Assessment of Compliance to Hand Washing Guidelines amongst Food Handlers in Selected Fast-Food in Abia State

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Abstract

This research was conducted to assess the level of compliance to hand washing guidelines among food-handers in selected fast-foods centers operating in Abia State. Four research objectives, four research questions and six hypotheses were raised to guide the study. The study adopted combination of observational and cross-sectional design. Thirty (30) fast-foods centers within the study area were sampled randomly from one hundred and twelve (112) registered fast-food Centre in the study area from which 270 food-handers were sampled. The checklist and questionnaire were used for data collection which was analyzed using descriptive and inferential statistics using SPSS version 20. Descriptive statistics were used to answer the research question and achieve the objectives while independent sample t-test and One-way ANOVA were used to test hypotheses. The results revealed that that; first, availability of facilities and material required for effective hand washing is high (74.33%), the results revealed that average level of compliance to hand-washing guideline by the food handlers complied is high (66.67%.) and also that the perception of the food-handlers to the importance of hand-washing is good (3.19 >2.5), finally the results of the hypotheses tested revealed that gender is a significant predictor of level of compliance and their perception to importance of hand washing. The results revealed that educational level and age are significant predictor of their perceptions toward as the important of hand washing but not significant predictors of their compliance level (p=0.05). it was concluded, among others, that compliance level as well as perception of the food-handlers to importance of hand washing is good. It therefore recommended, among others, that Management of the fast-food centers should periodically organize hand hygiene awareness training and programs to help their food-handlers understand the hand washing guidelines and importance of good hand hygiene to themselves, their customers and their business

Keywords: Compliance, Hand, Washing, Guideline, Food-handlers

1.0 INTRODUCTION

Globally, food borne infections rank second in the scale of communicable disease after air borne diseases (World Health Organization; 2020). The spread of germs from the hands of food handlers to food is a common cause of foodborne illness outbreaks in restaurants. It accounts for nine out of ten outbreaks in which food was contaminated by food handlers (Reboucas et al., 2017). World

Health Organization; 2020, proposed proper hand washing as a panacea to curb high rates of communicable diseases, especially food borne in factious diseases. The essence of hand washing was first recognized by Oliver (1942) as a means of preventing child fever and secondly by Ignaz (1948) as a means of reducing maternal mortality in a Vienna hospital. All these discoveries were carried out as early as 1840s, yet till date, adherence and compliance to the proper guidelines of hand washing is still low (below 40%) in most of the food restaurants vendors (Katz 2004; Trampuz & Widmer 2004). The spread of germs from the hands of food handlers to food is a common cause of foodborne illness outbreaks in restaurants. It accounts for nine out of ten outbreaks in which food was contaminated by food handlers (Reboucas et al., 2017). Federal guidelines recommend how and when food handlers should wash their hands, but not all handlers follow them, based on this, hands of food handlers are known to be the main culprit of cross transmission of pathogens in food service industry, and, as stated by the WHO and Nigeria Centers for Disease Control and Prevention (NCDC),

Hand washing is the act of cleaning one's hands with soap and water to remove dirt and germs that might be transmitted by use of hand to handle objects, things as food (CDC: 2021) Hand hygiene is the most effective preventive measure against Hands associated illness. Nonetheless, Hand hygiene compliance among food handlers is unacceptable, below 40% globally (Erasmus et al., 2010, Lee et al., 2011 and Marra et al., 2011)

Food handlers are individuals working in restaurants and fast foods who are responsible for food safety throughout the chain of producing, processing, storage and preparation (Chukwuocha et al., 2009; Okojie et al 2005). Mishandling and disregard for hygiene measures on the part of these food handlers may result in food contamination and its attendant consequences (Chukwuocha et al., 2009) including food poisoning (Okojie et al 2005: Viedma et al 2000) and spread of diseases with resultant morbidity and occasional mortality. It is generally accepted that the hands of food handlers are an important vehicle of food cross-contamination and that improved personal hygiene and scrupulous hand washing would lead to the basic control of hand-to-mouth spread of potentially pathogenic transient microorganisms (Allwood et al., 2005; Sneed et al., 2004). Engaging in proper hand hygiene, either by washing with water and soap or by using hand sanitizer, is the single most effective way for food workers to reduce the spread of preventable infectious diseases (Hasan et al 2016). However, proper adherence to hygiene standards can vary greatly among restaurant workers and in different food preparation contexts

Food handlers can spread foodborne illness in the food service environment through hand contact with pathogens from their gastrointestinal tracts or objects or food contaminated with pathogens and subsequent passage of pathogens to food (Pragle et al 2017). Thus, worker hand contact with foods represents a potentially important mechanism by which pathogens may enter the food supply (Pragle et al 2017). Indeed, the review by Pragle et al (2017) of 81 foodborne illness outbreaks attributed to food contaminated by food workers found that 89% of these outbreaks involved the transmission of pathogens to food by workers' hands.

