



## Hand Hygiene Experiences of Gastronomy and Culinary Arts Students: The Case of Anadolu University\*\*

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### Abstract

Hand hygiene is a mainstay of personnel hygiene also like a stage of food safety and hygiene. Foods are created through kitchen personnel. The aim of the study is to examine the hand hygiene experience of gastronomy and culinary arts students in Anadolu University who will be responsible for food and beverage businesses in the future. Research type is a phenomenology from qualitative researches. Observation and face to face interview techniques was used in the research. First 10 students were chosen from 3rd and 4th grade through purposive sampling method and the students were observed in practical course for examining their hand hygiene behaviors. Further, face to face interviews were conducted with students for their hand hygiene knowledge. Observation forms and interview questions were evaluated by four experts and were created as semi-structured. Data were analyzed by descriptive analysis. The findings show that participants' knowledge and behavior towards hand hygiene was inadequate. On the basis of findings, suggestions were made for educational institutes and food and beverage.

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## **INTRODUCTION**

Eating and drinking is a must for human health as it is to be done with healthy food. Direct food intake into human body, and serious health issues from simple food poisoning to complicated health issues deriving from this underlines the importance of hygiene. Human is the most important element in the creation of necessary hygiene in kitchens and food preparation. Kitchen, in spite of the industrialization we are faced today, appears as a working field which directly utilizes human factor.

On the other hand, despite the increasing information, technology and the quality control practices today, the amount of diseases and poisonings based on food also increases. According to the researches, 1 out of 1000 persons in the United States falls in food based diseases every year, while this amount is 10 per cent in developing countries, including Turkey. Increase in the number of collective nutrition places such as hospitals, schools, workplaces and restaurants, also increases the risk that many people can get poisoned or sick (Barten, Fustukian & de Haan, 1996).

Considering these facts, food safety is explained as a precautionary concept controlling all the phases related to food from purchasing to stock and from processing to preparation. Personnel hygiene as an important phase of providing food safety ensures the control of microbiological factors that food may be exposed to until arriving at consumer. Hygiene is defined as avoiding any kind of living organism, object or activity that may be harmful to human health. Since hands are the basic body parts in labour and food preparation, they are important elements in providing personnel and food hygiene (Pittet, Simon, Hugonnet, Pessoa-Silva, Sauvan, & Perneger, 2004).

While there are numerous studies about health and general hand hygiene of kitchen personnel (Ayçiçek, Aydoğan, Küçükaraaslan, Baysallar & Başustaoğlu, 2004; Pragle, Harding & Mack, 2007), no studies were found about the hand hygiene experience of gastronomy and culinary students, that will favor the development of food sector in the future. In studies conducted on kitchen personnel's food and hand hygiene, it is generally found that their knowledge and behavior is inadequate. Jevsnik, Hlebec and Raspor (2008) found that there are some gaps of food handlers' knowledge on microbiological hazards. Especially for those working in catering and retail, Garayoa, Vitas, Diez-Leturia and Garcia-Jalon (2011) report that hygiene practices were applied with systematic incorrect procedures in 60% of the kitchens.

Therefore, the study aims to examine the hand hygiene experiences of gastronomy and culinary arts students. Gastronomy and culinary arts undergraduate programs' mission of educating chefs and food and beverage sector supervisors outlines the importance of the study. In addition, increased effects related to educational institutions and food sector are expected with the study findings.

### **Food Safety, Hygiene and Hand Hygiene**

Food is an easy tool that the personnel can pass respiratory system diseases such as flu and quinsy, and digestion system diseases such as typhoid, to the customers (Malagie, Jensen, Graham, & Smith, 1998). Considering the risk it can compose, food safety and hygiene in collective food centers has an important place and secured via legal rules.

Food Hygiene Regulations and Hygiene Education Regulations, published in accordance with the law no: 5996 dated on 11<sup>th</sup> of June 2010, are among the regulations that indicate rules on implication (Karaman, 2012).

Food safety is defined as the precautions that require the control of physical, chemical and microbial factors which foods are exposed from purchasing to fork. It is indicated that the possibility which foods lead up to diseases because of microbial factors is more widespread than of physical and chemical factors (Scott, 1996).

