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Hygiene Beliefs, Attitudes, and Practices of Suya Producers in Nigeria

Vivian Iwar
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Walden University

College of Health Sciences

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Vivian Iwar

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2017

Abstract

Hygiene Beliefs, Attitudes, and Practices of Suya Producers in Nigeria

by

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MBA, University of Agriculture, Abeokuta-Nigeria, 2009

DVM, University of Maiduguri, Nigeria, 1987

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2017

Abstract

The street food sector continues to grow in Nigeria in a largely unregulated environment. The lack of regulation poses a significant public health risk for consuming unsafe street foods such as suya. Quantitative research has revealed high levels of microbiological contamination of suya, despite qualitative findings that suggest that food handlers are knowledgeable about safe food handling practices. This discrepancy reveals a gap in understanding about what influences safe food handling practices besides knowledge. This qualitative study was therefore designed to gain a deeper understanding of the beliefs and attitudes that influence hygienic practices among suya producers. Guided by the social cognitive theory, a phenomenological design was used to investigate and describe the hygiene phenomenon. Ten suya operators were recruited in Abuja, the Federal Capital Territory of Nigeria, to participate in the study. Data were collected from interviews and observation of participants. Semistructured, open-ended questionnaires were used in face-to-face interviews to elicit participants' views on hygiene. Hygiene practices among participants were also observed. Information gathered was recorded, stored, transcribed, and analyzed using the NVivo software and based on emerging themes. The findings revealed that participants' understanding of hygiene was related to popular culture rather than science. Furthermore, findings also revealed that family, religious, and cultural beliefs, as well as environmental factors such as consumer attitude influenced their hygiene practices. These findings may provide evidence-based guidance for public health interventions for safer suya production processes with positive social change implications for improved consumer health.

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Dedication

This work is dedicated to my husband — Austin, and our sons —Terna, Msughter and Austin (junior). You all give me a life of immense joy, and I owe everything to you.

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I specially thank and acknowledge my committee Chair, Dr. Cheryl Anderson, whose patience and gentle guidance made the dissertation process a rewarding experience for me. Thank you for sharpening my thinking on the subject with your gentle critique. I thank my committee member, Dr. Earla White, for always providing me useful insight to improve my work. The reviews by my University Research Reviewer, Dr. Kenneth Feldman, and Daniel Fleischhacker of Form and Style were invaluable in bringing quality to the study presentation. I owe you all a depth of gratitude.

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Chapter 1: Introduction to the Study

Introduction

Street foods provide a diverse range of inexpensive foods to low-income city dwellers in urban cities all over the world. While there has been a long tradition in many countries of consuming street foods as an alternative to home-prepared meals, this has assumed a survival and coping strategy for the urban poor in recent times and constitutes a part of the daily diet of these populations (Taronga, 2014). The increasing phenomenon of street food trading and consumption has been attributed to growing urbanization and migration, longer travelling times between living and working areas, the need to meet the nutritional and food security needs of these populations, and the rising urban poverty rate (Ohene-Yankyera, 2015; Taronga, 2014). Street foods provide a diverse range of foods to low-income city dwellers, but the public health risk of consuming unsafe foods remains a concern.

The risks of consuming unsafe foods have been well documented. In 2013, the World Health Organization (WHO; 2013) estimated that contaminated foods have been responsible for 1.5 billion diarrhea cases and 1.5 million mortalities annually in children. Suya is one of such contaminated street foods as quantitative researchers have shown high levels of fungal and microbial contamination (Apata, Adeyemi, Apata, & Kuku, 2013; Dwumfour-Asare & Agyapong, 2014; Madueke, Awe, & Jonah, 2014; Odeh et al., 2013) as well as physical, chemical, and environmental contaminants (Egbedi & Seidu, 2014; Okojie & Isah, 2014) found within it. Such identified contamination poses public health concerns to consumers of suya.

Delivering safe foods is a challenge all over the world. In developing countries, street food vending has considerable health implications, and street food vending operations continue to be carried out under poor sanitary environments (Baluka, Millar, & Kaneene, 2015; Davies, Brough, & Johnstone, 2014). Food stalls often lack the necessary storage, refrigeration, and appropriate cooking facilities to prevent contamination (Odeh et al., 2013; Okejie & Isah, 2014), and poor access to water and waste disposal further increases risks of food contamination (Ohene-Yankyera, 2015). Proper food handling is important in avoiding contamination along the food preparation chain.

