

Hygienic Practices of Street Food Vendors and Schools in Some Iraqi Governorates

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Abstract

“The study was conducted during the period from December 2018 to May 2019, to assess hygiene practice in schools and street food vendors inside two Iraqi cities (Babylon and Thiqr). The Codex code for practice of general principles on food hygiene, observations and other relevant documents to provide information that may clarify certain misconceptions on hygienic practices related to street food vendors. 110 street food vendors and schools were studied in all Babylon and Thiqr. Specially designed questionnaire form was used, allowed fast data collection. Many noncompliance was found in the hygienic practices and requirement, personal hygiene, hygiene of equipment, food preparation and food service. Babylon Governorates in term of hygiene of equipment and food preparation generally showed higher conformity than in Thiqr Governorates. The level of fulfillment of the hygienic requirements was most strongly influenced by the type of schools and street food vendor in both section of personal hygiene and hygiene of equipment and food preparation and serving for Babylon and Thiqr. The results of this work should not discourage to eat street food, but to minimize food poisoning risk, support the reasonable choice of eating-places according to basic food hygiene knowledge.”

Key words: food safety, schools, street food, food hygienic practices.

Introduction

Food poisoning is still causing a growing risk to public health. European Food Safety Authority (EFSA) indicated that foodborne diseases raising also in the EU European union. EFSA reported that in year 2010 about 48.7% of foodborne illness were associated with catering establishments ^{5,7}. Significant part of the foodborne probably result of inappropriate hygienic practices of food service sector. The safety of street vended food in countries where such a food plays an essential part of life and culture is of particular concern ^{16, 4}. According to the WHO, worldwide epidemiological studies showed that, in the majority of cases, outbreaks of foodborne diseases are due to the incorrect handling of food by food workers. “Causes of foodborne disease by food handlers include cross contamination between

raw and processed food items; “storage and cooking of food in adverse conditions; and utilizing contaminated utensils and equipment. Food handlers are defined as “employees who are employed directly in the production and preparation of foodstuffs. Those include employees in the manufacturing, catering and retail industries as well as those who are undertaking maintenance or repair of equipment in food handling areas, whether permanent staff, workers on contract or visitors to food handling areas ¹. Food handling, comprises all stages of food treatment from farm to fork ^{8,1} probability that food handlers could carry pathogens while not showing any symptoms and transmit those pathogens in food such as salmonella, staphylococci, and E. coli ⁶. A new concept called Street Food Safety Objective (SFSO) was also introduced by ² in an effort to approach the safety of street food with the FSO concept. In order to achieve the SFSO a well-planned programme of good hygiene practices should be applied starting from the safety of the ingredient and raw materials entering the street food chain. In particular, there is a special provision setting down requirements for street food vendors. The

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regulation is based on Codex Alimentarius (CA) general principles of food hygiene (CCFH, 2003). And this basic code of practice is used also by the CA for publication of regional codes of practice pertinent to street foods e.g. for Asia (CCASIA, 2017). Those requirements comprise willingness to abide by food hygiene requirements and may reflect lack of knowledge about transmission of microorganisms¹⁷.

Materials and Method

Sampling Plan

“The information was collected from 110 food vendors in two governorates (Babylon and Thiqr) having either direct or indirect contact with food in Iraq restaurants through a questionnaire. “The field period of the survey lasted from December 2018 to May 2019”. “The information was collected through questionnaires and face to face interviews to ensure the accuracy of responses”. “Participation by respondents was voluntary and sufficient time “20-30 minutes” was allowed to answer the questions”. The general characteristics of the vendors were analyzed according to Governorates of vendor’s placement their location in the city, type of facility, type of food sold or served and number of employees in premises,

“Observations”

“Inspections were carried out by direct and discreet semi-structured observation using a specially determined questionnaire which allowed fast evaluation and observation. Interviews with respective food handlers were not carried out”. “The food handlers were also not aware of the observation carried out to minimize influence on food handlers’ attitudes during inspection”. “Each observation lasted for about 20 min”.

