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Assessment of knowledge, attitude, and practice about food safety among fried chicken meat street vendors in ilala Dar-es-salaam region, Tanzania

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Abstract

Background

Street-vended fried chicken is a widely consumed source of affordable nutrition and income in urban Tanzania, but its informal nature and limited regulatory oversight pose significant food safety risks.

Materials and Methods

This study assessed the knowledge, attitudes, and practices (KAP) of 405 fried chicken vendors in Ilala District, Dar es Salaam, between November 2024 and February 2025, alongside observation checklists and key informant interviews to identify structural and socio-economic factors affecting hygiene compliance. Data analysis involved descriptive and regression analysis.

Results

Descriptive analysis revealed that the majority of vendors had low knowledge (97.3%; median score 16.7%), neutral attitudes (85.7%; median score 65.5%), and fair practices (93.8%; median score 66.7%). Regression analyses demonstrated that knowledge significantly predicted attitude ($\beta = 0.64$, $R^2 = 0.51$, $p < 0.001$) and practice ($\beta = 0.83$, $R^2 = 0.665$, $p < 0.001$), while attitude strongly predicted practice ($\beta = 0.98$, $R^2 = 0.748$, $p < 0.001$). Mediation analysis revealed that attitude partially mediated the effect of knowledge on practice (approximately 50%). Qualitative findings highlighted regulatory weaknesses, infrastructure constraints, and socio-economic pressures as major barriers to safe food handling.

Conclusion

Overall, fried chicken vendors in Ilala District exhibited critical gaps in knowledge, attitudes, and practices, creating substantial public health risks. Interventions should prioritize enhancing vendor knowledge, fostering positive attitudes, strengthening regulatory oversight, and improving hygiene infrastructure to ensure safer street food practices.

1 Introduction

Street-vended foods play an important role in urban food systems of low- and middle-income countries, including Tanzania, by providing affordable, readily available, and convenient meals to a large proportion of the population [1]. In rapidly urbanizing settings such as Dar es Salaam, street food vending also serves as an important source of income for many households and contributes to employment generation within the informal sector [2]. Fried chicken is among the most commonly sold street foods due to its relatively low production cost, ease of preparation, and high consumer demand [3, 4]. However, despite their socio-economic benefits, street-vended foods are frequently associated with food safety challenges, particularly microbial contamination that can lead to foodborne diseases [5]. Contamination may occur at various stages along the food chain, including slaughtering, handling of raw meat, inadequate cooking, improper storage, and unhygienic

serving conditions [6]. Common foodborne pathogens reported in street-vended meat products include *Salmonella* spp., *Staphylococcus aureus*, and *Escherichia coli*, which pose significant public health risks to consumers [7].

Food safety outcomes among street food vendors are largely determined by the knowledge, attitudes, and practices (KAP) related to food hygiene and handling [8]. Adequate knowledge of foodborne hazards, positive attitudes toward hygiene, and consistent application of safe food handling practices are important in preventing contamination [3, 8]. Nevertheless, evidence from studies conducted in various Tanzanian cities indicates that while many street food vendors possess general awareness of food safety principles, substantial gaps remain in their understanding of key issues such as cross-contamination, temperature control, personal hygiene, and safe storage of cooked foods [9]. In addition, socio-demographic characteristics, including age, sex, level of education, and length of vending experience, have been shown to influence food safety behaviours [8, 9]. Vendors who are younger, less educated, or operating informally are more likely to demonstrate unsafe food handling practices compared to their counterparts [8].

Although Tanzania has established regulatory and institutional frameworks aimed at ensuring food safety standards set by the Tanzania Bureau of Standards, Public Health Regulations, and municipal by-laws, effective implementation remains inconsistent [10]. Enforcement challenges are often linked to limited resources, inadequate routine inspections, the mobile nature of street vending, and partial compliance among vendors [11]. As a result, street-vended foods, particularly high-risk products such as fried chicken, may continue to expose consumers to microbial contamination and foodborne illnesses [7]. Despite the growing consumption of fried chicken in urban areas, existing studies in Tanzania have largely focused on general street food vending, with limited emphasis on specific food categories and district-level contexts [1, 9]. This creates a knowledge gap regarding food safety risks and hygiene practices among fried chicken street vendors, particularly in densely populated urban districts of Tanzania.

Assessing the knowledge, attitudes, and practices of street food vendors is an important practice for effective food safety regulation. Previously, several studies have examined food hygiene among street food vendors in the same highly populated areas of Tanzanian includes Zanzibar, Dodoma, Morogoro, and Moshi, while in the Ilala District, it remains scarce. This study aimed to assess food safety knowledge, attitudes, and practices among fried chicken street vendors in Ilala District and to identify socio-demographic and structural factors associated with hygiene practices, so as to provide evidence to support and improve regulatory enforcement.

2 Materials and Methods

2.1 Study area

The study was conducted in Ilala District, one of the five administrative councils of the Dar es Salaam Region in eastern Tanzania. Ilala lies between approximately 6.84°–7.05°S and 39.20°–39.33°E, and is characterized by a humid tropical climate with high temperatures and intense commercial activity throughout the year [12]. According to the 2022 Population and Housing Census, the district has a population of 1,649,912 residents, making it one of the most densely populated urban areas in the country. Ilala serves as the region's primary commercial and administrative hub, hosting major markets such as Kariakoo, Buguruni, Kisutu, and Mchikichini, along with transport terminals, slaughter slabs, food-processing facilities, and a thriving network of

street food vendors. Daily activities include wholesale and retail trade, food vending, transportation, and small-scale manufacturing, which attract large consumer flows and increase demand for ready-to-eat foods such as fried chicken [12]. The district was selected due to its high vendor concentration, diverse vending environments, and elevated potential for food safety risks, making it ideal for assessing hygiene practices among fried chicken vendors.

2.2 Study design and sampling strategies

A cross-sectional study was conducted from November 2024 to February 2025 among street retailers of fried chicken meat in Ilala District, Dar es Salaam. The sampling frame comprised all fried chicken meat vendors operating in each selected ward. From a list of 23 wards, wards were selected using simple random sampling. Within each selected ward, eligible vendors (those selling fried chicken and operating for at least one consecutive year) were selected using systematic/random sampling to participate in the KAP survey. Key informants responsible for food hygiene management in the district were selected purposively.