Delivering safe foods encompasses adherence to regulations, policies, and actions that ensure the delivery of safe foods from the farm to the table. Qualitative researchers have explored the perceptions and knowledge of food handlers on food safety regulations and procedures (Baluka et al., 2015; Githiri et al., 2013; Omemu, Atanda, Ayinde, & Henshaw, 2011; Oridota, Ochulo, Akanmu, Olajide, & Soririyana, 2014). However, a dearth of researchers has examined the hygiene beliefs and attitudes of individuals that influence food-handling practices, particularly among suya producers. This is the gap that I addressed in this study.

This chapter will include 10 sections and includes the background of the research problem, the problem statement, as well as the purpose statement. The chapter will also include the research question, the theoretical framework that guides the study, the nature of the study, and the assumptions made. Furthermore, the chapter will include the scope

and limitations, the significance of the study to the scientific community, as well as a summary.

Background

Various meat products are sold on the street in Northern Nigeria, where cattle rearing is the main occupation and source of livelihood. Suya is grilled skewered meat spiced with locally sourced, mixed dry ingredients that is prepared and sold on the street. Contamination of street food, such as suya, is a public health concern (Hassan & Dimassi, 2014). The contamination of street foods in Nigeria have been attributed to factors such as the unstructured nature of the street food industry, inadequate public health infrastructure, the poor state of environmental health and sanitation, and a lack of enforcement of sanitary regulations (Hassan & Dimassi, 2014; Onyebwueke & Geyer, 2011; Rahman, Arif, Baker, & Tambi, 2012). Understanding the factors implicated in the contamination of street foods as well as the health and socio-economic relevance of street foods in Nigeria is important in providing further clarity on the individual hygiene practice of suya producers.

Quantitative researchers have provided laboratory evidence of high levels of physical, chemical, and microbial contamination of suya (Apata et al., 2013; Egbedi & Seidu, 2014; Madueke et al., 2014). Qualitative researchers have also examined the hygiene knowledge of food handlers (Baluka et al., 2015; Githiri et al., 2013; Nee & Sani, 2011; Omemu et al., 2011; Oridota et al., 2014; Osagbemi, Abdullahi, & Adenibigbe, 2010) and found that despite knowledge on food safety regulations and procedures, individuals did not always utilize this knowledge in practice. Food safety

hygiene risk reduction tools, such as thermometers, are lacking in many street food operations, and basic food safety procedures, including frequent hand washing, are not practiced (Henley, Stein, & Quinlan, 2012). There are few studies on the beliefs and attitudes that influence hygiene practices that support improved food safety standards.

Therefore, there is a gap between food hygiene knowledge and the practice of such knowledge among food handlers. An understanding of why individuals do not apply basic hygiene knowledge to practice was therefore pertinent. The findings from this study can contribute to filling the gap in the literature between knowledge on food handling and putting such knowledge into practice for the delivery of safe foods. The findings from this study can also be useful in identifying positive food-handling beliefs and attitudes among suya operators that can influence safe food practice. Better food handling practices will help in the delivery of safe suya to consumers with a reduction in food contamination, which will result in a subsequent positive public health and social change outcome.

Problem Statement

Ensuring food safety in developing countries poses challenges to food safety standards regulators. Such challenges include inadequate policies and outdated regulations, a lack of trained regulators, as well as inadequate public health institutions and infrastructure (Ades, Leith, & Leith, 2014; Egbebi & Seidu, 2011). Lack of food standards, poor environmental sanitation, and a lack of education on basic hygiene practices all impact the delivery of safe street foods in developing countries (Egbebi & Seidu, 2011; Hassan & Dimassi, 2014; Onwe, 2013; Williams, 2011). Where hygiene

policies and food safety standards exist, there may be a lack of enforcement of such regulations due to inadequate infrastructure and personnel (Egbebi & Seidu, 2011). Nigeria is one of the developing countries facing these challenges.

