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Knowledge, Attitude, and Practice (KAP) of Personal Hygiene among Food Handlers in the South Region of Makkah, Saudi Arabia

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ABSTRACT

Background: *Poor personal hygiene of food handlers can act as source of infection. It becomes a serious issue if the food handlers serve in a busy community like Makkah where millions of visitors gather yearly for Hajj and Umura. This study was carried out to determine the level of knowledge, attitude, and practice (KAP) of personal hygiene among food handlers in south region of Makkah, Saudi Arabia.* ***Methodology:*** *A cross-sectional study was conducted in the south region of Makkah. Data was collected from 50 food handlers by questionnaires designed to elicit socio-demographic information and check-list which contained questions about KAP of food handlers. Data was recorded on Likert scale converted to 0-100 scale to simplify the presentation and interpretation of data.* ***Results:*** *Majority of participants (74%) was within the age range of 20-35 years and more than half of the participants (56%) were non-educated. Respondents knowledge, attitude and practice were 82 (95% CI 80-84), 66 (95% CI 61-72) and 66 (95% CI 58-73) respectively. Educational level appears to affect the attitude (p=0.001) and practice (p=0.009) of the participants.* ***Conclusion:*** *The study conirmed that food handlers in the south region of Makkah seems to be knowledgeable with a moderate level of attitude and practices.*

Keywords: Personal hygiene, KAP, Food hygiene, Hand washing, Food handler, Makkah

INTRODUCTION

Personal hygiene is the science of healthy living of an individual [1]. It has been reported that washing hands with water and soap could reduce the diarrheal and respiratory diseases by 44% and 23% respectively [2]. Human body usually carries food poisoning bacteria on their skin, noses or in the intestinal tract. Thus, food handlers should keep themselves clean by washing their hands, wearing a clean cloth and avoid jewelry inside restaurant to avoid cross-contamination [3]. In additional, outbreaks of foodborne diseases mostly associated with restaurant and food handlers play a major role in transmitting pathogens passively from contaminated source to food product. Therefore, poor personal hygiene of food handlers can act as source of infection [4].

Food and Drug Administration (FDA) classified five main responsible pathogens for food borne diseases which include norovirus, *Salmonella Typhi*, *E. coli* O157:H7, *Shigella* spp. and Hepatitis A virus [5]. A considerable amount of literature has been conducted to assess the knowledge, attitude, and practice (KAP) of food hygiene among different target population. For example, studies among food handlers in food establishment [6-9], students [10,11] and among food handlers in hospital [12-14].

From global perspective, World Health Organization (WHO) estimated that 230,000 deaths resulting from foodborne diseases [15]. In Saudi Arabia, in the past 10 years food poisoning has become one of the most priorities [16]. In 2016, 3415 cases from food and food handlers' activity were recorded [17]. The higher numbers were in Riyadh with 807 cases followed by Qassim (402 cases) and in Hail (331 cases). In Makkah, the number of cases due to food and food handlers were 298. It was reported that knowledge and training of food handlers is vital in the prevention of most type of foodborne diseases [18,19]. Hence, in Saudi Arabia, there is poor information about the KAP of food handlers regarding the personal hygiene. Therefore, we conducted this study aimed at evaluating knowledge, attitude, and practice of personal hygiene among food handlers in the south region of Makkah, Saudi Arabia in 2016.

METHODOLOGY

Study Area

The study was conducted in the holy city of Makkah in western Saudi Arabia. Food handlers in restaurants in the south region of Makkah were our target group.

Data Collection

Fifty food handlers were asked to complete questionnaire and checklist. The informed written consent was taken from all participants prior to involvement in the study. Data collected was facilitated by staff of Municipality.

Knowledge Questionnaire

The knowledge part was designed to evaluate the knowledge of food handlers about personal hygiene and the importance of personal hygiene on the control of foodborne disease. It includes 10 questions. Each question consisted of four optional answers of: "Strongly agree", "agree", "not sure", "disagree". In addition, questions on the demographic characteristics such as age, level of education and year of experience were included.

Attitude Questionnaire

The attitude section consisted of four questions to assess some hygienic factor such as cut hair, wearing rings or watch with four scales arranged as "strongly agree", agree", "not sure" and "disagree".

Practice Check-List

Practice part included a total of nine questions which were directly observed by the researchers. Some questions were developed from food standard agency of hygienic inspection checklist. The questions were scored as "yes" and "no".

