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RESEARCH ARTICLE

Sanitary Practices of Food and Drinking Establishments and Associated Factors in Worabe Town, Silte Zone, Ethiopia

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Abstract

Background: Foodborne illnesses pose a significant threat to public health worldwide, affecting both developed and developing nations. In urban settings, food service establishments cater to large volumes of customers, increasing the risk of infections. However, there is limited information about the sanitary practices of these establishments in the current study location. Therefore, this study aimed to assess the sanitary practices and associated factors in food and drinking establishments in Worabe Town, Silte Zone, Ethiopia.

Method: A cross-sectional study design was conducted from August 1 to 10, 2023, with 339 randomly selected participants from food and drink establishments. Data were collected using pretested structured questionnaires and observation checklists. The collected data were entered into EpiData version 4.6 and transferred to SPSS version 26 for analysis. Descriptive statistics, including means, frequencies, and percentages, are presented, along with bivariate and multivariable logistic regression analyses.

Result: In this study, 334 respondents from food and drink establishments participated, resulting in a response rate of 98%. Nearly half of the participating establishments were restaurants (49.7%). Among the facilities, 45.5% provided both food and drink services, while 41.6% offered food exclusively. The study found that 68.9% of respondents followed good food handling practices, but 52.4% of food and drinking establishments were found to have poor sanitary practices. Establishments with trained food hygiene managers (AOR = 2.6, 95% CI: 1.58–4.42), food handlers who underwent medical examinations (AOR = 1.3, 95% CI: 1.01–2.95), and those receiving supportive supervision from regulatory bodies every six months (AOR = 2.3, 95% CI: 1.66–4.06) were significantly associated with better sanitary practices.

Conclusion: This study revealed that only half of the food and drinking establishments operate under satisfactory sanitary conditions. Factors significantly associated with improved sanitary practices included having trained food hygiene managers, food handlers who had undergone medical examinations, and establishments receiving regular supportive supervision from regulatory bodies. It is recommended to strengthen the implementation of hygiene training, medical check-ups, and sustainable supportive supervision for all workers in these establishments.

Keywords: Food and drinking establishment, Sanitary practice, Silte Zone, Worabe, Ethiopia

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1 Introduction

Sanitary practices in food and drinking establishments, including handwashing, surface sanitization, and safe food storage, are essential to prevent contamination and health risks. Mendebo, Berhane, and Haile (2017) found that sanitary conditions in Ethiopian establishments are affected by environmental and managerial factors. In developing countries, foodborne diseases, stemming from poor food handling, inadequate temperature control, and poor personal hygiene among food handlers, hinder socio-economic development [1, 2]. Effective sanitary practices ensure proper maintenance, availability of handwashing facilities, waste management, and monitoring of cleanliness process [3].

Food safety is the most public health concern and is a scientific discipline that describes the handling, preparation, and storage of food in ways that prevent foodborne illnesses [4]. An adequate supply of safe, healthy, and nutritious food is essential for health and well-being. People can become sick when they eat food contaminated with hazards called foodborne disease [5]. The magnitude of over 200 different foodborne diseases caused by various bacteria, viruses, parasites, and harmful toxins or chemicals makes food safety a critical public health issue globally [6,7].

Improper food handling procedures are responsible for over 50% of total food poisoning cases worldwide [8]. Developed countries face a significant challenge with food safety, with an estimated 76 million cases of foodborne illnesses each year, leading to 325,000 hospitalizations and 5,000 deaths, costing $23 billion [9]. Poor food handling practices cause approximately 600 million cases and 420,000 deaths annually, with one in ten people becoming ill from consuming contaminated food. Food-borne illnesses are prevalent globally, making food safety a public health issuer [10]. In the USA and England, outbreaks of food-borne illnesses cause 5,000 and 500 deaths each year, respectively, with similar trends reported in other parts of Europe and North America [11]. The African region and Southeast Asia have the highest rates of morbidity and mortality due to foodborne diseases, as reported by the WHO [12].

