

Knowledge of Environmental and Personal Hygiene Practices among Food Handlers and Students at Wellspring University, Benin City, Nigeria

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ABSTRACT

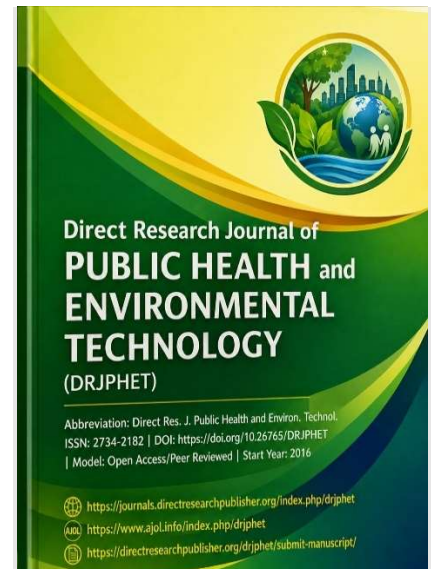
Background: Foodborne illnesses are a major public health concern worldwide which often results from poor food handling and hygiene practices. This study examines the knowledge of environmental and personal hygiene practices among food handlers and students at wellspring university, Benin City, and their impact on the incidence of food poisoning. **Methods:** A descriptive cross-sectional design was employed for the study with a sample size of 250 participants. Data were collected using a structured questionnaire. The reliability of the instrument was assessed using Cronbach's alpha and the reliability coefficient was 0.77, which indicated an acceptable reliability for the study. Data analysis was conducted using SPSS version 22, and hypotheses were tested using Chi-square statistics at a 0.05 level of significance. **Findings:** Most respondents (74.8%) demonstrated good knowledge of food poisoning, while 25.2% had moderate knowledge. About 66.8% reported high environmental and personal hygiene practices compared to 33.2% with low practice levels. Hygiene practices were significantly associated with knowledge of food poisoning ($P = 0.001$). Sanitation facilities were generally adequate, with 84.0% having hand washing sinks, 96.0% having access to running water, and 56.0% using liquid soap. The prevalence of food poisoning was 10.0%, and its occurrence was significantly associated with hygiene practices ($P < 0.001$). **Conclusion:** High food safety knowledge and adequate sanitation facilities support good hygiene practices, which are crucial in reducing the risk of foodborne illness among food handlers.

Keywords: Knowledge, Environmental, Personal Hygiene Practices and Food Handlers

INTRODUCTION

Foodborne diseases remain a major public health concern globally, strongly linked to the hygiene practices of food handlers (World Health Organization, 2022). Unsafe food continues to cause substantial illness and mortality which has prompted calls for improved local food safety systems

(Boyce, 2021). Food handlers are critical in preventing contamination along the food chain, yet inadequate personal hygiene which includes poor hand washing, unsafe water use, and failure to wear protective clothing have remained the common causes of outbreaks



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(Ahmednur, 2022). Substandard environmental hygiene, such as inadequate water supply and unsanitary food-contact surfaces has further contributed to transmission (Chukwukasi, 2024). Evidence from low- and middle-income countries indicates that knowledge does not always translate into safe practice. For instance, 28.1% of Nigerian food vendors washed their hands with only water, and 27.7% did not wash hands before handling food (Ibrahim, 2025). In another study, only 58.3% of canteen food handlers had correct personal hygiene scores, although 81.6% reported using soap and water for hand washing (Folasade, 2021). Targeted food safety training, regulatory supervision, and access to safe water and sanitation predict better hygiene behaviours (Fenta, 2025). University food service settings are particularly vulnerable due to high demand, varied staff training, and constrained infrastructure, increasing the risk of contamination (Barnabas, 2024). These gaps can be addressed through mandatory training, regular inspections, behavioural interventions, and reliable hand washing facilities (Ali, 2022).

World Health Organization (2022), identifies the reduction of foodborne illnesses, particularly those caused by the most severe pathogens, as a global public health priority. However, there is a notable lack of studies examining how school food handlers and institutional sanitary conditions affect students in Benin City. To address this gap, this study aims to evaluate knowledge of environmental and personal hygiene practices among food handlers and students at wellspring university, Benin City, Nigeria.

