

Environmental Hygiene Practices, Food Safety and Community Health in Sub-Saharan Africa: A Scoping Review Study.

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ABSTRACT

Food safety is a fundamental aspect of community health, ensuring that food consumed by individuals is free from harmful contaminants. WHO estimates that annually, there are nearly 600 million cases globally associated with poor food hygiene. Most studies on hygiene and food safety demonstrate that washing hands often with soap and water for at least 20 seconds plays a significant role in food safety. The objective of this review was to identify and characterize primary literature examining hygiene practices and food safety with a focus on facility related hygiene practices at household and establishment levels in Sub-Saharan Africa. The scoping review adopted the Joann Briggs institute (JB) manual for reporting items. A comprehensive search was conducted from scientific databases (PubMed) and other research bodies and relevant articles published within 2015-2025. To ensure consistency, three reviewers independently screened the existing studies for relevance. Data extraction was performed using Microsoft excel, and meta-analysis. The extracted data from included studies was organized and presented using narrative synthesis. The review established that most studies identified (WASH) practices as important factors in food safety. Promoting hand washing with soap was found to be an important health intervention in the control of foodborne illnesses. The study further noted that there is limited data on food safety and determinants of environmental factors like air ventilation, cleaning and disinfecting regularly touched surfaces. The study concluded that there is need to explore the existing gap on how air and facility hygiene practices in homes influence foodborne illnesses. Further research is needed to establish to what extent fresh air circulation in indoor space and cleaning and disinfecting regularly touched surfaces in households affects food safety. These results will guide policy on how to enhance food safety knowledge through targeted home-based interventions. Dissemination of these findings will be done through journal publications and various media platforms.

Keywords: Environmental Hygiene, Hygiene Practices, Food Safety, Foodborne Illnesses

INTRODUCTION

Hygiene refers to practices that promote good health and cleanliness, such as bathing with soap and water (CDC, 2025). In many areas particularly in the Sub-Saharan Africa, lack of access to clean water and soap makes observance of hygiene difficult. Globally, as of 2023, about 2.3 billion people did not have access to a handwashing facility with water and soap at home (WHO, 2025). Around 670 million people did not have access to any handwashing facility at all, and 462 million children lacked access to handwashing facilities at schools (WHO, 2025). Hygiene and community health are affected by unequal access to essential resources like clean water, sanitation, and hygiene (WASH), which disproportionately affects developing regions and contributes to a high burden of disease, particularly among children (WHO/UNICEF, 2022).

According to the GHC, (2025), water, sanitation and hygiene interventions are essential for reducing the burden of foodborne diseases and achieving global health goals. Good hygiene is also crucial in preventing respiratory diseases in the population by limiting the spread of germs through actions like covering coughs and sneezes, washing hands frequently, and cleaning high touch surfaces (Oyeshalem Mekasha et al., (2023). According to WHO/UNICEF, (2019), nearly 300 million people got sick and almost 2 million died due to lower respiratory infections alone. Food safety on the other hand is the practice of handling, storing, and preparing food to prevent foodborne illnesses, which are diseases caused by consuming contaminated food. WHO, 2024, estimates that

annually, nearly 600 million people fall ill and 425,000 die, leading to a loss of 33 million healthy life years after eating contaminated food. Children under 5 years of age carry 40% of the foodborne disease burden, with 125,000 deaths every year. The Sub-Saharan African region has the highest burden of foodborne diseases, with 137,000 deaths reported annually (WHO, 2024).

These infections are caused by bacteria, viruses, parasites, and chemical contaminants, including mycotoxins, heavy metals, and processing toxins (Dhrow D, (2024)). They are often associated with poor hygiene and improper storage, leading to significant health impacts. The Common pathogens include salmonella, campylobacter, and Escherichia coli (Dhrow D, (2024)). Hygiene, food safety and community health are intertwined with access to clean water, sanitation and hygiene, (GHC, 2025). WASH encompasses access to clean water, adequate sanitation facilities, and the promotion of hygiene practices to prevent diseases and enhance well-being.

It plays a pivotal role in food safety by mitigating contamination risks throughout the food supply chain, from production to consumption. Contaminated water which may be due to inadequate access to safe drinking water, often as a result of poor sanitation, leads to the consumption of water containing disease-causing organisms (Venkatesh U, (2023)). Fecal-oral transmission can occur where germs from feces easily transfer to hands, food, or surfaces. This can happen if hands are not washed after using the toilet or if food is not handled safely (Merchant M, (2023)).