Like other developing countries, in Ethiopia there is a high burden of foodborne diseases due to food contamination. The main reasons for the consumption of unsafe food were the lack of clean water, weak regulatory / supervision activities, a dense population, and poor environmental conditions intensifying the situation. The rise in the appearance of diarrheal diseases among children is an indicator of the food hygiene situation and inappropriate food preparation practices in the Region [13]. In many urban centers, eating in food service establishments such as restaurants, hotels, cafeterias, and fast-food restaurants is common. These facilities prepare, handle, and serve large amounts of foods and drinks to large groups of people in a short period of time, which may present a potential risk of infection [3]. Food processed in large quantities is susceptible to contamination and increased foodborne illness when it does not follow food hygiene principles [14].

In previous studies, poor sanitary practices in food and drink establishments in Ethiopia have been documented, with magnitudes varying across locations: Burayu Town (47.9%), Addis Ababa (58.8%), Adwa (53.3%), and Bahrdar (78.7%) [15–18]. In Worabe town, most public restaurants and drinking establishments are in densely populated areas and often do not meet standard sanitation requirements, resulting in poor hygiene practices. The urban's lively economic, recreational, and construction sectors contribute to heavy daily usage of these establishments. Consequently, the health risks posed to customers due to potential foodborne diseases are markedly elevated. Additionally, there is a notable scarcity of research-based information on the extent and associated factors of sanitary practices within public food and drinking establishments in the study area. Therefore, this study aimed to address this study gap by assess sanitary practices and associated factors in food and drinking establishments in Worabe town, Silte Zone, Ethiopia.

2 Methods and Materials

2.1 Study setting and Period

The study was conducted in Worabe town, which is in located central Ethiopia, Silte administrative zone, from August 1 to 10, 2023. It is found 172 kilometers south-west of Addis Ababa, Ethiopia's capital. In total, 79,408 people live in Worabe, 40,498 of whom are men and 38,910 of whom are women. In the town, there are eleven health posts, two health centers, and one specialized hospital with more than 500 medical professionals. Additionally, the town is home to 1,586 licensed food and drink establishments, spread out among cafeterias (361), hotels (10), restaurants (779), bars and restaurants (127), juice houses (123) and bakeries/bakery (40) [19].

A cross-sectional study design was employed to assess the sanitary conditions of these licensed food and drinking establishments and the factors associated with them.

2.2 Source population

All licensed food and drink establishments in Worabe Town served as the source population for this study. The study subjects were randomly selected from these establishments.

2.3 Eligibility criteria

The study focused solely on food and drink establishments that had obtained proper authorization from regulatory bodies, such as the town's Trade and Industry office, to prepare and sell food and beverages for consumption. Establishments that were suspended or restricted by regulatory bodies during the data collection period were not included in the study.

2.4 Sample Size Determination

The sample size was determined using a single population proportion formula, based on an assumption of overall poor sanitary conditions in 53.3% of establishments [17], a 5% margin of error, and a 95% confidence level, resulting in an initial sample size of 382. Since the study area had a finite population of 1,586 establishments (less than 10,000), a sample size reduction formula was applied, decreasing the sample size to 308. After accounting for a 10% non-response rate, the final sample size was adjusted to 339.

2.5 Sampling Procedure

All food and drink establishments were included in the sampling frame for the sampling procedure. The targets were determined based on the size of the sampling frame using proportional allocation. Establishments were stratified by their type of service into the following categories: hotels, bars and restaurants, restaurants, cafeterias, pastry shops, and juice vendors. This stratification ensured representativeness and avoided over- or underrepresentation. Study subjects were then selected through simple random sampling.

