The forgotten step in hand hygiene : a look at hand drying practices in the VFSM survey

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Abstract. Handwashing is a cornerstone defense against the growing threat of antimicrobial resistance (AMR). This study explores knowledge of proper handwashing techniques among participants in the Village Food Safety Movement (VFSM) Program across all 34 Indonesian provinces. We conducted a Pre-Post Intervention survey to assess the knowledge of proper handwashing techniques. The survey revealed a low percentage of correct responses concerning proper handwashing techniques across all four respondent groups: housewives, youth, the household food industry, and the ready-to-eat food industry. Even after the intervention, correct response rates remained below 30% in these groups. The respondents from schools (77%) and retail (61%) showed a slightly higher percentage of correct responses after the intervention, but it remained below the ideal standard of 80%. This highlights a critical knowledge gap: proper handwashing includes thorough drying after washing hands. This study reveals a concerning lack of understanding about the complete handwashing process, potentially hindering efforts to prevent disease transmission and AMR in Indonesia. Future research should prioritize interventions that specifically address hand drying practices in addition to washing techniques. Policymakers and healthcare professionals should integrate hand drying education into their AMR control strategies.

1 Introduction

Antimicrobial resistance (AMR) is a global public health concern. According to a paper by Institute for Health Metrics and Evaluation (IHME), AMR has become a leading cause of death globally. The study showed that 1,27 million deaths in 2019 were directly caused by AMR [1]. In Indonesia, there were 34,500 deaths attributable to AMR and 133,800 deaths associated with AMR in 2019 [2]. Furthermore, another research article on antimicrobial resistance indicates that the situation regarding AMR in Indonesia is not improving [3].

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The World Health Organization (WHO) has developed tools for optimizing the prevention and control of AMR, adopting a One Health approach. Based on The Tracking AMR Country Self Assessment Survey in 2023, more effort and investment are required on AMR training and education in the sectors of food production, food safety and their environmental aspects for more sustainable AMR action. Interventions should also aim to transition from awareness to adaptation and behaviour change [4]. Good manufacturing and hygiene practices to reduce the development and transmission of AMR in food processing became one of indicators in the tools.

Handwashing is a cornerstone defence against the growing threat of AMR especially in food safety practices. When optimally performed, hand washing prevents the spread of germs and cross contamination. The comprehension of appropriate hand hygiene practices in Indonesia is notably deficient. According to Indonesia Health Survey (SKI) 2023, the percentage of handwashing practices in proper manner was 51,1% [5]. The inadequate understanding associated with hand hygiene practices necessitates our concentrated attention on this subject.

Since 2015, Indonesian Food and Drug Control Authority (Indonesian FDA) has launched the Village Food Safety Movement (VFSM) Program across all 34 provinces. This initiative involves conducting interventions to enhance food safety. The VFSM program is predicated on the principle of empowering village communities on both the supply side (food enterprises) and the demand side (the communities themselves). The objective of VFSM is to enhance the self-sufficiency of communities within the food safety sector. This empowerment enables communities to independently monitor food safety, thereby ensuring the provision of safe food at an individual level. Furthermore, this initiative contributes to the strengthening of the village economy [6].

In order to accomplish the goals of this program, it is crucial to execute a pre-intervention evaluation of the village communities' understanding and behaviour concerning food safety, including their capacity to implement food safety measures such as effective hand hygiene practices. The outcomes of this evaluation serve as a basis for determining an efficacious intervention strategy tailored for the village communities. Moreover, it is essential to conduct monitoring and evaluation of the VFSM program through a post-intervention assessment. The findings from the post-assessment are utilized to enhance or devise other programs, particularly those aimed at combating the issue of AMR within communities.

2 Materials and Methods

2.1 Participants

The village communities, which were housewives, youths, schools (teachers and canteen hawkers), household food industry, ready-to-eat food industry, and retail participated in the Pre-Post Test Intervention survey across 227 villages in the VFSM program within all 34 Indonesian provinces in 2023.

2.2 Research Design

This study conducted operational research focused on food safety intervention in the VFSM program, which included training on proper handwashing techniques. The study employed a pre-post test one group design and consisted of three stages: pre-intervention assessment, the intervention involving training for Village Cadres and technical guidance for Village Communities, and post-intervention assessment.

The data collected pre-post intervention was analyzed using univariate methods. This included calculating frequencies, distributions, central tendency values, and dispersion of the research variables. The questionnaires used for the assessments pre-post intervention had the same questions. The scores from these assessments were compared to determine the effectiveness of the intervention.

2.3 Data collection tools

This study employed questionnaire surveys distributed to participants by enumerators of Indonesian FDA regional offices in 34 provinces. Filled questionnaires collected via EpiData and sent to Directorate of Community and Processed Food Entrepreneurs Empowerment of the Indonesian FDA to be analysed.

3 Results and Discussion

According to a pre-post intervention survey conducted across selected villages participating in the Village Food Safety program throughout all 34 provinces in Indonesia, there was a notably low percentage of correct responses regarding proper handwashing techniques (see Table 1).

