

QUALITY OF HANDWASHING IN INFORMAL WORKERS IN INDONESIA

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Abstract

Introduction: Worker behavior of handwashing with soap in the informal sector has rarely not been studied in Indonesia. This study was conducted to determine factors related to the quality of handwashing performed by workers in the formal and informal sectors in Indonesia. **Methods:** The research used secondary data from Indonesia Basic Health Research. The research design was cross-sectional, and a total sample included was 421,404 workers at the productive age of 15-64 years across 34 provinces in Indonesia. The data collected included age, gender, marital status, education, place of residence, occupation, and handwashing practice. The determinants were identified using binary logistic regression. **Results and Discussion:** Results showed that 1.9% of workers did not wash their hands, and 35.0% only washed their hands with water; most of them worked in the informal sector (77.5%). Regarding the characteristics of workers, age (OR=1.17; 95% CI: 1.14–1.21), gender (OR=1.23; 95% CI: 0.93–0.99), education (OR=2.07; 95% CI: 2.01–2.14), and formal workplace (OR=1.43; 95% CI: 1.40–1.46) were mostly related to the quality of handwashing. **Conclusion:** The government is expected to formulate a structured policy in educating the workers, especially for male, young (15-24 years), low educated, and informal workers, about good handwashing. This study recommends that the government should use the current research findings to target proper population for the policy implementation.

INTRODUCTION

Informal workforce gives irregular income from unregistered entities. According to the Statistics Indonesia in 2019, the informal workforce consists of entrepreneurs assisted by temporary workers and families, farm/agricultural workers, non-agricultural workers, and unpaid family labor. According to the Statistics Indonesia in 2019, 74.08 million people (7.27%) work in the informal sector in 2019 (1). Occupational Health Efforts (OHE) are used to develop occupational health in the informal sector in Indonesia. The implementation of OHE includes promotive, preventive, curative, and rehabilitative services. OHE is a type of community empowerment to protect informal workers from adverse impacts and free them from work-related health problems (2).

Protection from the risk of disease transmission through infected palms is by handwashing with soap in running water. According to the World Health Organization (WHO), three billion people or 40% of the world's population do not have handwashing stations with soap and water (3). Three-quarters of those who lack access to water and soap live in the world's poorest countries. According to scientific evidence and recent experience, efforts to improve hand hygiene globally can

prevent approximately 165,000 deaths from diarrheal diseases each year (4). Improving hand hygiene strategies can reduce healthcare-associated infections and antimicrobial resistance (5-6).

Access to hand hygiene in public and home facilities is critical to protecting workers' health and reducing the risk of future outbreaks. The benefits of handwashing with soap (HWWS) for personal and community health are reducing 23-40% of people with diarrhea, 16-21% of people with respiratory diseases such as colds, and 58% of diarrhea cases in people with weak immunity (7). One of the efforts to improve hand hygiene is to facilitate basic access to handwashing facilities equipped with soap and water, both at home and in public facilities. According to BPS data, the population with handwashing facilities with soap in five years has increased quite well. The best increase in handwashing facilities occurred in the first three years of 2016, 2017, and 2018 at 66.28%, 68.16%, and 78.87%, respectively. Meanwhile, the growth of handwashing facilities decreased in 2019 to 76.07% and increased again in 2020 to 78.3% (8).

Even though some informal workers and their families live in urban areas, they will still be at risk of contracting the virus. The surroundings are too crowded

and unsanitary, and thus physical distancing is hard to do. Lack of access to clean, running water and handwashing facilities restricts workers to handwash (9). Informal workers, those especially in rural areas, lack information about preventive measures e.g., handwashing with soap, as well as the virus, its symptoms, and spread. If they continue to work, they usually do not have access to Personal Protective Equipment (PPE) and adequate handwashing facilities (10). Constraints such as limited workspace in urban areas make it impossible to build handwashing facilities such as sinks, thus making informal workers handwash with little water. Even if people handwash in a shorter time but frequently, they can still maintain their hand hygiene. Handwashing with soap in clean running water is a sanitary measure to maintain the quality of hands and fingers hygiene. The duration of good handwashing with soap, according to the WHO, ranges from 20-40 seconds (6). However, the fact that hand hygiene can last than an hour is still not widely known. When bacteria and viruses land on surfaces made of cardboard, metal, and plastics, they can last for hours, even days (11).

