

Do Nurses Implement the Occupational Safety and Health Standards? A Survey Study in Public Health Centers

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Abstract Health services provided by healthcare workers, especially nurses, place nurses and patients at risk and cause occupational accidents. Accidents at work must be observed, and their causes must be identified to prevent similar incidents from occurring again. This survey aims to investigate the perceived ability to implement Occupational Health and Safety Standards (OSHS) at Puskesmas/PHC in Banda Aceh, Indonesia. It is a quantitative study with a cross-sectional plan involving 11 primary health facilities in the Banda Aceh region. The sample for the analysis comprised 67 respondents, who were selected through purposive sampling. The study tool used was an up-to-date questionnaire which was tested for its validity and reliability. Data were collected by distributing questionnaires directly to respondents, followed by data analysis using the descriptive statistical method. The results indicated that the perceived ability to implement OSHS at PHC was in the "High" category (50 respondents/74.6%). The most significant element (89.6%) is the Cultivation of Clean & Healthy Living, in the "High" category. And the management system is the minor element, with 52.2% of respondents classified as "Low." It is hoped that the head of the PHC will be able to socialize the application of OSHS sustainably, especially in the management of Hazardous and Toxic Materials (HTM) and HTM waste, operational procedures, proper domestic waste management, preparation of OSH

programs, and preparation of an effective management system. The local government must be committed to providing adequate facilities and infrastructure to facilitate occupational health and safety administration training for all PHS officers.

Keywords Occupational Safety and Health, Occupational Accidents, Nurses, Workplace Incidents, Health Administration

1. Introduction

Nurses are part of a healthcare organization that ensures patient safety and addresses various safety and health risks [1]. Occupational Safety and Health (OSH) describes five nurse safety risks that nurses must face in their work environment: biological, chemical, physical, environmental, ergonomics, and psychosocial [2]. Managing nurse safety involves many aspects, such as education, communication between nurses and patients, and techniques for exploiting nursing safety [3].

A work-related accident is an event that does not occur by accident but has a cause. As a result, accidents must be investigated, and causes must be found to prevent similar incidents from occurring in the future [4]. Patient safety is strongly linked to the protection of nurses, as they are in

the same environment. When the nurse's level of security is high, job satisfaction increases, work-related stress decreases, and patient satisfaction with the services provided increases [1]. Workplace safety should focus on developing processes or efforts to prevent hazards and losses because they cannot be overcome; they will contribute to events that can cause property damage, workplace disruptions, personal risks, and adverse health effects [2].

According to the International Labor Organization (ILO) cited in Safitri [5], an estimated 2.78 million workers die yearly from occupational accidents and illnesses. About 2.4 million, or 86.3%, were caused by occupational diseases, and 380,000 (13.7%) were caused by occupational injuries. Data from the OSHA [6] reported that hospitals in the United States recorded 6.8 workplace injuries per 100 healthcare workers (HCWs) in 2011. According to Badan Penyelenggara Jaminan Sosial (BPJS) Employment (Indonesian Insurance), the number of work accidents in Indonesia in general in 2017 was reported as 123,041 cases, while in 2018, it increased to 173,105 cases. [8]. The National Safety Council (NSC) report indicates that workplace accidents occur about 41% more in hospitals than in other industries. Cases of work accidents in public places such as hospitals nationally in Indonesia were reported by 9.2% [9].

One of the healthcare facilities that are part of the health resources that the community needs to support the delivery of health efforts is Public Health Center (PHC). PHC is a leading health facility with an essential role and function in improving the health of society as a primary care provider for the community and under public health resources for public health services [10]. However, in Indonesia, cases related to occupational accidents and illnesses of HCWs have not been well documented [11].

Indonesian Ministry of Health [12] stated that occupational health and safety are critical to assessing PHC certification. Part of evaluating PHC accreditation instruments is the availability of OSH procedures and personal protective equipment for officers and monitoring their use. Health centers must develop a facilities and security management program to ensure a safe environment, including safety and security management, hazardous and toxic materials and waste management, disaster management, fire management, utility system management, and educating staff about facility management and safety.