Environmental hygiene includes clean compounds and working surfaces (Bennetah M. Wafuko et al., 2021). According to the Kenya Public Health ACT CAP 242 of 2022, food premises ought to meet varied environmental standards relating to their construction. Among them are that the premises should be regularly fumigated to eliminate pests and rodents. The design of the premises should allow for separate storage of uncooked and cooked products. The premises should have sufficient space and should be put up in fitting locations. Moreover, the premises should be put up in ways that minimize the related potential for causing environmental pollution and contamination. The law further states that food premises should be designed properly so that they are easy to clean, maintain and repair. The premises should also have sufficient supplies of water, lighting and ventilation.

According to Dr. Negasa ES, (2025), environmental hygiene services are essential to food safety, directly preventing contamination by managing sanitation, pests, and air quality in food production areas. The role of Sanitation and environmental hygiene services in food safety includes prevention of contamination in form of regular cleaning and sanitization of food preparation areas, equipment, and utensils to reduce the risk of microbial contamination and compliance with regulations where food businesses comply with local, national and international food safety regulations. Promoting hygiene practices by training of staff on proper sanitation protocols and personal hygiene practices minimizes the risk of cross-contamination and enhances food quality (Dr. Negasa ES, (2025)). Further, cleaning of the environment to ensure overall quality and safety of food products leads to better consumer trust and satisfaction and promote proper food hygiene and safety.

A study by OJ Okesanya, (2024) notes that by adhering to the key practices for food hygiene (proper personal hygiene, food handling and preparation, separating raw and cooked foods, cooking at safe temperatures, proper storage and sanitation and cleaning of equipment, work surfaces, and storage areas) help ensure that food products are safe for consumption. Further, he cites food handler profile (lack of personal hygiene, motivation and attitudes), (lack of food safety training and knowledge) and social-economic factors (access to clean water, income level, education and access to resources like finances) as important factors influencing food safety. It's worth noting that observing food safety in households and establishments is essential for preventing foodborne illnesses, which can lead to over 200 diseases, ranging from diarrhea to cancers. It also protects community health, reduces healthcare costs, and enhances consumer confidence in food systems (Dr. Negesa ES, (2025)).

Despite the challenges encountered in adhering to food safety requirements, A, Cathlene Tohono et al., (2024) suggests that education and health awareness can reduce the risk of foodborne illness and improve community health outcomes. Overall, It was determined that there is extensive research conducted on this subject matter, but there is a glaring lack of data on food safety and determinants of environmental hygiene factors like air

ventilation, cleaning and disinfecting regularly touched surfaces among households in Sub-Saharan Africa and therefore there is need to explore this area for a further study.

MATERIALS AND METHODS

The scoping review followed the guidelines outlined in the preferred reporting items for systematic review and meta-analysis (PRISMA-ScR) framework and as contained in Joanna Briggs Institute (JBI) manual. The purpose of this review was to identify and characterize the primary data related to hygiene practices and food safety with a special focus on environmental hygiene factors that influence food safety. To ensure comprehensive coverage, a broad search strategy was implemented using the following keywords: hygiene practice or food hygiene or food safety or environmental hygiene.

The next step involved a search for the primary scientific research in various electronic databases (PubMed, Embase, Cochrane, and the virtual health library platforms), which provided access to lilacs, web of science, and ScoPus. Meanwhile, google scholar was used to locate pertinent grey literature. For each study that passed the full-text screening, key data were extracted and recorded in a Microsoft excel spreadsheet. The extracted data included the specific hygiene practice topics covered in the study, the year of publication, the keywords used in the article and the geographical location.

To ensure validity and reduce bias, quality appraisal of the included studies were subjected to the (CASP), checklist, and (JBIF) and (MMAT) tools. For the study to ensure consistency in the evaluation of studies, two independent reviewers screened and extracted the data. The third reviewer resolved disagreements arising between the other two reviewers. A two stage screening including title/abstract and full text was conducted. Data extraction was performed using Microsoft excel, and meta-analysis. The extracted data from included studies was organized and presented using narrative synthesis.