Statistical Analysis

Data from questionnaires and check-list were analyzed by using SPSS version 20.0. For knowledge and attitude parts, data were scored by using Likert Scale from 1 to 4. Data from practice part were scored as 2 for yes and 0 for no answer. To simplify the presentation and interpretation of the results, the scores given were ranged between 0 and 100 and scores less than 50 were considered as poor result. Characteristics of the participants and their scores in relation to knowledge, attitude and practices were tested by using Kruskal-Wallis test. Spearman's correlation coefficient was used to test the relationship between knowledge, attitude, and practice of food handler. $P<0.05$ were considered as statistically significant.

RESULTS

Socio-Demographic Characteristics

Table 1 provides an overview of surveyed food handlers. All participants were males and their age ranges from 18 to 54 years with mean of 29.1 years. More than half of the participants were uneducated (illiterate). While, 50% of the food handlers had more than 5-year experience in the food industry.

Table 1 Summary of the demographic information of food handlers (n=50)

Variables	Number	Percentage
Age in years		
<20	4	8%
20-35	37	74%
35-50	6	12%
>50	3	6%
Education		
Primary school	4	8%
Secondary school	10	20%
High school	6	12%
College	2	4%
No education	28	56%

Experience in years		
<1 year	9	18%
1-5 year	16	32%
5-15 year	20	40%
>15	5	10%

Knowledge of Food Handlers

In relation to the knowledge of food handlers, the results illustrate that the food handlers are aware of issues regarding their personal hygiene and the important role of hygiene in the transmission of infection (Table 2). The majority of food handlers show a positive knowledge related to the risk of poor personal hygiene to contaminate food product such as long hair (86%), nails (90%) and hand (74%). Specifically, in response to question 8, most of those surveyed (74%) agree with false statement that dry hands have more risk to transmit infection compared to wet hands. From the current study, no significant difference was found between age (p=0.47), level of the education (p=0.64), experience (p=0.27) and knowledge of participants. Overall, the mean knowledge of food handlers was 3.39 (95% CI 3.32-3.47) with standard deviation of 0.26 corresponding to the mean of 82 (95% CI 80-84).

Table 2 Food handlers' knowledge of personal hygiene

Questions	Strongly Agree	Agree	Not sure	Disagree
Food handler should wash hands after touching any part of his/her body.	37 (74%)	6 (12%)	2 (4%)	5 (10%)
Food handlers should wash hands with soap and water immediately after leaving bathroom.	43 (86%)	4 (8%)	3 (6%)	0
Washing hands with soap and water after touching raw foods is enough to prevent contamination.	38 (76%)	9 (18%)	3 (6%)	0
Food handlers should wash hands before and after using gloves.	33 (66%)	10 (20%)	3(6%)	4(8%)
Hands are most sources of bacteria and microbes.	31 (62%)	6 (12%)	7 (14%)	6 (12%)
It is possible for microbes to be present under nails.	39 (78%)	6 (12%)	2 (4%)	3 (6%)
When coughing or sneezing covering mouth and nose prevents spread of infection.	35 (70%)	9(18%)	3 (6%)	3 (6%)
There is possibility of spread of infection from dry hands compared to wet hands.	26(52%)	11 (22%)	5 (10%)	8 (16%)
Long hair could transmit microbes to food when head is not covered while handling food.	35 (70%)	8 (16%)	6 (12%)	1 (2%)
Maintaining personal hygiene is important to control food borne disease.	40 (80%)	7 (14%)	2 (4%)	1 (2%)

Attitude of Food Handlers

The next section of the study was concerned with measuring the attitude of the food handlers (Table 3). Concerning question 1, almost two third (62%) of the surveyed food handlers strongly agree with false statement that covering mouth when coughing could prevent infection. The other part of the questionnaire shows a good attitude toward wearing jewelry (60%), cutting hair (86%) preparing food without gloves (92%). The overall mean of the food handlers in this section was 2.92 (95% CI 2.75-3.09) with SD=0.5 corresponding to 66 (95% CI 61-72). As shown in Figure 1, the result of the study suggested that educational level have a significant (p=0.001) impact on the attitude of the participants. Particularly, those who had secondary school have significant difference compared to illiterate food handler. Other socio-demographic factors did not show a significant impact.