A study conducted by Ibrahim et al. [13] found work-related incidents such as needle sticks (32.8%), knife cuts (3.3%), injuries (24.5%), and splashing with blood and other body fluids (39.4%). Nada et al. [14] also reported that 50% of nurses had experienced needle sticks at work, and 8% of staff were estimated to be sick due to work. A study led by Surbakti et al. [15] found that a needle had stabbed 71.43%, 57.14% had slipped during labor, and 71.43% had tripped or been struck on the job. Based on evidence from Ardi and Hariyono [16], in one

hospital from 2009 to 2012, there were 34 cases of workplace accidents with frequent slips. A further study in 2015 at Zainoel Abidin Hospital Banda Aceh documented 19 workplace accidents [17].

Other research findings noted that the implementation of OSH in PHCs still needs to be as intended, although the OSH program has been implemented in all PHCs [18]. However, in its application, there remain differences in understanding caused by differences in the socialization process experienced by PHC. There are internal and external barriers to implementing the OSH program at PHC. Internal factors include the need for more competent personnel in OSH at the PHC, weak efforts to cultivate OSH, limited budget, lack of monitoring and evaluation, and lack of awareness of each officer implementing the OSH program. Meanwhile, external factors generally stem from the need for more support from the programs' supervisory body.

In a pandemic like Covid-19, health facilities currently pose a high risk of occupational accidents and illnesses, and vigilance over implementing OSH during a pandemic is higher than in typical situations. In addition, the availability of Personal Protective Equipment (PPE) and other support equipment has been a significant issue, as HCWs are the focal point in managing Covid-19 [19]. Therefore, it is crucial to use PPE to prevent the spread of infection when actions are taken by HCWs, especially nurses [20].

From some of the studies above, it can be concluded that OSHS implementation is mandatory in all health facilities, especially PHC. However, it still needs to work optimally. According to interviews with three PHCs in Banda Aceh, one PHC reported a workplace accident, needle punctures, last year. The other two PHCs stated that there had been no work-related accidents in recent years, but the OSH program has yet to work well. OSHS is an effort by nurses to create a safe workplace to avoid the hazards and harmful effects of workplace accidents on themselves and others. Leaders and nurses must demonstrate a high level of self-awareness to minimize work-related injuries or even prevent adverse events. Therefore, this research is essential to: Identify the perceived ability to implement OSHS at the Banda Aceh PHC and describe the level of OSHS implementation in each PHC in the Banda Aceh work area.

2. Materials and Methods

2.1. Study Design and Sampling

The research design used is a cross-sectional study. Quantitative research with a survey approach was conducted on 11 PHC in the working area of Banda Aceh, Indonesia, with the targeted research population being 75 nurses (the total number of nurses from 11 PHC). The

sampling technique used is purposive sampling with several inclusion criteria, including being willing to be a respondent in the study without coercion from any party, not sick, and not in the process of taking a leave of absence. Furthermore, the sample that met the inclusion criteria was 67 because eight nurses are undergoing independent isolation due to exposure to the Covid-19 virus (response rate 89.3%). Data was collected for two weeks (August 19-31, 2021).

2.2. Data Collection Tools

The research instrument used a questionnaire and consisted of 2 parts—first, the characteristics of respondents. Second, the Perceived Ability to Implement of Occupational Safety and Health Standards Questionnaire (PSK3Q/PAI-OSHSQ) contains 32 positive statement items on a Likert scale. Alternative answers are Yes (score 3), Uncertain (score 2), and No (score 1).

The PSK3Q/PAI-OSHSQ was developed by researchers based on literature from the Indonesian Ministry of Health [21] regarding Occupational Safety and Health in Health Service Facilities, which consists of 11 components. The research instrument has undergone the validity and reliability test stages before being distributed to respondents. Stage 1, the content validity test, was carried out by experts in nursing management. Phase 2 was followed by a construct validity test of 17 respondents from PHC at Aceh Besar District. With a significance level of 5%, 32 statement items were declared valid with r value > r table (0.482). Finally, the reliability test results on the instrument obtained Cronbach's Alpha value of 0.957.

2.3. Statistical Analysis

Data is processed following the fourth steps: editing, coding, processing, and cleaning [22]. Descriptive statistics were used and then analyzed using IBM SPSS Statistic v.26. Respondent characteristics in this study include Gender, Age, Education Level, and Length of Work. Categorization of the Perceived Ability to Implement OSHS and all their components use the category "HIGH" if the value is $x \geq \bar{x}$ and "LOW" if $x < \bar{x}$. Then, percentages are used to determine the data resulting from the categorization [23].