Street foods are of increasing importance in Nigeria, particularly in urban areas, to provide diverse, inexpensive cooked foods, offer job opportunities, and contribute to the economy (Egbebi & Seidu, 2011; Ohene-Yankyer, 2015). Suya is spicy meat, grilled on sticks that is prepared and sold by street vendors (Egbebi & Seidu, 2011). Quantitative researchers have shown contamination of the suya product that occurs at several points in the production process and in the storage methods (Apata et al., 2013; Egbebi & Seidu, 2011; Eke, Irabor, Okoye, Aitufe, & Ekoh, 2013; Madueke et al., 2014). Contamination has been identified at the point of procuring and transportation of meat, handling of meat during processing, introduction of ingredients, and at the packaging and storage stage (Egbebi & Seidu, 2011; Eke et al., 2013; Ifeadike, Ironkwe, Adogu, & Nnebue, 2014; Madueke et al., 2014). The traditional spices used in the preparation of suya have also been found to be a potential source of contamination (Ogbonna, Danladi, Akinmusire, & Odu, 2012). Therefore, curtailing contamination at the various levels of suya production and storage is pertinent.

The continuing production of suya as a sustainable business for operators depends on their ability to provide wholesome and safe products to the consuming public. It was therefore pertinent to understand the perspectives of individual suya producers on what constitutes a wholesome and safe product according to their belief systems and the attitudes that shape their hygiene practice. Such an understanding may provide

information on why operators in the industry fail to self-regulate for the production of quality and safe suya product.

Previous researchers on the suya production process in Nigeria provided quantitative information on the physical and microbial quality of suya (Apata et al., 2013; Egbebi & Seidu, 2011; Eke et al., 2013; Madueke et al., 2014). While past qualitative researchers have examined food handlers' knowledge and the influence of such knowledge in their practice of safe food handling (Baluka et al., 2015; Githiri et al., 2013; Omemu et al., 2011; Oridota et al., 2014), few researchers explored the hygiene beliefs and attitudes of food handlers in Nigeria that influence their practice. This study was an attempt at bridging this gap in literature. In this study, I examined the individual beliefs and attitudes of suya operators that shape their hygiene perspectives and influence their practice of handling and preparing the suya product.

Purpose of Study

The purpose of this study was to explore the hygiene beliefs, attitudes, and practices of suya producers in Nigeria. I designed this study to gain insight into how beliefs and attitudes influence the hygiene practices of the suya operators. This study was intended to provide information that will enable a deeper understanding of how hygiene beliefs influence food safety practices and provide clarity on how such knowledge can be utilized for self-regulation among suya operators in the production of suya. The findings from this study may be useful in formulating strategies for supporting improvements in hygiene practices among suya producers. The findings can also be used for evidence-

based public health decision-making and to guide and provide recommendations on further studies.

Research Questions

Research questions guide a study. The overarching question for the study was

What are the hygiene perspectives of suya producers in preparing suya for consumers?

The two subquestions were:

1. How do suya producers describe hygiene?
2. How do beliefs and attitudes influence hygiene practice in suya production?

Theoretical Framework of the Study

The social cognitive theory (SCT) guided this study. The SCT explains human behavior as a three-way, dynamic, reciprocal model involving personal factors, environmental influences, and behavior in continuing interaction (Bandura, 1998, 2001; Stykovic & Luthans, 1998). SCT integrates several discrete ideas, concepts and subprocesses into an overall framework for understanding human functioning. Key concepts of SCT that are relevant to behavior change interventions include observational learning, outcome expectations, setting goals, self-regulation, and self-efficacy (Bandura, 2001; Creswell, 2013). Strategies targeting the individual level that enable goal setting, an understanding of behavior, and health communication tailored to the needs identified is necessary in interventions on food safety issues.

SCT emphasizes that learning occurs in a social context through observation and is based on several basic assumptions on learning and behavior (Bandura, 1998). SCT

assumes that individual, behavioral, and environmental factors influence each other due to continuous interaction between cognitive, behavioral, and contextual factors (Bandura, 2001). SCT further assumes that individuals have the ability to influence their own behavior and their environment in a purposeful, goal-directed manner, but such individuals need motivation to do so (Bandura, 2001). Learning involves acquiring new behavior and knowledge, cognitive skills, and concepts, as well as rules, values, and other cognitive constructs (Bandura, 2001). Therefore, learning and the demonstration of what has been learned are seen as distinct processes in SCT, as learning can occur without an immediate change in behavior (Bandura, 2001; Creswell, 2013). Therefore, SCT is useful in learning appropriate hygiene practices.