Statistical analysis

“ Analysis of such a large number of variables required using several statistical methods”. “To characterize the level and distribution of scores the mean scores, median, mode, standard deviation, coefficient of variation, skewness and kurtosis coefficients were used”. To investigate the dependence of country, vendor’s location, type of food sold and number of employees on the obtained scores, a variance analysis - SPSS - was used. for Windows, version (24.0) . Two analyses were conducted: “for the first and for the second part of questions was performed using Spearman’s

correlation coefficient”. The two-sided p-value of < 0.05 was applied and considered to be statistically significant

Results and Discussion

Overall characteristics

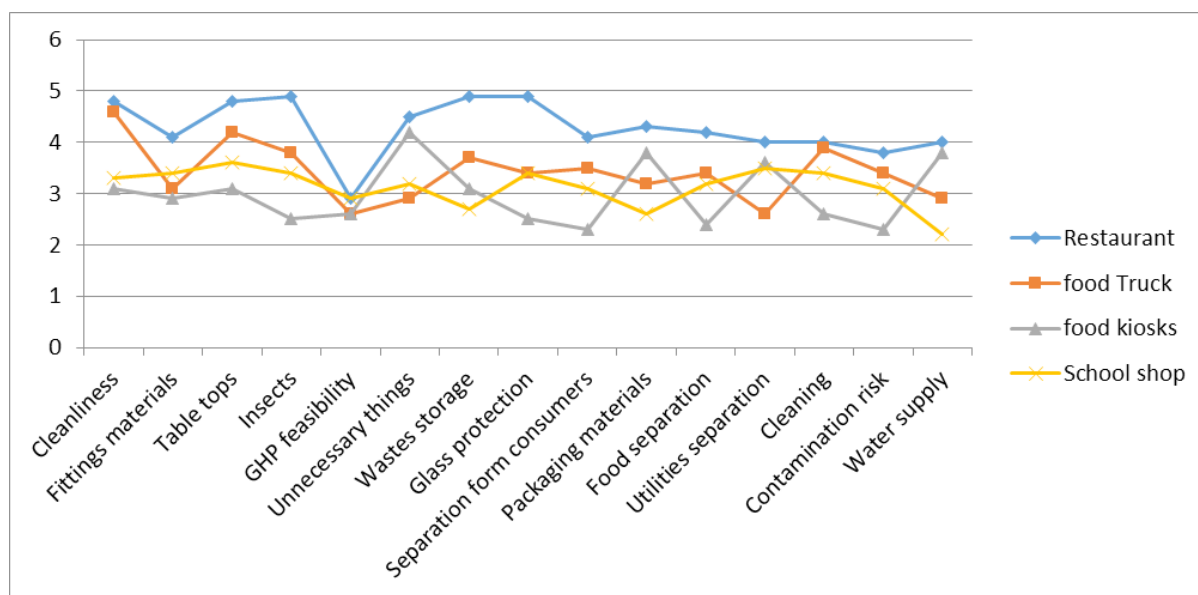
“The socio characteristics of one hundred and ten (n=110) food handlers in restaurants in Iraq the first one grouped vendors selling fresh fruit, vegetables, fish, meat, eggs . “The second one grouped higher rated vendors which were vendors selling meat and fish meals, falafel and other dishes such as shakes, ice cream, coffee, tea”.” The first analysis, concerned the hygiene of equipment, personal hygiene and food preparation indicate that, The largest groups were small street restaurants “30.3%” followed by food kiosks “25.2%”. mobile food vendors for example food cart bike “21.7%” and stands selling street food “20.7%”. The smallest group was food trucks “2.3%”. In most street food vendors meat or fish meals were produced and popularly sold “44.6%”. fruit and vegetable meals for example squeezed juices and pilled and sliced fruits and vegetables “22%” fresh fruits vegetables meat fish and eggs “19.8%” and others “10%””. The largest group of street food vendors that appointed one employee “61%” next with two employees “24.1%” and the smallest group was vendors with three or four employees “14%”. “Most of the street food vendors were located in the outskirts and suburbs of the cities “45.5%” city center “28.6%” and tourist sites “25.9%”. (40.9%) of them have an education at College/ University level”. “Approximately (55.4%) of food handlers with direct or indirect contact with food have 1-6 years of experience in the food sector”.” More than half (75.0%) of the respondents have not participated in any food safety training program”. “From these respondents, only (1.3%) have attended a food safety course more than two years ago”. “ (54.9%) of the total number of respondents had a medical examination card by the Ministry of Health, Iraq.