2.3 Sample size determination

The sample size for questionnaire survey was determined using Cochran's (1977) formula for sample size estimation for proportions in large populations: $n_0 = Z^2P(1-P) / d^2$, where n_0 is the initial sample size, Z is the standard normal deviate at the desired confidence level (1.96 for 95% confidence), P is the assumed proportion of the population with the characteristic of interest, in this case, the assumed awareness level of food safety among respondents (set at 50% or 0.5 to maximize the sample size), and d is the desired margin of error (set at 5% or 0.05). Substituting the values gives: $n_0 = (1.96)^2 \times 0.5(1 - 0.5) / (0.05)^2 = 384$.To account for a potential 5% non-response rate, the sample size was increased by multiplying by 1.05, giving a final sample size of approximately 405 respondents.

2.4 Data collection

Data collection in this study employed a mixed-methods approach to obtain detailed and reliable information from participants. First, questionnaires containing both open- and closed-ended questions were used to collect quantitative data and basic opinions from a sample of participants selected purposively and randomly according to the study criteria. Second, semi-structured interviews were conducted with key stakeholders to gather in-depth information, perspectives, and experiences related to the research topic. Third, direct observations and document reviews (such as reports, official statistics, and policies) were carried out to verify and enrich the information obtained from the questionnaires and interviews. Prior to data collection, all tools underwent expert review and a pilot study to ensure validity and reliability. Permission was obtained from relevant authorities, and informed consent was secured from all participants, observing ethical principles such as confidentiality, anonymity, and the right to withdraw at any time.

2.5 Data Analysis

Quantitative data from questionnaires were entered into Excel for cleaning and coding, then exported to Epi-Info version 7.2.6.0 for analysis. Descriptive statistics (frequencies, percentages, and means) were used to summarize socio-demographic characteristics and KAP variables. Composite knowledge, attitude, and practice scores were constructed and categorized according to Bloom's cut-off points. Associations between KAP levels and independent variables (sex, age, education, experience, and location) were assessed using chi-

square tests and linear regression. Qualitative data from five key informant group discussions were transcribed, translated, and analysed thematically. Emerging themes were triangulated with quantitative findings to enhance interpretation and validity.

3 Results

3.1 Socio-demographic Characteristics of Chicken Meat Vendors

Socio-demographic characteristics of interviewed chicken meat retailers are shown in Table 1. The study population was predominantly male, with most participants aged 18–30 years. The majority had completed primary education and reported 5–10 years of professional experience. A small proportion of participants were older than 30 years, possessed secondary or tertiary education, or had less than 5 years or more than 10 years of experience. Approximately 21% of participants reported having undergone a health check, whereas the remaining 79% had not.

Table 1

Table 1: Socio-demographic characteristics of interviewed chicken meat retailers (n = 405)

Demographic	Category	Number (%)
	Female	**104 (25.7)**
	Male	301 (74.3)
Age (years)	18–30	344 (85.0)
	31–40	50 (12.3)
	> 40	11 (2.7)
Education	Primary	326 (80.5)
	Secondary	70 (17.3)
	Tertiary	9 (2.2)
Experience	≤ 4 years	8 (2.0)
	5–10 years	388 (95.8)
	11–20 years	9 (2.2)
Health check	No	320 (79.0)
	Yes	85 (21.0)
Location (Wards)	Segerea	115 (28.4)
	Kariakoo	71 (17.5)
	Buguruni	54 (13.3)
	Ukonga	44 (10.9)
	Ilala	41 (10.1)
	Vingunguti	41 (10.1)
	Kinyerezi	22 (5.4)
	Kitunda	10 (2.5)
	Kisutu	7 (1.7)

3.2 Categories of knowledge, attitude, and practice among respondents

The proportions of respondents classified into KAP categories are shown in Table 2. Generally, 97.3% (n = 394), which means the majority of participants had low knowledge, and none had high. The median composite knowledge score was 16.7%. Also, the attitude of 87.7% (n = 347) of respondents was neutral, with a median composite score of 65.5%. In terms of practice, the majority (n = 380, 93.8%) of respondents were classified in the fair category, with a median composite score of 66.7%.

Table 2
Proportions of respondents grouped into specific KAP categories with corresponding mean scores

	KAP categories			KAP scores				
	Category	**n**	**Percent**	**Mean ± SE**	**Median**	**IQR (Q1-Q3)**	**Min**	**Max**
Knowledge	Low	394	97.3	19.03 ± 0.75	16.7	16.70-18.46	8.3	70.4
	Medium	11	2.7					
	High	0	0					
Attitude	Negative	38	9.4					
	Neutral	347	85.7	63.81 ± 0.34	65.5	62.70–68.20	31.8	80
	Positive	20	4.9					
Practice	Poor	4	1					
	Fair	380	93.8	65.94 ± 0.63	66.7	63.00-66.70	11.1	96.3
	Good	21	5.2					

3.3 Item-Specific Food Safety Knowledge, Attitudes, and Practices

At item level, most vendors were aware of bacterial contamination (98.8%, n = 400) and identified diarrhoea as a sign of foodborne illness (82.7%, n = 335); however, knowledge of specific food safety risks was low, including awareness of cross-contamination between raw and cooked meat (3.7%, n = 15) and improper storage temperatures (3.0%, n = 12). Attitudinal responses were largely non-supportive, with about 70–75% of respondents expressing unfavorable attitudes toward recommended food safety practices, while favorable attitudes were reported by approximately 30% of vendors for visible hygiene- and responsibility-related items. In contrast, reported practices were high for routine behaviors such as proper reheating (99.3%, n = 402), appropriate storage of raw chicken (99.0%, n = 401), and immediate correction of unsafe practices (99.3%, n = 402); however, critical hygiene practices were limited, with only 9.1% (n = 37) washing hands before food handling and handling money during food preparation reported by 98.8% of vendors.

Figure 2 displays the proportion of vendors answering each knowledge item correctly, highlighting high awareness of “bacteria” and diarrhoea, but very limited understanding of specific contamination routes, temperatures, and hygiene requirements.

Figure 3 presents the percentage of respondents endorsing favourable attitudes for each statement, showing that supportive attitudes are concentrated in basic hygiene and responsibility items, while most items remain neutral or unfavourable.

Figure 4 shows the proportion of vendors adhering to each specific practice. The figure contrasts high performance on visible, routine actions (e.g., reheating, waste management) with poor performance on critical hygiene and cross-contamination control (e.g., handwashing, glove use, separation of raw and cooked meat).

3.4 Factors influencing knowledge, attitude, and practice among respondents

Knowledge was significantly associated with age, education, and work experience. The proportion of acceptable knowledge decreased from 90.9% among respondents aged above 40 years to none among the 18–30 age group ($\chi^2 = 333.51$, df = 2, $p < 0.001$). Similarly, the proportion of acceptable knowledge decreased from 88.9% among respondents with tertiary education to none among those attained primary school only ($\chi^2 = 262.69$, df = 2, $p < 0.001$). A similar trend was observed for work experience, with the most experienced individuals having higher knowledge than lower experience ($\chi^2 = 258.7$, df = 2, $p < 0.001$). Knowledge was not associated with sex ($\chi^2 = 2.65$, df = 1, $p = 0.104$), health check status ($\chi^2 = 0.80$, df = 1, $p = 0.371$), see Table 3 below.