The inclusion criteria were that the primary focus of the article was on hygiene practices and food safety, the full-text of the article was accessible for a more detailed eligibility assessment, and the article was written in English language and for the period (2015-2025). Exclusion criteria were letters to the editor, editorials, and commentary perspectives and article reviewer's comments.

RESULTS

Identification of studies via databases and registers

This review identified 1226 published studies. The types of studies included observational (cohort, case studies and cross-sectional), experimental (randomized controls trials and quasi-experimental), qualitative, quantitative and mixed methods. From this number, 1174 studies were removed after screening due to overlapping, Contradicting titles with the study theme and unclear study objectives. The review studies (52) that met the inclusion criteria were selected. The types of studies assessed were observational (10), experimental (12), quantitative (6), qualitative (8), and mixed method studies (16). Out of the studies sampled, 12 (6.24%) were published in Ethiopia, followed closely by Nigeria with 10 (5.2%), South Africa, 8 (4.16%) and Kenya with 3 (1.56%). Slightly over (90%) of these studies investigated the role of water, sanitation and hygiene practices and food safety.

A common research methodology was noted where a fairly good number of these studies were in the urban settings and clustered into (low density high income), (medium density middle income), (high density low income) and (informal settlement low income). Among the environmental sanitation characteristics studied were water supply and quality indicators (amount of water a family uses per day, whether household treat the water before use, methods of treatment and water shortage frequency), sanitation methods (type of toilet facility, adequacy of the toilet facility, washing of hands after visiting the toilet and disposal of waste), household and personal hygiene practices (presence of insect vectors and uncollected solid wastes, type of container, whether covered or not and their management). Food handling practices (equipment and facilities where food was stored, prepared and served including knowledge and attitudes of the people handling the food).

Access and availability of drinking water in the households and establishments

This review determined that access and availability of drinking water was a major concern in most of the Sub-Saharan African Countries. In Kenya, majority of the respondents obtained their water from either household tap, public water tap or water container. In Kinshasa, 58% of households used tap water. Ethiopia, (67%) obtained their water from storage equipment, while in Nigeria, 57.6% of the households obtained their water from vendors from unknown sources. The review further established that all the households had a known source of water supply. Respondents from the high-income environs obtained their water mainly from the household's tap. Those from the low-income environs had their water from a public tap.

A disparity existed between the high-income and the low-income resident in regard to quantity of water use, water treatment and frequency of water shortages. To determine the quality of water the respondents consumed, the review established that water samples that were taken from the household's taps for bacteriological test were found to be negative, while those from the public taps contained microbial contaminants (*T. coli* and Total coli bacteria) respectively. Noted too was the existence of significant differences between access to water quality and adequacy and respondent's residence.

Sanitation, facility hygiene and food safety

The review highlighted the roles of sanitation and facility hygiene services in food safety as preventing contamination, compliance with regulations and promoting hygiene practices. It further determined that (45%) of households from rural areas of Ethiopia, and (51%) of households in urban and rural Ethiopia demonstrated good food handling practices by separating raw and cooked food. Food handlers with valid health certificates were only 21.1%, and non among the street food vendors. In Ethiopia and Ghana, 82.4% and 99.34% of the respondents understood the importance of handwashing in preventing food contamination. In Uganda, 58.8% of food service establishments were in poor sanitary conditions. It was common to find restaurants lacking essential infrastructure such as toilets and access to clean water. In Kinshasa, (53%) of restaurants had their walls made of sheet metal. In Benin, some restaurants operated in the open air or under trees.

Personal hygiene practices and food contamination

The importance of hand washing to prevent food contamination was reinforced in this study. Hand washing with soap and water significantly reduced *E. coli* bacteria (AOR: 2.81, 95% CI: 1.62-11.8) and scrubbing with soap for >10 seconds further enhanced this reduction (AOR: 5.07, 95% CI: 1.34-19.1). In Bamako, 42.4% of canteen workers did not use soap when washing hands, while 90% in food stalls washed their hands with soap and water. The practices of separating raw and cooked food by food handlers scored 38.9% in Ethiopia and 87.8% in southern Nigeria. Checking food expiry dates, Ethiopia had 42.2% and Nigeria 69.9% respectively. Covering of the prepared food, Ethiopia had highest rate of 83.6%, and lowest rate was 73.3%. The review also noted that the attitudes of the community towards food expiry date varied across the studies, where (89.2%) of respondents in Ghana saw the importance of discarding expired foods. In Kenya, only a small number of respondents (22.6%) shared this view.