Setting achievable goals, ensuring commitment to behavior change, and monitoring are useful strategies towards increasing individual self-regulation and efficacy in the food industry. The concepts and processes utilized in SCT draw on cognitive and emotional models of behavior change (Bandura, 2001; Creswell, 2013). This can be applied in developing effective interventions on appropriate behavior change in food safety. Utilizing the basic premise of SCT that individuals learn both from their own experiences as well as by observing others is useful in applying educational interventions on appropriate food handling techniques to food handlers in suya production.

Nature of the Study

This study was qualitative in nature and its results provide a deeper understanding of the hygiene beliefs, attitudes, and practices of suya operators. I used a phenomenological design to describe the hygiene beliefs of the population of suya

operators and how such beliefs influence their hygiene behavior and practices in the production of suya. This deeper understanding is useful in identifying needs and drawing on the views of suya operators to develop strategies to improve hygiene practices in suya production. I designed questionnaires, conducted face-to-face interviews, and used observational approaches to investigate the hygiene beliefs and attitudes of individual suya operators in Nigeria.

The inclusion criteria were participants' ability to speak English or pidgin and role as a suya producer. I used community leaders and gatekeepers to gain access to suya producers. Interviews were conducted in 30–45 minutes slots, but not for more than 3 hours at a time, until no new themes emerged. In these interviews, I collected information on the hygiene beliefs and attitudes of suya producers. Follow-up interviews were conducted when I needed to clarify a participant's response or add to the data.

Quantitative studies on the physical, chemical, and microbial quality of suya abound, while fewer qualitative studies have been completed on the food handling knowledge of food handlers and a near absence of mixed methods studies on food safety issues in Nigeria. Qualitative studies are useful in gaining a deeper understanding of a phenomenon, particularly in providing insights to researchers seeking a deeper understanding of individual decisions (Baluka et al., 2015; Githiri et al., 2013; Omemu et al., 2011; Oridota et al., 2014). The views of individuals and their personal experiences provide details that can be helpful in explaining a phenomenon from the perspective of the individual. Quantitative studies, on the other hand, do not provide such details and the related nuances and instead quantify the issues under consideration utilizing statistics

rather than rich descriptive words (Creswell, 2013). The mixed methods approach combines both quantitative and qualitative methods in the collection and analysis of data (Creswell, 2013).

I used the qualitative approach in this study to examine the role of hygiene beliefs and attitudes in influencing individual hygiene practices in the production of suya. Using this study design with a small sample size was helpful in gaining deep understanding of the hygiene phenomenon from the perspective of this population. Phenomenological approaches were useful in examining the hygiene phenomenon and providing a rich description of the views of suya producers. Phenomenology was useful in understanding the personal hygiene experiences of suya producers and provided deep insight into the motivations of individuals on hygiene practice. Phenomenology was also helpful in the exhaustive description of the structure of hygiene and how beliefs influence hygiene attitudes and practices among suya producers.

Definitions

Food-borne diseases: Diseases caused by the consumption of contaminated food or drink (WHO, 2005). Various microbes, chemical contaminants, and pests can cause such contamination. Microbes including bacteria, viruses, and parasites,; as well as poisoning by toxins and heavy metal contamination are implicated in food-borne diseases (WHO, 2005).

Pidgin language: A simplified form of the English language widely spoken in Nigeria and containing elements of local languages (Crystal, 1997).

Street foods: A wide range of ready-to-eat foods and beverages prepared and sold on the street (WHO, 2005). Street foods reflect local cultures and provide endless variety and diversity. Vendors' stores are located outdoors and are usually modest.

Suya: Grilled skewered meat, spiced with mixed dry ground ingredients (Alonge & Hikko, 1981).

Assumptions

There are a range of street food handlers. In this study, I focused on suya producers that were willing to share their views and perspectives on hygiene. In relation to the SCT, I assumed that individuals have the ability to influence their own attitudes and that their environment is useful in changing hygiene practices. The findings of this study can be useful for policy makers and program designers for developing interventions that are focused on hygiene practices among suya producers for improved food safety.

Scope and Delimitations

I investigated the attitudes of suya producers on hygiene in Nigeria. The participants were suya producers that provided insight into the beliefs that shape their hygiene attitudes and impact their food handling practices from their own perspective. Suya producers willing to be interviewed and observed were included in this study. However, limiting the study to specific suya producers limits the generalizability of the study, as confidence is reduced in its applicability and transferability to other settings and other groups.

