs use new equipment for each procedure. The statistical test results of the effect of K3 training on the action of work tools and equipment ( $p = 0.03 < 0.05$ ) means that there is a significant effect on the actions and tools and equipment. The tools and equipment assessed here checks the condition of the tool before working, wears footwear, and does not recapping syringes. The results of the researchers' observations were that there were officers who wore ordinary footwear / sandals. After K3 training, there was a change in the use of proper footwear. This is also in line with research which states that as much as 20.1% of officers wear safety shoes when carrying sharp objects [22].

## 5. CONCLUSION AND SUGGESTION

The results of the study can be concluded that there are 5 potential hazards in the low risk category, 12 potential hazards of medium risk and 18 potential hazards of high risk categories.

There is a significant effect of occupational safety and health training (K3) on safety behavior based on implementation procedures, use of personal protective equipment and use of tools and equipment. There is no significant influence on health behavior based on work posture. It is recommended for officers to always be disciplined in carrying out their duties according to the SOP at respective public health center. In addition, it is recommended to form a K3 team at respective public health center that oversees the implementation of occupational safety and health and socializes the importance of implementing the Minister of Health regulation Number 52 year 2018.

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