Table 3
Socio-demographic factors associated with knowledge, attitude, and practice

Variable			Knowledge		Attitude		Practice	
	Category	N	Acceptable	p-value	Acceptable	p-value	Acceptable	p-value
Age	18–30 yrs	344	0 (0)	p < 0.0001	306 (89)		340 (98.8)	
	31–40 yrs	50	1 (2)		50 (100)		50 (100)	
	> 40 yrs	11	10 (90.9)		11 (100)	0.024	11 (100)	0.699
Sex	Female	104	0 (0)	0.104	66 (63.5)		100 (96.2)	
	Male	301	11 (3.7)		301 (100)	p < 0.0001	301 (100)	0.004
Education	Primary	326	0 (0)	p < 0.0001	288 (88.3)		322 (98.8)	
	Secondary	70	3 (4.3)		70 (100)		70 (100)	
	Tertiary	9	8 (88.9)		9 (100)	0.006	9 (100)	0.613
Experience	≤ 4 years	8	0 (0)		0 (0)		6 (75)	
	5–10 yrs	388	3 (0.8)		358 (92.3)		386 (99.5)	
	11–20 yrs	9	7(77.8)	p < 0.0001	9 (100)	p < 0.0001	9 (100)	p < 0.0001
Health check	No	320	7 (2.2)		290 (90.6)		316 (98.8)	
	Yes	85	4 (4.7)	0.371	77 (90.6)	1	85 (100)	0.675

3.5 Predictors of Knowledge, Attitude, and Practice

Multivariate analysis (Table 4) showed that food safety knowledge, attitude, and practice were influenced by key socio-demographic factors. Higher knowledge scores were observed among male respondents (β = 4.11), those with tertiary education (β = 20.62), vendors with 5–10 years of experience (β = 5.20), and respondents

aged above 40 years ($p < 0.001$). Attitude was significantly more acceptable among males (100% vs. 63.5% in females; $\chi^2 = 117.11$, $p < 0.001$) and increased with older age ($\chi^2 = 7.44$, $p = 0.024$), higher education ($\beta = 21.55$), and greater work experience ($\beta = 16.54$). Food safety practices were also higher among males (100% vs. 96.2% in females; $\chi^2 = 8.09$, $p = 0.0045$) and respondents with over 10 years of experience (100%; $\chi^2 = 48.14$, $p < 0.001$). Although age and education were not significant in bivariate analysis for practice, regression results showed that male sex ($\beta = 8.79$), tertiary education ($\beta = 21.81$), and work experience remained important predictors across all KAP domains, with younger respondents consistently scoring lower.

Table 4: Multivariate regression analysis results indicating factors influencing knowledge, attitude, and practices

Predictors		Knowledge			Attitude			Practice		
Variable	Category	Estimate	t-value	p-value	Estimate	t-value	p-value	Estimate	t-value	p-value
Age	Intercept	33.3	10.0	<0.001	47.2	14.2	<0.001	65.3	17.1	<0.001
	18-30	-25.0	-8.3	<0.001	-8.3	-2.8	0.0062	-22.2	-6.4	<0.001
	31-40	-22.5	-7.7	<0.001	-5.4	-1.9	0.061	-19.5	-5.8	<0.001
	>40*									
Sex	Male	4.1	8.3	<0.001	10.1	20.6	<0.001	8.8	15.5	<0.001
	Female*									
	Primary*									
	Secondary	7.4	7.5	<0.001	3.0	3.0	0.0029	3.7	3.2	0.0014
	Tertiary	20.6	5.7	<0.001	21.5	6.0	<0.001	21.8	5.2	<0.001
Experience	≤4*									
	5-10 yrs	5.2	3.5	0.001	16.5	11.2	<0.001	14.9	8.7	<0.001

3.6 Relationships between Knowledge, Attitude, and Practice

3.6.1 Normality of Knowledge Altitude and Practice scores

The distributions of knowledge, attitude, and practice scores were assessed for normality using Q-Q plots (Fig. 5). Visual inspection of the Q-Q plots indicated deviations from normality across all three KAP domains. The Shapiro-Wilk test results confirmed this observation, with $W = 0.627$ ($p < 0.001$) for knowledge scores, $W = 0.824$ ($p < 0.001$) for attitude scores, and $W = 0.786$ ($p < 0.001$) for practice scores.

3.6.2 Linear regression analysis

Linear regression analysis was conducted to explore the relationships between knowledge, attitude, and practice scores among participants. The results are summarized in Table 5. Knowledge score was positively associated with attitude score ($\beta = 0.64$, $SE = 0.03$, $t = 20.46$, $p < 0.001$), explaining approximately 51% of the variability in attitude ($R^2 = 0.51$). Similarly, knowledge score was a significant predictor of practice score ($\beta = 0.83$, $SE = 0.03$, $t = 28.30$, $p < 0.001$), accounting for 66% of the variance in practice. Furthermore, attitude score

was strongly associated with practice score (β = 0.98, SE = 0.03, t = 34.54, p < 0.001), with 75% of the variability in practice explained by attitude.

Table 5
Linear regression analysis results showing the effects of knowledge on attitude and practice, and attitude on practice.

Outcome Variable	Predictor	Estimate (β)	Std. Error	t-value	p-value	R^2
Attitude Score	Knowledge Score	0.637	0.031	20.46	< 0.001	0.509
Practice Score	Knowledge Score	0.826	0.029	28.3	< 0.001	0.665
Practice Score	Attitude Score	0.982	0.028	34.54	< 0.001	0.748

3.6.3 Mediation analysis

Figure 5 illustrates a detailed analysis of the effect of knowledge on practice (mediation effects), which indicates that 50% (Estimate, 0.504, 95%CI: 0.373–0.663) of the total effect of knowledge on practice (Estimate, 0.826, 95%CI: 0.751–0.944, p < 0.001) is mediated by attitude. The indirect effect (mediation) of knowledge on practice was 0.416 (95% CI: 0.294–0.609, p < 0.001), while the direct effect was 0.410 (95% CI: 0.304–0.501, p < 0.001).