Limitations

The Hawthorne effect occurs when individuals adjust their behavior in response to the scrutiny of others (Chapman et al., 2013; Creswell, 2013; Patton, 2011). I used the observational approach for observation of the suya production processes at the premises of their operation. The Hawthorne effect may have been a limitation of the study, where participants adjusted their behaviors in the preparation of suya due to my presence. I conducted observations unobtrusively in order to enable participants to carry-on with their activities without distractions.

In this study, I used open-ended, semistructured questions in the interviews. The use of semistructured questions in the face-to-face interviews was aimed at encouraging participants to provide in-depth explanations and descriptions in response to the questions but was challenging in terms of time and the effort necessary to analyze the results. Participants were exposed to the same questions but were required to provide further clarifications where necessary. This interview approach could be unfair to participants that had to answer more questions. I explained the interview procedure to participants and informed them of their free will to discontinue the interview at anytime they felt the need to do so.

Researcher's bias during observation may have been a problem, but I took every precaution to avoid such bias. I made a conscious effort to detach myself from the ongoing activities of suya operators. I did not ask any questions, did not call attention to myself, and kept notes of my observations. Bracketing of previous experiences (Creswell, 2013), using an adequate sample size, and conducting interviews to information

saturation were aimed at improving the rigor of the study. I also used triangulation of data sources including previous research, face-to-face interviews, and observation to further ensure the trustworthiness of the data (Creswell, 2013). Crosschecking the accuracy of my findings with participants was useful in determining accuracy.

Significance

Food safety has implications for health. The WHO (2012) has stated that a clean environment, keeping raw and cooked foods separately, thorough cooking, storing at appropriate temperatures, and the use of safe water ensure food safety. Research provides information for understanding and evidence for decision-making. In this study, I aimed at understanding the hygiene beliefs of suya producers. The findings can contribute to the body of knowledge on food hygiene among suya producers and be useful in education and enlightenment on the appropriate handling, preparation, and storage of foods to prevent contamination and spoilage.

Understanding the belief systems of suya producers can further enable the tailoring of public health interventions that will encourage safer food preparation processes through organized public health systems and institutions. Sharing individual stories can provide better understanding of the factors that influence hygiene practice and the expectations of food handlers for improvements in practice. Findings from the individual views and perspectives of suya producers can provide opportunities for positive social change through implementation of ideas for improving hygiene and food safety practice, and therefore, human health. Better food handling practices can improve the quality of the product and possibly curtail foodborne illnesses from suya

contamination with resultant positive public health implications. The findings from the study can also bring about positive social change through improved livelihoods as a multiplier effect of the improved quality of product, leading to a continuing source of income for families, communities, and the government in Nigeria.

Summary

Street food vending is increasingly important in developing countries among the urban poor. However, operators continue to operate in less than optimal hygiene conditions. Food safety concerns include microbial hazards, chemical contaminants, and pest infestations resulting in illnesses and even death (WHO, 2012). Food safety, therefore, remains a public health priority and requires the attention of individuals, organizations, communities, and governments to ensure proper food handling at all levels. This requires a good understanding of hygiene practices by producers.

In this chapter, I provided an overview on the hygiene beliefs and attitudes of suya operators that influence their food handling practices. I will present the review of literature in Chapter 2, where I will elaborate on past relevant research on hygiene and the public health ramifications of poor hygiene practices. In Chapter 3, I will present the methodology of the study. Chapter 4 will include the results of the study, while in Chapter 5 I will present the discussions, make recommendations, and draw conclusions on the findings of the study.

Chapter 2: Literature Review

Introduction

In Chapter 2, I will investigate the related and relevant literature on the core concepts of this study. In this chapter, I will explore the studies that have looked at the public health ramifications of street food vending with particular emphasis on suya production. The review will also include the food safety and public health beliefs and attitudes of street food operators that inform their food handling practices.

The chapter will contain nine sections. In the first section, I will present the search strategy used to gather the needed research articles and literature. The second section will include the underpinnings of the street food sector in Nigeria that encompasses suya production. I will shed light on the socio-economic aspects of the sector to the overall economy of nations in the third section. In the fourth section, I will investigate the public health significance of street foods in general and suya production in particular. I will also explain the health implications of poor sanitary standards on populations. The fifth section will include the characteristics of street food vendors. I will explore the knowledge and consumer awareness of food safety and how these influences hygiene practice in the sixth section, while in the seventh section I will establish the cultural influences of food hygiene behavior and practice on food safety. Furthermore, the eighth section will include related works that utilize the theory of phenomenology to explain the phenomenon under study, and in the ninth section I will provide a conclusion that sums up Chapter 2.

