Employees’ perception of hygiene in the catering industry in Ankara (Turkey)

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Abstract

This study has been carried out to determine employees’ perception of hygiene in the catering industry in Ankara (Turkey). The data has been collected by conducting face to face interviews and having 400 employees from the sector fill in a questionnaire constructed for this purpose. The responses to the questionnaire have been measured by assigning ‘hygiene perception points’ to each respondent according to their replies. These hygiene perception points have been analysed in terms of gender, age, educational level and work experience of the employees involved. The results have revealed that women, 35-and-above age group, high school and university graduates and those who have been employed for seven or more years have a higher level of perception of hygiene than men, younger-than-35 age group, those with lower education levels and those employed for less than seven years, respectively. These findings show that employees’ perception of hygiene in the catering industry in Ankara is inadequate and there is a need for training on the subject. The training should be provided immediately, should be repeated at certain intervals and the behaviours acquired should become habits.

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1. Introduction

Intense work conditions caused by urbanization and modern life, changing nutritional habits and long distances between living and working areas in large cities have led to a rapid growth in the catering sector, and thus, it has become an important field concerning public health (Medeiros et al., 2004). Due to the complex structures and broad extents of the kitchens in the catering sector, if hygiene rules are not fully obeyed, there might be unpleasant consequences in terms of public health (Yiğit & Duran, 1997). As a matter of fact, foodborne illnesses affect millions of people each year (Medeiros et al., 2004). Despite great therapeutic breakthroughs, infectious diseases remain a threat to human health even in industrialized countries (Larson, 1999).

A considerable increase in foodborne infections was noted over the last ten years in Europe and in the United States (Scott, 1996). People who prepare food take place at the final stage of protection against foodborne illnesses, and they have to take the necessary measures to decrease the number of pathogen microorganisms down to the minimum level in food (Medeiros et al., 2004).

When working conditions, personal hygiene and the tools used by food handlers are not favourable, food poisoning occurs. A study in the USA suggested that improper food handling practices in food serving establishments contributed to approximately 97.0% of foodborne illnesses (Howes, McEwen, Griffiths, & Haris, 1996). This shows that employees should pay attention to their personal hygiene. Because they work at every phase of food preparation – from purchasing to product offer – they are responsible for cleanliness at every stage. The fact that the staff pay
attention to the surfaces of the tools (such as work tables or counters, and cooking equipment) used for food and beverages service fields and to the cleanliness of their hand, body and cloth will prevent the transition of pathogen microorganisms to the foods (Sneed, Strohbehn, Gilmore, & Mendonca, 2004). Various sites and surfaces may be considered as either simple reservoirs, such as dish driers, toilets, sink drains, which feature a high level of pathogenic contamination but a low level of transmission, or reservoirs with a high potential of transmission such as sponges and towels. The latter, due to their common use, will spread bacteria over various surfaces, especially on kitchen utensils and surfaces used to prepare meals, and thus, be responsible for cross-contamination which accounts for almost 39% of digestive infections (Scott, 2000). Similarly, infected food handlers not only a common source of foodborne virus infections but also of other pathogens, such as Staphylococcus aureus, salmonella and others. Many cases of foodborne virus infection have been associated with catering (WHO, 1999).

A study was conducted in Iowa to assess the microbiological quality of food contact surfaces and a surface that could cross-contaminate food to determine the effectiveness of cleaning and sanitation. Critically, cross-contamination from these surfaces could result in contamination of food; thus, attention needs to be given to training; supervision to ensure proper hand washing and appropriate cleaning; and sanitation procedures to reduce or eliminate cross-contamination (Sneed et al., 2004).

The hands of food service employees can be vectors in the spread of foodborne diseases because of poor personnel hygiene or cross-contamination (Ehiri & Morris, 1996). In a study in which hand cleanliness of the staff has been evaluated, a considerably significant amount of bacteria have been found on bare hands (totally 180 hands), compared with the amount of bacteria on gloved hands in the course of food preparation (P < 0.05). As the most commonly observed bacteria, S. aureus (126/180), Coagulase negative staphylococci (102/180), Diptheroid bacilli (39/180), Bacillus spp.(19/180) and Escherichia coli (14/180) have been isolated. The amount of bacteria in the hands of the inexperienced staff is considerably high, compared with the hands of the experienced staff (P < 0.05). Therefore, they should be trained on the subject and, as a rule, must be made to wear gloves while working (Ayciçek, Aydogan, Küçükkaraaslan, Baysallar, & Başıstağolu, 2004).