2.4. Ethical Consideration

This research has gone through the ethical test stage and has received a letter of permission from the ethics committee of the Faculty of Nursing, Universitas Syiah Kuala. Respondents received informed consent for this study and had the opportunity to complete a questionnaire or decline at any time if they felt uncomfortable. We ensure that respondents' privacy and anonymity are well maintained.

3. Results

Sixty-seven respondents met the inclusion criteria and participated (response rate 89.3%). The characteristics of the respondents in this study are presented in Table 1:

Table 1. Respondents' Characteristics of PHC in Banda Aceh (n=67)

Respondents Characteristics	Frequency	%
Gender		
Male	8	11.9
Female	59	88.1
Age (years): (Min-Max= 26-58; \bar{x} = 40.75; SD= 6.37)		
26-35 (Early Adult)	13	19.4
36-45 (Late Adult)	40	59.7
46-55 (Early Elder)	12	17.9
56-65 (Late Elder)	2	3
Education Level		
Diploma	57	85
Bachelor	4	6
Magister	6	9
Length of Work (years) [24] (Min-Max= 1-30; \bar{x} = 15.03; SD= 7.18)		
< 6 years	7	10.5
6-10 years	12	17.9
> 10 years	48	71.6

Table 2. Contributing Factors to Perceived Ability to Implemented OSHS (n=67)

Contributing Factors	Nurses' Perceived Ability to Implemented OSHS			p-Value
	High	Low	Total (%)	
Gender				
Male	4	4	8 (11.9)	0.088
Female	46	13	59 (88.1)	
Age				
Early adult	9	4	13 (19.4)	0.016
Adult	29	11	40 (59.7)	
Early elderly	12	0	12 (17.9)	
Elderly	0	2	2 (3.0)	
Education				
Diploma	42	15	57 (85.0)	0.452
Bachelor	4	0	4 (6.0)	
Magister	4	2	6 (9.0)	
Length of Work				
< 6 years	6	1	7 (10.5)	0.000
6-10 years	6	6	12 (17.9)	
> 10 years	38	10	48 (71.6)	

For the perceived ability to implement OSHS, respondents were categorized as "HIGH" if $x \geq 87$ and "LOW" if $x < 87$. The results of the study found that most respondents have a "High" perceived ability to implement OSHS, as many as 50 respondents (74.6%), and 17 respondents (25.4%) in the "Low" perceived.

Based on Table 1 above, the most dominant Gender distribution is female as many as 59 respondents (88.1%), with the age of most respondents in the Late Adult category, as many as 40 respondents (59.7%). Then, the majority of respondents' education level (57 people/85.1%) and Length of Work >10 years, as many as 48 respondents (71.6%) dominated among other lengths of work.

Table 2 shows that the "high" outcome (74.6%) of the perceived ability to implement OSH in the study may be affected by several factors. First, respondent characteristics show that most respondents (59 people/88.1%) are female. The results of crosstabs (Table 2) show that as many as 81.35% of women (46:59 respondents) have a better performance than 50% of men (4:8 respondents) in the implementation of OSH in the PHC of Banda Aceh. Dwiari and Muliawan [11], in their research, also found that women were better perceived by 77 respondents (59.69%) towards the application of OSH vis-à-vis men, who have only 23 respondents (39.66%). It was confirmed that women's characteristics, such as patience, gentleness, and caring, made them more understanding and thorough in carrying out their duties and responsibilities [32].

The second feature shows that the majority of those surveyed, 29 people (72.5%) who are in the late adult phase (36-45 years), have a "High" perceived implementation of OSH in the PHC of Banda Aceh. Tewal et al. [34] claimed that age often relates to a person's productivity; given that age increases, productivity will tend to rise due to diverse experiences. Furthermore, most respondents (57 people/85.1%) are at the diploma level, and up to 42 respondents (73.68%) perceived the ability to apply to OSH well. Similarly, for the Bachelor's level of education (4 persons/6%), all (100%) are ranked as high in implementing OSH. Lastly, regarding nurse education (6 respondents/9%), up to four respondents (66.6%) also implemented high OSHS.

However, most respondents have a diploma, considered the lowest level of education in the Indonesian nursing curriculum [35]. We speculate that more than just nurse education influences a strong perception of OSHS implementation. This conclusion is corroborated by Dwiari and Muliawan (2019), who stated that the level of education did not have a meaningful relationship to the implementation of OSH ($p > 0.05$). Research by Ernawati and Nurlelawati [36] also indicates no link between education and the performance of OSH ($p\text{-Value} = 0.519$).