Handwashing with soap in Indonesian population has improved in the last ten years; the results of the Basic Health Research in 2007, 2013 and 2018 showed that the proportion of proper handwashing in the Indonesian population aged 10 years and over increased from 23.2% in 2007 to 47.0% in 2013 and 49.8% in 2018 (12–14). However, the trends of handwashing with soap in informal sector workers have nationally not been informed yet. This study aimed to convey information about the quality of handwashing in informal sector workers in Indonesia using the 2018 Basic Health Research. Based on this aim, it is necessary to prove whether there is a relationship between types of workers, age, gender, marital status, education, and the quality of handwashing, and occupation.

METHODS

Research Design and Data Collection

The research used secondary data from the 2018 Basic Health Research. The Indonesian Ministry of Health through The National Institute of Research and Development (NIHRD) released the results of Basic Health Research which were collected for two months from April to May 2018 across 34 provinces. Indonesia Basic Health Research is a national-scale survey with a cross-sectional study design targeting all households in Indonesia as the study population. It used the probability proportional to size (PPS) method and the stratified multistage systematic random sampling design to determine the household samples. In the the first stage,

the current research used PPS to select 30,000 primary sample units (PSU) from the 2010 Indonesian Population Census. Each PSU consists of several census blocks (BS) as census enumeration areas (EA). The second stage was the selection of BS in each selected PSU using PPS based on the estimated number of households from the 2010 Indonesian Population Census. The third stage was BPS random selection of 25 selected households based on inclusion criteria. A total of 295,720 households as many as 1,091,528 household members were successfully surveyed/visited as a sample of the 2018 Basic Health Research in 34 provinces (14). Exceptions for BS were inaccessible due to extreme geographical conditions, social unrest/conflict, and natural disasters.

Data collection in the Basic Health Research was done by trained enumerators. Previously, enumerators received training on how to use questionnaires, approach respondents, communicate effectively, and get approval from respondents. Village officers and local health workers accompanied the enumerators to visit the selected households. Before starting the interview, the enumerators asked for consent from all family members who needed to fill out a consent form. After obtaining approval, the enumerators conducted interviews with the guardians or parents (representatives of the households, e.g., older members, spouses, and the head of the household) followed by all other household members. During the interview, parents or guardians accompanied household members aged less than 15 years. Data collection was done using a structured paper-based questionnaire about household and individual levels. There are two types of Basic Health Research questionnaires in 2018, namely household questionnaires and individual questionnaires. The use of household questionnaires at the beginning of the interview, where the enumerators asked various questions about individual information in the household, access to health facilities, mental disorders in the household, and environmental health. At the same time, the use of individual questionnaires after the household questionnaire contains questions about infectious diseases, non-communicable diseases, mental health, disability, cedar, traditional health services, behavior, knowledge, and attitudes towards HIV/AIDS, maternal health, toddler health, measurement, and examination clinic. The CSPro 7.3, a census and survey processing system, was used to perform data entry (15).

Data and Variable Resources

This study further analyzed a subset of data from the 2018 Indonesia Basic Health Research. The units of analysis were 421,404 respondents who worked across 34 provinces in Indonesia and were at the productive age

of 15-64 years. We chose a minimum age of 15 years because the age range was categorized as teenagers in the Indonesia setting (16). Teenagers are mature in thinking and able to make decisions (17). The inclusion criteria of the respondents were Formal and informal workers. The formal workers were those who worked in state-owned enterprises, national army or police sector, regionally owned enterprises (code 3), or private employees (code 4). Informal workers receive irregular income from entities that are not registered while formal workers gain income from registered organizations. On the questionnaire, types of informal workers were self-employed worker (code 5), farmer/farm laborer (code 6), fisherman (code 7), laborer/driver/housemaid (code 8), and other occupations (code 9) (14). The exclusion criteria of the respondents were individuals who did not work and finish schools. Other variables involved in the analysis were individual characteristics such as age, gender, marital status, place of residence, and education of the respondents.

Statistical Analysis

Descriptive analysis was performed to the dependent variable to describe the general characteristics of the respondents (amount, frequency, and proportion). The distribution of characteristics (respondents' age, sex, marital status, and education) was then presented in a frequency distribution table and graph . Bivariate analysis was utilized to examine the relationship of the quality of handwashing with independent variables. Variables from the bivariate model analysis that were significant at a p-value of <0.2 were included in the multivariable logistic regression model (18). Multiple logistic regression analysis in this study was conducted to determine the most correlated variables among types of workers, age, sex, marital status, place of residence and education with the quality of handwashing. Factors related to the quality of handwashing were obtained through multivariable logistic regression analysis after potential confounders were adjusted. In the final model, the independent variables were evaluated by looking at the value of the statistical significance level at 5%, odds ratio (OR) and 95% of confidence interval (CI). Due to the complex nature of data sampling structure in the 2018 Basic Health Research, a complex data analysis was performed.