Considering all the problems related to handling, inadequate or insufficient storage and poor hygienic conditions, the risk of contracting food-borne disease is high (Lucca & Torres, 2006).

If food handlers develop a correct perception of hygiene, it will be possible to succeed in this field and, as a result of this success, the risk of foodborne illnesses will decrease (Clayton, Griffith, Price, & Peters, 2002). A number of studies indicate that although training may bring about an increased knowledge of food safety, it does not always result in a positive change in food handling behaviour (Howes et al., 1996; Powell, Attwell, & Massey, 1997). Clayton et al. (2002) asserted that food handlers were aware of food safety actions; however, 63% of them did not conduct behaviour in favour of food safety.

In order to contribute to the field and to find out about the situation in Turkey, this study has aimed at determining the ‘hygiene perception’ of the staff who work in the catering industry in Ankara, the capital of Turkey.

2. Material and methods

The research sampling was formed from 400 voluntary employees from nine of the catering firms registered to the Chamber of Commerce (ATO) in Ankara. The research data were collected through a questionnaire and face-to-face interviews.

The first eight items of the questionnaire have been designed to obtain information about the demographic characteristics and the health status of the participants. In order to determine their perception of hygiene, the 36-statement Likert type scale, whose validity and reliability were checked (alpha = 0.8290) by Buyruk and Ahin (2002), has been used. In the scale, 14 statements are about ‘food hygiene’, 12 statements are about ‘personal hygiene’ and 10 statements are about ‘kitchen and equipment hygiene’. The scale includes a set of negative sentences (see Appendix, statements 3, 4, 15, 17, 23, 27, 28, 32, 34 and 36) in addition to the positive ones. Responses to the positive sentences have been graded as follows: ‘I certainly agree’, 5 points; ‘I agree’, 4 points; ‘undecided’, 3 points; I don’t agree’, 2 points and ‘I certainly don’t agree’, 1 point. In the negative sentences, the grades have been assigned in a reverse order. When all the statements are replied correctly, the grade that should be obtained from the ‘kitchen and equipment hygiene’ part is 50 points; from the ‘personal hygiene’ part, 60 points; and from the ‘food hygiene’ part, 70 points, amounting to a total of 180 points.

The findings have been analysed with respect to gender, educational level and work experience variables in the Statistical Package for Social Sciences (SPSS) programme.

In evaluating the hygiene perception grades, “Independent-samples T test” for the gender variable, “One-way anova” analysis and “scheffe test” for the other variables have been applied. Frequencies, averages and standard deviations have been calculated.

3. Results

3.1. Sampling Characteristics

Of the 400 participants involved in the research, 78.5% are men, 21.5% are women; the majority (67.4%) are middle and high school (secondary education) graduates, 27.8% are primary school graduates and 4.8% are univer-
sity graduates. 71.8% of the participants are 34 years old or younger, and the rate of those who are 35 or above is 28.2%. 74.4% have been in this sector for six years or less whereas 25.6% have been so for seven or more years. When the employers responding to the survey have been evaluated according to their duty distribution, it has been found that 38.9% of them are chefs, cooks and assistant cooks who are related to food preparation and cooking in the first level, 40.8% of them are staff responsible for service, 18.8% are dishwashers who are responsible for other works except food cooking, and 6.7% are managers responsible for every phase of food preparation and service.

It has been determined that the majority of the employers did not go through health inspection including teeth, skin and psychiatric check-up, when they were first hired; and 74.0% of the staff subject to check-up have stated that they had lung scintigraphy, 66.8% went through parasite check and 69.3% had blood analyses.