2.6 Data Collection Tools and Process

Data were collected using a structured questionnaire and an observational checklist adapted from previous studies [16–18,20]. The reliability of these tools was assessed using Cronbach's alpha. A team of six data collectors and supervisors, consisting of five certified nurses and one Bachelor of Science in Environmental Health, conducted interviews with the managers and/or owners of the establishments and observed food handlers. The collected data included the physical conditions of the food and drink establishments, sanitary facilities, and verification of the legal authorization to serve food and drink [21]. The checklist was modified based on comparable research and guidelines from the Ethiopian Food and Drug Authority (EFDA), which currently tracks and evaluates food and beverage establishments using operational inspection checklists.

2.7 Study Variables

Sanitary practices (good or bad) serve as the dependent variable in this study. The overall sanitary practice score was calculated based on 18 criteria, with each criterion assigned a value of '1' for the presence of a sanitary practice and '0' for its absence. The sum of these criteria was computed, and the mean score of all observations was used as a cut-off point to categorize

establishments. Food and drink establishments that scored equal to or above the mean value were classified as having good sanitary practices, while those scoring below the mean were considered to have poor sanitary practices [16]. For analysis, a value of '1' was assigned for good sanitary practices and '0' for poor practices. The internal consistency of the items used to measure each composite variable (all 18 variables) was assessed using Cronbach's alpha, yielding a value of 0.76.

The independent variables included the presence of sanitary facilities such as chemicals and detergents, sewerage systems, washing basins and sinks, separate kitchens, water storage, clean utensils, and waste disposal methods (both solid and liquid). Other factors considered were personal hygiene, environmental sanitation, the presence or absence of regulatory inspections, and the presence or absence of trained managers in hygiene and sanitation. Additionally, socio-demographic characteristics of the managers, including sex, age, marital status, level of education, and business ownership, were also included as independent variables.

2.8 Data Quality Assurance

Questionnaires and observation checklists were originally written in English, then translated into Amharic, the local language, and subsequently back into English to ensure consistency. Data collectors and supervisors underwent three days of training on data collection methods and techniques. Five percent of the tools were pretested in Butajira Town to assess their clarity. Supervisors closely monitored the data collection process, and at the end of each day, we held discussions with them to address any issues that arose.

2.9 Data Analysis

The collected data were checked for completeness and consistency before being coded and entered EpiData version 4.6, then exported to SPSS version 26 for further analysis. Descriptive statistics were calculated for all variables according to their type. Means, medians, and standard deviations were calculated for continuous variables, while categorical variables were presented as frequencies and percentages. The mean score value was used to assess sanitary practices. Model fit was evaluated using the Hosmer-Lemeshow goodness-of-fit test. All tests with $p < 0.05$ at a 95% confidence interval were considered statistically significant.

3 Results

3.1 Food and drink establishment characteristics

The study included 334 establishments, resulting in a response rate of 98%, with 49.7% identified as restaurants. Among these establishments, 41.6% served exclusively food, 8.1% served exclusively drinks, 45.5% offered both food and drink, and 4.8% provided food, drinks, and lodging. Many of the establishments (63.2%) were rented, and 68.6% had been supervised at least once in the past six months. Additionally, 60.8% of the establishments were in operation for 1 to 2 years, while only 5.4% had been in service for more than 11 years. The analysis revealed that 88% of the establishments had separate kitchens from other areas, and within these kitchens, 76% maintained clean processing equipment. Furthermore, a significant portion of the kitchens (85.6%) had refrigerators equipped with fixed thermometers for storing perishable food items (Table 1).

Table 1 Characteristics of food and drink establishments in Worabe Town, Silte zone, Ethiopia, 2023 (n=334)