Knowledge and attitudes of food handlers

The practice of reheating previously cooked food to reduce risk of contamination found that 65.8% of respondents always reheated their food, 17.4% did so often, and 1.5% occasionally. Noted too, was that the respondents kept their premises clean particularly the kitchen. Overall, this review established that although the importance of environmental sanitation as an intervention on food hygiene at household and establishment levels has been highly published, a fairly good number of people in Sub Saharan Africa don't practice it. The study further noted that while there are numerous benefits to improving WASH services for food safety, several challenges hinder their implementation. They include funding limitations, community resistance, political and regulatory barriers. However, engaging stakeholders in discussions about their experiences with water, sanitation and hygiene (WASH) services can provide valuable insights into the challenges faced and solutions developed at local level.

DISCUSSIONS

Majority of the studies analyzed in this review observed that access and quality of water was a major concern in many households. The review determined that the source of water supply for most of the respondents was either from the household tap, community tap, unlicensed water vendor and storage equipment. There was clear disparity in terms of respondent's economic status and water supply. Significant differences with regard to the water use, shortage, frequency of supply and treatment were noted. These finding goes against the WHO, (2024) recommendations which state that each community should have a safe and adequate supply of water for household's needs. WHO further notes that Intervention for prevention and control of diarrheal diseases not only include enhanced water quality but also steps to improve access to water supply within domestic and community health settings. Unequal access of water supply in the community is also of concern to the WB, (2015) that observed that the poor are normally disproportionately underserved with water services.

With regard to water contamination levels, this review determined that the water sampled for microbial contaminants from both high-income and low-income residence differed significantly. Non-compliance was higher for public water tap compared to the household's water tap, contravening the WHO/UNICEF, (2021), and EMCA, (2017), microbial guidelines where total and fecal coliform bacteria must not be detectable in any 100ml sample collected from drinking water source. To ensure safety of food products, (Bhairavi Silvara et al., (2015), recommends effective water management and treatment program to prevent contamination.

In regard to sanitation coverage, the studies reported inadequate household sanitation particularly among the low-income earners. It was common to find households lacking essential infrastructure such as toilets, with others in poor sanitary conditions in liquid waste facilities. On solid waste management, the review established that there were inadequate waste management systems. In some cases, there were no waste collection containers and collection of waste was irregular and indiscriminate. The studies further determined that households from low-income areas were poorly covered with sanitation facilities as compared to the high-income areas.

These findings support (Olalekan JO et al., (2023) where he observed that with poor sanitation infrastructure, most parts of Africa dispose their wastes indiscriminately, threatening community health. Further, the findings concur with the WHO/UNICEF, (2019), which indicated that the Sub-Saharan Africa Countries lack adequate sanitary facilities hence the waterborne disease burden from consumption of contaminated water. The poor are even more vulnerable with diminished opportunities to quality and adequate sanitation facilities and therefore prone to dire health implications (WHO/UNICEF, 2019).

Personal hygiene and food safety practices evaluation indicated moderate to high levels of personal hygiene practices and health awareness among the respondents. There were significant regional differences in hand washing behaviors and attitudes. Also noted was the variation in household utensil cleaning practices. Some regions had high cleaning rates than others, highlighting the need for improved community health interventions and education to promote better handwashing habits before food preparation. In Ethiopia, an intervention of educating communities about hygiene practices, such as hand washing and safe food handling, along with ensuring access to clean and safe water reduced exposure to foodborne illnesses and waterborne diseases (Negesa Eshete Soboksa et al., (2025).

A similar initiative in Kenya where school based (WASH) programmers integrated hygiene education into the curriculum not only improved students health but also raised awareness in their families about the importance of (WASH) for food safety (WHO/UNICEF, 2019). A Food expiry and shelf stability revealed varied results. There was low prevalence rate in most regions, contrasting with the prevalence rates in Malaysia which were found to be higher. The high prevalence rates in Malaysia might have been due to better public awareness campaigns and education about food safety, and economic status of the respondents. On separating raw and cooked food to prevent contamination/cross-contamination in the kitchen and during processing, the study observed significant differences across countries. Similar studies in Vietnam and China found low adherence in the practice, suggesting that differences in social-economic conditions and cultural practices contribute to the variations in adherence rate (Sukanta Kumar Pal., (2021).