Ethical Clearance and Consent

The National Ethics Commission at the Institute for Health Research and Development, Indonesian Ministry of Health has given ethical clearance with letter

number: LB.02.01/2/KE.024/2018. Before starting the data collection, the enumerators asked the respondents for written consent upon their involvement in the research regarding the confidentiality of the identity and data submitted.

RESULTS

Descriptive Results

The distribution of the socio-demographic characteristics of workers is presented in Table 1. A total of 421,404 workers of working age group (15-64 years) were included in the analysis. Most of the workers involved in this study were adults aged 35-44 years (26%), while regarding the representation of gender the research had more female respondents than male (63.6%) and married respondents (82.9%). The latest education of the workers was dominated by secondary education level (48.6%), and some did not finish primary school (15.5%). According to the place of residence, most of the respondents lived in urban areas (54.1%). Based on the type of work, most of the workers worked in the informal sector (77.5%). In this study, 8,124 workers (1.9%) did not wash their hands, 147,398 workers (35.0%) did good handwashing, and 265,882 (63.1%) performed good handwashing.

Table 1. Distribution of Characteristics of Workers in Indonesia in 2018 (n= 421,404)

Individual Characteristics	n	%
Age		
15-24 years (Ref.)	55,724	13.2
25-34 years	107,995	25.6
35-44 years	109,409	26.0
45-54 years	91,812	21.8
55-64 years	56,464	13.4
Gender		
Man (Ref.)	268,160	63.6
Woman	153,244	36.4
Marital Status		
Single (Ref.)	72,089	17.1
Married	349,315	82.9
Education		
No education (Ref.)	65,165	15.5
Primary	101,992	24.2
Secondary	204,707	48.6
Tertiary	49,539	11.8
Residence		
Urban (Ref.)	227,806	54.1
Rural	193,598	45.9
Occupation		
Informal (Ref.)	326,789	77.5
Formal	94,615	22.5
Hand washing quality		
Bad (Not washing hands)	8,124	1.9
Enough (Sometimes washing hands)	147,398	35.0
Good (Regularly washing hands with soap in clean running water)	265,882	63.1

Bivariate Analysis

In Table 2, the results of the bivariate logistic regression test show the relationship of the quality of handwashing with demographic characteristics and employment status. Viewed by age group, older participants (aged 25 years and over) were more likely to perform good handwashing. Workers aged 55-64 years were significantly associated with good handwashing (OR = 0.93; 95% CI: 0.91 – 0.95). According to gender, female workers were significantly associated with good handwashing than males (OR = 1.21; 95% CI: 1.20– 1.23). Workers who were married were more likely to perform good handwashing than single ones (unmarried).

Table 2. Bivariate Analysis of Variables Related to the Quality of Handwashing Among Workers in Indonesia (n=421,404)

Variable	Quality Hand Wash				
	Yes	No	OR	95% CI	p
Age					
15-24 years (Ref.)	63.2	36.8			
25-34 years	63.2	36.8	1.00	0.98 – 1.02	0.83
35-44 years	63.5	36.5	1.01	0.99 – 1.04	0.19
45-54 years	63.5	36.5	1.01	0.99 – 1.04	0.23
55-64 years	61.4	38.6	0.93	0.91 – 0.95	0.00
Gender					
Man (Ref.)	61.5	38.5			
Woman	65.9	34.1	1.21	1.20 – 1.23	0.000
Marital Status					
Single (Ref.)	63.3	36.7			
Married	63.1	36.9	0.99	0.97 – 1.01	0.266
Education					
No education (Ref.)	52.3	47.7			
Primary	57.7	42.3	1.24	1.22 – 1.27	0.000
Secondary	65.8	34.2	1.75	1.72 – 1.78	0.000
Tertiary	77.5	22.5	3.13	3.05 – 3.22	0.000
Residence					
Urban (Ref.)	71.5	28.5			
Rural	53.2	46.8	0.45	0.45-0.46	0.000
Occupation					
Informal (Ref.)	59.6	40.4			
Formal	75.2	24.8	2.05	2.02 – 2.09	0.000