Characteristics	Category	Frequency (N)	Percentage (%)
Type of establishments	Hotels	2	0. 6
	Restaurants	166	49.7
	Bar and Restaurants	23	6.9
	Cafeterias	77	23
	Bakery/Pastry	40	11.9
	Juice Vendors	26	7.8
Type service provides	Exclusively Food	139	41.6
	Exclusively drink	27	8.1
	Food and Drink	152	45.5
	Food, Drink and bed	16	4.8
Ownership of the building	Owned	123	36.8
	Rented	211	63.2
Supervised at least once in last six months	Visited	229	68.6
	Not visited	105	31.4
Service Year of establishments	1-2 years	238	71.1
	3-5 years	35	10.5
	6-10 years	78	23.4
	≥11 years	18	5.4
A separate room for kitchen	Yes	294	88
	No	40	12
Equipment cleanness and free from dirt and filth	Yes	254	76
	No	80	24
Running water in the kitchen	Yes	283	84.7
	No	51	15.3
Proper food handling	Yes	230	68.9
	No	104	31.1
Floor clean	Yes	262	78.4
	No	72	21.6
Presence of hood and chimney	Yes	244	73
	No	90	27
Insect Observed	Yes	124	37
	No	210	73
Availability of Refrigerator	Yes	286	85.6
	No	48	14.4
Separate storeroom	Yes	226	67.7
	No	108	32.3

3.2 Characteristics of managers of establishments

In this study, more than half of the establishments (52.7%) were managed by their owners, while 30.8% were managed by relatives and 16.5% by employed managers. The majority of managers were women (51.2%), with a mean age of 33.22 years. The educational backgrounds of the managers varied: 6% had no formal education, 36.2% had primary education, and 31.7% had secondary education. Only 35.9% had received training in food hygiene or related topics. While 79.9% of food handlers wore clean overcoats or gowns, only 52.4% wore appropriate

hair coverings, and just 33.5% had undergone medical checks within the last six months. Furthermore, the majority (66.5%) did not possess a medical check-up card at the time of data collection (Table 2).

Table 2 The socio-demographic characteristics of managers of public food and drinking establishments in Worabe Town, Silte zone, Ethiopia, 2023 (n = 334)

Characteristics	Category	Frequency	Percentage (%)
Manager of the Establishment	Owner	176	52.7
	Relatives	103	30.8
	Employed	55	16.5
Sex ofmanager	Male	163	48.8
	Female	171	51.2
The age range of managers	18-24 years	100	29.9
	25-30 years	132	39.5
	31-35 years	57	17
	≥36 years	45	13.4
Marital status	Single	159	47.6
	Married	127	38
	Divorced	37	11
	Separated	3	0.9
	Widowed	8	2.4
Educationalstatus	No formaleducation	20	6
	Primaryeducation	121	36.2
	Secondaryeducation	106	31.7
	Diploma and above	87	26

3.3 Accessibility of Water Supply and Sanitation Facilities

A significant majority of establishments (91.6%) utilized privately installed water sources supplied by the municipality. Additionally, 64.4% had water storage tanks to manage shortages. Almost all establishments (94.1%) had latrines, with 72% providing comfortable toilets and 40% offering separate latrines for males and females. Furthermore, 90.4% of the establishments had separate handwashing facilities, although only 54.2% supplied soap or liquid detergent for handwashing (Table 3).

Table 3 Availability of water supply and sanitation facilities of food and drinking establishments in Worabe Town, Silte zone, Ethiopia, 2023 (n = 334)

Characteristics	Category	Frequency	Percentage (%)
Source of water for establishment	Privately instilled	306	91.6
	Communal distribution	10	3.0
	Buy from others	18	5.4
Presence of tanker	Yes	215	64.4
	No	119	35.6
Presence of toilet	Yes	314	94.1
	No	20	5.9
Separation of toilet for male and female	Yes	134	40.0
	No	200	60.0
Toilet comfortable	Yes	242	72.0
	No	92	28.0
Presence of hand washing basin in the toilet	Yes	243	73.0
	No	91	27.0
Presence of separate hand washing facility in the toilet	Yes	302	90.4
	No	32	9.6
Presence of soap for hand washing	Yes	181	54.2
	No	153	45.8
Availability of shower service	Yes	234	70.0
	No	100	30.0
Separate room for clothing, resting and placing of cloths	Yes	167	50.0
	No	167	50.0
Basin for washing utensils used for food and drinking	Yes	334	100
	No	-	-
Number of compartments of basins for establishments	3 compartments	202	60.5
	2 compartments	115	34.4
	1 compartment	17	5.1
Utensils and equipment stored in containers	Yes	261	78
	No	73	22
Appropriate refuse receptacles placed in appropriate place	Yes	246	73.7
	No	88	26.3
Refuse transport to final disposal before over filling	Yes	273	81.7
	No	61	18.3
Installation of drainage system for collection of liquid waste	Yes	219	65.6
	No	115	34.4
Type of drainage system for the collection of liquid waste	A closed type	290	86.8
	Open trench	44	13.2