3.7 Key informant interview

Key informant interviews highlighted regulatory, operational, and public health challenges related to street-vended fried chicken in Ilala District (Table 6). While regulations exist, enforcement is weak due to limited resources, vendor non-compliance, and mobile operations. Hygiene and food handling were reported as poor, with risky practices including mixing raw and cooked chicken, reusing oil, and leaving food exposed. Vendors faced infrastructure constraints such as limited water access, a lack of storage, and the absence of testing laboratories. Knowledge gaps and socio-economic pressures affected compliance, although some vendors received education via inspections and media. Despite no documented outbreaks, officials noted high public health risks. Recommendations emphasized mandatory vendor registration, improved inter-institutional coordination, investment in laboratories and hygiene infrastructure, and regular training and sensitization.

Table 6
The results of Key informant interviews

Theme	Key Issues Identified	Frequency
Regulation & Enforcement	Low registration and poor enforcement of standards	5/5
	Limited follow-up and weak penalties for non-compliance	4/5
	Mobile vendors are complicating monitoring	3/5
Food Hygiene Practices	Mixing raw and cooked chicken	4/5
	Reuse of oil, uncovered food, and improper storage	5/5
	Inadequate personal hygiene (e.g., unwashed hands, dirty tools)	5/5
	Lack of protective gear	3/5
Infrastructure Challenges	Limited access to clean water	4/5
	Lack of storage, electricity, or basic sanitation facilities	4/5
	No food testing labs available	3/5
Knowledge & Awareness	Vendors lack training on hygiene and safety	5/5
	Some awareness through inspections or the media	3/5
	Inconsistent knowledge-to-practice translation	3/5
Public Health Risk	Potential risk of foodborne diseases (cholera, diarrhoea)	4/5
	No documented outbreak cases, but high perceived risk	3/5
Collaboration & Monitoring	Routine inspections conducted by TMB/local authorities	4/5
	Joint efforts exist, but are irregular or under-resourced	3/5
Recommendations	Register all vendors and maintain a central database	5/5
	Improve collaboration between institutions	4/5
	Establish food testing laboratories	3/5
	Provide training, affordable gear, and infrastructure support	5/5
	Continuous public sensitization and monitoring	4/5

3.8 The results of the observation checklist regarding the safety and hygiene of meat vendors

Observational data from 405 meat vendors reveal extremely low compliance with basic food safety and hygiene practices (Table 7). Most indicators, including handwashing, use of protective clothing, clean cutting tools, safe meat storage, and waste disposal, had compliance below 6%, indicating widespread neglect of hygiene and sanitation standards. Only drainage infrastructure showed high adherence (97.5%), suggesting

that structural facilities were better maintained than actual hygienic behaviors. These results highlight critical gaps in vendor practices, posing substantial public health risks.

Table 7
The results of the observation checklist regarding the safety and hygiene of meat vendors

Theme	Indicator	Compliant (n)	Non-Compliant (n)	% Compliant
Hygiene Practices	Regular Handwashing	4	401	1.0
	Use of Protective Clothing	6	399	1.5
	Handwashing Station Available	23	382	5.7
	Clean Cutting Tools	5	400	1.2
Sanitation and Cleanliness	Clean Water Use	9	396	2.2
	Cleanliness of Vending Facility	1	404	0.2
	Presence of Pests	22	383	5.4
Meat Handling and Storage	Safe Meat Storage	17	388	4.2
	Temperature Control	8	397	2.0
	Separation of Raw/Cooked Products	8	397	2.0
	Meat Display Protection	2	403	0.5
Waste Management	Waste Disposal System	4	401	1.0
	Disposal of Slaughter Waste	0	405	0.0
Infrastructure	Drainage System	395	10	97.5

4 Discussion

Street-vended fried chicken plays as an important source of affordable nutrition and income in urban Tanzania; however, its informal nature and limited regulatory oversight expose consumers to substantial food safety risks [13]. The present study integrated KAP surveys, observation checklists, and key informant interviews to assess the safety practices of vendors in Ilala District. The findings reveal critical gaps in knowledge, attitudes, and practices, while highlighting structural and socio-economic factors that hinder observance of safe food handling.

The most striking finding is the exceptionally low level of food safety knowledge among vendors, with 97.3% classified as having low knowledge. While nearly all vendors recognized general bacterial contamination (98.8%) and associated diarrhoea with foodborne illness (82.7%), their awareness of critical safety measures, such as cross-contamination (3.7%), appropriate storage temperatures (3.0%), and limitations of reheating, was negligible. This pattern indicates that vendors may understand “general” hygiene concepts but lack specific,

actionable knowledge required to prevent contamination [4, 8]. Knowledge was strongly associated with age, education, and experience, suggesting that older, more educated, and longer-serving vendors have accumulated both formal and practical understanding, which younger and less-educated vendors lack. This highlights the need for tailored, technical training programs that focus on critical food safety measures rather than general awareness.

Attitudes toward food safety were predominantly neutral (85.7%), with only 4.9% expressing positive attitudes. Favourable attitudes were mostly limited to visible hygiene measures and responsibility toward customers, while critical practices such as handwashing, glove use, and separation of raw and cooked meat were largely neglected. Self-reported practices appeared relatively high for routine actions such as reheating (99.3%) and proper storage (99.0%); however, observation checklist results revealed extremely low compliance for essential hygiene behaviours, handwashing (1%), protective clothing (1.5%), clean cutting tools (1.2%), safe storage (4.2%), separation of raw and cooked meat (2%), and meat display protection (0.5%), except for drainage system compliance (97.5%). This discrepancy between reported and observed practices confirms that vendors may perform socially desirable behaviours while neglecting high-impact hygiene actions critical for preventing foodborne diseases [14, 15]. The nearly universal handling of money during food preparation (98.8%) further exacerbates the risk of cross-contamination, emphasizing that superficial compliance is insufficient for public safety.

Statistical analyses revealed important interrelationships between KAP components. Knowledge significantly predicted attitude ($\beta = 0.64$, $R^2 = 0.51$, $p < 0.001$) and practice ($\beta = 0.83$, $R^2 = 0.665$, $p < 0.001$), while attitude strongly predicted practice ($\beta = 0.98$, $R^2 = 0.748$, $p < 0.001$). Mediation analysis indicated that approximately 50% of the effect on practice was mediated through attitude (Estimate = 0.504, 95% CI: 0.373–0.663), confirming that knowledge alone is insufficient to change behaviour. These findings suggest that interventions must combine technical expertise with behavioural motivation and attitudinal reinforcement to ensure consistent adoption of safe practices [3, 16]. Regression analyses further highlighted that male vendors, those with tertiary education, and experienced vendors were more likely to demonstrate acceptable practices, whereas younger, less-educated vendors consistently scored lower, identifying key target groups for capacity-building initiatives.