3.2. Hygiene Perceptions

The findings have been analysed with respect to gender, age, educational level and work experience variables.

3.2.1. Gender

Table 1 shows the average hygiene perception points of employees in catering firms. According to these results, women employees have received higher grades than men (female 129.3 ± 1.3, male 125.7 ± 0.8). The results of the statistical analysis shows that this difference is significant (P < 0.05).

When the table is examined by taking into consideration the three different sections – namely, kitchen and equipment, personal and food hygiene, it can be observed that both women and men got lower points than they were expected to; and for the ‘kitchen and equipment hygiene’ section, the difference in average points is significant with respect to the gender variable (P < 0.01).

3.2.2. Age

The hygiene perception points of the employees have been evaluated in four different age groups in Table 2. The difference between the average points received from the ‘kitchen and equipment hygiene’ and ‘food hygiene’ sections and the age groups is statistically insignificant. The hygiene perception point averages in the ‘personal hygiene’ section, on the other hand, increase with age and the highest average belongs to the staff who are at the age of 35 years or older (49.6 ± 0.5). Thus, differences between the age groups and the average points have been found to be statistically significant (P < 0.05).

Furthermore, the average perception points in this table are lower than the expected points (kitchen and equipment hygiene 50, personal hygiene 60, food hygiene 70), especially in the food hygiene section. It is a fact that both knowledge and experience increase with age. This is clearly observed in the high average of points received by those 35 years old or above.

3.2.3. Educational status

The findings with respect to the educational status variable are presented in Table 3. According to these results, the higher the educational status, the higher the level of hygiene perception is. As a matter of fact, the highest grades have been received by university graduates. There is a statistically significant difference between the points received from the ‘kitchen and equipment hygiene’ section and educational status. The difference is especially observed between employees who are primary school graduates and have a university degree, and between employees who are secondary school graduates and who have a university degree (P < 0.01) (Table 3). A statistically significant difference has been found in the points received from the ‘food hygiene’ and ‘general hygiene’ sections between the staff who are primary school graduates and the staff with a university degree (P < 0.05).

3.2.4. Work experience

The findings on the perception of hygiene with respect to the work experience variable are presented in Table 4. In general, the perception points of employees who have
Table 3
The results of variance analysis towards hygiene perception of catering staff based on educational status

<table>
<thead>
<tr>
<th></th>
<th>Primary school</th>
<th>Secondary school</th>
<th>High school</th>
<th>University</th>
<th>F</th>
<th>Sig</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen and equipment hygiene</td>
<td>39.6 ± 0.5</td>
<td>39.7 ± 0.4</td>
<td>40.4 ± 0.4</td>
<td>43.8 ± 1.3</td>
<td>4.217</td>
<td>0.006**</td>
<td>1–4, 2–4</td>
</tr>
<tr>
<td>Personal hygiene</td>
<td>48.1 ± 0.7</td>
<td>47.7 ± 0.5</td>
<td>48.0 ± 0.5</td>
<td>50.1 ± 1.4</td>
<td>0.871</td>
<td>0.456</td>
<td></td>
</tr>
<tr>
<td>Food hygiene</td>
<td>38.6 ± 0.5</td>
<td>37.6 ± 0.4</td>
<td>38.4 ± 0.4</td>
<td>41.5 ± 1.4</td>
<td>3.391</td>
<td>0.018*</td>
<td>2–4</td>
</tr>
<tr>
<td>General hygiene</td>
<td>126.2 ± 1.5</td>
<td>125.0 ± 1.1</td>
<td>126.9 ± 1.2</td>
<td>135.3 ± 3.6</td>
<td>2.920</td>
<td>0.034*</td>
<td>2–4</td>
</tr>
</tbody>
</table>

* P < 0.05.
** P < 0.01.