3.4 General sanitary practice in food and drinking establishments

The absence of standardized grading tools complicates the assessment of overall sanitary practices in food and drink establishments. By selecting 18 determinants, a mean score of 11.5 was established to classify the establishments as having either good or poor sanitary practices (Table 4).

Table 4 Sanitary practice of public food and drinking establishments in Worabe Town, Silte zone, Ethiopia, 2023 (n=334)

Criteria for sanitary condition:	Frequency	Percentage (%)
Establishments with functional washing facility	302	90.4
Establishments with functional latrine	314	94
Establishments that managed latrine facility properly	253	76
Establishment containers for solid waste storage	246	73.7
Establishments that disposed liquid wastes properly	290	86.8
Establishments having 3 compartments for dish/glass washing	202	60.5
Establishments with storeroom for non-perishable foods	227	67.7
Establishments with separate kitchen rooms	294	88
Establishments with functional refrigerator	286	85. 6
Establishments with piped water supply	306	91.6
Establishments that dispose of solid waste properly	246	73.7
Establishments that practice proper storage of food utensils	261	78
Establishments that store water drinking materials properly	215	64.4
Establishments with food handlers wearing proper outer garment	267	79.9
Establishments with food handlers wearing proper hair cover	150	46.7
Establishments with food handler's medical checkup in the last 6 months	112	33.5
Establishments with no insect or rodent infestation	124	37
Establishments with separate dressing room for food handlers	167	50

Overall, 47.7% of establishments had good sanitary practices while 52.3% had poor sanitary practices, as shown in Figure 2.