CONCLUSIONS

1. There is lack of data on food safety and determinants of environmental hygiene factors like air ventilation, cleaning and disinfecting regularly touched surfaces in households.
2. Investing in projects and programs in water, sanitation and hygiene in the community can help to prevent foodborne and waterborne illnesses
3. Household's economic status determines access to water, sanitation and hygiene infrastructures.
4. Health education and awareness creation is a good intervention towards promoting food safety at household and establishment levels.

RECOMMENDATIONS

1. Enhance food safety knowledge through targeted house-based interventions and training
2. Institute policies and programs to improve household income levels for the poor to be able to access water, sanitation and hygiene infrastructures
3. Promote food safety practices by creating hygiene awareness through media platforms to help reduce the burden of foodborne.
4. Further research should be conducted to determine how important fresh air circulation in indoor space is to food safety.
5. Further research to establish to what extent regular cleaning of the home and use of disinfectants can help protect against foodborne illness.

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Declarations

Ethics approval and consent to participate

Not applicable for this study

Conflict of Interest

REFERENCES

1. A, Cathlene Tohono, Mathias Hounsou and D. Sylvain Dabade (2024). Food hygiene in Sub-Saharan Africa: A focus on catering services, Science Direct
2. Bhairavi Sivaramaingan, Ian Young and Liso Waddeli (2015). Scoping review of research on the effectiveness of food safety education interventions directed at consumers, public health agency, department of population medicine, university of Guelph, Ontario, Canada
3. Benneth M. Wafukho, Dorothy Rotich, and Isabella Mapelu Cheloti (2021). Moi University, School of hospitality and events management, department of hospitality management, Moi University, Kenya
4. CDC, (2025). Global water, sanitation, and hygiene (WASH). U.S. centers for disease control and prevention
5. Dhrow, D, (2024). Perspectives on food hygiene and public health, J food microbial, Saf Hyg. 9: 278
6. Dr. Negasa ES, (2025). Boosting food safety: The impact of improved water supply, sanitation and hygiene services, Stellenbosch university
7. EMCA, (2017). Water quality regulations, NEMA, Nairobi, Kenya
8. GHC, (2025). Global hygiene council. Every day hygiene and its impact on health, <https://www.hygiene-council.org>
9. Merchant M, (2024). The measures and conditions between food hygiene and public. J food microbial, Saf Hyg

- 10 Negasa Eshete Soboksa, Habtamu Endashau and Xikambiso Getrude Mbhenyane (2025). A systematic review and meta-analysis of household food safety and hygiene practices and their determinants in Africa, BMC Nutrition
- 11 Olalekan, JO, Safayet J, and Gilbert E (2024). Water, sanitation and hygiene (WASH) practices in Africa: Exploring the effects on public health and sustainable development, PMC
- 12 Oyeshalem Mekasha, Getachew Kassa and Demisuzenbaaba (2022). Food hygiene practices and determinants among handlers in public food establishments in Debre Markos town, Northern Ethiopia; A systematic review and meta-analysis, PMC
- 13 OJ Okesanya, (2024). Water, sanitation and hygiene practices in Africa, National Institute of Health. <https://pubmed.ncbi.nlm.nih.gov>
- 14 PHA, (2022). The Public Health Act, CAP, 242, of 2022, Nairobi, Kenya
- 15 Subrata Kumar Palo, Sricenta kanungo, Mousumi Samal and Dabadutta Sahoo (2021). Water, Sanitation, and Hygiene (WASH) practices and morbidity status in a rural community: Findings from a cross-sectional study in Odisha, India, PUB MED
- 16 Venkatesh U, (2023). Water, sanitation and hygiene: A global imperative for health. Indian journal of Community health
- 17 WB, (2022). Water supply and sanitation. Policies, institutions and regulations. Washington DC: WB
- 18 WHO/UNICEF, (2019). Hygiene and public health, New York, WHO/UNICEF
- 19 WHO/UNICEF, (2022). Water, sanitation and hygiene, Switzerland, WHO/UNICEF
- 20 WHO, (2024). Sanitation and hygiene, eastern and southern Africa, Geneva, WHO
- 21 WHO, (2025). Water, sanitation and hygiene, Geneva, WHO