

ORIGINAL ARTICLE

Factors Associating the Sanitation Practices of Worship Places in Indonesia: A Cross-sectional Study

Musfirah Musfirah^{1,2}, Jojok Mukono¹, Ichtiarini Nurullita Santri², Dandi Aninda Putri³, Juliana Jalaludin⁴, Saliza Mohd Elias⁴

¹ Doctorate Degree Program of Public Health, Faculty of Public Health, Universitas Airlangga, 60115, Surabaya, Indonesia

² Department of Public Health, Faculty of Public Health, Universitas Ahmad Dahlan, 55164 Yogyakarta, Indonesia

³ Metro City Health Service, 34124, Lampung, Indonesia

⁴ Department of Environmental and Occupational Health, Faculty of Medicine and Health Science, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia

ABSTRACT

Introduction: Poor sanitation can harm health and may even lead to death. Worship places are public places with many visitors and potentially become a source of disease transmission. This study aimed to assess the associations between knowledge, attitude, human resources, and facilities with sanitation practices in worship places to prevent disease transmission. **Materials and methods:** This cross-sectional study employed quantitative methods. The worship places were located in the workplaces of the Sukaraja Nuban Health Center, Lampung, and consisted of 66 worship places and 66 respondents. A total sampling technique was used in this study. Data were analyzed using frequency distribution for univariate analysis and chi-square test for bivariate analysis. **Results:** The results of the bivariate analysis showed associations between knowledge ($p=0.001<0.05$), attitudes ($p=0.005<0.05$), availability of human resources ($p=0.011<0.05$), and the availability of sanitation facilities ($p=0.008<0.05$) with sanitation practices. The study found significant associations between knowledge, attitudes, availability of human resources, and sanitation facilities with practices ($p < 0.05$ for all factors). **Conclusion:** Knowledge, attitudes, availability of human resources, and sanitation facilities are the factors associated with sanitation practices in the worship places at Sukaraja Nuban Health Center Work Places, Lampung, Indonesia. Efforts to raise awareness among venue managers on the importance of environmental health and sanitation are crucial to reducing disease transmission in worship places. *Malaysian Journal of Medicine and Health Sciences* (2025) 21(SUPP7): 85-91. doi:10.47836/mjmhs.21.s7.12

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Corresponding Author:

Musfirah Musfirah, M.Kes.

Email: musfirah-2023@fkm.unair.ac.id

Tel : +62 85298907347

INTRODUCTION

Inadequate sanitation poses significant health risks, contributing to disease transmission and, in severe cases, even mortality. Previous research has shown that poor sanitation is linked to an increased risk of diseases such as diarrhea and other infectious diseases in public spaces, making sanitation improvements essential. Insufficient sanitary facilities harm millions of people worldwide (1). Inadequate sanitation conditions account for over half of the causes of child malnutrition (2). Poor sanitation is moderately linked to diarrhea (3) and increases the burden of neglected tropical illnesses such as trachoma, dracunculiasis, and visceral leishmaniasis (4). Approximately 68% of the population with access to sanitation meet health requirements (5). Similarly, in developing countries without sanitation facilities, Bangladesh's sanitation access is only 57.7% (6).

Indonesia's population exceeds 240 million individuals, and the country faces intricate health challenges associated with environmental conditions. These challenges encompass water supply, housing, waste disposal, wastewater, and sanitation (7,8). The absence of adequate water and sanitation infrastructure harms various aspects of health, society, economy, and overall well-being (9). In Indonesia, where only 54.01% of public places met health sanitation requirements in 2017, worship venues pose a particular concern, as these spaces often lack the necessary infrastructure to prevent disease transmission. This achievement aligns with the 2017 Ministry of Health Strategic Plan target. Lampung Province received the lowest ranking in terms of the health sanitation requirements of public places, with a percentage of 1.41% in 2016 (10) and 47.29% in 2017 (11).