Hygiene of equipment and food preparation

“The analyzed data, which concerned the hygiene of equipment and food preparation presented in Fig.1”. “The Mean scores, SD and values of statistical coefficient in street food vendors’ hygiene of equipment and food preparation”. “The distribution of questionnaire scores of all street food vendors on two group, the first one grouped vendors selling fresh fruit, vegetables, fish, meat, eggs”. The second one grouped higher rated vendors which were vendors selling meat

and fish meals, falafel and other dishes such as shakes, ice cream, coffee, tea. The degree of compliance i.e. fulfillment of requirements, in hygiene of equipment and food preparation was differentiated the Mean score was 2.7 The mean scores for all questions were below the suppositional Mean score 3.5, with Standard deviation 0.91 , degree of compliance was 68 %. The Mean score level Is not equal mode and median, which confirmed that the distribution of scores for each question was left asymmetric negative skewness. :Negative skewness indicated a greater dispersion and variability in the lower scores As indicated value of Skewness and Kurtosis coef. were (1.66 , 1.39) respectively” . “Indicating that the answers of street food vendors and the low level of assessment, do not give high attention to the Hygiene of equipment and food preparation. Which indicates the cleanliness of food production and preparation equipment in Babel governorate is very low”.

“The data revealed the hygiene of equipment and food preparation the SPSS analysis indicated that the level of assessment of street food vendors in the significant and consistent manner was strongly influenced by three characteristics, Insects, Unnecessary things, and Water supply”, “The other characteristics i.e. location of facility and other variables, had a lesser impact on the assessment scores”. “Statistically there are no significant relationship between other variables and location of facility”. “Also, there was a statistically significant relationship between type of food and Water supply only, other variables are having no significant relationship”. “There was a statistically significant relationship between Location of facility in the city with Insects, and Water supply and there is a very low significant relationship between the other variables which makes it reflect negatively on the hygiene of equipment and food production-preparation and serving in Babel governorate”.



“Fig 1 Questions abbreviation according to the hygiene of equipment and food production-preparation and serving (Part I of the questionnaire) in Babel governorate”.

The analyzed data, which concerned the hygiene of equipment and food preparation presented in Fig.2. The Mean scores, SD and values of statistical coefficient in street food vendors’ hygiene of equipment and food preparation”. The distribution of questionnaire scores of all street food vendors on two group, the first one grouped vendors selling fresh fruit, vegetables, fish, meat, eggs. The second one grouped higher rated vendors which were vendors selling meat and fish meals, falafel and other dishes such as shakes, ice cream,

coffee, tea. The degree of compliance i.e. fulfillment of requirements, in hygiene of equipment and food preparation was differentiated the Mean score was 2.88. The mean scores for all questions were below the suppositional Mean score 3.5, with Standard deviation 1.07, degree of compliance was 72 %. The Mean score level is not equal mode and median, which confirmed that the distribution of scores for each question was left asymmetric negative skewness. Negative skewness indicated a greater dispersion and variability in the

lower scores. The value of Skewness and Kurtosis coef. (0.91 & 1.15) respectively. Indicating that the answers of street food vendors that the level of assessment low, Do not give high attention of “Hygiene of equipment and food preparation Which indicates the cleanliness of food production and preparation equipment in Thiqr governorate is very low”.

The data in Fig 2 revealed the hygiene of equipment and food preparation The SPSS analysis indicated that the level of assessment of street food vendors in

the significant and consistent manner was strongly influenced by three characteristics, Insects, unnecessary things and food separation. Statistically there are no significant relationship between the other variables and location of facility. There was a statistically significant relationship between Food separation with Type of food, Type of facility and Insects. There is a very low significant relationship between the other variables which makes it reflect negatively on the hygiene of equipment and food production-preparation and serving in Thiqr governorate”.