Foodborne diseases represent a significant health problem and leads to substantial level of sickness and mortality globally (WHO, 2015). Many reported outbreaks of foodborne diseases usually originate in food service establishments (WHO, 2015), and sporadic foodborne illnesses have been

associated with having eaten outside the home (WHO, 2015; Liu *et al.,* 2018). Additionally, food handlers' poor personal hygiene is an important contributor to outbreak of foodborne diseases (Liu *et al.,* 2018; Greig *et al.,* 2017). For example, Liu *et al* (2018) found that annually from 1993 to 2016, poor personal hygiene of food handlers was a contributing factor in over 38% of foodborne disease outbreaks in Chine, and Greig et al (2017) found that in 89% of outbreaks caused by food contaminated by food handlers, pathogens were transferred to food by workers' hands.

Although contamination of food can occur at any point from farm to table but food handlers are primarily responsible for foodborne disease outbreaks in many settings (Greig et al., 2017), and restaurant food handlers are known to be a common source of foodborne illness (Angelo *et al., 2016*). Indeed, Fast foods are responsible for the highest percentage (40%) of foodborne disease outbreaks involving food service establishments in most developed countries (Todd *et al.,* 2017). Over 50% of all foodborne disease outbreaks reported to the Centers for Disease Control and Prevention in the United States are associated with eating at fast foods (Gould*et al.,* 2013). Furthermore, one study reported that 23.4% of foodborne disease incidents in China occur in commercial restaurants, which is second only to the percentage of cases that happen at home (24.4%) (Xue, &Zhang 2013). Therefore, understanding the impotence of compliance to hand hygiene (hand washing) guidelines and procedures among restaurant food handlers is of great significance for reducing the incidence of foodborne illness globally

In response to evidence that a substantial proportion of foodborne illness outbreaks are caused by food contaminated by food workers, the U.S. Food and Drug Administration (FDA) included guidelines on methods to prevent food contamination from food workers' hands in the FDA Food Code for retail establishments (USFADA 2005). These methods include hand washing and the prevention or minimization of bare hand contact with food. Proper hand washing can significantly reduce the transmission of pathogens from hands to food and other objects (Pragle et al 2017; Tood et al., 2018). The Food Code provides a list of situations in which hands should be washed, such as before food preparation and after handling dirty equipment. The Food Code also indicates that hand washing should take at least 20 s and include running warm water, soap, friction between hands for 10 to 15 s, rinsing, and drying with clean towels or hot air. As hand washing does not remove all pathogens from hands (US.FDA 2005; Pragle et al 2017; Tood et al., 2018), the Food Code also specifies that bare hand contact should be prevented when working with ready-to-eat food (RTE) (foods that are safe to eat without further cooking) and minimized when working with non-RTE food by the use of barriers such as disposable gloves, deli tissue, and utensils.

Anecdotal evidence suggests that food service establishments most commonly use disposable gloves as barriers between bare hands and food. Proper glove use can be effective in decreasing the transfer of pathogens from hands to food (Shojaei et al., 2016; Burtonet al., 2011). However, some food safety researchers and practitioners believe that glove use can promote poor hand washing practices (Lues & Van Tonder 2017). For example, research suggests that some workers believe that glove use negates the need for hand washing (Radu et al., 2014).Because the transmission of pathogens from food handler's hands to food is a significant contributor to foodborne illness outbreaks, assessment and improvement of food worker hand washing practices is critical. Such improvement is dependent upon a clear understanding of current hand washing guidelines and practices. This understanding can be obtained through descriptive studies. People

tend to over-report the frequency with which they engage in socially desirable behaviors, such as safe food preparation practices and hand washing practice; thus, it has been argued that observations, as opposed to self-reports, provide the best descriptive data concerning following the hand washing guideline by food handlers in fast foods (Al-Kandari *et al.,*2019). Most observational studies on food worker practices report whether a specific guideline, practice or regulation violation was observed in food service establishments (Ncube *et al.,* 2020; Osaili *et al.,* 2013; Pichler *et al.,* 2011). For example, the US FDA (2005) reported that improper hand washing by food handlers was observed in 73% of full-service establishments. Although such studies are informative, they typically provide data only on whether specific practices occur in establishments; they do not provide detailed data on how often or in what situations these practices occur.