Qualitative findings contextualize these gaps, revealing systemic and infrastructural barriers that exacerbate unsafe practices. Key informants reported weak regulatory enforcement, irregular inspections, and challenges in monitoring mobile vendors. Observed risky behaviours included mixing raw and cooked meat, reusing frying oil, leaving food uncovered, and handling food with unwashed hands. Structural constraints, such as limited access to clean water, inadequate storage facilities, and the absence of local food testing laboratories, combined with socio-economic pressures, like minimizing costs and maximizing daily income, often prevented vendors from practicing safe food handling, even when knowledge and attitudes were adequate. Although no documented outbreaks were officially reported, officials expressed concern about the high potential for cholera and diarrhoeal diseases, suggesting underreporting and highlighting the need for integrated interventions (FAO/WHO, 2020; Mensah et al., 2002).

Conclusion and Recommendation

Fried chicken vending in Ilala District is a critical livelihood activity but poses substantial public health risks. Vendors' extremely low knowledge, neutral attitudes, poor adherence to essential hygiene, and structural constraints create conditions for potential foodborne disease outbreaks. Observational and qualitative findings suggest that self-reported behaviors overestimate actual compliance. Filling these gaps requires integrated interventions targeting knowledge, attitudes, behaviors, and infrastructure simultaneously. Targeted, context-specific training programs should focus on younger, less-experienced vendors, emphasizing critical hygiene practices, safe storage, cross-contamination prevention, and handwashing. Behavioral reinforcement, through role modelling, supervision, and repeated messaging, should accompany technical education. Regulatory authorities should strengthen vendor registration, inspections, and inter-institutional coordination, while investing in water, sanitation, and testing facilities. Community awareness campaigns can empower consumers to demand safer food. Future research should explore effective strategies for bridging knowledge-to-practice gaps, evaluate the impact of infrastructural improvements, and investigate the socio-economic drivers of unsafe practices to inform scalable interventions.

Declarations

5. Ethics, Consent to Participate

Permission to conduct this study was obtained from Sokoine University of Agriculture (SUA) [Ref: SUA/ADM/R.1/8/1311], SUA Directorate of Postgraduate Studies, Research, Technology Transfer and Consultancy [Ref: SUA/DPRTC/MPH/D/2023/0004/03], TAMISEMI [Ref: AB.307/323/01/185], the Regional Commissioner's Office [Ref: EA.260/307/02b403], Ilala Municipal Council, and Dar es Salaam City Council [Ref: DCC/AF.3]. All methods that involved people were conducted in accordance with Local Government Authority and SUA guidelines and regulations. Participants were fully informed about the study objectives, and written consent was obtained.

6. Consent to Publish declarations

All participants, including the local governments, authors and chicken meat vendors were informed and willingly provided consent for publications

7. Clinical trial number

Not applicable.

8. **Authors' Contributions**

Mohamed Said Ahmed conceptualized the study, conducted data collection, performed data analysis, and prepared the first draft of the manuscript. Athumani Msalale Lupindu supervised the fieldwork, contributed to study design, assisted in data interpretation, and reviewed the manuscript. Hezron Emmanuel Nonga provided guidance on methodology, contributed to data interpretation, and critically reviewed and edited the manuscript. All authors read and approved the final version.

9. **Conflict of Interest**

The authors declare that there are no conflicts of interest regarding the publication of this study.

10. **Data Availability**

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

11. **Financial Statement**

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Figures

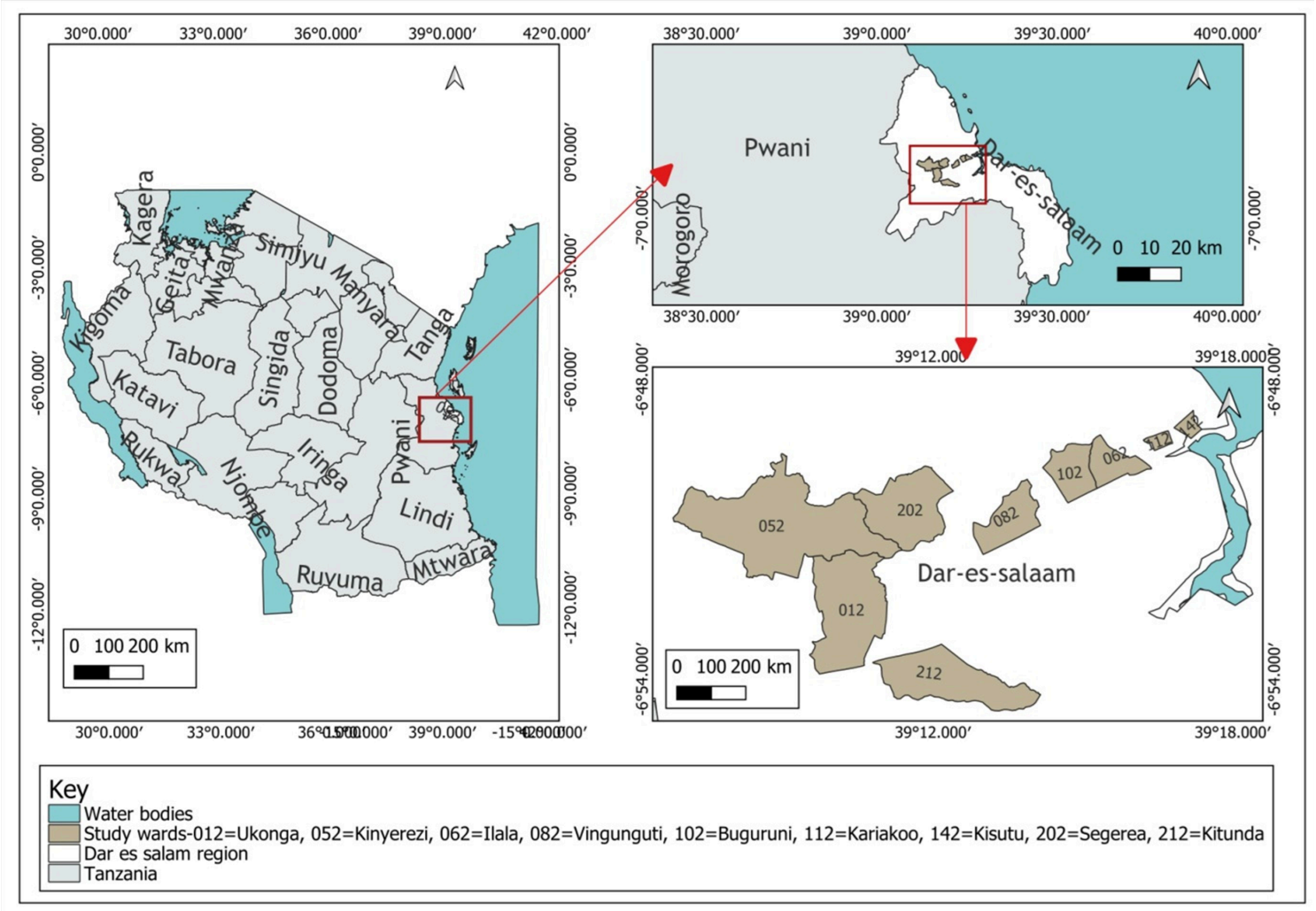


Figure 1

Map of Tanzania showing the 26 regions of the mainland. Note the red box shows the relative location of the Dar es Salaam region, where Ilala city is located. The study wards are coded with special numbers.