While sanitation in public places like markets and transportation hubs has been studied, worship places remain understudied despite their high visitor volumes and potential health risks. Worship places, as high-traffic public venues, are susceptible to becoming hotspots

for disease transmission due to inadequate sanitation facilities and poor hygiene practices (12). It is essential to effectively communicate and provide suggestions to elderly workers regarding sanitation and hygiene issues to minimize contamination. The evaluation of housing sanitation for elderly workers uncovered a potential health hazard related to falling accidents, specifically in the bathroom. The lack of anti-slip sheets and dry-wet separation is the main cause. Coliform was identified in most samples, including food, touch surfaces, unwashed hands, and drinking water (13).

Public places encompass a variety of establishments such as lodging facilities, bus stops, public transportation hubs, markets, cinemas, beauty salons or barbershops, massage parlors, amusement parks, meeting lobbies, Islamic boarding schools, worship places, and various natural or artificial landmarks. Ensuring cleanliness and meeting sanitation requirements is crucial for worship places, as they can also pose health risks and contribute to disease transmission and environmental pollution if not adequately maintained (12). Community religious institutions can change, develop, and protect religious and cultural values. Improved sanitation and hygiene in these institutions are critical for reducing infectious diseases (14).

There are 66 worship places in the Sukaraja Nuban Health Center, as well as Lampung working places. A preliminary study was conducted on February 10 and 12, 2021, using interviews with the head of the environmental health sector at the Sukaraja Nuban Health Center, Lampung. Data recapitulation of the sanitation program for public places at the Sukaraja Nuban Health Center, Lampung, showed that only 50% of the worship places had met the sanitation requirement, and the minimum service standard target for public places was 80%.

The preliminary study was continued by observing and interviewing the venue managers from five worship places. The four worship places needed to meet the sanitation requirements of worship places. They considered venue managers necessary to gain knowledge and attitude regarding sanitation and hygiene in the worship places. The knowledge of the venue managers about sanitation was poor due to the lack of information obtained, and the health center has never provided counseling related to health sanitation of worship places. The availability of human resources is associated with sanitation practices in worship places. Limited human resources contribute to poor sanitation practices. Addressing human resource gaps in the sanitation sector is crucial to ensuring effective sanitation practices (15). Then, poor sanitation facilities are associated with sanitation practices (16). The venue managers must learn the facilities to implement sanitation practices in worship places. The study identified several issues, including the absence of proper garbage disposal, unsanitary bathroom tubs

with mosquito larvae, inadequate sanitation of worship places, and the presence of water puddles in their yards during rainfall.

The numerous worship places may need to meet health and sanitation standards to avoid human health risks. Despite these risks, there is limited research focusing specifically on sanitation practices in worship places in Indonesia. This study addresses this gap by exploring key factors contributing for sanitation practices in these venues. This study investigated the association between knowledge, attitude, human resources, and sanitation facilities and how these factors influence sanitation practices in worship places. The findings of this study hold enormous importance for the Sukaraja Nuban Health Centre in Lampung, as they pertain to the establishment of healthy worship places.

MATERIALS AND METHODS

Study Design and Respondents

This study was quantitative, with a cross-sectional design conducted from February to July 2021. The study locations were all worship places in the Sukaraja Nuban Health Center Work Places Lampung, Indonesia, with as many as 66, and each worship place was represented by 1 (one) venue manager as a respondent. The respondents' criteria are that worked for more than 1 year, are over 25 years old, and are residents close to the worship places. The total subjects were 66 respondents using the total sampling technique. All worship places in the Sukaraja Nuban Health Center Work Places were taken in this study without specific criteria. The ethics committee of Universitas Ahmad Dahlan, number 012108053, has approved the ethical clearance of the study.

Instruments

A validity test is an index that shows the measuring instrument measures what is being measured (17). A questionnaire on knowledge and attitude was referred from the Guidelines for Sanitation of Public Facilities and Buildings for Worship Places (18). The questionnaire was tested on 30 venue managers of worship places in the Working Places of the Gajah City Inpatient Health Center. The reliability test result showed a Cronbach alpha value of 0.736, which means that the questions in the knowledge questionnaire are reliable. The validity test was also carried out, and it can be stated that of the 21 questions, three questions fell out because they were invalid $r_{count} < r_{table}$.