Finally, the predominant working time is over ten years (48 respondents/71.6%). Based on these characteristics, the perceived ability to implement OSH shows that most respondents (38 persons/79.1%) are in the highest category. These findings confirm that experience is critical in implementing OSH at the PHC in Banda Aceh. The research of Maria et al. [37] yielded different results, who reported that nurses with a mandate more remarkable than ten years had a high level of unsafe actions by 25 respondents (25.3% of 54.5%). Although they have extensive work experience, they are less cautious because they can master all jobs effectively, often act carelessly, and ignore workplace safety principles. A further study by Ernawati and Nurlelawati [36] indicated no relationship between tenure and OSH implementation ($p\text{-Value} = 0.854$).

The implementation of OSHS sequentially from the highest to the lowest for each PHC in the working area of Banda Aceh is as follows (Table 3).

Based on Table 3, in the "management system" component, 35 respondents (52.2%) have a perception of "Low" implementation. This result is strengthened by Siswanto's [25], which states that more than half of respondents (63%) describe that the OSH management system at the PHC of Tulungagung was also still low. In contrast, research conducted by Edison et al. [26] found that the implementation of the OSH management system in 5 PHC at Semarang City ($n = 88$) is in the excellent category, with 58 respondents (66%) already having an exemplary commitment in implementing the OSH management system. This outcome may occur because the management of PHCs needs to be written with the provisions and rules regarding the penalties imposed for each violation.

Table 3. Mean, SD, Min-Max, and the Level of Perceived Ability to Perform OSH (n= 67)

Component	\bar{x}	SD	Min- Max	Category (%)
Management system (3 items)	7.64	1.26	5-9	Low (52.2)
Recognition of Potential Hazards and Risk Control (3 items)	8.40	0.97	4-9	High (64.2)
Application of Standard Precautions (4 items)	11.46	0.74	9-12	High (59.7)
Application of Ergonomic Principles (2 items)	5.33	1.14	2-6	High (68.7)
Occupational Health & Immunization Services (2 items)	5.0	1.2	2-6	High (68.7)
Cultivation of a Clean & Healthy Life (1 item)	2.87	0.42	1-3	High (89.6)
Facilities & Infrastructure Management (6 items)	16.12	2.43	8-18	High (73.1)
Medical Equipment Management (2 items)	5.58	0.87	2-6	High (76.1)
Preparedness for Emergency or Disaster Conditions (6 items)	16.18	2.36	9-18	High (70.1)
HTM Management, HTM Waste, & Domestic Waste (2 items)	5.75	0.58	3-6	High (80.6)
Training (1 item)	2.7	0.52	1-3	High (73.1)
Perceived Ability to Implemented OSHS (32 items)	87	8.68	64-96	High (74.6)

The component of "recognition of potential hazards and risk control" shows that 40 respondents (59.7%) already have a "High" perceived ability to implement OSHS. A study led by Wagesti et al. [27] showed that there were 66 sources of danger in the work environment of the PHC, with controls that had been implemented in the form of using PPE according to standards, providing safety boxes, repairing and maintaining tools, Standard Operational Procedure (SOP) for service flow, as well as policies related to clinical services. Tweedy [2] suggested that hazard identification efforts focus on hazardous conditions, hazards, damaged equipment, and behavioral differences. Risk management includes hazard, identifying, assessing, and managing risks [10].

The next component is the "implementation of standard precautions". There are more than some respondents (40 or 59.7%) who also have a "High" perception. These results align with the research [28], which states that standard precautions have been applied under applicable laws and regulations. In the following component, "perception of the application of ergonomic principles," 46 respondents (68.7%) were in the "High" category. Nonetheless, Enisah and Susanto [28] point out that Cijagra Lama's PHC did not work well because the officers did not consider the weight of the luggage and the ability to work on posture. As stated by the Indonesian Ministry of Health [21], the goal of applying ergonomic principles is to work safely, comfortably, efficiently, effectively, and productively because ergonomic hazards can injure HCWs.

The "occupational health services and immunizations" component shows that 46 respondents (68.7%) perceived the application of this component as being in a "high" category. Enisah and Susanto [28] also reported that the health checks of HCWs went well, but the vaccines were not given to all HCWs. A study in three Indonesian

provinces found that 28 out of 50 respondents (56%) reported that regular medical examinations for PHC officers remained mediocre [29]. Regarding the component of "cultivating clean and healthy living behavior," it is known that the majority of respondents (60 or 89.6%) already have a "High" perceived ability to implement. This finding demonstrates that nurses working in PHC can adopt healthy work-life behaviors.