A study by Al-Kandari et al., (2019) provides these additional data. They found that, on average, food handlers washed their hands adequately in 9% of those instances in which they touched their face or hair and in 25% of those instances in which they touched potentially contaminated objects (3). Studies such as this provide the detailed descriptive data needed to understand food handlers' hand washing practices, yet no such studies have been undertaken in Nigeria and particularly among the food handlers working in fast foods in Abia State. This study focused in Abia state because Abia state houses chain of markets that is considered as one of the largest market in West Africa that accommodates both national and international traders. These markets spread across four out of the seventeen local government areas of the state. These chains of markets made Abia state one of the most developed states in the south-east region of Nigeria. Thus, there are numerous and different categories of fast foods and restaurants around and within these market which serve the daily food needs of both the foreign and local traders and their customers. These fast foods and restaurants employ the services of numerous food handlers who work on daily basis to ensure availability of food for the customers. Thus, there is needed to assess the compliance of these food handlers to the basic hygiene practices, hand washing, to ensure that the issues of spreading foodborne diseases which is commonly associated with eating in these fast foods are minimized. Thus, to the best of the researcher knowledge, no study has been conducted to assess the compliance to hand washing guideline of the food handlers working in the fast-food in any state in Nigeria let alone in Abia state. Thus, this current study is conducted to fill this lacuna by assessing the compliance to hand washing guidelines among the food handlers in fast foods in Abia state.

1.2 Statement of the Problem

Among the causes of foodborne illness in the food service industry, inadequate hand washing has been found to be a major contributor (Todd *et al.,* 2010; Pragle *et al.,* 2017). Pathogens can easily be transferred from food handlers' hands as well as utensils and kitchen surfaces, to raw food during preparation (Lues & Van Tonder 2017; Todd et al., 2018). Research on the prevalence of hand washing and glove use in food-service establishments indicates that these hand hygiene practices do not occur as often as they should. For example, food handlers have reported that they sometimes or often do not wash their hands and/or wear gloves when they should, do not always wash their hands after touching raw meat, and do not always change their gloves after touching raw meat (Todd *et al.,* 2017; Shojaei*et al.,* 2016).

Many empirical studies in Nigeria and oversea have mainly focused on food hygiene issues in fast foods and restaurants. In Nigeria, these studies primarily addressed food hygiene knowledge and practices (Okojie*et al.,* 2005; Nnebue *et al.,* 2014, Bamidele*et al.,* 2015) and oversea, these studies are mainly on food hygiene and sanitation knowledge and practices (Abdul-Mutalib *et al.,* 2012; McIntyre *et al.,* 2013; Laikko-Roto, *et al.,* 2014).

1.1 Aim and Objectives of the Study

The major aim of this study is to ascertain the level of compliance to hand washing guideline of the food handlers in fast-food establishment in Abia state. And the objectives includes to:

1. Identify the various hand washing guidelines currently recognized and accepted by the Nigeria Center for Disease Control (NCDC)
2. Determine the availability of the facilities and materials required for effective hand washing practices as recommended by the NCDC hand-washing guideline in the fast-food operating in Abia state

1.2 Research Hypotheses

The hypotheses formulated for the study are;

1. There is no significant difference between the level of compliance to NCDC hand washing guideline by male and female food handlers operating in fast-food establishments in Abia State
2. There is no significant difference between the perception of the male and female food handlers on the importance of hand washing to overall well-being of their customers and performance of their establishment

2.0 METHODOLOGY

This study adopted a combination of observational and cross-sectional design. The population of this study comprises of all the food handlers in the fast foods shops located in Abia state Nigeria. A total of 270 food handlers formed the sample size for this study; which represents about 30% of estimated population of food handlers in the study area. Two different type of instrument were used for data collection in this study, and they include checklist and structured questionnaire. The data collected in this study will be analyzed using descriptive statics (mean, percentage and weighted average) and inferential statistics (Analysis of Variance (ANOVA).