METHODOLOGY

Research Design

The study was conducted using a descriptive cross-sectional design.

Study Setting

This research work was carried out in Wellspring University, in Oredo Local Government area of Edo State, Nigeria.

Duration: The period of study lasted from September 2025 to November 2025.

Study Population

The study included all nursing students from year one to year four in the Department of Nursing Science, as well as all food vendors and their workers, making a total sample population of 460.

Inclusion Criteria

The study included undergraduates in nursing department

and registered food handlers who were willing to participate and was present during the period of data collection.

Sample Size Calculation

The studied sample was determined from the study population using the Taro Yamane equation. The Yamane formula is given as $n = N / (1 + Ne^2)$

Where N = population size (Students) = 432

e = alpha level, i.e. $e = 0.05$ at confidence interval of 95%.

Therefore, $n = 432 / [1 + 432(0.05)^2]$

$$= 432 / (1 + 1.08)$$

$$= 432 / 2.08$$

$$= 432 / 2.08$$

$$= 207$$

Adjusting for attrition (non-response) rate,

$$Ar = \frac{n}{1 - 10\%}$$

where $n = 207$

$$Ar = \frac{207}{0.9} = 230$$

Hence, the sample size for the study = 230 students plus 20 food handlers = 250 participants.

Sample Size

A total of 250 participants were recruited for this study.

Instrument for Data Collection

Data were collected using a structured, researcher-developed questionnaire comprising 24 items organized into five sections. Section A elicited information on the socio-demographic characteristics of the respondents. Section B assessed respondents' knowledge of food poisoning, while Section C examined environmental and personal hygiene practices. Section D evaluated the availability of sanitation facilities, and Section E assessed the prevalence of food poisoning among the respondents. The questionnaire consisted of closed-ended (Yes/No) and open-ended questions, and participants were instructed to indicate their responses appropriately. The questionnaire was developed following an extensive review of relevant literature and was subjected to expert validation by the project supervisor to ensure content validity. Reliability of the instrument was assessed using the test-retest method. Data obtained from the reliability test were analyzed using IBM SPSS Statistics version 22.0, and internal consistency was determined using Cronbach's alpha coefficient. The instrument yielded a reliability coefficient of 0.77, indicating acceptable reliability for the study.

Pilot Study

A pilot study was conducted among 26 participants (10% of the study sample), comprising 23 students and 3 food handlers from Benson Idahosa University, Benin City, Nigeria. The pilot participants were excluded from the main study. The pilot study was conducted to assess the clarity, comprehensibility, and reliability of the research instrument before its administration in the target population.

Data Collection Procedure

The questionnaire was administered through face-to-face interactions with the respondents. All 250 distributed questionnaires were completed and returned, resulting in a response rate of 100%.

Statistical Analysis

Data were coded, entered, and analyzed using IBM SPSS Statistics version 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies and percentages, were used to summarize the data and were presented in tables and figures where appropriate. Associations between categorical variables were evaluated using the Chi-square (χ^2) test. Statistical significance was set at $p < 0.05$ for all analyses.

Ethical Considerations

Ethical approval for the study was obtained from the Health Research Ethics Committee of Wellspring University, Nigeria (Approval No. WSU/003/25). Prior to participation, respondents were informed of the study objectives, procedures, benefits, and their rights as participants. Both verbal and written informed consent were obtained from all participants before data collection. Confidentiality and anonymity of respondents were maintained throughout the study in accordance with established ethical guidelines for human subject research.

RESULTS

Socio-demographic information

Socio-demographic characteristics of the respondents are detailed in (Table 1) ($n = 250$). The data shows that a substantial majority of the participants, 158 (63.2%), fell within the 21–25 years age bracket, followed by 25 (10.0%) aged 26–30 years, and 22 (8.8%) aged 16–20 years. The remaining age cohorts comprised 15 (6.0%) aged 31–35 years, 13 (5.2%) aged 41–45 years, 10 (4.0%) aged 36–40 years, and 7 (2.8%) aged 46–50 years.