Other components linked to "facilities and infrastructure management" showed that 49 respondents (73.1%) also had a "high" capacity for implementation. These findings align with Dwiari and Muliawan [11], who found that 167 (89.3%) HCWs had a higher perception of the availability of facilities and infrastructure. However, a separate study showed that 68% of respondents reported that the infrastructure required to support the implementation of OSH in their work still needed to be improved [29]. Results from the "management of medical equipment" component showed that almost all respondents (51 persons/76.1%) had "High" perceptions of the implementation. One element that supports patient healing is medical equipment. Moreover, if medical equipment is unavailable or cannot be used properly, it will impact the quality of health services. As a result, the condition and functioning of medical equipment must be adequate and optimal [30].

In addition, 47 respondents (70.1%) have a perceived "high" capacity to implement the "Preparedness for Emergency or Disaster Conditions" component moving forward. Enisah and Susanto [28] pointed out that fire protection has also been adequately implemented. Saputra and Saputri [31], in their research, indicated that the PHC has also performed well in fire prevention and control. In general, it is safe to say that nurses have been well prepared for undesirable events in the future. Within the component "management of HTM, HTM waste, and

domestic waste," 54 respondents (80.6%) did well. As a comparison, a study at PHC in Pekanbaru also went well, from sorting, storing, and transporting. However, there remain limitations regarding treatment or destruction [32]. Finally, the component describing "training" shows that 49 respondents (73.1%) belong to the High category. Tweedy [2] suggests that training should focus on the causes of workplace accidents and hands-on training with case studies or demonstrations. However, OSHA training is not available to all HCWs. Typically, only the head of the OSH management team and a few members can receive funding from each organization [28].

4. Discussion

This study suggests that the perceived ability to implement OSHS for PHC nurses is in the "high" category of 50 respondents (74.6%). This finding is consistent with research from Nada et al. [14]. They noted that PHC X in the Pekalongan District already has an OSH commitment as evidenced by the existence of an OSH order for the PHC Leader and their Implementation Team, the availability of qualified resources supported by regular training and the allocation of funds, the availability of HTM waste management and the existence of SOPs and PPE for the implementation of actions.

Another study found that the PHC met 80% of the OSH implementation requirements per Minister of Health Regulation No. 52, 2018 [28]. However, the findings of this study show that there is still a need to improve the performance of OSH on the elements of facilities and infrastructure regarding the transfer of property and patients, regular health checks, immunization of HCWs at risk, and maintenance of medical equipment and training. Other findings led by Rifai et al. [33] stated that, in general, PHC had implemented OSH effectively. However, some things still need to be improved, including at the time of regular health checks, the lack of the provision of PPE, and the lack of health promotion media within the PHC. A separate study by Prasetyowati et al. [18] reported that achieving OSH implementation at the PHC still needed to be as expected. This situation is due to a lack of support and socialization of monitoring agencies, the need for HCW awareness of OSH implementation, and the need for more completeness of facilities and infrastructure supporting OSH implementation.

Furthermore, to maintain the implementation of OSHS for all HCWs in PHC, especially nurses, a shared commitment is needed to implement all OSHS components [26]. In addition, PHC management must prepare written provisions and rules regarding rewards and punishments for any violations that occur [26]. The most important thing is support and supervision from the advisory agency (Health Office), increasing awareness of health workers through seminars and ongoing training,

and the fulfillment of complete facilities and infrastructure [18].

5. Conclusions

Based on the research results of 67 respondents, it was found that the perceived ability to implement OSHS at the PHC in Banda Aceh was in the "High" category (50 respondents/74.6%). Cultivating Clean & Healthy Living is the component with the utmost "High" class (89.6%). In contrast, the management system is the component with the "Low" category, 52.2%. Based on the results of this study, it is hoped that the OSHS program can operate optimally, such as regularly socializing on the importance of OSHS in the PHC workplace. Concerning the PHC management system, there is a need to develop policies, plan and implement plans, monitor and assess occupational safety and health, and review and improve performance in implementing OSHS to minimize the risk of adverse events and workplace accidents.

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Conflict of Interest

The authors declare no conflict of interest in this research.

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