Four questions fell out in the attitude questionnaire validity test from 21 questions because they were invalid $r_{count} < r_{table}$. The reliability test result showed a Cronbach alpha value of 0.714, which means that the questions contained in the questionnaire are reliable. Then, for the questionnaire on the availability of human resources, the researcher adopted a modification from the previous research (19). The questionnaire was tested

on 30 venue managers of worship areas in the Working Area of the Gajah City Inpatient Health Center with the same characteristics. Based on the validity test results that have been carried out, it can be stated that of the seven questions, two fell out because they were invalid r count $<$ r table. The reliability test result showed a Cronbach alpha value of 0.649, which means that the questions contained in the questionnaire are reliable.

Statistical Analysis

Univariate and bivariate data were analyzed using SPSS 21 software with the Chi-square test. Univariate analysis was conducted to see the characteristics and distribution of each variable's frequency and percentage. Bivariate analysis was performed to see the relationship between the independent variables (knowledge, attitudes, availability of human resources, and availability of sanitation facilities) and the dependent variable (application of sanitation practices in worship places). This study used the Chi-square test to analyze the relationship between categorical variables with a significance of 0.05 for 95% Confidential Interval (CI) estimates.

RESULTS

Respondents Characteristic

The characteristics of respondents in the Sukaraja Nuban Health Center Work Places, Lampung, are described in (Table I). Table I provides a detailed breakdown of respondent characteristics, including age, gender, education, and other variables. The venue managers of worship places in the Sukaraja Nuban Health Center work Places, Lampung, mainly belong to the early elderly group (46-55 years) with 25 (37.9%) respondents. Most venue managers at worship places are male, accounting for 48 (72.7%) respondents, while 28 (42.4%) also work as farmers. The majority of venue managers hold a junior high school education, accounting for 37 (56.1%) of the respondents; 35 (47%) have a poor knowledge of sanitation, 39 (59.1%) have a poor attitude towards sanitation, 40 (60.6%) have limited human resources, and 36 (54.5%) have inadequate sanitation facilities.

Most venue managers demonstrated poor knowledge (53%) and attitudes (59.1%), while human resources and sanitation facilities were rated inadequate in 60.6% and 54.5% of worship places, respectively.

Table I: Respondents Characteristic in this study (n=66)

Characteristics	n (%)
Age (Years)	
26-35	18 (27.3)
36-45	23 (34.8)
46-55	25 (37.9)
Gender	
Female	18(27.3)
Male	48 (72.7)
Education level	
Less than high school	42 (63.6)
High school and more	24 (36.4)
Other Job	
Laborer	3 (4.5)
Trader	11 (16.7)
Self-employed	15 (22.7)
Farmer	28 (42.4)
Housewife	9 (13.6)
Knowledge	
Poor	35 (53)
Good	31 (47)
Attitude	
Poor	39 (59.1)
Good	27 (40.9)
Availability of Human Resources	
Poor	40 (60.6)
Good	26 (39.4)
Availability of Sanitation Facilities	
Poor	36 (54.5)
Good	30 (45.5)

Bivariate analysis

Table II shows that the bivariate analysis of the data showed a positive relationship between knowledge, attitude, human resources, and facilities of worship places sanitation with the sanitation practice in the Sukaraja Nuban Health Center Work Places, Lampung. Bivariate analysis revealed significant associations between knowledge ($p=0.001$), attitudes ($p=0.005$), human resources ($p=0.011$), and sanitation facilities ($p=0.008$) with sanitation practices in worship places. Venue managers with poor knowledge, attitudes, human resources, and sanitation facilities were over twice as likely to exhibit inadequate sanitation practices compared to those with higher ratings, as indicated by PR values ranging from 2.07 to 2.25, which can lead to poor sanitation practices than venue managers with good category in all variables. The strong association between human resources and sanitation practices highlights the critical need for resource allocation in worship places.