Hygiene is defined as “all the cleaning precautions and practices for defending from insanitary environment” (Whitby, McLaws & Ross, 2006). The fact that it is the personnel factor which minimizes microbial factors for food hygiene and provides food safety, requires both personnel hygiene and control of the food preparation process. Hand is important for personnel hygiene also and contact to food very frequently. In the studies carried out on hand hygiene, it is reported that the number of bacteria on the hands of the personnel working at food and meat facilities and food and beverage companies is pretty much more than of other people (Cordoba, Cordoba & Jordano, 1999; Seligman & Rosenbulth, 1975). Contamination reasons of the micro-organisms on hands expand beyond food. Exterior factors such as existing permanent or temporary microorganism on hands and nail gaps, wound and boil liquids, microorganisms on face, eye, nostril and scalp, ornaments on hand and wrist such as watch, ring, bracelet and nail polish, contaminated clothes, apron, fabric and tools, and door handle, rubbish, food packages, increase the number of microorganisms on hands and pose a risk of contamination to food (Marriott & Robertson, 1997). Things to ensure hand cleanness are possible with eliminating all these contamination sources.

## **METHODOLOGY**

The research type was descriptive phenomenology. Main purpose of the study was to examine the hand hygiene experiences of gastronomy and culinary arts students in Anadolu University. Sub-purposes or themes set down about research main purposes:

- Finding out if students have taken education on food safety and hygiene at or out of the school before, and stating the benefits of such education for hand hygiene,
- Examining the knowledge and behavior of students about achieving hand hygiene in the kitchen,
- Examining the knowledge and behavior of students about the correct way of hand washing and drying,
- Examining the knowledge and behavior of students about cross-contamination between foods and equipment,
- Examining the knowledge and behavior of students about personal contamination,
- Examining the knowledge and behavior of students about exterior contamination,
- Examining the knowledge and behavior of students about smoking in the kitchen specifically.

Within this context, observation and face to face interview technics were used in the research. Interviews measured knowledge of the students about hand hygiene while observations measured behavior of the student in the kitchen. Related literature was reviewed while preparing the observation form and interview form and three gastronomy and culinary arts, one hygiene and sanitation experts were consulted. Interview forms' questions were as follows:

- Would you introduce yourself please? Which grade are you in?
- Have you taken any education about food safety and hygiene in or out of school? If yes, where did you take this education?

If it was in school which course and which grade? Also what was thought about hand hygiene?

If it was out of school how did you take?

- Would you describe how someone's hands should be in the kitchen?
- Could you explain to correct hand washing and drying before cooking?
- Could you explain what should be done in case of hand injuring during or before cooking?
- Could you explain how should be prevented cross contamination during cooking?
- Could you explain how should be prevented cross contamination between foods and equipment?
- Could you explain how should be prevented personal contamination during cooking?
- Could you explain how should be prevented exterior contamination during cooking?
- Do you smoke? If yes, do you smoke during cooking?

The themes and sub-themes of the observation forms were:

- Achieving hand hygiene

General hand care (cleanliness, nails, lacquer)

Hand washing and drying (duration, shape, material)

Covering wounds and infection

Using glove

- Cross contamination

Hand washing after processing different foods (fish, meat, poultry, vegetables, dairy products..)

Equipment washing after processing different foods (knife, chopping board, other equipment)

- Personal contamination

Hand washing after touch the personal organs (ear, nose, hair, face..)

Hand washing after sneezing

Hand washing after coming from toilet

- Exterior contamination

Hand washing after coming to outside and smoking

Hand washing after touching foods packets, recipes, phone, lighter, clothes, door handle and other exterior contamination source

In the research, using bonnet, apron, slippers and smoking behavior were also observed. First, 10 students were observed through nonparticipant observation technique in practical course for evaluating their hand hygiene behaviors. Attendants were chosen through purposive sampling method at 3<sup>rd</sup> and 4<sup>th</sup> grade. The reason for choosing 3<sup>rd</sup> and 4<sup>th</sup> grade students was that they were at the stage of graduation and to find out which experiences they had about hand hygiene until then. Face to face interviews were also conducted with students about their hand hygiene knowledge. During the interviews, semi-structured questionnaire form was used, and 10 students were interviewed between 16 May 2018 and 30 May 2018. Data collected through observation and interview methods were themed according to research purposes and analyzed with descriptive methods. All themes were approved by two researchers.