Table 3 Personal hygiene attitudes of food handlers

Questions	Strongly Agree	Agree	Not sure	Disagree
Cover your mouth while coughing to prevent spread of infection?	31 (62%)	9 (18%)	0	10 (20%)
Do you prefer wearing ring or watch inside restaurant?	14 (28%)	6 (12%)	3 (6%)	27 (54%)
cutting hair every 4-5 weeks or trimming it is healthy?	33 (66%)	10 (20%)	4 (8%)	3 (6%)
Touch food by hand without gloves lead to contamination and cause food poisoning?	36 (72%)	10 (20%)	2 (4%)	2 (4%)

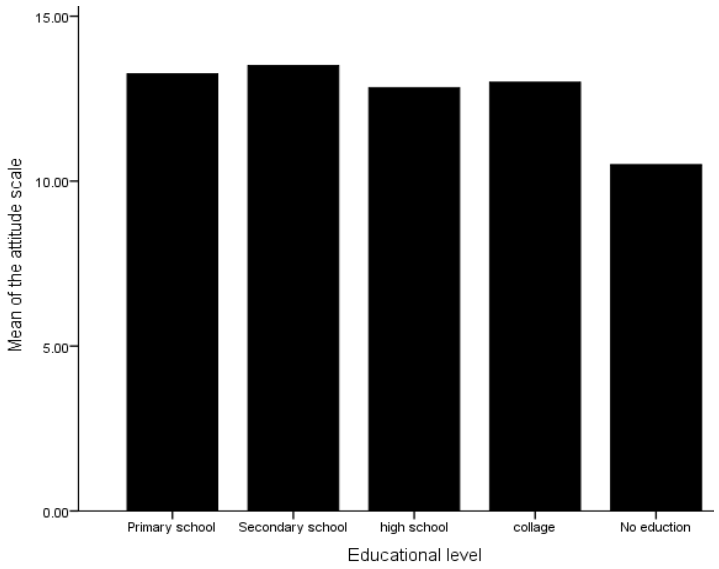

Figure 1 Distribution of the mean of food handler attitude score to the educational level

Practice of Food Handlers

In this final part of the survey, participants were observed by the researchers to assess the practices concerning with personal hygiene (Table 4). Food handlers seem to have a good practice about wearing clean cloth and avoid jewelry inside restaurant. Over half (54%) of those food handlers surveyed did not adhere with wearing gloves on both hands. In general, the practice of food handlers in issues regarding to personal hygiene seems to be good.

Table 4 Personal hygiene practice of food handlers

Questions	YES	NO
Wear clean clothing?	30(60%)	20(40%)
Keep body, hands, and hair neat clean?	37(74%)	13(26%)
Avoid wearing jewelry, rings, and watches?	34(68%)	16(32%)
Keep fingernails clean and trimmed short?	35(70%)	15(30%)
Use glover on both hands?	23(46%)	27(54%)
Wash hands before wearing or changing gloves whenever changing task is necessary?	29(58%)	21(42%)
Do not handle money and food at same time?	36(72%)	14(27%)
No tasting, eating, drinking or smoking in food service?	38(76%)	12(24%)
Wash hand frequently?	35(70%)	15(30%)

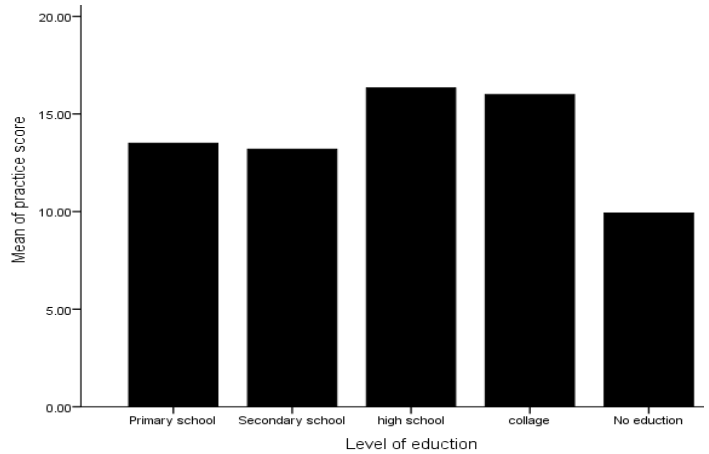

Figure 2 Distribution of the mean of food handler practice score to the educational level

These results of this section indicate that educational level plays a significant role (p=00.4) in the practice of the food handlers. As shown in Figure 2, the results demonstrate that food handlers who had high school education show a significant (p=0.009) hygiene practice score compared to non-educated food handlers. Overall, the mean score of practice of food handlers was 1.32 (95% CI 1.17-1.46) SD=0.2 corresponding to 66 (95% CI 58-73).