Table 4
The results of variance analysis towards hygiene perception of catering staff based on work experience

<table>
<thead>
<tr>
<th></th>
<th>&lt;2</th>
<th>3–6</th>
<th>7–10</th>
<th>11+</th>
<th>F</th>
<th>Sig</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen and equipment hygiene</td>
<td>40.6 ± 0.4</td>
<td>38.9 ± 0.5</td>
<td>40.2 ± 0.8</td>
<td>41.0 ± 0.5</td>
<td>3.324</td>
<td>0.020*</td>
<td>1–2</td>
</tr>
<tr>
<td>Personal hygiene</td>
<td>48.4 ± 0.4</td>
<td>46.5 ± 0.7</td>
<td>49.1 ± 0.7</td>
<td>49.4 ± 0.6</td>
<td>4.772</td>
<td>0.003**</td>
<td>1–2, 2–4</td>
</tr>
<tr>
<td>Food hygiene</td>
<td>38.8 ± 0.4</td>
<td>37.0 ± 0.5</td>
<td>38.8 ± 0.7</td>
<td>39.4 ± 0.5</td>
<td>4.169</td>
<td>0.006**</td>
<td>1–2, 2–4</td>
</tr>
<tr>
<td>General hygiene</td>
<td>127.8 ± 1.0</td>
<td>122.4 ± 1.6</td>
<td>128.1 ± 2.0</td>
<td>129.8 ± 1.3</td>
<td>5.092</td>
<td>0.002**</td>
<td>1–2, 2–4</td>
</tr>
</tbody>
</table>

* P < 0.05.
** P < 0.01.

worked for seven or more years are higher. And when all the three sections are considered, the lowest perception points belong to those with 3–6 years of work experience (Kitchen and equipment hygiene 38.9 ± 0.5, personal hygiene 46.5 ± 0.7, food hygiene 37.0 ± 0.5). The statistically significant differences can be observed between those with a two or fewer years of work experience and those with 3–6 years of work experience in all the three sections; and between those with a 3–6 years of work experience and those with 11 years or more of work experience in personal hygiene and food hygiene sections (P < 0.01, P < 0.05).

4. Discussion

There is very limited research related to food hygiene perception and practices of food handlers in catering. A study on the subject shows that foodborne diseases stem from inappropriate food production/processing techniques (Ehiri & Morris, 1996). A study in the USA suggested that improper food handling practices gave rise to approximately 97.0% of foodborne illnesses in food serving establishments (Howes et al., 1996).

Food handlers who are symptomatically ill may present a real hazard and should be excluded from work (Bryan, 1988; Evans et al., 1998). In this respect, the Turkish Ministry of Health has passed a regulation (in compliance with Law no. 3572; allowing employees to work in the sector only upon approval from a hospital) which makes feces and throat check and lung scintigraphy obligatory for the staff who work in the production of food and additives (Bulduk, 2003; Anonymous, www.kkgm.gov.tr). The findings of this study, however, indicate that 87.3% of food handlers did not go through any health control before starting work. The Turkish public health law and regulations on food production and sales points have arranged further practices in this regard. This kind of legislation requires that persons working in food services have to go through an examination every three months and obtain a report indicating that they may work in such services (Kir, Ucar, Gocgeldi, Kilic, & Azal, 2006). But in WHO consultation report, routine medical and microbiological examination of food handlers is not generally recommended but if food handlers are suffering from an illness that includes symptoms such as jaundice, diarrhoea, vomiting, fever, sore throat, skin rash or skin lesions such as boils or cuts, they should report this to their supervisor before starting work (Adams & Motarjem, 1999). Many of the studies showed that employees with the symptoms of infectious diseases, which may infect end users via foods, should not work at food handling (Daniels et al., 2002; Parashar et al., 1998; Reid, Caul, White, & Palmer, 1988). Personnel with diarrhoea, infected skin lesions in areas that could come into contact with food, or purulent conditions of the nose, ear, eye or other exposed sites should be regarded as possible transmitters of pathogens and should therefore not be permitted to handle unwrapped foods to be consumed raw or without further cooking or other forms of treatment (Käferstein, 2006).