## **FINDINGS**

### **Findings on the participants’ gender and educational background**

<b>Participant’s code</b>	<b>Participant’s gender</b>	<b>Participant’s grade</b>	<b>Participant’s education on food safety and hygiene</b>	<b>Place where the participant received the education on food safety and hygiene</b>
A	Female	4 <sup>th</sup> grade	Yes	School/ as separate lesson
B	Male	4 <sup>th</sup> grade	Yes	School/as separate lesson
C	Female	3 <sup>rd</sup> grade	No	-
D	Female	3 <sup>rd</sup> grade	Yes	School/ in other lessons
E	Male	4 <sup>th</sup> grade	Yes	Internship
F	Female	3 <sup>rd</sup> grade	Yes	School/ in other lessons
G	Female	3 <sup>rd</sup> grade	Yes	School/as separate lesson
H	Female	3 <sup>rd</sup> grade	Yes	School/ in other lessons
I	Male	3 <sup>rd</sup> grade	Yes	Internship
J	Male	4 <sup>th</sup> grade	Yes	School/as separate lesson

**Table 1.** Participants’ gender and educational background.

Table 1 shows the participants’ information. It is seen that 4 of the participants are male and 6 of them are female. 4 of the participants are at the 4<sup>th</sup> and 6 of them are at the 3<sup>rd</sup> grade. Most of the 3<sup>rd</sup> grade students have taken the food safety and hygiene course as a separate course. In addition, most of the students have not taken a separate course on food safety and hygiene but get related information within the context of other courses. The fact that food safety and hygiene course is selective in the gastronomy and culinary arts department explains the phenomenon. Participants A, G and I among those who took the food safety and hygiene course talked about the education they took about hand hygiene, correct way of hand washing, use of glove, common hygiene rules and smoking within the framework of the course, on the other hand participant B made the comment that the course was not intense and focused. Participants E and I, who took the food safety and hygiene education at the internship, indicated that it did not made a practical contribution and the possibility to reflect the theoretical information to practice is low.

### **Findings on the participants’ knowledge and behaviors about common hand hygiene**

All of the participants expressed their opinions about the rules on hand hygiene that must be followed by kitchen personnel. They have information on at least two of the rules that must be followed while going in the kitchen like eradicating contamination sources from hands such as short nails, nail care and nail polish, covering of infections and wounds, washing hands, prevention of cross contamination. While participants B, C, D, E, G, H, I and J

mentioned the necessity of washing hands, and shortening and cleaning nails to provide cleanness in the kitchen, participant D also added that nail polish is a source of contamination. The fact that all female participants had no nail polish and others' short and well-cared nails during the observation period supports this finding. However, it was seen that participants' knowledge about regular hand washing was not put into practice in the kitchen. Except participants A and E, it was discovered that, participants were weakly habited in washing hands after touching contamination source.

While participants G and H declared that the infection and wounds on hands had to be covered with a bandage or glove, it was observed that participant H did not covered his wounded hand, and the finding that theoretical knowledge was not put into practice.

Participant A provided the most limited information about ensuring hand hygiene. This data was supported during the participant's observation period. Participant A's behaviors about shortened and cleansed nails and hand washing habits were observed to be very weak.

### **Findings on the participants' knowledge and behaviors about the correct way of hand washing and drying**

Most of the participants provided information about using soap and rubbing fingers and nails for a while, which are important criteria for righteous hand washing. Participants A, B, C, D, E, F, I and J declared that hands must be washed at least 30 seconds; participant B gave the full information about the subject and said "*Correct hand washing, the most important thing is time, and what we disregard is foaming, we take some soap and wash hands very shortly. Right amount of soap and at least 20 seconds... time is actually about the period required for bacteria to die. This is what we aim. In addition, nails must be well rubbed and rinsed. We mostly dry without rinsing adequately and we work with chemical residue on our hands.*" Participants A, E and I never mentioned the use of antiseptic while washing hands. This finding about the participants was also observed during implication. It was observed that participant I did not wash hands in the kitchen even when it was necessary or washed with only water for a short period, and participants A and E used dish washing liquid despite the existence of antiseptic soap in the kitchen. Apart from participants A, E and I who did not mention that hands must be washed with soap; it was observed that the information given by the participant G who declared that hands must be washed with a disinfectant soap and participants B, C, D, F and H who declared that hands must be washed with soap was not reflected to their hand washing behaviors. It was observed that these participants washed their hands with dish washing liquid for a very short period of time. It can be interpreted that nearly all the participants did not wash their hands in the correct way and time.