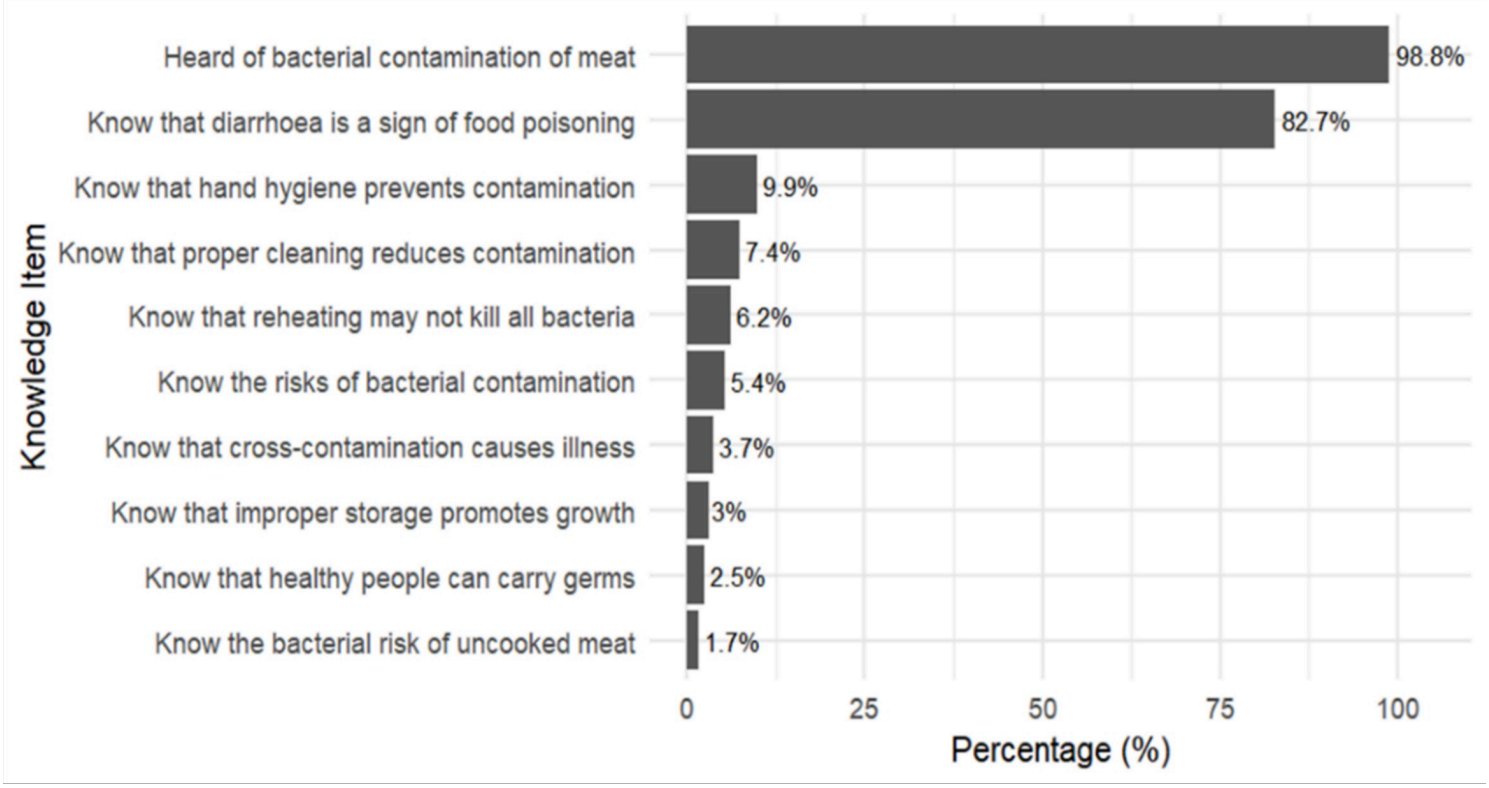


Figure 2

Responses on specific food safety knowledge among vendors

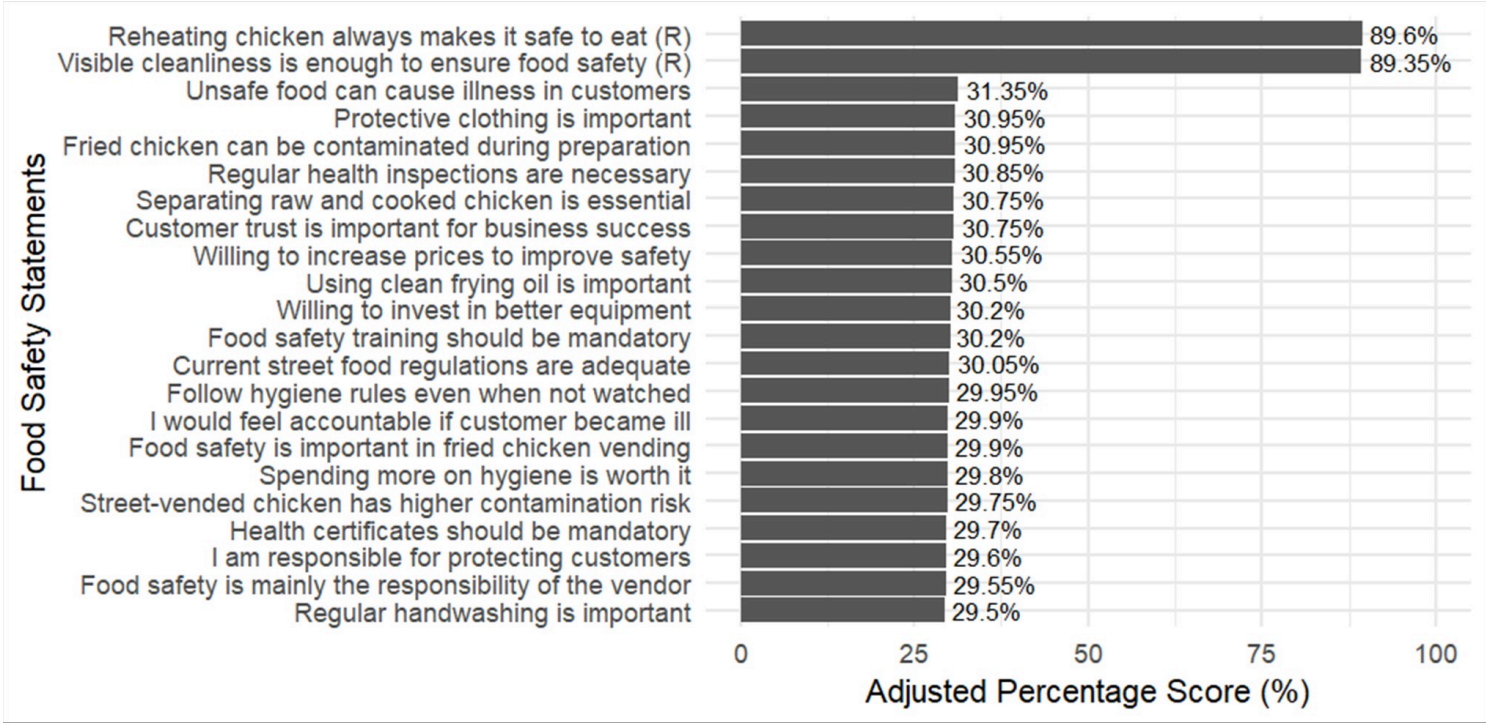


Figure 3

Attitudes toward specific food safety items

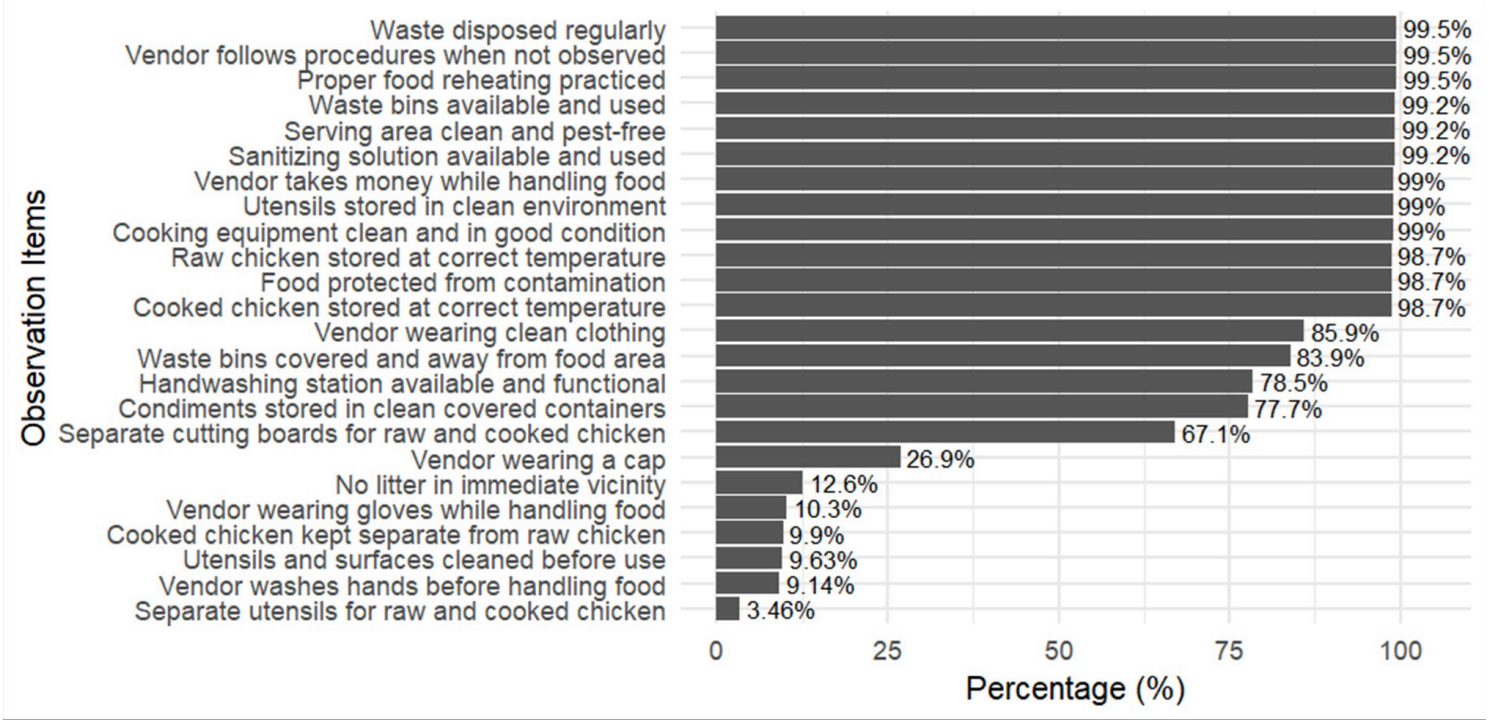


Figure 4

Specific food safety practices and the proportion of vendors

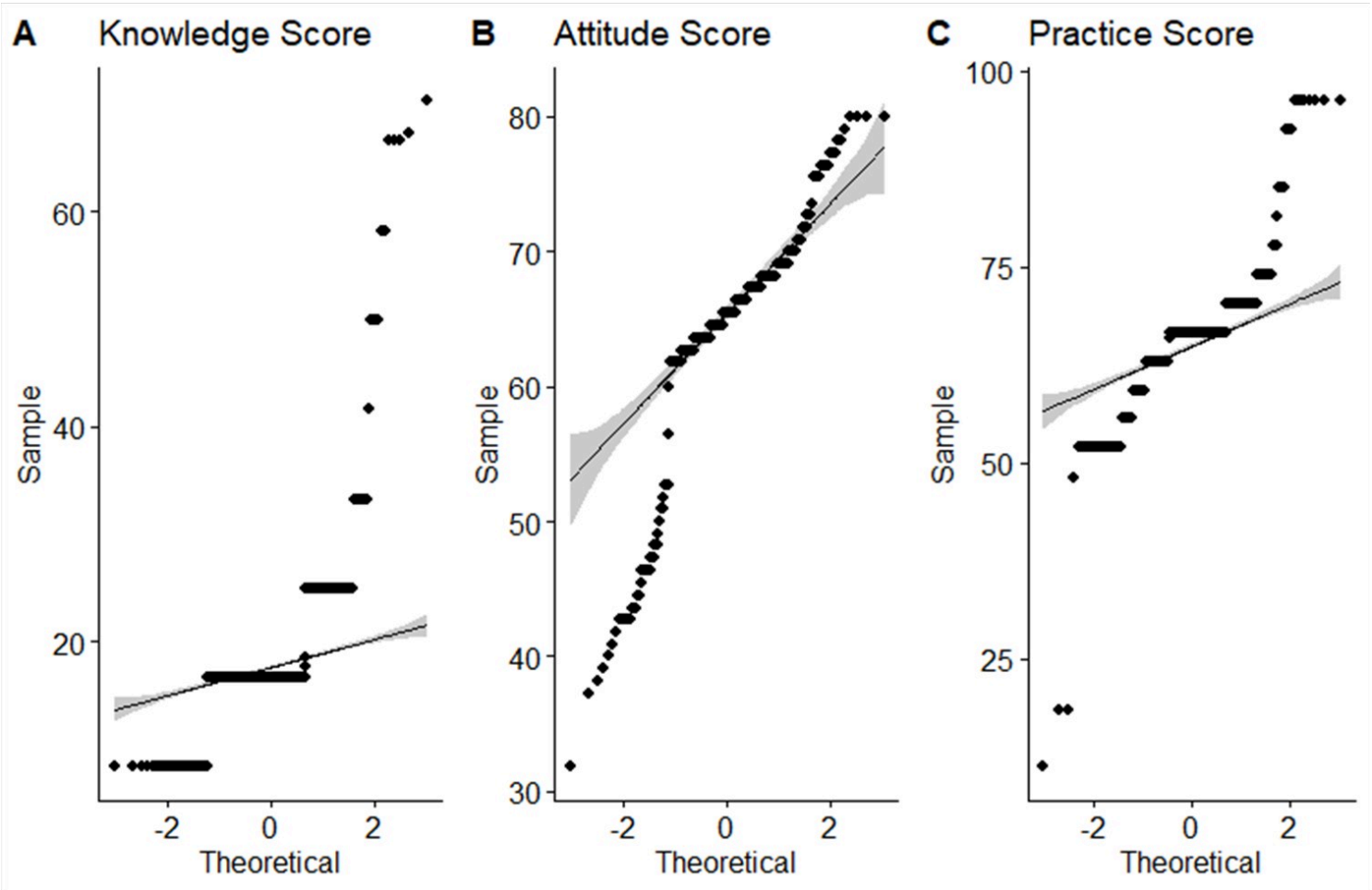