Search Strategy

I undertook the search for relevant literature to provide an overview of peer-reviewed research for the development of this chapter. Literature was searched through online databases, libraries in Nigeria, as well as relevant books, journals, and conference reports. Online databases I searched included those accessible through the Walden Online Library, PubMed; WHO; and United Nations Food and Agriculture Organization (FAO). The main keyword search terms used included *street foods*, *suya production process*, *food hygiene and safety*, *hygiene in suya production*, and *the informal food sector*. Other search words I used included *beliefs and attitudes on hygiene*, *phenomenology*, *street food vending*, *urbanization and the street food industry*, *culture and religious beliefs in food safety and hygiene*, *family and consumer influences on food safety*, *public health implication of street food vending*, and *socio-economics of the street food sector*. My searches were focused mainly on information in Nigeria and Africa. I accessed the Economic Community of West African States library, Nigeria's National Library, and the Nigeria Academy of Science Library for peer-reviewed journals, books, and conference reports. Books procured from Walden University as course materials were also consulted, as each of such course materials presented relevant information.

Theoretical Framework

The SCT served as the theoretical framework for this study. SCT can be used as a model for predicting and understanding food hygiene behaviors and attitudes (Mullan & Wong, 2010). SCT was further useful this study in examining the motivations for learning and achievement of change in hygiene behavior. My use of this theoretical

framework included examining if hygiene behavior can be learned through observation, an individual's ability to influence their own behavior, and available support for increasing food safety knowledge (Clayton, Griffith, Price, & Peters, 2002; Mullan & Wong, 2010). Using the SCT approach can be a useful tool for encouraging positive social change in the practice of hygiene. SCT explains learning as a dynamic reciprocal interaction of the person, environment and behavior. The theory helps in understanding motivation and achievement. SCT is therefore useful in predicting and understanding hygiene attitudes and examining the motivation for learning safe food handling practices among suya producers.

Social Cognitive Theory

The SCT is a social learning theory advanced by Bandura (1977) that stresses the importance of observational learning, imitation, and modeling. SCT integrates continuous interaction between behaviors and personal and environmental factors, explaining human behavior as a three-way, dynamic, reciprocal model (Bandura, 2001; Creswell, 2013). The SCT emphasizes that learning occurs in a social context and has been applied in diverse areas of human endeavor including health (Bandura, 2001). SCT has also been applied in understanding motivation, learning, and achievement (Clayton et al., 2002; Mullan & Wong, 2010). SCT further indicates the importance of learners' perceptions of the environment in general, of the person modeling a behavior specifically, and of the learners' expectation regarding the consequences of behavior (Bandura, 1977). However, Denter, Wolters, and Benzon (2015) have found that SCT contradicts earlier assumptions

within behavioral models that learning results from trial and error and that changes in behavior are due primarily to an individual's own action.

SCT is predicated on some basic assumptions on learning and behavior. One assumption is that personal, behavioral, and environmental factors interact to influence an individual's ongoing functioning (Bandura, 2001). SCT also assumes that individuals have the ability to influence their own behavior and the environment through purposeful goal setting (Bandura, 2001). This assumption conflicts with the earlier forms of behaviorism that advocated more rigorous forms of environmental determinism, as SCT argues that through forethought, self-regulation, and self-reflection individuals can influence their own outcomes and that of the environment (Bandura, 2001; Creswell, 2013). Forethought and self-reflection are necessary elements of self-regulation, which are important components of behavioral influence (Bandura, 1998). Bandura (2001) further postulated that the SCT assumes that individuals can learn without immediately changing their behavior, as learning and the demonstration of learning are presented as distinct processes and concluded that individuals need to be motivated to demonstrate what has been learned.

SCT demonstrates the value of modeling for acquiring new behaviors and provided initial evidence for the separation of learning and performance (Bandura, 2001). A large number of discrete ideas, concepts, and subprocesses are integrated into the overall framework for understanding human functioning (Bandura, 1998). SCT has key concepts that are considered relevant to behavior change interventions. These include observational learning, outcome expectations, goal setting, as well as self-regulation and

self-efficacy (Bandura, 2001; Creswell, 2013). Strategies targeting the individual level that enable goal setting, an understanding of behavior, and health communication tailored to identify needs is necessary in interventions on food safety issues. SCT has been utilized as a reliable model for predicting food hygiene behaviors and providing support for increasing food safety knowledge (Mullan & Wong, 2010). Setting achievable goals, ensuring commitment to behavior change, and monitoring are useful strategies towards increasing individual self-efficacy (Bandura, 2001; Creswell, 2013). The concepts and processes utilized in SCT draw on cognitive and emotional models of behavior change (Creswell, 2013). This can be applied in developing effective interventions on appropriate behavior change for food handling practices.