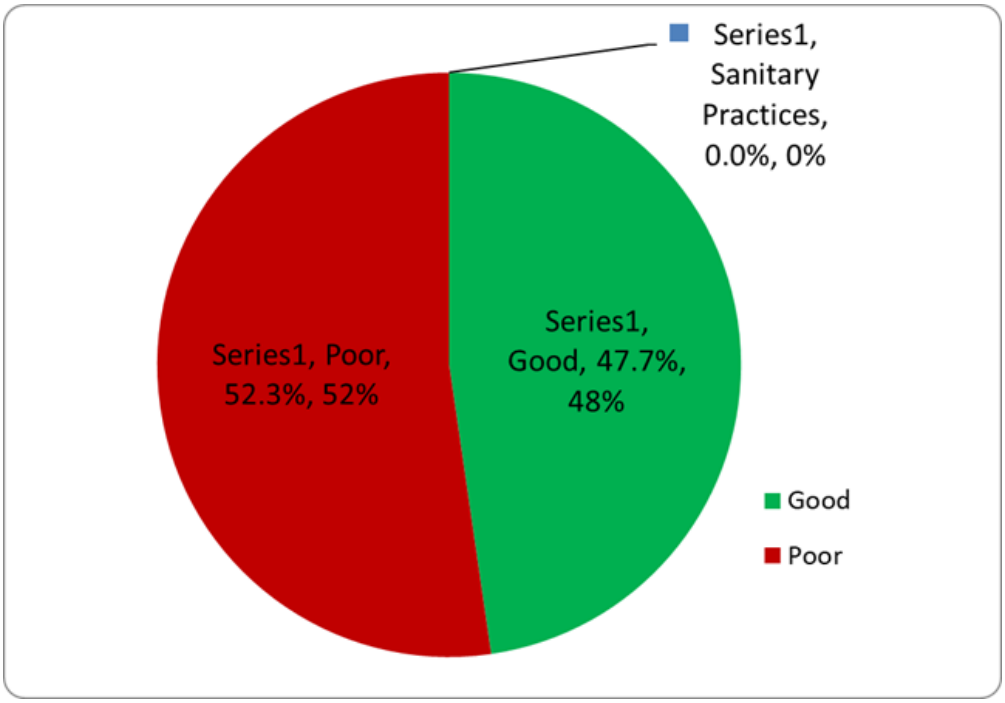

Figure 1 Overall status of sanitary practice in the food and drinking establishment in Worabe Town, Silte zone, Ethiopia, 2023

3.5 Factors associated with sanitary practices

In the bivariate analysis, candidate variables for multivariable analysis included food hygiene training received by the manager, visits in the last six months, equipment cleanliness, availability of a separate handwashing facility, appropriate refuse receptacle placement, proper food handling, floor cleanliness, ventilation, the presence of a separate storage room, workers wearing appropriate clean coats, and possession of a medical check-up card within the last six months.

The multivariable logistic regression analysis showed that managers who received food hygiene training, establishments supervised in the last six months, and food handlers who had medical check-ups were statistically significantly associated with good sanitary practices ($P < 0.05$). However, factors such as equipment cleanliness, the presence of a separate handwashing facility, appropriate garbage receptacle location, proper food handling, clean floors, installed ventilation, separate storage rooms, and workers wearing clean overcoats were not statistically associated ($P > 0.05$) with good sanitary practices.

Establishments that had been supervised by regulatory bodies at least once in the past six months were 2.35 times more likely to have good sanitary practices compared to those not supervised during that period (AOR = 2.35, 95% CI: 1.66–4.06). Managers trained in food hygiene were 2.6 times more likely to operate establishments with good sanitary practices compared to untrained managers (AOR = 2.6, 95% CI: 1.58–4.42). Additionally, food handlers who had undergone medical check-ups were 1.73 times more likely to maintain good food handling practices compared to those who had not (AOR = 1.73, 95% CI: 1.01–1.95) (Table 5).

Table 5 The candidate variables for sanitary practices among public food and drinking establishments in Worabe Town, Silte zone, Ethiopia, 2023 (n=334)

Variable	Category	Sanitary practice		COR (95%CI)	AOR (95%CI)
		Good	Poor		
Floor clean	Yes	138	124	2.7(1.53-4.74)	1.42(0.69-2.92)
	No	21	51	1	1
Workers wear appropriate clean over coat	Yes	129	128	2.55(1.43-4.53)	1.87(0.98-3.58)
	No	20	47	1	1
Supervised in the last six months	Yes	128	101	3.02(1.84-4.957)	2.35(1.66-4.06)*
	No	31	74	1	1
Dose equipment's cleanness	Yes	135	119	2.64(1.546-4.533)	1.4(0.73-2.28)
	No	24	56	1	1
Separate hand washing facility	Yes	152	150	3.611.51-8.62)	1.33(0.49-3.64)
	No	7	25	1	1
Food handling properly	Yes	130	100	3.36(2.03-5.55)	1.42(0.629-2.92)
	No	29	75	1	1
Food hygiene training taken by the manager	Yes	80	41	3.3 (2.02-5.15)	2.64(1.58-4.42) *
	No	79	134	1	1
Installed for ventilation	Yes	134	110	3.16(1.87-5.35)	1.14(0.536-2.43)
	No	25	65	1	1
Separate storeroom	Yes	124	102	3.58(1.65-7.8)	1.286(0.72-2.75)
	No	32	73	1	1
Medical checkup card in the last six months	Yes	88	41	2. 63(1. 649-4.21)	1.73(1.01-2.95) *
	No	71	134	1	1
Appropriate refuse receptacle place	Yes	134	112	3.01(1.78-5.10)	1.34(0.7-2.58)
	No	25	63	1	1