In terms of gender distribution, the sample was heavily dominated by females, who accounted for 238 respondents (95.2%), while males accounted for 12 (4.8%). Regarding educational attainment, a vast majority of 226 participants (90.4%) were undergraduates, 14

(5.6%) held an SSCE, 6 (2.4%) held an HND, and 4 (1.6%) possessed an OND. Correspondingly, 226 (90.4%) of the respondents maintained student status within the university, whereas 24 (9.6%) were food handlers. Among the food handlers ($n = 24$), 15 (62.5%) sold cooked food and drinks, 5 (20.8%) provided snacks and drinks, and 4 (16.7%) offered fruits and drinks.

Knowledge of food poisoning

The respondents' specific baseline knowledge regarding food poisoning variables is illustrated in (Table 2). Overall awareness was high which yielded an impressive Mean Knowledge Score of 80.4%. Individually, a large majority of 224 respondents (89.6%) recognized that improper food handling poses distinct health hazards to consumers. Similarly, 220 individuals (88.0%) understood that foodborne illnesses can be acquired by consuming contaminated food, and 190 (76.0%) agreed on the profound importance of handwashing to prevent foodborne diseases. Lastly, 170 participants (68.0%) correctly identified that foodborne illness can stem from contamination during the preparation stage. To provide a broader overview, the overall comprehension levels were compiled into a single metric. As summarized in (Table 3), the structural breakdown of composite knowledge levels indicates that 187 respondents (74.8%) demonstrated a "Good" knowledge base by scoring 70% or higher on the assessment. The remaining 63 participants (25.2%) displayed a "Moderate" knowledge level with scores within 50% to 69.9% range. No participants fell into a low knowledge category.

Practice of environmental and personal hygiene

The daily behavioural compliance regarding hygiene is documented in (Table 4) ($n = 250$). Using a cut-off threshold where a mean score below 2.0 indicates "Low Practice" and a mean of 2.0 or above signifies "High Practice," the study group achieved a solid Grand Mean score of 2.30 ± 0.706 . Strong compliance behaviour was noted across several variables: a notable 185 participants (74.0%) always wash their hands before handling food (2.59 ± 0.735), 147 (58.8%) always wash fruits and vegetables before consumption (2.45 ± 0.728), and 145 (58.0%) never use food items beyond their expiration dates (2.45 ± 0.716). Additionally, 105 respondents (42.0%) always clean and sanitize surfaces and equipment used for food prep (2.32 ± 0.653). Conversely, distinct behavioural deficits were identified regarding regular hair covering during food preparation (1.97 ± 0.630 , where 21.2% never comply) and prioritizing fresh, wholesome market foods (1.99 ± 0.776 , where 30.4% never comply).

The overarching evaluation of behavioural adherence is synthesized in (Table 5). The composite behavioural analysis reveals that 167 of the surveyed individuals (66.8%) maintained a verified "High" level of regular

Table 1: Social-demographic characteristics of the respondents (n = 250)

Variable	Classifications	Frequency	Percent
Age	16-20years	22	8.8
	21- 25years	158	63.2
	26-30 years	25	10.0
	31-35years	15	6.0
	36-40years	10	4.0
	41-45 years	13	5.2
	46-50years	7	2.8
Gender	Male	12	4.8
	Female	238	95.2
Level of Education	SSCE	14	5.6
	OND	4	1.6
	HND	6	2.4
	Undergraduates	226	90.4
Status in the university:	Students	226	90.4
	Food handler	24	9.6
Type of food sold (n = 24)	Cooked food and drinks	15	62.5
	Fruits and drinks	4	16.7
	Snacks and drinks	5	20.8

Source: *Field Survey, 2025***Table 2:** Knowledge of food poisoning among the respondents (250)

Items	Responses		Remark
	Yes (%)	No (%)	
Improper handling of foods poses health hazards to consumers	224(89.6)	26(10.4)	Good
Food borne disease can be caused by contamination of food during preparation	170(68.0)	80(32.0)	Moderate
Food borne illnesses can be acquired from the consumption of contaminated food	220(88.0)	30(12.0)	Good
Hand washing is important to prevent food borne disease	190(76.0)	60(24.0)	Good
Mean Knowledge Score = 80.4%			