Association of the Knowledge, Attitude, and Practice

The results of the correlational analysis are set out in Table 5. There is a significant positive correlation between attitude and practice (r=0.397, p=0.004).

Table 5 Correlations between knowledge, attitude and practice scores of food handlers regarding personal hygiene

Level	Spearman's rho	Significant value
Knowledge- Attitude	-0.248	0.082
Attitude- Practice	0.397**	0.004
Practice- Knowledge	0.067	0.645
**Correlation is significant at the 0.01 level (2-tailed)		

DISCUSSION

Personal hygiene is an important component of food hygiene and plays key role in preventing foodborne diseases. This research aimed at investigating the level of KAP of food handlers regarding the personal hygiene. Fewer studies were conducted to investigate the personal hygiene of food handlers alone. However, there are lots of KAP studies that examined the food hygiene with some aspects of personal hygiene.

The current study observed a good knowledge among food handlers which broadly supports other studies such as that of Al-Shabib et al. [10], Abdullah Sani and Siow [20], Abdul-Mutalib, et al. [7] and Rebouças, et al. [21]. Conversely, the knowledge of food handler recorded in the present study was higher compared to those observed by Baş, et al. [22], Soares, et al. [23] and Lee, et al. [9].

According to World Health Organization (WHO), poor hand hygiene is an important risk factor for foodborne diseases. Food handlers should always have high knowledge of issues related to hand hygiene and should always wash their hands during their work. The percentage of food handlers who agree with the importance of hand washing was high (86%). In addition, the study observed that 70% of food handlers were committed to washing their hands. These results match those reported by Abdullah Sani and Siow [20] and Al-Shabib, et al. [10].

In the section on attitude, food handlers show a moderate level of attitude towards personal hygiene. In some items such as coughing by covering mouth with hands is a good attitude, the food handlers showed poor results. This may be due to less emphasis on health promotion campaigns in issues related to coughing etiquettes (Table 3). In general, attitudes of food handlers observed in this study were higher than those obtained by Baş, et al. [22] and are in agreement with study by Parry-Hanson Kunadu, et al. [6].

In the final part, personal hygiene practices are important to confirm that food is safe for consumers. Contrary to expectations, this study shows that over half of the participants did not wear gloves on both hands when handling foods. Rebouças, et al. [21] stated that 39.6% of the food handlers did not wear gloves when handling foods. In general, practices of food handlers in this study were above average and are lower than those obtained by Abdullah Sani and Siow [20] and higher than that noted by Baş, et al. [22] and Parry-Hanson Kunadu, et al. [6]. Also, practices of the food handlers reported by Rebouças, et al. [21] were almost similar to that of present study.

As shown in Table 5, the study shows that even though the food handlers have high knowledge score but do not essentially have a good practice. It should be expected that food handlers with high attitude score should also have good practices, but this was not the case [23]. This may suggest that knowledge acquired from courses and health promotion campaign related to personal hygiene cannot automatically lead into anticipated changes in attitudes and practices of food handlers. There are other factors that can affect attitudes and practices. For example, carelessness of food handlers could play a role since they rarely applied their knowledge when handling or distributing foods. The same association was noted by Clayton, et al. [24].

Concerning the impact of socio-demographic factors on the KAP of food handlers, the study demonstrates that educational level plays a role in attitude and practice of food handlers. However, other socio-demographic factors did not show any significant difference in the current study.

CONCLUSION

The study confirmed that food handlers in the south region of Makkah seem to be knowledgeable with moderate level of attitude and practices. Great efforts are needed to ensure the application of personal hygiene measures among food handlers. Since the study was limited to the south western region of Makkah with small sample size, it may not be possible to generalize the results as such, but the results pointed out good reasons to monitor the larger samples with a view to modify policies appropriately. Further studies with larger sample size are suggested.

DECLARATIONS

Conflict of Interest

The authors declare that there is no conflict of interest in this research.

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