3.0 RESULTS

Table 3.1 Results of the Demographic Variables of the Respondents

Demographic factor	Groups	Number	Percentage
Gender	Male	105.00	39.000%
	Female	164.00	61.00%

Educational Level	BSC	30.00	11.20%
	HND/OND	57.00	21.20%
	SSCE	110.00	40.90%
	NONE	72.00	26.08%
Age	18-25	168,00	62.80%
	25-35	58.00	21.60%
	36 and above	42.00	15.60%

Table 3.1 show the summary of the demographic variable results of the respondents in which three key demographic factors were considered namely, gender, educational level and age. From these results, it was revealed that there are more female (61.00%) in the study population that male (39.00%). This is as expected because in the food handling business is more of women job and only few males are normally accepted or hired in that position. From the results, it was revealed that workers with SSCE are the highest (40.90%) while workers with BSC are the least (10.90%). Also, it was observed that those within age bracket of 18 to 25 are the highest (62.80%) while those within age 36 and above are the least (15.60%).

3.1 Various hand washing guidelines currently recognized and accepted by the Nigeria Center for Disease Control (NCDC)

According to Nigerian center for Disease Control NCDC (2012) as adopted from hand hygiene procedure of the World Health organization WHO (2010), hand washing guideline is separated into two; namely, guideline on "When to wash the hands" and guideline on "How to wash the hands" the summary of guideline on "when to wash the hands" are

1. Wash hands with soap and water when visibly dirty or visibly soiled with fluids
2. Wash hands with soap and water after using the or restroom or toilet
3. Wash hands with soap and water after blowing the nose, coughing or sneezing

The summary of the guideline on "How to wash the hands" are

1. Rub your hands vigorously for at least 20 seconds. Scrubbing all surfaces, including the backs of the hands, wrists, between fingers and under your fingernails.
2. Rinse appropriately on running tap till the slippery and soapy feeling on the hand are completely rinsed out.
3. Dry hands with a Tissue or towel. Also use the tissue or towel to turn off the water taps

Table 3.2 Availability of facilities and provision needed for effective handwashing by the Food-handlers

S/N	Facilities and Provisions	Available	Not-available	Remark
1	Functional Wash hand system (well-connected Wash-hand Basin) at the strategic point in the Fast-food Shope	26.00 86.66%	4.00 13.34%	High
2	Constant water supply suitably connected to Wash hand system	25.00 75.00%	5.00 25.00%	High
3	Constant availability of detergents or soap in the wash hand systems	27.00 90.00%	3.00\ 10.00%	High
4	Constant availability of alcohol-based hand sanitizer close to the wash-hand basin	13.00 43.33%	17.00 56.67%	Low
5.	Availability of hand cleaning towel close to the wash hand system (which is washed and changed on daily bases)	23.00 76.67%	7.00 23.33%	High

Table 3.2 showed the results of the descriptive statistics on the availability of facilities and material required for effective handwashing procedures by food-handlers in Abia state. The results were based on observational survey on the thirty fast-food centers samples for this study. The results revealed that the availability of a functional Wash-hand system (well-connected Wash-hand Basin) at the strategic point in the Fast-food Shope, Constant water supply suitably connected to Wash hand system, Constant detergents or soap in the wash hand systems and hand cleaning towel close to the wash hand system (which is washed and changed on daily bases) is high with availability percentage of 86.66%, 75%, 90% and 76.67% respectively, the result also revealed that the availability of alcohol-based hand sanitizer close to the wash-hand basin is low with availability percentage of 43.33%. these results implied that on there is appreciable availability of the facilities and material needed for effective handwashing in the fast-food centers sampled which, we believed, could, in long and short run, encourage effective hand washing by the food-handlers.

Hypothesis Testing

Ho1. There is no significant difference between the level of compliance to NCDC hand washing guideline by male and female food handlers operating in fast-food establishments in Abia State

Table 3.3 Independent Samples Test for significance difference between gender and compliance level

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
Compliance level	Equal variances assumed	0.463	0.497	-0.543	267	0.588	-0.01146
	Equal variances not assumed			-0.548	228.488	0.585	-0.01146

At 0.05 significant level

Table 3.3 showed the independent sample t-test used to ascertain whether there is significant difference between the level of compliance to NCDC hand washing guideline by male and female food handlers operating in fast-food establishments in the study area. The first significance value p= 0.499 is used to test for the assumption of equal variance. Thus, since p=0.497 is greater than 0.05, equal variance is assumed as the upper case of the second significance value will be used which is 0.588. therefore, since p=0.588 is greater than 0.05, it means that there is no significance difference between the level of compliance of the male and female food-handlers to hand washing procedures, thus, null hypothesis is accepted and alternate hypotheses rejected.