Education level was significantly related to the quality of handwashing with soap. The higher the worker education level, the better the possibility of handwashing. Workers who attended primary education (OR = 1.24; 95% CI: 1.22 – 1.27), intermediate education (OR = 1.75; 95% CI: 1.72 – 1.78), and high education (OR = 3.13; 95% CI: 3.05 – 3.22) were more likely to perform good handwashing compared to those who did not attend school. The place of residence was significantly related to the quality of handwashing. Workers who lived in urban areas were more likely to perform good handwashing than those in rural areas (OR = 0.451; 95% CI: 0.445-0.457). Occupation was significantly related to the quality of handwashing as well. Formal workers were more likely to perform good handwashing than informal workers (OR = 2.05; 95% CI: 2.02-2.09).

Multivariate Analysis

The binary logistic regression test results on factors related to the quality of handwashing in workers are depicted in Table 3. This statistical test can determine the determinants of knowledge about the quality of handwashing among workers in Indonesia. For reference, the selected category is “no handwashing”. Table 4 illustrates that workers in the older age group had a more significant opportunity to wash their hands than those in the age of 15-24 years as a reference. For example, workers aged 55-64 years had a 1.17 times chance of washing their hands compared to workers aged 15-24 years (OR = 1.17; 95% CI: 1.14 – 1.21). By gender, it appeared that female workers were more likely to perform good handwashing than male workers. Female workers were 1.23 time more likely to practice good handwashing than male workers (OR = 1.23; 95% CI: 0.93 – 0.99).

Table 3. Analysis of Multivariate Odds Ratio (OR) Factors Related to the Quality of Handwashing Among Workers in Indonesia in 2018 (n = 421,404)

Variable	Quality Hand Wash				
	Yes	No	OR	95% CI	p
Age					
15-24 years (Ref.)	63.2	36.8			
25-34 years	63.2	36.8	0.96	0.94 – 0.99	0.006
35-44 years	63.5	36.5	1.06	1.03 – 1.08	0.000
45-54 years	63.5	36.5	1.13	1.10 – 1.16	0.000
55-64 years	61.4	38.6	1.17	1.14 – 1.21	0.000
Gender					
Man (Ref.)	61.5	38.5			
Woman	65.9	34.1	1.23	1.21 – 1.25	0.000
Marital Status					
Single (Ref.)	63.3	36.7			
Married	63.1	36.9	1.11	1.09 – 1.14	0.000
Education					
No education (Ref.)	52.3	47.7			
Primary	57.7	42.3	1.24	1.21 – 1.26	0.000
Secondary	65.8	34.2	1.51	1.48 – 1.54	0.000
Tertiary	77.5	22.5	2.07	2.01 – 2.14	0.000
Residence					
Urban (Ref.)	71.5	28.5			
Rural	53.2	46.8	0.53	0.52 – 0.53	0.000
Occupation					
Informal (Ref.)	59.6	40.4			
Formal	75.2	24.8	1.43	1.40 – 1.46	0.000

Workers with married status were 1.11 times more likely to practice good handwashing than those who were unmarried yet or never married (OR = 1.11; 95% CI: 1.09 – 1.14). Workers with tertiary education were 2.07 times more likely to practice good handwashing than those who never attended school (OR = 2.07; 95% CI: 2.01 – 2.14). Based on the housing criteria, workers from rural areas were 0.53 more likely to practice good handwashing than those living in urban areas (OR = 0.53; 95% CI: 0.52 – 0.53). Workers in the formal sector were

1.43 times more likely to practice good handwashing than those in the informal sector (OR = 1.43; 95% CI: 1.40 – 1.46).

DISCUSSION

Good handwashing is washing hands with soap in running water to rinse the foam at the indefinite duration. Referring to the Joint Monitoring Program (JMP), the indicators for good handwashing practice is divided into three. First, handwashing facilities are available at home, and they provide soap and water. Second, limited handwashing facilities are available at home without soap or water. Third, none of handwashing facilities available at home is referred to no service. However, this definition is limited to households, technically not non-household groups (19). Washing hands properly can help prevent the spread and eliminate viruses on the surface of the hands that emerge after coughing, sneezing, and touching objects containing infectious pathogen. Handwashing also reduces the rate of respiratory infections and prevent them to enter the body or transmit (20–23).