All participants, except I, declared that hands must be dried with a clean, single-use napkin or drier, but it was observed that this knowledge was not followed all the time and they dried their hands on the kitchen clothes and apron and pants they wear outside. An additional important finding was that the participants did not wear the apron only in the kitchen but also went out with it. Participants not taking care about the cleanness and tidiness of the apron is also among the observed data.

### **Findings on the participants' knowledge and behaviors about preventing cross contamination between food and equipment**

All participants have correct knowledge about cross contamination between food and equipment. All of them mentioned that cooked-uncooked meat and food, vegetable and meat-milk products must not be processed on the same bench and with the same equipment, and hands and equipment must be washed after each process. However participants I, J and C had the risk to contaminate between uncooked-cooked meat and food, vegetable and baked products. In this context, it can be said that participants have knowledge about cross contamination but some of them did not reflect this knowledge to their behaviors from time to time.

### **Findings on the participants' knowledge and behaviors about preventing personal contamination**

It was found out that participants could not explain the relationship between personal contamination and hand hygiene. All participants underlined the importance of washing hands frequently and participants G and H added the necessity of routine health controls. In addition to frequent hand washing, participant F added that infections and wounds on hands must be covered and participant D mentioned the importance of washing hands while going in and out the toilette and kitchen. Participant I declared the importance of personal cleanness apart from hand washing. Only participant B mentioned the existence of bacteria on organs such as face, nose, hair, ear, which is important in personal contamination. Participant B noted that *"It is important where we put our hands on. Touching to our hair or nose. Because, even if it is a very small moment, contamination to our hand occurs. Then, is there a flux when we enter the kitchen? Our nose? Nasal? Are we coughing? Do we let something out of our body? Do we touch with our hand?"* This finding about the participant was supported during the observation process. It was seen that the participant washed hands while going in and out the kitchen and after touching to his organs such as hair, nose, face, wore a bonnet and cared his personal and equipment cleanness. Inadequate knowledge of all other participants' was supported by observation. Among the participants observed A, C, D, E, F, G, I and J frequently touched their organs such as face, nose and hair and did not wash hands afterwards. Males did not wear bonnet from time to time and women only used hair band. In addition to participants' inadequacy of knowledge and practice, some missing knowledge in the rules of getting in and out the kitchen can also be interpreted. Another point that was observed was that participants protected their hands while sneezing and coughing.

### **Findings on the participants' knowledge and behaviors about preventing exterior contamination**

All participants, except A, expressed their ideas about exterior contamination. While participants C, D, E, G, H and J mentioned smoking, exterior clothes, shoes and slippers about exterior contamination, participants B, G and I added the product package factor to that. Participant F is the only one who mentioned cosmetics factor. She said that *"Actually cosmetic products do matter. It is forbidden to use but people use perfume and deodorant, etc. I mean, I can give that example. They contaminate to what we wear and to our hands from there. We dry our hands or equipment to these clothes."* Despite their knowledge about exterior contamination, it was observed that participants' behavior did not support the data. Smoking participants A, C, D, G, H and I went out to smoke during course breaks but did not wash hands while coming back into the kitchen. In addition all participants, except B, brought their phones

into the kitchen and touched them frequently while cooking. Participants C, D and E even put their phones on the chopping boards. None of the participants washed their hands after touching exterior contamination sources such as pants they wear outside, door handle, receipt, food package etc. and continued the cooking process. Participants used phone while cooking also. In addition, about the finding, it is also seen that inadequacy of kitchen rules caused exterior contamination.

### **Findings on the participants' behaviors about smoking**

All participants, except A, expressed that they smoked. Also it was observed that all participants except participant J who smoke continued to smoke during the course breaks.

## **DISCUSSION**

Hand hygiene is the most important prerequisite for ensuring hygiene of the kitchen and the food prepared in it. Although hand hygiene is important for the preparation of healthy and hygienic food, it is also seen that this is disregarded most of the time. Either the pace of the work or the limitations of the working field cause this fact to be ignored usually.