Source: *Field Survey, 2025***Table 3:** Composite knowledge of food poisoning

Knowledge Level of Food Poisoning	Frequency (n)	Percentage (%)
Good knowledge ($\geq 70\%$)	187	74.8%
Moderate knowledge (50–69.9%)	63	25.2%

Source: *Field Survey, 2025***Table 4:** Practice of environmental and personal hygiene (n = 250)

Items	Responses			Mean $\pm$ SD	Remark
	ALW (%)	SMT (%)	NV (%)		
Wash hands before handling food	185 (74.0)	28 (11.2)	37 (14.8)	2.59 $\pm$ 0.735	High
Cover hair regularly during food preparation	46 (18.4)	151 (60.4)	53 (21.2)	1.97 $\pm$ 0.630	Low
Clean and sanitize all surface and equipment used for food preparation and eating	105 (42.0)	119 (47.6)	26 (10.4)	2.32 $\pm$ 0.653	High
Wash fruits and vegetables before eating	147 (58.8)	68 (27.2)	35 (14.0)	2.45 $\pm$ 0.728	High
Buy fresh and wholesome food from market	74 (29.6)	100 (40.0)	76 (30.4)	1.99 $\pm$ 0.776	Low
Use food beyond its expiration date	33 (13.2)	72 (28.8)	145 (58.0)	2.45 $\pm$ 0.716	High
Grand Mean				2.30$\pm$0.706	

Source: *Field Survey, 2025*Mean cut-off = 2.0. Mean < 2.0 = Low Practice, Mean $\geq$ 2.0 = High Practice

Key: ALW = Always; SMT = Sometimes; NV = Never

Table 5: Composite practice of environmental and personal hygiene

Hygiene Practice Level	Frequency (n)	Percentage (%)
High practice of environmental and personal hygiene ($\geq 70\%$)	167	66.8%
Low practice of environmental and personal hygiene (20-49.9%)	83	33.2%

Source: *Field Survey, 2025***Table 6:** Sanitation facilities available in the University (n = 250).

Items	Responses		Remark
	Available (%)	Not available (%)	
Hand washing sink beside each toilet	210(84.0)	40(16.0)	High
Source of running water	240(96.0)	10(4.0)	High
Liquid soap for hand washing	140(56.0)	110(44.0)	High
Hand sanitizers	90(36.0)	160(64.0)	Low
Is there any infection control unit in the university	50(20.0)	200(80.0)	Low

Source: *Field Survey, 2025***Table 7:** Prevalence of food poisoning among students and food handlers.

Items	Frequency	Response	Percent
Have you ever experienced food borne disease after eating in wellspring university cafeteria? (n = 250)	25	Yes	10.0
	225	No	90.0
If yes, how many times have you had the experience? (n = 25)	20	Once	80.0
	5	Twice	20.0
What type of food borne disease? (n = 25)	4	Stooling	16.0
	11	Vomiting	44.0
Indigestion	10		40.0
Did you seek medical treatment thereafter? (n = 25)	22	Yes	88.0
	3	No	12.0
Were you treated in the University health facility? (n = 22)	5	Yes	22.7
	17	No	77.3
If no, specify (n = 17)			
Self-Medication	17		77.3

Source: *Field Survey, 2025*

environmental and personal hygiene practices ($\geq 70\%$). In contrast, 83 respondents (33.2%) demonstrated a "Low" tier of hygiene practice, falling within the 20% to 49.9% performance range.

Sanitation facilities available in the university

The institutional environment was evaluated to see if it supports safe behaviours. Table 6 outlines the availability of vital sanitation facilities within the university environment as reported by the 250 participants. Basic structural provisions scored highly; a sweeping 240 respondents (96.0%) verified the presence of a functional running water source, while 210 participants (84.0%) noted handwashing sinks placed directly beside toilets. Furthermore, liquid hand soap availability was confirmed by 140 respondents (56.0%). However, significant infrastructure gaps were exposed regarding advanced protective measures: 160 participants (64.0%) noted that hand sanitizers were not readily available, and a substantial 200 respondents (80.0%) stated that there was