Ho2. There is no significant difference between the perception of the male and female food handlers on the importance of hand washing to overall well-being of their customers and performance of their establishment

Table 3.4 Independent Samples Test for significance difference between gender and perception level

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
Perception level	Equal variances assumed	0.136	0.713	-0.398	267	0.691	-.02491
	Equal variances not assumed			-0.394	215.050	0.694	-.02491

At 0.05 significant level

Table 3.4 showed the independent sample t-test used to ascertain whether there is significant difference between the perception level of the male and female food handlers toward importance of hand washing in their various fast-food establishments in the study area. The first significance value p= 0.713 is used to test for the assumption of equal variance. Thus, since p=0.713 is greater

than 0.05, equal variance is assumed therefore as the upper case of the second significance value will be used which is 0.691 therefore, since p=0.691 is greater than 0.05, it means that there is no significance difference between the perception level of the male and female food-handlers towards the importance of hand washing in their various fast-food centers. Thus, null hypothesis is accepted while the alternate hypotheses rejected.

Discussion of Findings

Based on the first objective, and According to Nigerian center for Disease Control NCDC as adopted from hand hygiene procedure of the World Health organization WHO (2010), hand washing guideline is separated into two; namely, guideline on "When to wash the hands" and guideline on "How to wash the hands" the summary of guideline on "when to wash the hands" are Wash hands with soap and water when visibly dirty or visibly soiled with fluids, Wash hands with soap and water after using the or restroom or toilet, Wash hands with soap and water after blowing the nose, coughing or sneezing. The summary of the guideline on "How to wash the hands" are Rub your hands vigorously for at least 20 seconds. Scrubbing all surfaces, including the backs of the hands, wrists, between fingers and under your fingernails. Rinse appropriately on running tap till the slippery and soapy feeling on the hand are completely rinsed out. Dry hands with a Tissue or towel. Also use the tissue or towel to turn off the water taps

The findings of the study on the second objective have revealed that the availability of a functional Wash-hand system (well-connected Wash-hand Basin) at the strategic point in the Fast-food Shope, Constant water supply suitably connected to Wash hand system, Constant detergents or soap in the wash hand systems and hand cleaning towel close to the wash hand system (which is washed and changed on daily bases) is high with availability percentage of 86.66%, 75%, 90% and 76.67% respectively, the result also revealed that the availability of alcohol-based hand sanitizer close to the wash-hand basin is low with availability percentage of 43.33%.. with overall availability percentage of 74.33%. these results implied that on there is appreciable availability of the facilities and material needed for effective hand washing in the fast-food centers sampled which, we believed, could, in long and short run, encourage effective hand washing by the food-handlers.

These results contradict the work of Verrill et al (2021) done to ascertain level of execution of hand washing by food service employees as it was confirmed that it could greatly reduce the risk of transmitting foodborne pathogens to food and food contact surfaces in restaurants assess the relative impact of the convenience and accessibility of hand washing facilities; the maintenance of hand washing supplies, multiunit status, having a certified food protection manager, and having a food safety management system for compliance with proper hand washing and their results revealed 45% overall availability of facilities and provisions for effective hand washing food handlers which is low compare to 74% reported in current study.

3.0 Conclusions

Based on the results and findings of this study, it was concluded that;

1. The percentage of availability of facilities and provision required for effective handwashing by the food-handers in the fast-food canters within the study area is high and encouraging
2. The level of compliance to handwashing guidelines by the food-handlers in the fast-food canters within the study area is also high and encouraging
3. The perception of the food-handers towards the importance of hand washing to them, their business and their customers is good
4. Finally, it was concluded that gender is a significant predictor of level of compliance of the food-handers to hand washing guideline and also the perception of the food-handers towards the importance of hand washing while age and years of experience are significant predictors of perception of the food-handlers towards importance of hand washing but not the level of compliance to hand washing guidelines.

4.0 Recommendations

Based on these conclusions, it was recommended that;

1. The management of the fast-food centers should improve more on provision of facilities and material needed for hand-washing and hand hygiene especially as concern constant availability of alcohol-based hand sanitizers for the food-handlers.
2. Management of the fast-food centers should periodically organize hand hygiene awareness training and programs to help their food-handlers understand the hand washing guidelines and importance of good hand hygiene to themselves, their customers and their business
3. The managers of fast-food centers should also consider the demographic characteristic of their possible employees when hiring because it has been revealed that some demographic factors like gender, age and years of experience significantly determine the level of compliance of the employees to hand washing and also determine how they perceive the importance of hand washing.

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