Food-processing equipment has also been shown to be a source of contamination such as Listeria monocytogenes, in many studies (Aarnisalo, Tallavaara, Wirtanen, Maijala, & Raaska, 2006; Aguado, Vitas, & Garcia-Jalon, 2001; Fonnesbech-Vogel, Jørgensen, Ojeniyi, Huss, & Gram, 2001; Miettinen, Björkroth, & Korkeala, 1999; Suhko et al., 2002). Hygiene problems in equipment are caused when microorganism become attached to the surfaces and survive on them (Aarnisalo et al., 2006). Aarnisalo et al. (2006) pointed out that hygiene problems with
food processing equipment are mainly caused by poor hygienic design.

The results of this study indicate that the kitchen and equipment hygiene perception points of women are higher than those of men ($p < 0.01$); the points of university graduates are higher than those of primary ($P < 0.01$) and secondary school graduates ($P > 0.05$) and the points of employees with two or fewer years of work experience are higher than those of employees with 3–6 years of work experience ($P < 0.05$).

According to Baş (2004), the staff employed in food and beverages services should be persons who have a clean, tidy and proper look, do not have any skin infections, have good teeth hygiene, have short finger nails and are not in the habit of biting nails, do not wear jewellery except for their wedding ring, do not wear make-up, work in clean shoes and uniform, and believe that hygiene is a must. Many of the studies conducted have proven that it is imperative to care about personal hygiene, and especially hand cleanliness because hands are important agents when it comes to transmitting microorganism and intestinal parasites to food (Aarnisalo et al., 2006; Baş, Ersun, & Kivanç, 2006; Lucca & Torres, 2006; Marrakchi et al., 2002). A positive attitude was reported by a great majority of food handlers, who agreed that using caps, masks, protective gloves and adequate clothing reduces the risk of food contamination (82.9%). Findings showed that personnel with abrasions or cuts in fingers or hands should not touch unwrapped foods (45.8%), and that raw food should be isolated from cooked food (59.3%). In addition, the food safety attitude score of food handlers was 44.2 ± 13.2 (Baş et al., 2006).

In this study, the average personal hygiene perception points were found to be higher in women (49.0 ± 0.5) than men, higher in the 35–44 age group (49.6 ± 0.5) than the other age groups, higher among university graduates (50.1 ± 1.4) than other educational levels and higher among those who have a work experience of 11 years or more (49.4 ± 0.6) than other work experience levels. Considering that the maximum points to be received from this section is 60.0, it can be stated that the personal hygiene perception of all of the participants are inadequate.

In a study carried out in England, it has been found that staff involved in the research think that food hygiene training is beneficial but 21% of the staff who work part-time and 26% of them who work temporarily do not share the same opinion (Mortlock, Peters, & Griffith, 2000). As a result of Askarian, Kabir, Aminbaig, Memish, and Jafari (2004), it was found that old staff had better attitudes towards food hygiene. In the research carried out by Aarnisalo et al. (2006), 42.4% of the maintenance personnel reported that they always or often touched surfaces with contact in food, and 55.9% of them usually wore gloves while working in the production area. However, only 13.6% washed their hands after smoking and 23.7% before starting to work without gloves. Only 42.4% washed their hands before entering the production area.

In order to reduce foodborne illnesses, it is crucial to gain an understanding of the interaction of prevailing food safety beliefs, knowledge and practices of food handlers (WHO, 2000).

In their research, Baş et al. (2006) also found that food safety knowledge of food handlers were poor. The mean food safety knowledge score was 43.4 ± 16.2 (out of 100 possible points). The Mean scores and Standard deviations for the different sections of the questionnaire were as follows: knowledge of temperature control, 45.5 ± 30.7; knowledge of poisoning, 42.7 ± 19.4; knowledge of cross-contamination, 53.4 ± 19.2; and knowledge of personnel hygiene, 31.8 ± 23.1.

According to the results of this study, the average food hygiene perception points were found to be higher in women (38.8 ± 0.5) than men, higher in the 45 or above age group (39.6 ± 1.0) than the other age groups, higher among university graduates (41.5 ± 1.4) than other educational levels and higher among those who have a work experience of 11 years or more (39.4 ± 0.5) than other work experience levels.