no active infection control unit operating within the university ecosystem. The prevalence, clinical presentation, and subsequent management of foodborne illness among the university population are detailed in (Table 7). The baseline data indicates that a small minority of the total sample, 25 respondents (10.0%), reported ever experiencing food poisoning after consuming food items from the university cafeteria. Among this affected subgroup (n = 25), a substantial majority of 20 participants (80.0%) reported experiencing only a single episode of illness, while 5 individuals (20.0%) experienced two distinct episodes. In terms of clinical symptomatology reported by the affected individuals, vomiting was the most prevalent symptom, noted by 11 respondents (44.0%). This was closely followed by indigestion, which affected 10 participants (40.0%), and stooling, reported by 4 respondents (16.0%). Regarding healthcare-seeking behaviour and clinical intervention, a high proportion of the affected cohort, 22 respondents (88.0%), sought medical treatment following their illness. Within this treated group (n = 22), only 5 individuals (22.7%) received care directly at the University health facility, whereas the remaining 17 participants (77.3%) resorted to self-medication strategies.

Table 8: Relationship between respondents' knowledge of food poisoning and practice of environmental and personal hygiene using Pearson chi-square at 0.05 level of significance.

Hygiene Practices	Knowledge		Total (%)	df	χ^2	χ^2 value	P	Decision
	Good (%)	Moderate (%)						
High	136(81.4)	31(18.6)	167(100)	1	11.755	3.841	0.001	Reject (Ho ₁)
Low	51(61.4)	32(38.6)	83(100)					
Total	187	63	250					

Source: Field Survey, 2025

Table 9: Relationship between respondents' environmental and personal hygiene practices and incidences of food poisoning using Pearson chi-square at 0.05 level of significance.

Hygiene Practices	Food Poisoning		Total (%)	df	χ^2	χ^2 value	P	Decision
	Yes (%)	No (%)						
High	7(4.2)	160(95.8)	167(100)	1	18.856	3.841	0.001	Reject (Ho ₂)
Low	18(21.8)	65(78.3)	83(100)					
Total	25	225	250					

Source: Field Survey, 2025

Test of Hypotheses

H₀₁: There is no significant relationship between knowledge of food poisoning and practice of environmental and personal hygiene among students and food handlers in Wellspring University, Benin City.

As shown in (Table 8), respondents with high knowledge of food poisoning demonstrated better environmental and personal hygiene practices (81.4%) than those with low knowledge (61.4%). Pearson's chi-square analysis revealed a statistically significant association between knowledge of food poisoning and hygiene practices ($\chi^2 = 11.755$, $df = 1$, $p = 0.001$). Since the p-value was less than 0.05, the null hypothesis (H₀₁) was rejected. The findings indicate that knowledge of food poisoning is significantly associated with environmental and personal hygiene practices among students and food handlers at Wellspring University, Benin City.

H₀₂: There is no significant relationship between environmental and personal hygiene practices and incidences of food poisoning among students and food handlers in Wellspring University, Benin City.

As presented in (Table 9) respondents with high levels of environmental and personal hygiene practices reported a lower incidence of food poisoning (4.2%) compared with those exhibiting low hygiene practices (21.8%). Pearson's chi-square test showed a statistically significant relationship between hygiene practices and the incidence of food poisoning ($\chi^2 = 18.856$, $df = 1$, $p < 0.001$). Therefore, the null hypothesis (H₀₂) was rejected. The results suggest that good environmental and personal hygiene practices are significantly associated with a reduced incidence of food poisoning among students and food handlers at Wellspring University, Benin City.