The aim of the study is to examine the hand hygiene experience of gastronomy and culinary arts students who will be responsible for food and beverage businesses in the future. Findings show that most of the participants have opinion on how the hands have to be while going into the kitchen. Although all the participants have knowledge about eliminating contaminate sources from hands such as nail shortness and care, cleanness of hands, nail polish and washing hands after smoking, it was observed that this theoretical knowledge was not realized in practice. While it was found out that most of the participants get into the kitchen with clean, un-polished and well-cared nails, the evidence was that they also did not get used to wash hands as a primary hand hygiene rule in the kitchen. It was discovered that most of the participants did not usually wash their hands after entering the kitchen. This is coherent with Pragle, Harding and Mack's study (2007) reporting that the personnel working in the restaurant are pretty weak in hand washing as same finding. Additionally, nearly all participants washed their hands with the dish washing soap for an insufficient period of time and dried their hands with apron and clothes despite they have knowledge about the correct hand washing and drying. Participants were wearing their kitchen apron and clothes also outside the kitchen.

It was found that all of the participants had knowledge about cross contamination and most of them cleansed the equipment and their hands after processing with different foods and equipment. Their knowledge and behavior about personal contamination is, on the other hand, very weak. In addition to not explaining personal contamination subject satisfyingly, they frequently expressed behaviors that may cause personal contamination in the kitchen. It was observed that most of the participants touched their organs such as nose, hair and face, and did not wash their hands afterwards. It can be said that female participants used hair band instead of bonnet and this caused them to touch and fix their hair. It was discovered that knowledge of participants about exterior contamination was limited. All of them mentioned some points about exterior contamination. While most of the participants have knowledge about the necessity of washing hands after smoking to prevent exterior contamination, they did not practice this rule in their behavior. The finding was that most of the participants had smoking habit and did not wash their hands after smoking.

In addition, it was observed that most of the participants have touched to exterior contamination sources such as phone, lighter, paper receipt, food package that are used outside and door handle during the implementation period in the kitchen and did not wash their hands. Absence of a rule about not bringing exterior contamination sources into the kitchen, such as receipt and packed food, is another important finding. These findings were also encountered in other studies. In their study, Sormaz and Şanlıer (2017) explored that the personnel did not have enough knowledge about personal cleanness and practices. Similarly, Şanlıer, Cömert and Durlu-Özkaya (2010) reported that the personnel working in hotel kitchen have inadequate knowledge about both personal and exterior contamination.

In accordance with all these findings on hand hygiene, it was discovered that participants have knowledge about general hand cleanness and care, cross contamination between food and equipment, but did not have adequate knowledge about personal and exterior contamination. Compared to their knowledge about exterior and personal contamination, their frequent behaviors that may cause exterior contamination can be explained with this lack of knowledge; but it can be interpreted that their habits were not developed enough considering that they have not washed their hands often enough while entering the kitchen. It is thought that it would be convenient to make some suggestions to both education institutions and businesses that cover food and beverage services, as a result of the findings of the study:

- For a healthy society, healthy individuals, healthy food and beverage and tourism businesses, hand hygiene must be a mandatory education course to those working in all related institutions.
- Since gastronomy and culinary arts students have to be equipped with full knowledge about food and personnel hygiene, hygiene and sanitation must be a mandatory course at the 1<sup>st</sup> grade.
- Antiseptic soap, hand washing basins and paper tissues must be placed at the entrance of kitchens and hand washing behaviors must be observed with cameras if necessary.
- Kitchens must be entered only with clothes, aprons and slippers used in the kitchen.
- Hair must be fully covered with bonnet while going into the kitchen.
- Phone use must be forbidden during the time spent in the kitchen.
- In the kitchen, smoking must be forbidden during the breaks.
- Foods must be taken into the kitchen within a gastronomy, after uncovering from packages.
- Sources that may cause exterior contamination such as napkin and equipment must be kept out of the kitchen.

Literature must contain other studies that will support the research. More detailed studies must be conducted that will lay down the rules of going in kitchen in means of equipment, personnel and food; personnel behaviors of kitchens that apply correct and strict rules and others must be comparatively searched, and studies about increasing hygiene habits must be expanded.

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