NB: *shows significant association at P <0.05, COR=Crude Odds Ratio, AOR=Adjusted Odds Ratio

4 Discussions

The aim of this study was to assess sanitary practices and associated factors in food and drinking establishments in Worabe town, Silte Zone, Ethiopia. The current study findings revealed that the magnitude of poor sanitary practices of establishments was 52.4%. The findings of this study nearly similar to study conducted in Adwa, which found a similar magnitude of poor sanitary practices (53.3%) [17]. However, study found a lower magnitude of poor sanitary practices than similar studies conducted in other parts of Ethiopia, such as Addis Ababa (58.8%) [16], Fiche (71.8%) [22] and Bahr Dar (78.7%) [18] and Benin, Nigeria (69.2%) [23]. The disparity could be attributed to the fact that food and drinking establishments in major urban are more vulnerable to poor sanitation practices due to factors such as high customer volumes, staff turnover, competition and cost pressures, and the complexity of supply chains. These factors can make it challenging for businesses to keep proper sanitation practices, which can lead to health risks for customers.

Despite the lower magnitude of poor sanitary practices in our study, the high proportion of establishments with poor sanitary practices is still concerning and highlights the urgent need for interventions aimed at improving food hygiene practices in Ethiopia. The risk of foodborne illnesses is particularly high among vulnerable populations such as children, pregnant women, and immune-compromised individuals, emphasizing the importance of addressing this issue [24].

This could be attributed to the relative similarity of socio-economic and socio-cultural status between the two study areas. However, regardless of the reasons for the magnitude of poor sanitary practices, the need for interventions aimed at improving food hygiene practices remains urgent.

The majority of establishments in our study (94%) had toilets, which is in line with the results of previous studies done in other parts of Ethiopia like Fiche (74%), Bahir Dar (93.2%) and Addis Ababa (92.2%) [16,18,22]; but lower than similar studies done Mekelle (97.0%) and Adwa (98.4%) [17,21].This may be the food and drinking establishment included in study from Mekele and Adwa city may include establishment that have high standards for sanitations or may have greater access to resources such as funding, materials and skilled labor compared to the others. On the other hand, in the current study, only 76% of the establishments with toilets were properly managed. Compared to a study carried out in Addis Ababa, which found that 71% of establishments had properly managed latrine facilities, this finding is marginally better [16]. The availability of toilet facilities does not guarantee good sanitary conditions, and toilet facilities must be properly kept and cleaned on a regular basis. If a latrine is not maintained in a hygienic and clean manner, it is of little use or benefit. Regular cleaning, disinfection, and appropriate waste disposal techniques are necessary for this [25].

In our study, 73.7% of food and drinking establishments had appropriate solid waste collection and storage containers. The results of this study were higher than those of related studies conducted in Bahir Dar and Addis Ababa [16,18], where 33.6% and 46.8% of establishments, respectively, had appropriate solid waste collection and storage containers. The socio-economic differences between the establishments included in the study and the study area may account for the higher percentage of establishments in the study area that have suitable containers for collecting and storing solid waste; however, more solid waste collection and storage containers are still needed.

The current study also found factors associated with the sanitation practices of food and beverage establishments in the study area. Among these associated factors were the manager's food hygiene training, any recent six-month supervisions, and any medical checkups for food handlers. For instance, establishments with managers who have received training on food hygiene are more likely to have good sanitary practices than establishments without such training. Our study finding was supported by a study conducted in Addis Ababa city, Addis Ababa Uni-

versity Students' cafeteria, Burayu town, Fiche town and Adwa town [15–17,22,26]. According to studies, training managers and other staff on sanitation and hygiene has a direct impact on the overall sanitation of food and drinking establishments [27,28]. This is because they have a better understanding of the risks associated with foodborne illnesses, are more compliant with regulations, can provide leadership to their team, and can improve the establishment's reputation. Overall, this leads to a reduced risk of foodborne illnesses and increased customer satisfaction [29].