Table II: Association between knowledge, attitude, availability of human resources, and availability of sanitation facilities with sanitation practices in worship places.

Variables	Sanitation Practices			P value	PR	95% CI
	Poor n (%)	Good n (%)	Total N (%)			
Knowledge						
Poor	27 (77.1)	8 (14.8)	35 (53)	0.001	2.83	1.308-3.612
Good	11 (35.5)	20 (13.2)	31 (47)			
Attitude						
Poor	28 (71.8)	11 (28.2)	39 (59)	0.005	2.25	1.141-3.292
Good	10 (37)	17 (63)	27 (41)			
Availability of Human Resources						
Poor	28 (70)	12 (30)	40 (61)	0.011	2.07	1.075-3.082
Good	10 (38.5)	16 (61.5)	26 (39)			
Availability of Sanitation Facilities						
Poor	26 (72.2)	10 (27.8)	36 (55)	0.008	2.14	1.114-2.926
Good	12 (40)	18 (60)	30 (45)			

-RP: Rate Prevalence, CI: Confidence interval

DISCUSSION

This research showed that the knowledge of the venue managers of worship places could have been improved. Poor knowledge of respondents reported from questions about waste management, the requirements for trash bins that should be used in the worship places, the condition of the worship places yards, the condition of the worship places floors, related to lighting, and relating to draining the bathroom tub at certain times. Most respondents answered the questions incorrectly because of limited information about the sanitation of worship places. Most worship venue managers are relatively elderly, so they are non-optimal in getting information. It can also cause them to be less responsive and alert when dealing with the dirty environment inside and around the worship places. Also, most respondents have their last education in junior high school. The limited information obtained by the worship places' venue managers leads to age and education affecting a person's knowledge. Another study found that education, information/mass media, socio-cultural and economic, experience, environment, and age can influence a person's ability (20).

Another study reported that time constraints, lack of knowledge, and senior management commitment are the main barriers to implementing facility management policies and practices (21). The results of the present study are also in line with another study, which showed a relationship between knowledge and sanitation conditions in the Mahama Refugee Camp of Kirehe District (22). In this regard, the worship places' venue managers received information about environmental sanitation from print and electronic media, such as television and radio. It provided insight into environmental sanitation to the venue managers and influenced their ability to respond to the questionnaire (23).

Successful sanitation of worship places is influenced by the amount of money saved for this primary sanitation facility, sanitation and hygiene messages received,

and the location where the message was received. The person who visits religious institutions should get fundamental cleanliness knowledge via various channels and practical model promotion (14,19). Every religious person should appreciate and maintain the environment since their god made it an environment for humankind (24). In addition, there is a lack of knowledge, attitudes, and practices (KAP). Water, sanitation, and hygiene are vital in infectious disease transmission (25). Thus, worship place health extension activities must be revived to improve knowledge, attitudes, and practices related to water, sanitation, and hygiene. In contrast to other research, education and personal hygiene did not improve room cleanliness. (26).

This study revealed that the venue managers of worship places needed more knowledge and attitudes regarding rainwater drainage, wastewater and ablution water management, restroom cleanliness, and worship items. According to the field observations, many worship facilities still have open sewers, filthy and dirty bathrooms, and moist prayer equipment that smells musty and needs to be cleaned. Inadequate facilities and the venue manager's lack of experience and knowledge led to these issues. To improve health status, we must prioritize health knowledge and socio-behavioral changes related to sanitation practices (27). Various factors can shape attitudes, such as personal experiences, the influence of influential individuals, cultural and societal norms, mass media, educational and religious institutions, and emotional factors (28). Bad attitudes and weak legal enforcement caused poor sanitation (29).

The results of this study aligned with relevant research that found the need for more experience of the venue managers caring for the worship places and constraints on funds to maintain and repair sanitation facilities of worship places (22). Attitudes and sanitation conditions of worship places are related. It is necessary to support a positive attitude with various cultures, experiences, and facilities to create a positive attitude among communities

(23,30).