Observational Learning

Observational learning/modeling is a core premise of SCT that shows that individuals learn through observation (Bandura, 1977). In SCT, the learning process is indirectly achieved through watching the behavior to be modeled and its consequences in the environment (Bandura, 1998). Verbal descriptions, video or audio recordings, as well as other less direct forms of performance are also considered forms of modeling, with distinctions among the different types of models (Bandura, 1998). For example, using short video clips on appropriate hygiene practice can present powerful visual models on hygiene behavior to individuals. These approaches can be useful in the investigation of hygiene behavior among suya producers. The SCT learning processes of attention, retention, production, and motivation can also be helpful in imparting new hygiene behaviors among suya operators.

The observational learning model requires attention by individuals and retention is necessary for reducing and transforming what has been observed into a form that can be retrieved for later use (Denter et al., 2015). The production process enables the retrieval of stored information when trying to perform what has been observed, and the motivational process is key to understanding why individuals engage in recreating the new skills they have observed (Denter et al., 2015). However, these processes can be affected by certain factors including the developmental level of the learner and the characteristics of the modeled behavior (Denter et al., 2015). Modeling is also useful in the understanding of when and why previous learned behaviors are exhibited or inhibited.

SCT considers several levels of the social ecological model in addressing behavior change (Bandura, 1998). Utilizing the basic premise of SCT that individuals learn both from their own experiences as well as by observing others was useful in applying educational interventions on appropriate food handling techniques to food handlers. Bredbemer et al. (2006) found that 60% of young individual males had knowledge of risk related to foodborne diseases but not about the common sources of such risks and encouraged efforts on improving knowledge and ultimately safe food handling among males.

Outcome Expectation

Outcome expectations reflect individual's beliefs about the expected consequences for the performance of specific behavior. Beliefs are formed inactively through individuals' past experiences and indirectly by observation (Bandura, 2001; Denter et al., 2015). In SCT, outcome expectations are important in shaping people's

decisions on what action to take and the behavior to suppress (Bandura, 2001; Creswell, 2013). Studies investigating content analysis of the perceptions and attitudes of food safety by food handlers and experts on food risk management identified themes and showed that the two groups had different perspectives on managing risks in the food, particularly as they related to the role of media in enhancing consumer confidence in the food management system (Buchanan, 2011; Kwitoski, 2014). According to the researchers, behavior frequency seems to increase when outcomes are valued, while behaviors associated with irrelevant or unfavorable outcomes are avoided.

Goal-Setting

Goal setting is a central process in SCT that reflects cognitive representations of anticipated, desired, or preferred outcomes (Bandura, 1977; Schunk, 1990). Goals entail envisioning the future, identifying desired outcomes, and taking action to ensure such outcomes. For example, models of goals can be in the form of behavioral outcomes such as change in hygiene behavior for the acceptable levels of performance, thereby intricately linking outcomes with their self-efficacy. Goals are also the outcomes expected from engaging in particular behaviors that are important prerequisites for self-regulation and benchmarks for judging progress (Bandura, 1977).

Self-Efficacy

Self-efficacy is an individual's ability to persist in an action despite the inherent challenges, and this attribute is useful in influencing behavior change (Bandura, 1998). It relates to individuals' ability to be more effective in learning with more effort. The SCT suggests that tasks should be designed to ensure that individuals learn in a systematic

manner with reasonable effort (Bandura, 2001). Self-efficacy is also improved with exposure to peer coping models, particularly when such models are confidence boosting (Bandura, 2001).

Buchanan (2011) and Kwitoski (2014) have utilized SCT in examining the attitudes of food handlers on food safety through self-reporting in the food industry and stated that respondents perceived their job of low risk, and therefore, felt no need for food safety behavior change. The low risk perception of food handlers in the food industry poses concerns for the application of appropriate hygiene practices for the production of safe foods. Researchers, however, have not further explored the utilization of self-efficacy models in boosting the confidence of individual food handlers through systematic learning and hygiene practices.