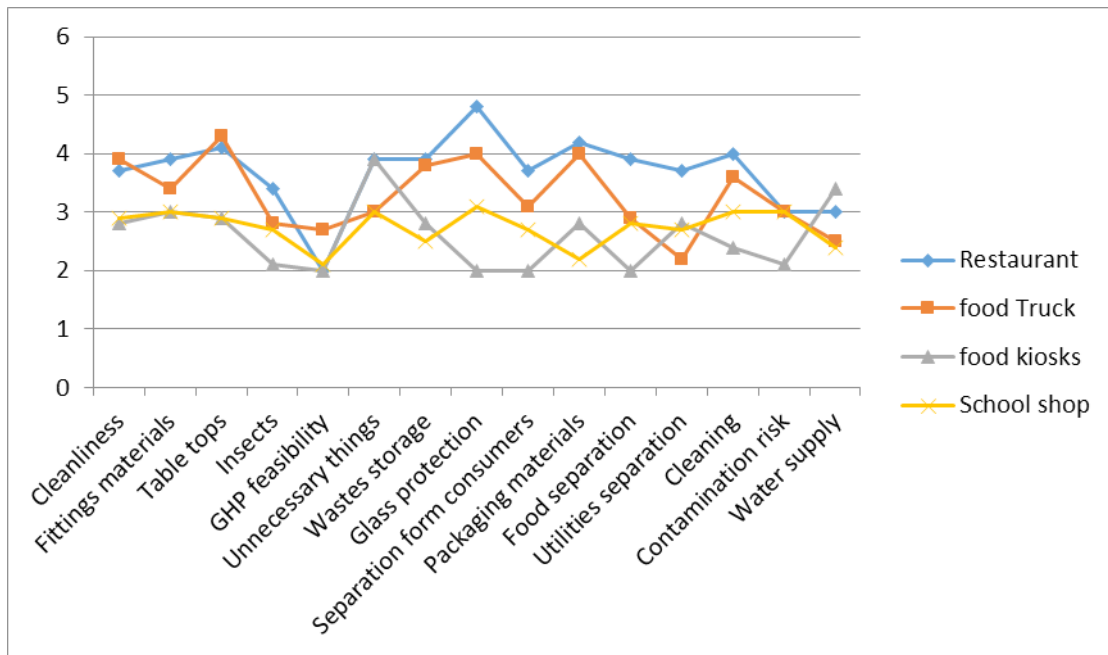


Fig 2 questions abbreviation in the evaluation of street food vendors hygiene of equipment and food preparation according to the hygiene of equipment and food production-preparation and serving (Part I of the questionnaire) in Thiqr governorate.

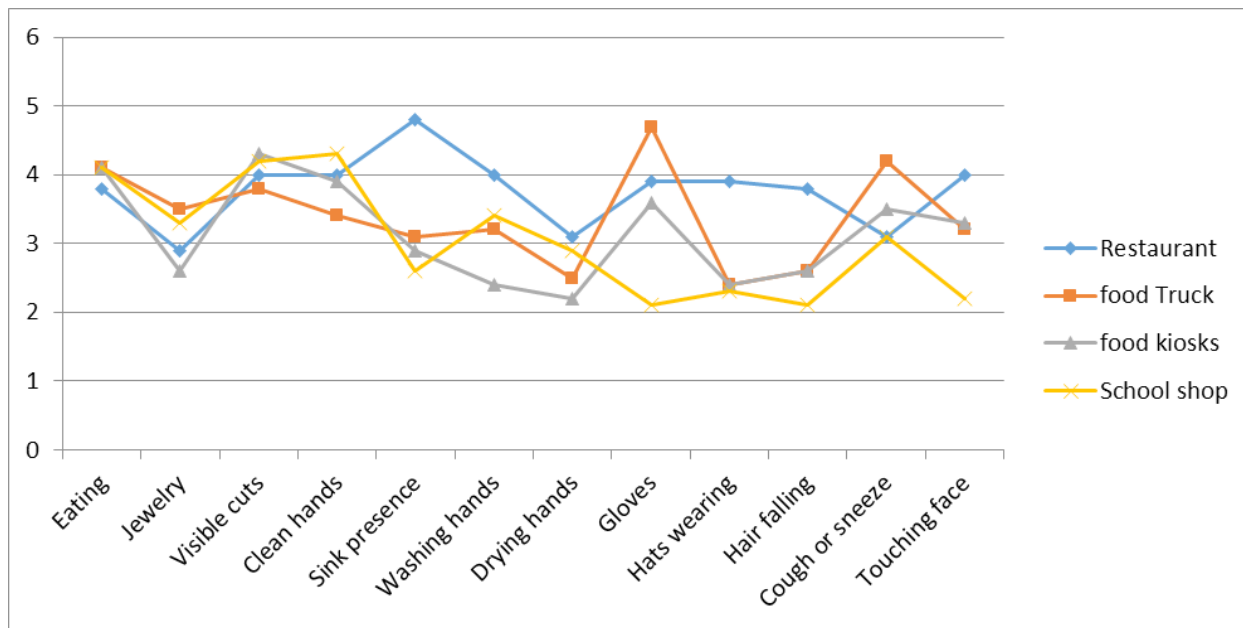
“Personal hygiene”