DISCUSSION

Knowledge of Food Poisoning

The findings from Wellspring University show that 89.6% of respondents understand improper handling as a health risk aligned with similar studies on food safety knowledge among food handlers and students globally. Studies globally emphasize the significant role that hygiene knowledge and practices play in reducing food poisoning incidents. A study by Kingston (2022) in the United Kingdom found that only 33% of food handlers correctly identified the best method for controlling bacterial growth, which is lower compared to the 89.6% observed in this study. Similarly, the authors reported that 53% of food handlers did not recognize that food can be contaminated even when it appears normal which further highlights the gaps in food-safety knowledge which is relative to the present findings. The present finding is also higher than (86%) reported by Mohd (2018) among dietetic students (DS) and food handlers (FH) in a public university in Malaysia. Similarly, Siddiky (2024) found that institutional food handlers in Bangladesh scored about 61% on food safety knowledge and 64% on food safety practices which indicated moderate levels of knowledge and practices among the respondents. A study that assessed 400 food handlers in Addis Ababa, Ethiopia Fekadu (2024) found that 65.5% of respondents had good overall food safety knowledge, and 100% recognized that hand washing before food handling reduces the risk of food poisoning, which shows a high awareness of contamination risks and prevention. In Bangladesh, Al Banna (2021) found that only 20% of meat handlers demonstrated a good overall level of food safety knowledge, despite 95.7% reporting that they washed their hands before work which indicated a gap between specific hygiene awareness and broader food safety understanding. This is comparable to the 68% in Wellspring University who recognized contamination as

a cause of foodborne diseases. Survey study among Bangladeshi students. Ali (2023) found that only 47% had adequate food safety knowledge, despite 87% having favourable attitudes, which indicated significant gaps in understanding cross-contamination risks and translating awareness into safe practices. This reinforces the importance of ongoing food safety education for students and food handlers, as found in the study.

Practice of Environmental and Personal Hygiene

The Wellspring University study revealed that 66.8% of respondents practiced high levels of environmental and personal hygiene, though covering hair and sourcing fresh food scored lower, reflecting similar challenges in other studies. Manafe (2023) found that 81% of household food handlers in Ga-Rankuwa, Tshwane reported to always wash their hands before handling food, and 69% always cleaned surfaces after handling raw meat, yet only 45% avoided thawing frozen meat in a bowl of cold water which demonstrated gaps in safe thawing practice. A study that examined food handlers in industrial food establishments in Ethiopia. Alemu (2023) found that although 89.1% demonstrated high food safety knowledge, just 47.6% reported good food safety practices which highlighted persistent gaps in hygiene consistency. Also, Serrem (2021) found that 74% of Kenyan university students reported inadequate personal and environmental hygiene practices in their food handling, which is lower than the 66.8% observed in this present study. Their findings noted that covering hair and using fresh ingredients were particularly under-practiced which further collaborated the study findings. The present finding is also higher than 51.1% reported by Yemane (2022) from Southern Ethiopian who also observed that while households 51.1% generally practiced good food safety, specific aspects such as washing produce before use and regularly covering hair were less consistently followed. This trend emphasizes the need to strengthen specific hygiene practices, even among knowledgeable food handlers, to ensure safety. In Nigeria, similar patterns emerge. In a similar context, a study by Ojide (2020) among food handlers in Enugu State, Nigeria, similarly reported gaps in hygiene performance, with males scoring 2.22 ± 0.41 and females 3.25 ± 0.20 on overall hygiene. Hand washing scores were 2.30 ± 0.49 for males and 3.26 ± 0.34 for females, while personal hygiene averaged 2.24 ± 0.46 and 3.25 ± 0.27 , respectively. Environmental hygiene also followed this pattern which underscores the persistent inconsistencies in food safety practices. Also, this highlights that practical adherence to hygiene, not just knowledge, is crucial to minimizing food poisoning risks in Nigerian universities.

Sanitation Facilities Availability

In this study, hand washing facilities such as sinks and running water were widely available, with 96 percent and

84 percent coverage respectively, which supports the view that adequate facilities promote good hygiene practices. Similar findings by Kolo (2017) in Nigeria's secondary schools showed that 61.7% of students reported washing their hands with soap or detergent after toilet use, suggesting that available sanitation facilities support personal hygiene. Chikwanu (2015) found that schools in Choma District with better WASH implementation reported improved hygiene conditions, though funding and coordination issues undermined full programme effectiveness. The emphasis on available resources supports the findings in this study, suggesting that proper facilities contribute significantly to maintaining hygiene standards. Similarly, a study by Yusuf (2018) found out that while 68.5 percent of households in unregulated premises in Ilorin, Nigeria had sanitation facilities, only 35.4 percent were hygienically maintained which indicated that availability alone does not guarantee good hygiene practices. Their study found that lack of adequate facilities hindered proper hygiene practices which is also similar to how the presence of running water 96% and hand washing sinks 84% at Wellspring University positively support hygiene routines.