According to result data, the Sukaraja Nuban Community Health Center in Lampung had limited human resources in the worship places, especially regarding equipment and supplies. The number of worship place cleaning staff still needs to be as required. Limited human resources in the worship places are associated with other factors, such as the lack of public awareness about the importance of implementing worship places sanitation, the lack of funds to hire janitors, and the irregularity of the venue managers cleaning the worship places. Some worship places are clean only when people use the areas for prayer and rely on other worshippers to clean them, whereas the worship place janitor only sometimes stays there. Hence, the worship places could be more well-maintained and cleaner. According to the characteristics of the respondents, most worship place venue managers also have other jobs aside from managing the worship place, namely as farmers, self-employed, traders, laborers, and housewives. Therefore, they spend most of their time outside the worship place. Contrary to expectations, a significant proportion of venue managers exhibited poor attitudes towards sanitation, indicating a need for targeted awareness campaigns.

An essential factor in achieving the Sustainable Human Resource Management (SHRM) program is good quality human resources and sufficient human resources (31). The lack of resources can seriously impact sanitation practices (32). The explanation also agrees with another study stating that human resources are essential to the organization (33). Human resources are frequently regarded as the most significant aspect of prospering in today's highly competitive corporate sector, ensuring successful sanitation-focused worship service delivery (34). Adequate human resource capacity in sanitation and drinking water is vital in improving and maintaining access to better sanitation (35). Other findings showed that lack of human and financial resources, knowledge and expertise, and external collaboration are the main problems in managing worship places and sanitation facilities (36).

The research data showed that most worship places need better availability of facilities related to the sewerage channel, which still needs smoother with a closed system. The availability of trash bins still needs to be fulfilled. Some worship places do not provide garbage bins, and many toilets and urinals must be cleaned and smell bad. The venue managers of worship places were unaware of the necessary facilities and the lack of funds to fulfill the worship places's sanitation requirements. Public health interventions include improving waste and refuse collection and disposal, building new sanitation facilities, and expanding sanitation and hygiene promotion activities (37). The availability of facilities can influence the community's behavior, actions,

and practices. For example, hand-washing facilities and media availability are associated with hand-washing and soap compliance among beach tourism workers as sanitation practices (38). Learning about basic sanitation at religious organizations may help communities to perceive risk and change their behavior. (39). Community-led total sanitation and public health awareness are active actions to enhance sanitation practices (40). The intervention can improve drinking water and sanitation access and socio-economic and environmental health conditions (41).

A limitation of this study was the small samples collected because of the pandemic. The community's social mobility to public places, including places of worship, was significantly restricted. In addition, the study solely focused on the conditions during primary data collection. It did not conduct a thorough qualitative analysis of health sanitation management in worship places during the pandemic and sustainable period.

CONCLUSION

This study identified significant associations between venue managers' knowledge, attitudes, availability of human resources, and Sanitation facilities, all of which play a critical role in determining sanitation practices in worship places, especially in Sukaraja Nuban Health Center in Lampung, Indonesia. The findings suggest that improving knowledge and attitudes towards sanitation, as well as ensuring adequate human resources and facilities, are essential to enhancing sanitation practices in worship places. Targeted interventions, such as educational campaigns and increased resource allocation, could significantly reduce the risk of disease transmission in these public spaces. In collaboration with religious institutions, health authorities should prioritize sanitation training for venue managers and allocate the necessary resources to ensure that worship places meet health and sanitation standards.

One limitation of this study was the small sample size, which may limit the generalizability of the findings. Future research should aim to include a larger sample and explore additional factors that may influence sanitation practices. Further research is needed to explore the long-term impact of improved sanitation practices in worship places and to examine the role of community engagement in sustaining these practices. By addressing these key factors, significant progress can be made toward creating healthier worship environments, ultimately reducing the public health risks associated with poor sanitation.

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