5. Conclusion

Today, in developed and developing countries, foodborne illnesses are leading problems that threaten public health. In a catering firm, the higher the knowledge level of the staff is, the higher the quality of, and the cleaner and healthier the food is. The findings of this piece of research show that there is a direct proportion between the staff’s work experience and educational level and their hygiene perception points. This proves that the educational level and work experience are important factors in healthy food handling. Wrong practices of improper and inefficient cleaning due to the lack of knowledge on hygiene cause food contamination. It is a legal and moral responsibility that great care is taken by the staff who work in food preparation and service in order to avoid microorganisms and other agents that might cause food poisoning. The best way to achieve this is to observe the principles of personal hygiene.

The research shows that the average of the hygiene perception level of all 400 employees is inadequate (126.5 ± 0.7, out of 180 possible points). The points received from the “food hygiene” section (38.3 ± 0.3; out of 70 possible points) are lower than the points received from the “kitchen and equipment hygiene” (40.1 ± 0.3, out of 50 possible points) and “personal hygiene” (48.1 ± 0.3, out of 60 possible points) sections. Considering this result, training on food hygiene is important. Training all the staff who work in this field on food hygiene, giving them adequate practice on the topic and checking their knowledge in regular intervals in order to make them gain a habit are necessary steps to be taken.
Appendix. The scale used in the research

1. Food hygiene is purification from the elements that cause disease
2. Each staff is a carrier of bacteria and he or she can spread it
3. There is no objection to the fact that garbage and food can be kept together in the kitchen (–)
4. Staff who are responsible for food service can touch food with bare hands (–)
5. Uncooked and cooked foods should be prepared on separate counters
6. Bacteria spread mostly through respiration
7. The outbreak of food poisoning damage the image of a catering firm
8. The part of the body on which microorganisms can be mostly found is hand
9. Bacteria can be spread through open wounds and digestive system
10. Staff health check-up should be conducted in every six months
11. Hot meals should be kept at 60 °C or higher until they are served
12. There is objection to the fact that employees can enter the kitchen in their shoes or clothes they wear outside (–)
13. Employees should wear clean and ironed caps or bonnets
14. The inside of cold stores and refrigerators should be clean and well-cared
15. There is no objection to the fact that sunlight can enter into the store or pantry (–)
16. Grounds of the fields of food production and service should be well-cared and kept dried
17. There is no objection to the fact that products with milk and egg and meat products can be kept at high temperature (–)
18. When purchasing meat, one should pay attention to the fact that it has labels
19. One should not put his or her hands into water glasses
20. There should be enough showers and bath for the staff
21. In case of cold, flu, diarrhea etc., staff should not work or they should work in background service
22. Clean and healthy water analysed in a laboratory should be used in the kitchen
23. There is no objection to the fact that one can hold forks and knives from their top parts (–)
24. Washing hands hygienically means washing them with hot water and soap by rubbing them from wrists and by brushing nails
25. Staff should pay attention to hygiene while entering and exiting the working area
26. The surfaces where food is prepared should be cleaned after putting away the foods
27. There is no objection to the fact that staff can smoke (–)
28. The used cleaning clothes do not always need to be washed and dried (–)
29. Hot food should be stored and cooled in small and shallow containers
30. In the course of washing dishes, one should be fastidious while washing, rinsing and sterilization of the dishes
31. Wastes should be eliminated from the kitchen by grinding or putting in the waste baskets
32. There is no objection to the fact that cooked food can be kept for two hours before serving them (–)
33. Wounds on the hands of the staff should be covered by water proof bandages
34. Food can be refrozen after dissolving (–)
35. Food should be tasted by a spoon different from the one used for stirring it
36. Frozen food should be thawed in a warm environment (in the kitchen, on the radiator etc.) (–)

PS: Variables numbered 1, 3, 4, 5, 7, 11, 17, 18, 22, 29, 32, 34, 35, 36 are about “Food hygiene”. Variables numbered 2, 6, 8, 9, 10, 13, 20, 21, 24, 25, 27, 33 are about “Personel hygiene”. Variables numbered 12, 14, 15, 16, 19, 23, 26, 28, 30, 31 are about “Kitchen and equipment hygiene”.

References