Medical examinations are intended to detect and treat food handlers who have organisms colonized on them in order to reduce the risk of food contamination and, consequently, safeguard consumers [30]. According to a study conducted in food establishments in Mettu and Bedelle towns, Southwest Ethiopia, having regular medical checkups, maintaining good hygiene, attempting to improve their knowledge and practice of food safety, and using separate utensils for raw and cooked foods to reduce cross-contamination are some of the factors that can help food handlers adhere to good sanitary practices [31]. The current study confirmed also that food handlers who underwent medical examinations had almost twice the likelihood of adhering to good sanitary practices compared to those who did not. This is because food handlers who were medically checked changed their behavior as a result of the counseling they received during their checkup [32].

The study also shows that regular supervision of visits from regulatory bodies are associated with good sanitary practice. Compared to their counterparts, establishments that had at least one supervision visit in the previous six months were more likely to have good sanitary practices. This is consistent with a study done in Addis Ababa, Fiche town, and Adwa town [16,17,22].This might be the result of regular supervisory visits to the establishment, which is a useful implement for enhancing and preserving the sanitary conditions of food and drinking establishments.

This study has some limitations. Since it was a cross-sectional study, it only reflected the sanitary practices of the establishments at the time of the assessment. These practices may change over time and under different circumstances. Despite the use of deep training and standardized checklists, there may still be an observational bias. Additionally, the use of self-reported questionnaires may result in over- or under-estimation of the outcome variable. Although efforts were made to control potential confounding variables, there may still be some unmeasured variables that could affect the results.

This study provides valuable insight into food and drinking establishments' sanitary practices in Worabe town, pinpointing areas needing improvement. The findings underscore the importance of trained food hygiene managers and regularly examined food handlers, as well as the role of supportive supervision from regulatory bodies. By identifying these key factors, the study contributes to understanding how to effectively enhance hygiene standards in the food services industry. Policymakers should prioritize prompt regulatory inspections and supportive supervision, mandate comprehensive capacity building for food managers and handlers and also promote routine medical examinations for food handlers. These measures will elevate the sanitation and hygiene standard and safeguard public health, fostering consumer trust in local food and drinking establishments.

5 Conclusion

In conclusion, the study findings indicate that the level of good sanitary practices among food and drinking establishments in the town is low. Significant factors that contributed to improved sanitary practices included establishments with trained food hygiene managers, food handlers who underwent medical examinations, and those receiving supportive supervision from regulatory bodies every six months.

Therefore, it is recommended that regulatory bodies conduct regular inspections to ensure proper hygiene and sanitation practices. Addi-

tionally, further training for food managers in food hygiene and sanitation is essential, along with promoting medical checkups for food handlers to monitor their health status. Furthermore, mixed-method studies and microbiological tests should be conducted to assess other sanitary practice-related issues in food and drinking establishments.

Declaration

Ethical consideration

Written ethical clearance was obtained from the Research and Ethical Committee of Addis Ababa Medical and Business College, with reference number AAMBC/ZC/2465/15. A formal letter was also submitted to the Worabe Town Trade and Industry Office, as well as the Health Office. Additionally, verbal consent was obtained from each respondent during the data collection process after briefly outlining the study's objectives. To maintain confidentiality, identifiers such as names and codes were not included in the questionnaire.

Conflicting interests

The authors have disclosed no potential conflicts of interest related to the study, writing, or publication of this article.

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Availability of data and materials

The manuscript holds all the data. The corresponding author can provide the datasets used in this study upon reasonable request.

Abbreviations

AOR	Adjusted Odds Ratio
COR	Crude Odds Ratio
EFDA	Ethiopian Food and Drug Authority
SPSS	Statistical Package for the Social Sciences
WHO	World Health Origination

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