Table 1. Percentage of Correct Responses Regarding Proper Handwashing Techniques

No	Respondents	Percentage of Correct Responses Regarding Proper Handwashing Techniques	
		Pre Intervention	Post Intervention
1	Housewives	6%	27%
2	School communities (teachers and canteen hawkers)	62%	77%
3	Youth communities	8%	25%
4	Household food industry	11%	28%
5	Ready-to-eat food industry	17%	28%
6	Retail	43%	61%

The survey revealed a low percentage of correct responses regarding proper handwashing techniques. As observed in Table 1, even after the intervention, the correct response rate from all groups remained below 30%. Although there was a slight increase in the percentages for schools and retail, it is evident that there is a need to strive towards achieving the 80% standard for knowledge, attitude, and practice. According to Bloom, the assessment of knowledge, attitude, and practice domains indicates that a score between 80 and 100% reflects good performance, while a score between 60 and 79% denotes moderate performance. Scores below 60% suggest poor performance in the domain [7–9]. This survey highlights a critical knowledge gap: proper handwashing includes thorough drying after washing hands. Another study reported that the percentage of handwashing practices in the proper manner in Indonesia was 51,1% [5]. In this study, the appropriate handwashing habit refers to the handwashing practice of using soap and running water [5].

The research clearly indicates that there is a significant lack of knowledge about proper hand washing in Indonesia. The practice of washing hands with soap and running water is not widespread among the Indonesian people. Additionally, the habit of washing hands with proper drying steps is also not widely practiced. This inadequate sanitation and poor personal hygiene can directly contribute to infections, leading to an increased need for antibiotics [10]. Furthermore, it is undeniable that poor hygiene practices play a crucial role in the spread of

community-based infections, such as gastrointestinal and respiratory tract infections [11]. Within our everyday environments, encompassing homes, schools, and other communal settings, there exist abundant opportunities for the propagation of infections. This includes the potential transmission of drug-resistant microorganisms within our communities [10]. Hands are crucial in spreading enteric pathogens between people and their environment. A comprehensive study involving 44 distinct microorganisms identified *E. coli* and fecal coliforms as the most frequently reported indicators. Additionally, the study documented hand contamination with 12 unique enteric pathogens, with adenovirus and norovirus being the most prevalent. The prevalence of *E. coli* on hands was determined to be 62%, while the prevalence of faecal coliforms was found to be 66% [12].

Improving hand hygiene is thus an important factor in controlling antimicrobial resistance. Effective implementation of hygiene practices at home and in daily life can significantly reduce infection rates and decrease the demand for antibiotic prescriptions. This proactive approach helps mitigate the development and spread of antibiotic resistance [11]. Hand hygiene is crucial for reducing healthcare-associated infections and limiting the transmission of antimicrobial-resistant pathogen [13]. Promoting hand washing in communities significantly prevents approximately one-quarter of diarrhea episodes [14]. Additionally, regular hand washing reduces the risk of respiratory infections, with reported risk reductions ranging from 6% to 44% [15]. These findings underscore the critical importance of hand hygiene in effectively reducing the incidence of infectious diseases. Hand hygiene represents a crucial frontline defense in combating the transmission of infectious diseases and curbing the escalation of antimicrobial resistance.

Utilizing proper handwashing techniques, involving thorough washing with soap and water, followed by complete drying using an air dryer or clean towel, effectively eliminates a diverse array of harmful microorganisms from hands. Properly drying hands after washing is essential for hand hygiene due to the higher risk of bacteria transmission from wet skin than dry skin [16]. As hands are dried with either an air dryer or a cloth towel, the amount of bacteria transferred through touch contact decreases progressively. This decrease aligns with the removal of leftover moisture from the hands during the drying process [17]. Adhering to stringent hand hygiene practices not only protects individuals but also promotes community-wide health resilience. By consistently washing hands properly, individuals play a proactive role in preventing infections and contribute directly to reducing the need for antibiotics. This proactive approach helps control the spread of diseases and antibiotic resistance, especially in places with limited resources.

This necessitates urgent action to promote better hand hygiene practices to prevent the spread of diseases and antibiotic resistance. It is crucial to continuously share knowledge about hand hygiene because it is an extremely effective way to keep people safe from infection. Understanding when and how to perform hand hygiene not only motivates action but also provides a very cost-effective way to achieve public health targets. Hand hygiene undeniably saves lives especially crucial in protecting vulnerable populations [18]. Extensive education on the correct hand washing techniques is imperative in order to make a significant impact. The provision of information, education, and communication on hand hygiene to secondary school students had a significant impact on improving the students' handwashing practices [19]. Another study reported that the intensive hand hygiene intervention successfully reduced the transmission of influenza among schoolchildren and was both feasible and acceptable [20]. The requisite steps that need to be taken are as follows: implementing education for the public should prioritize interventions that specifically address hand-drying practices in addition to washing techniques, policy makers and healthcare professionals should integrate hand-drying education into their AMR control strategies, make sure that hand washing facilities are readily available in schools, health facilities, public places, and other relevant locations, as the public needs both education about the importance of hand washing and access to the necessary

infrastructure to practice this behaviour. Educational activities can be strategically planned to educate the community about the crucial significance of hand hygiene. To achieve this, it is recommended to develop educational multimedia materials that comprehensively underscore the importance of proper handwashing. These materials serve as clear and powerful visual aid for the public. The content should be designed to be both engaging and informative, ensuring simplicity and memorability through the incorporation of auditory and visually elements.

4 Conclusion

This study reveals a concerning lack of understanding about the complete handwashing process, potentially hindering efforts to prevent disease transmission and AMR in Indonesia. Proper handwashing is crucial to stop the spread of infections. It is essential to raise public awareness about the importance of hand hygiene in preventing the transmission of infections and combating antimicrobial resistance. Future research should prioritize interventions that specifically address hand drying practices in addition to washing techniques. Policymakers and healthcare professionals should integrate hand-drying education into their AMR control strategies.

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