Prevalence of Food Poisoning

The prevalence of foodborne illnesses in this study is relatively low, with only 10% reporting such experiences, mostly related to single-episode incidences 80%. This finding is consistent with Negassa (2022) reported that only 48.4 percent of Ethiopian food handlers practiced hygienic food handling, and that strong hygiene practices were significantly less likely when training was lacking, hand-washing facilities were unavailable, or medical check-ups were infrequent which showed that foodborne illness risks can be reduced when hygiene practices are strong. However, even with relatively high knowledge and access, Teferi (2022) found that only 51.3 percent of meat handlers in Ethiopian butcher shops had good food handling practices, with common hygiene lapses such as working with cuts or wounds which contributed to contamination risk. In a study among nursing students in Nepal, Purbey (2022) found a notable outbreak of food poisoning where 70 percent reported abdominal pain and diarrheal, and 80 % of stool cultures grew pathogenic *E. coli*, which implied poor hygiene practices despite what was described as 'satisfactory' food-handling knowledge and attitudes. This reinforces the link between hygiene adherence and foodborne illness prevention, as evidenced in this finding.

Relationship between Knowledge of Food Poisoning and Practice of Environmental and Personal Hygiene

The findings showed a statistically significant association between participants' knowledge of food poisoning and their environmental and personal hygiene practices ($p = 0.001$). This finding suggests that a strong foundation in

food safety knowledge positively impacts hygiene practices, with students and food handlers more likely to adhere to proper practices when they understand the risks of poor hygiene. These results are consistent with global research; for example, a study by Al Banna (2021) found that meat handlers with higher knowledge levels were more consistent in maintaining hygiene practices, reducing contamination risk. Similarly, in Ethiopia, Fekadu (2024) found that food handlers with higher food poisoning knowledge demonstrated more thorough hand washing and hygiene practices. Similar finding was also reported by Hussien (2022) among Palestinian University Students. This correlation emphasizes that educational initiatives focusing on food safety knowledge could be a powerful tool in improving hygiene practices.

Relationship between Environmental and Personal Hygiene Practices and Incidence of Food Poisoning

The analysis also found a significant relationship ($p < 0.001$) between hygiene practices and the incidence of food poisoning, indicating that poor hygiene practices directly increase the risk of foodborne illnesses. Students and food handlers who demonstrated inadequate hygiene practices, such as inconsistent hand washing or not covering hair, were more likely to report food poisoning episodes. This is in line with findings from Manafe (2023) who observed that poor hygiene practices among self-catering university students increased the risk of foodborne illnesses. Negassa (2022) similarly noted a higher prevalence of foodborne diseases among food handlers with inadequate personal and environmental hygiene. This reinforces that practical adherence to hygiene protocols is critical in preventing foodborne diseases, underscoring the need for interventions that focus not only on knowledge but on consistent application of hygiene practices to reduce illness rates.

These hypotheses collectively demonstrate that while knowledge is essential, effective practice is crucial for reducing the occurrence of food poisoning. Educational programmes that reinforce both food safety knowledge and practical hygiene adherence could significantly mitigate foodborne illness risks among students and food handlers. Also, enhanced training and provision of sufficient sanitation facilities in educational institutions are essential for reducing foodborne illnesses across different regions.

Conclusion

This study demonstrated that students and food handlers at Wellspring University generally possessed good knowledge of food poisoning and exhibited satisfactory environmental and personal hygiene practices. The relatively low prevalence of food poisoning observed among the respondents suggests that these positive food safety behaviors, together with the availability of essential sanitation facilities, may contribute to reducing the risk of

foodborne illnesses within the university environment. Importantly, the study established significant associations between food poisoning knowledge and hygiene practices, as well as between hygiene practices and the occurrence of food poisoning. These findings underscore the critical role of food safety awareness and adherence to proper hygiene measures in preventing foodborne diseases. Strengthening food safety education and maintaining adequate sanitation infrastructure remain essential strategies for promoting a safer and healthier university food environment.

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