fig 3 shows that the Mean score of this part was 2.65. The mean scores for all questions were below the suppositional Mean score 3.5, with Standard deviation 0.86,” “degree of compliance was 64 % The Mean score level indicated that The mean scores Is not equal to mode and median, which confirmed that the distribution of scores for each question was left asymmetric negative skewness”. “Negative skewness indicated a greater dispersion and variability in the lower scores as indicated value Skewness coef. 1.72, Kurtosis coef. 3.58 . In other words, data Skewness coef. Towards the right of the normal distribution curve. Indicating that the answers of street food vendors that the level of assessment low, Do not give high attention of Hygiene of equipment

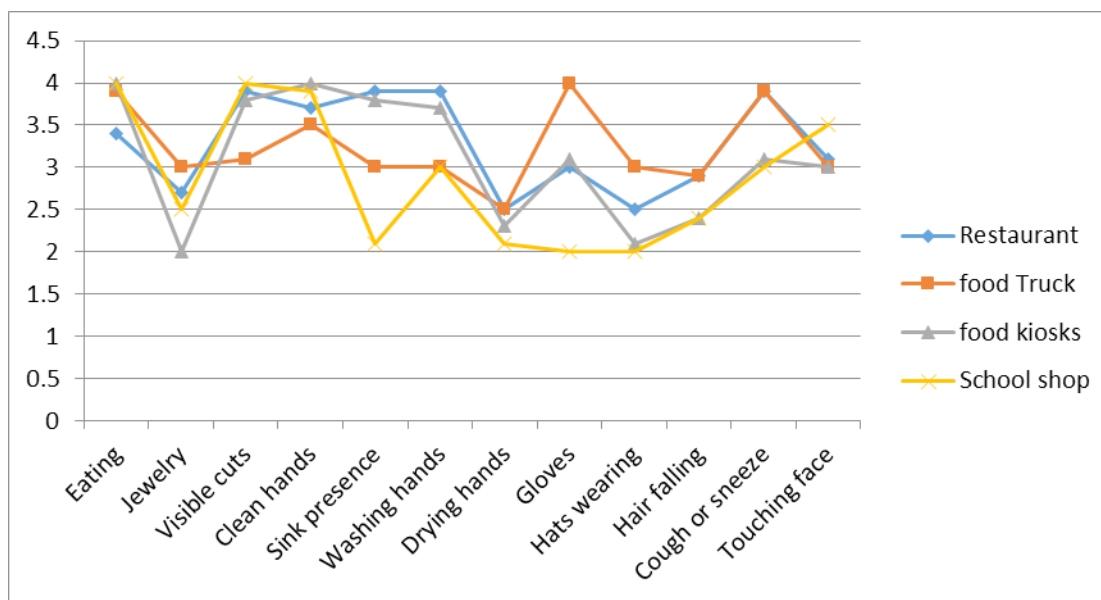
and food preparation Which indicates the cleanliness of food production and preparation equipment in Babel governorate is very low”.

the SPSS analysis of personal hygiene. there was a statistically significant relationship between Jewelry and Visible cuts with Location of facility in the city”.” Also, there Is no statistically significant relationship between other variables and location of facility”. There was a statistically significant relationship between Washing hands with Type of food only. there was a statistically significant relationship between Location of facility in the city with Visible cuts, and Gloves with Location of facility in the city, and Touching face with Type of food and there is a very low significant relationship between the other variables which makes it reflect negatively on

the hygiene of equipment and food production-preparation and serving in Babel governorate”.



“Fig 3 Questions abbreviation according to personal hygiene (Part II of the questionnaire). in Babel governorate”.



“Fig4 questions scores in the evaluation of street food vendors personal hygiene according to the vendor's characteristics (Part II of the questionnaire)”. in Thiagar governorate.