Results showed that 77.5% of the respondents worked in the informal sector. Of the workers, 63.1% washed their hands properly, and 1.9% of workers did not. From the analysis results, workers in the formal sector were 1.43 times more likely to practice good handwashing than those in the informal sector, possibly because of available handwashing facilities such as clean water sources, permanent handwashing facilities, running water, soap, and permanent toilets which are more likely available in the formal sector (24–26). According to the Situational Analysis Report from UNICEF, speaking public handwashing facilities e.g., terminals/stations and public transport, 56% of them have limited access, and 30% of them have no access. In traditional markets, parks, places of worship, public service, and others, 26% of them have limited access, and 44% of them have no access. Moreover, limited handwashing facilities are available in 99.29% of healthcare centers (27). Thus, it is necessary to improve basic handwashing facilities in public.

This current study showed female workers were more likely to practice good handwashing than male workers. These results are consistent with studies in the United States and Korea which found that female participants washed their hands significantly more than male participants (28–32). Women have high commitment to hand hygiene, and in general, this attitude is an acceptable behavior (33–35). Besides, men tend to ignore hand hygiene practices, especially in hurry when going to the bathroom alone (29). Compliance rates with

handwashing in women are generally better than men, and women may find it easier to follow hand hygiene guidelines from promotional materials (36-37). Thus, the effect of the promotion media on handwashing practice on women may be more potential than men.

The analysis results proved that older workers had a 1.17 times greater chance of washing their hands than younger workers (15-24 years). This finding is consistent with the results of several studies which stated that older age is associated with better perceptions of hand hygiene practices (38-39). However, these results are inconsistent with studies in Cameroon (40) and Bangladesh (41), where older age is significantly associated with lower mean scores of knowledge. These studies showed that older people have lower scores in knowledge about hand hygiene and handwashing practice compared to younger counterparts. Generally, older adults have fewer opportunities to receive education on hand hygiene than younger ones (42). Thus, education on hand hygiene or exposure to hand hygiene campaigns for older adults can increase their awareness of hand hygiene.

Workers with higher education were 2.07 times more likely to practice good handwashing compared to those who never attended schools. In general, workers with higher education had a work environment that has more accessible handwashing facilities and infrastructure. Individuals who did not attend school had fewer opportunities to receive education on hand hygiene or be exposed to hand hygiene campaigns compared to those with higher education levels. Access to education on proper handwashing is likely to increase awareness of handwashing.

Socialization and education on informal workers might increase awareness of microbial transmission through hands, emphasize the importance of hand hygiene and its indications, and demonstrate the proper handwashing procedure. The Information Education Communication (IEC) products, such as IEC print media, IEC social media, and IEC electronic media as sources of information can be used to promote good handwashing behavior (43). Primary healthcare centers need to conduct counseling related to good handwashing in public facilities (25). Good cooperation with social institutions/institutions related to handwashing programs needs to be encouraged (44). Involvement of health cadres in education and community empowerment is related to proper handwashing programs. Permanent handwashing facilities with the availability of soap and clean water should be provided around public facilities (schools, markets, transportation places, houses of worship, recreation areas, commercial buildings, and others) (45-46).

To improve the quality of hand washing, increasing access to water supply and physical infrastructure, soap, alcohol-based hand rub, and affordable cleaning equipment is another effort. In addition, it is necessary to change individual behavior since handwashing should be an integral part of our daily life. Some common obstacles are improper sink placement, damaged sink, perceived time; skin irritation; and workflows that do not provide workers opportunities to practice handwashing. Besides, hand hygiene is also one of the most cost-effective ways to prevent the spread of infectious diseases. According to WHO, improving hand hygiene policies can result in savings in health expenditures of up to 15 times.

The limitation of this study is that the questionnaire of Indonesia Basic Health Research did not address the adequate time and procedures for good handwashing which are supposed to accord with the WHO's recommendations. In addition, the questionnaire also does not have questions related to handwashing facilities at work, in public places, and residential areas, and thus this study does not describe the availability of facilities at work and home.

CONCLUSION

Out of 77.5% informal workers, 1.9% did not wash hands after doing activities at work; 35.0% did handwashing in water, and 63.1% did handwashing with soap in running water. The results showed that female workers are more likely to apply good handwashing than male workers. Highly educated workers are more likely to practice good handwashing than workers with low education. Formal workers are more likely to practice good handwashing than informal workers. The workers in the informal sector cannot access adequate public handwashing facilities. Support from various parties is needed to facilitate adequate basic access to public handwashing facilities and increase knowledge about good handwashing, especially in young (15-24 years), low educated, male informal workers. This study recommends that the government should focus on the current research findings to target a policy setting.

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