

## Knowledge and Practice of Ladies in Hail Region, KSA, Regarding Proper Food Hygiene and its Correlation to Socioeconomic Level

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DOI: 10.31080/ASMS.2023.07.1603

Received: June 08, 2023

Published: June 19, 2023

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### Abstract

Food poisoning and food borne diseases represent a major public health problem. Around 600 million people worldwide fall ill after eating contaminated food every year; 420,000 of them are fatal cases [1]. Biological contamination represents the most prevalent type of contamination and has more association with public health issues.

Good food hygiene plays a crucial role in preventing or reducing food borne diseases. This study aims to assess the knowledge and practice of ladies in Hail region regarding food hygiene and its relationship with education level and economic level to establish an evidence based educational plan targeting the local community.

**Methodology:** This cross-sectional descriptive analytical study was conducted in the Hail region from October/2022 to March/2023. The study involved 303 participants in the age group 18 - 60 years. Data was collected through Google self-administered questionnaire. Data was analyzed using SPSS and the overall score of knowledge and practice was expressed as means and standard deviations.

**Results:** The overall score of knowledge and practice among participants shows a statistically significant variations with different levels of education and statistically insignificant variation with different monthly incomes, a result which indicates that the level of education has a stronger effect on knowledge and practice concerning food hygiene than the effect resulting from financial level.

**Conclusion and Recommendations:** Our study shows that the educational level has a higher effect on food hygiene than the financial level. Public health education programs targeting women of low education level, increasing the dose of health education in primary and intermediate school levels and further studies are highly recommended.

**Keywords:** Food; Hygiene; Hail; Knowledge; Practice; Saudi Arabia

### Introduction

Roughly, more than 200 diseases can be classified as food borne [1], the most common include food poisoning, dysentery, hepatitis A & E, enteric fever, aspergillosis, and others [1]. Food poisoning

means acute gastrointestinal symptoms like diarrhea and vomiting come after ingestion of food contaminated with various types of viruses, bacteria, parasites, and toxic chemicals such as poisoning caused by eating mushrooms or toxins produced by some

bacteria [1]. Bacterial contamination of food is the leading cause of food poisoning representing more than 80% of food poisoning cases [2,3]. The common symptoms of foodborne diseases are nausea, vomiting, stomach cramps, and diarrhea [2]. Common bacterial pathogens associated with contaminated food involve *Campylobacter jejuni* [2], *Salmonella* spps, *Escherichia coli* O157:H7, *Listeria monocytogens*, *Staphylococcus aureus*, *Vibrio cholerae* and others [2]. The possibility of food contamination has increased in our contemporary times due to the accelerated globalization in food production and trade. Some foodborne disease outbreaks that were once contained within a small community may now occur across larger communities or on global dimensions. This made food and food safety authorities around the world acknowledge that the issue of food safety should not be dealt with on a local level, but also through the establishment of closer relationships and links between those authorities at the global level [4,5].

In KSA, number of food poisoning incidence has increased steadily during the period 2014-2018 from 1818 to 3140 cases with peak incidence in 2017 [4,6]. However as the reported cases are dependent both on the occurrence of cases and the efficiency of reporting system, it is difficult to assert that the observed trend is a result of real increase in the food poisoning outbreaks and not merely a reflection of improved reporting system [4,6].

Food Hygiene is the action taken to ensure that food is handled, stored, prepared, and served in such a way, and under such conditions that prevent – as far as possible – the contamination of food. Good food hygiene is essential to ensure that the prepared food is safe. Food safety and hygiene are important to safeguard consumer health [6,7].

Food hygiene plays an essential role in preventing chemical, physical and biological contamination of food [7] which can lead to more than 200 food borne diseases [7,8]. The pillars of food hygiene according to the WHO include good personal hygiene of the food handler/cook, proper food preparation, proper food storage and proper food servicing [9]. Improper food handling may be implicated in 97% of all foodborne illness associated with catering outlets [10].

## Materials and Methods

This observational analytical cross-sectional study was conducted in the Hail region, Kingdom of Saudi Arabia, during the years 2022 to 2023 as a part of the social accountability of the University of Hail towards local community. The study involved 319 ladies aged from 18 to 60 years residing in Hail, excluding all male population, females below 18 years, females above 60 years and people residing outside Hail region. Data was collected through an electronic self-administered questionnaire. A standardized consent was made and provided with the questionnaire. The questionnaire involved questions about demographic and socioeconomic characters and questions to assess hygienic awareness and practice like questions about hand washing, washing of meat, vegetables and fruits, cleanliness of cooking area, kitchen towels and instruments, proper storage of food, proper assessment of food edibility, protection of food from insects and germs, sources of food contamination, proper dealing with contaminated and partially contaminated food and others. Each answer was given a mark, the highest mark for the ideal answer, the lowest mark for the answer that indicates poorest knowledge and practice and the middle mark for the answer in between. The full overall score was 27 marks. The answers were analyzed to assess the overall score of knowledge and practice and its relation to educational and economic level. Data was analyzed using SPSS (version 23) and expressed in counts, percentages, means and standard deviations.