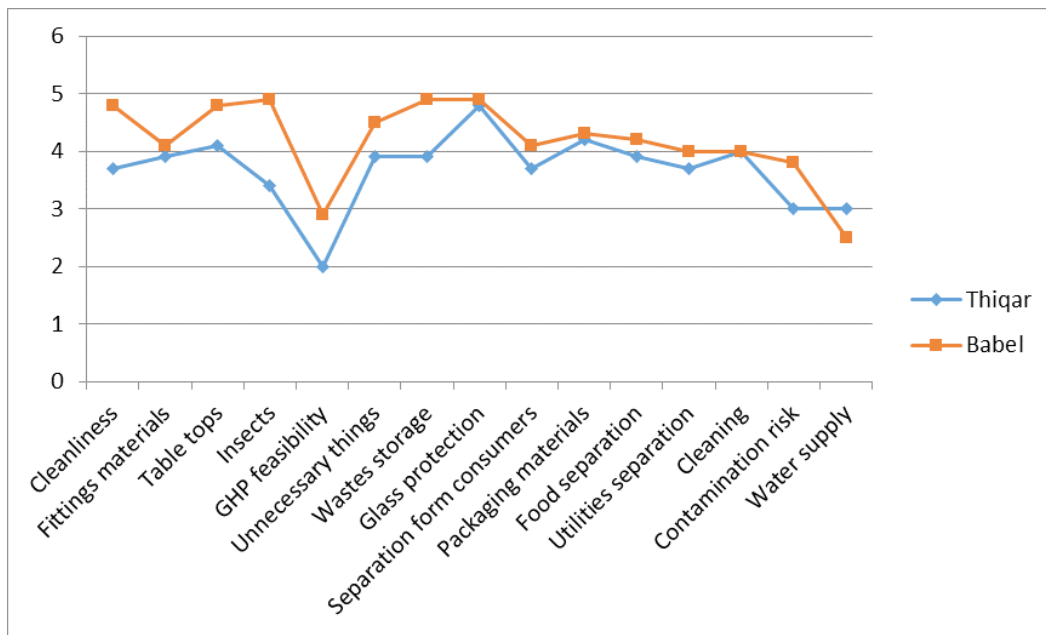
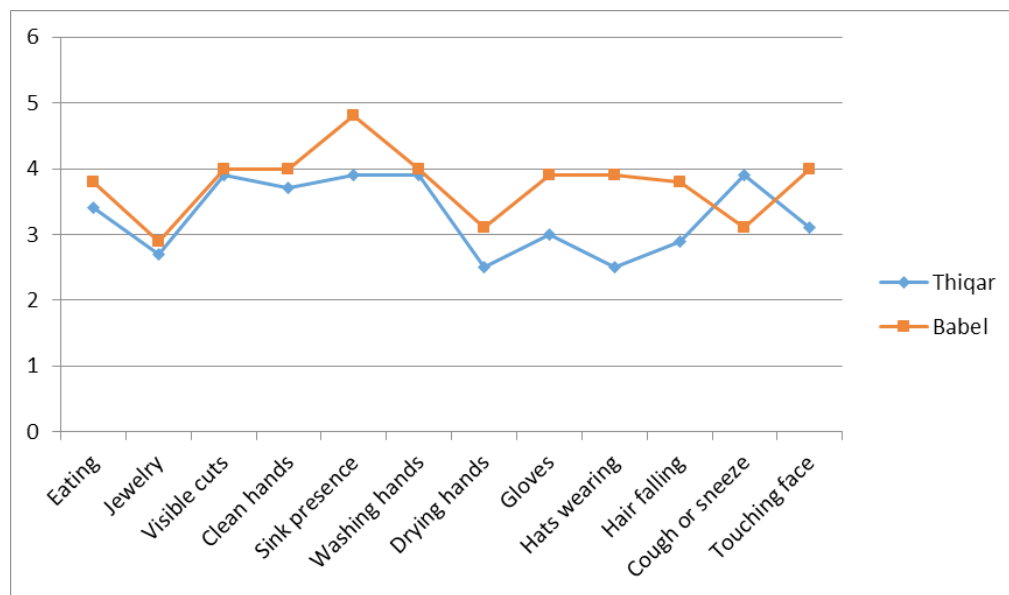


Fig 5 Comparison between Babel and Thiagar according to the hygiene of equipment and food production-preparation and serving.



“Fig6 Comparison between Babel and Thiagar according to the personal hygiene”.

Conclusion

The level of fulfillment of the hygienic requirements was most strongly influenced by the type of schools and street food vendor in both section of personal hygiene and hygiene of equipment and food preparation and serving for Babylon and Thiagar. The results of this work should not discourage to eat street food, but to minimize food poisoning risk, support the reasonable choice of eating-places according to basic food hygiene knowledge.”

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Food Science /Al-Qasim Green University and all experiments were carried out in accordance with approved guidelines.

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