Figure 5

Figure 4: The quantile-quantile (Q-Q) plot showing the statistical distribution patterns of KAP scores. The grey straight diagonal line is the reference line for a normally distributed dataset. Black data points are the KAP scores, significantly deviating from the normal reference line.

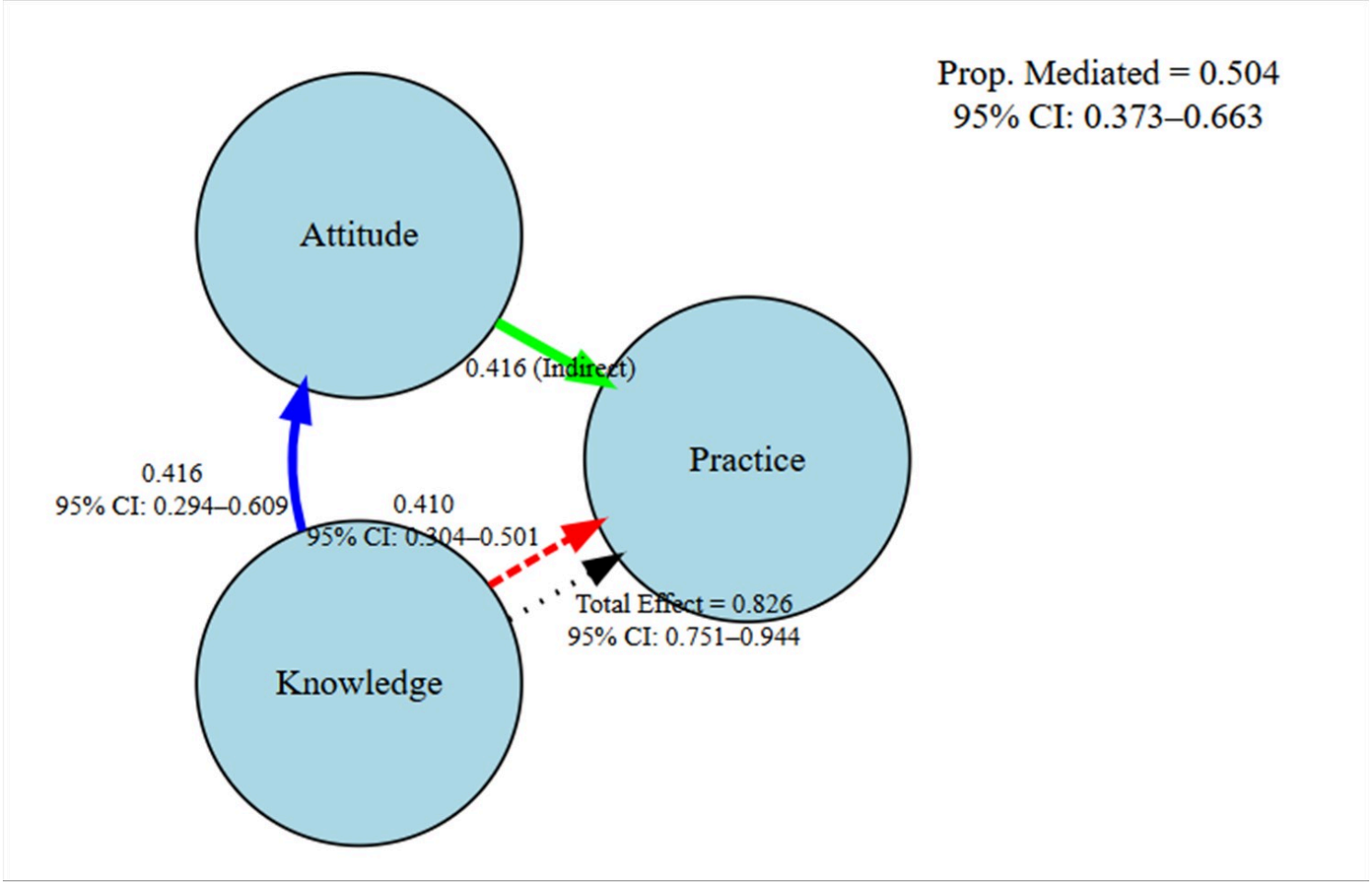


Figure 6

Figure 5: Pathways of the effects of knowledge on practice. The blue and green arrows indicate the indirect effect of knowledge on practice that is mediated through the attitude. The red broken arrow is the direct effect (not mediated), while the black broken line is the total effect combining the direct and indirect effects.