## Results and Discussion

An online questionnaire was distributed widely among the target population. Of the 319 ladies who received the questionnaire, 303 ladies filled it with response. Rate of 95%. The age distribution of participants shows marked decrease with age (Table 1). The vast majority of participant were Saudi and most of them resides in Hail city (Table 1).

Most of the participants are university and postgraduate students (63.7) followed by employees (23.1) and housewives (13.2) and most of them live in owned villas (Table 2).

Variable	N	%
Age		
18-30	218	71.9%
31-40	39	12.9%
41-50	30	9.9%
51-60	16	5.3%
Nationality		
Saudi	294	97%
Non-Saudi	9	3%
Residence		
Hail city	238	78.5
Hail peripheries	65	21.5

**Table 1:** Demographic data.

Variable	N	%
Occupation		
Employee	70	23.1%
Student	193	63.7
Housewife	40	13.2
Level of Education		
No certificate	16	5.3
Secondary School	68	22.4
University and Postgraduates	219	72.3
Housing		
Traditional House	40	13.2%
Apartment	66	21.8%
Villa	197	65.0%
Monthly Income		
> 5000	68	22.4%
5000-10000	99	32.7%
10000-15000	69	22.8%
<15000	67	22.1%

**Table 2:** Socioeconomic Characters.

Assessment of the knowledge and good practice related to food hygiene and correlating it with educational level shows that the overall score of knowledge and practice is significantly different

between those who got secondary school certificate and above and those who didn't reach or complete their secondary school education. This variation is statistically significant (P value less than 0.05) (Table 3).

	N	Mean Score	Standard Deviation	P value
No certificate	16	18.9375	4.20268	0.017
Secondary School Certificate	68	21.3529	2.61320	
University and Postgraduate Certificate	219	21.0228	3.07616	
Total	303	20.9868	3.07842	

**Table 3:** Correlation between Food Hygiene and Education Level.

Assessment of the knowledge and good practice related to food hygiene and correlating it with the monthly income shows that the overall score of knowledge and practice increases with higher income, however, the difference between the groups is statistically insignificant (P value more than 0.05) (Table 4).

Monthly Income	N	Mean Score	Standard Deviation	P Value
>5000	68	20.4706	2.93446	0.131
5000-10000	99	20.7778	3.16729	
10000-15000	69	21.1594	3.11365	
<15000	67	21.6418	2.98837	
Total	303	20.9868	3.07842	

**Table 4:** Correlation Between Food Hygiene and Financial Status.

### Discussion

This study assessed the knowledge and practice of ladies in Hail's region, KSA, regarding food handling in correlation with socioeconomic status stressing on two indicators for assessing socioeconomic level which are the level of education and the monthly income. Out of 303 respondents, 71.9% belong to the age group 18 - 30 years and the number of the respondents decreases gradually with age. This may reflect the interest and familiarity of youth with modern technologies which makes them more able to respond to Google questionnaires.

The full overall score of our questionnaire was 27. The mean overall score of our different groups varies from 18.937 (70% of the full score) to 21.64 (80% of the full score). Correlation of the knowledge and practice with educational level shows significant difference in knowledge and good practice between those who got secondary school certificate and above and those who didn't reach or complete secondary school (P value of 0.017). This reflects a significant increase in knowledge and a significant improvement in practice in higher educational levels.

On the other hand, correlation of knowledge and practice to monthly income also shows an increase in knowledge and an improvement of practice with higher monthly income but the variation is insignificant with P value of 0.131. This result states that the knowledge and good practice concerning food hygiene are more affected by the level of education than the variation in monthly income which reflects the significant importance of higher education in increasing knowledge and improving practice.

### Conclusion

Our study shows clearly that the level of education has a higher impact on food hygiene than the financial level and shows that the graduates of primary and intermediate school have a relative weakness on food hygiene both from the theoretical (knowledge) and the practical points of view. Based on our key findings in this study, we recommend the health authorities and the University of Hail to conduct a community educational program about proper food hygiene that targets illiterate ladies and ladies of low educational level. We also recommend the education authorities to increase the doses of health education and education about food hygiene in primary and intermediate school levels. The main shortage of the current study is the restricted geographical area, further studies that cover wider regions of the kingdom are highly recommended.

### Conflict of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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