Self-Regulation

Self-regulation requires self-observation, self-judgment, and self-reaction to be effective (Bandura, 1998). These can be achieved by supporting people to monitor the different aspects of their behavior by developing skills such as journaling, utilizing checklists, and reflecting on their performance (Paris & Paris, 2001; Zimmerman, Bonner, & Kovach, 1996). Paris and Paris (2001) and Zimmerman et al. (1996) further stated that adaptation, self-reinforcements, and rewards are important strategies for measuring progress and ensuring success

Reciprocal determinism is a key construct of SCT where an individual can be both a change agent and a responder to change (Bandura, 2001; Creswell, 2013). Changes in the environment, role models as examples, and reinforcements were, therefore, useful

in promoting behavior change in food safety. Dwumfour-Asare and Agyapong (2013) assessed food hygiene and safety practices among street food vendors in low-income communities and found poor food hygiene and safety practices with respondents repackaging leftover food for sale. However, food handlers with higher levels of education have been shown to exhibit better knowledge and attitudes on food safety (Baluka et al., 2015; Dwumfour-Asare & Agyapong, 2013; Okojie & Isah, 2014; Oridota, 2014) and can become role models in an intervention on hygiene change behavior and food safety practices.

SCT focuses on both the individual and multifaceted socio-structural determinants of health (Bandura, 2001). Therefore, SCT is useful for comprehensive approaches to promoting health hygiene and food safety requiring changes to practices detrimental social systems, building new structures and systems for risk reduction with emphasis on policy, and individual habits. SCT presents a belief in people's collective efficacy that is important in attaining social change and can be a major factor in developing policy and presenting public health perspectives for health promotion.

Overview of the Street Food Sector

Food safety poses significant public health challenges the world over, but particularly in developing countries such as Nigeria. Inadequate policies and outdated regulations, gaps in regulatory capacity (Bredbemmer, et al, 2006; Hassan & Dimassi, 2014; Ogbuabor & Malaolu, 2013; Rahman et al., 2012), and poor public health infrastructure are identified challenges. Other challenges militating against the provision of safe foods in African countries, especially Nigeria include low levels of education and

enlightenment on food safety issues (Ogbuabor & Malaolu, 2013; Olajoke, Aina, Kehinde, & Ogini, 2013; Onwe, 2013). The phenomenon of street foods only adds to the challenges.

Rapid urbanization, the need for accessible nutritional meals, employment, and income generation for the urban poor further compound the problem (Rheinlander et al., 2008). It is estimated that 70 cities will reach a population of more than one million and according to the National Bureau of Statistics (NBS) of Nigeria and the Regional Office for Africa (AFRO) of the WHO, the population in at least two cities – Kano and Lagos, have exceeded 10 million, with poverty rates estimated at over 40% (AFRO-WHO, 2015; Johnson & Yawson, 2010; NBS, 2013). The informal and unstructured environment in which these operations take place (Onwe, 2013; Williams, 2011), cultural beliefs (Njaya, 2014), low knowledge of food handling practices and consumer awareness (Oridota et al., 2014), all contribute to the unsafe nature of street food products.

Suya is a popular street food in Nigeria. It is prepared and sold on the street where it has been prepared, or it may be prepared elsewhere and hawked on the street. Quantitative studies show high levels of contamination of suya at several points in the preparation and storage process (Adebiyi et al., 2008; Apata et al., 2013; Egbedi & Seidu, 2014; Madueke et al., 2014; Uzeh, Akinyemi, & Nduaguba, 2012). Considering the health and socio-economic relevance of the street food sector in Nigeria, it is pertinent to understand the phenomenon of hygiene as it relates to suya producers. Such understanding will provide clarity on the factors that influence individual hygiene behavior, and how this can be harnessed for improvements in suya production in Abuja.

Traditionally, evaluation of food handling behaviors, and risk assessment and inspection information has been glimpsed from self-reported data. Qualitative studies utilizing focus groups, surveys, and inspection reports however show that food handlers do not always adopt the safe practices that they report including proper hygiene, and the use of risk reduction tools such as thermometers and hand washing (Clayton & Griffith, 2004; Chapman, MacLaurin, & Powell, 2013; Green & Selman, 2005). Thus while such self-reporting is useful in understanding the factors that impact safe food handling, it does not always provide the reliability needed for evaluating risk and making decisions in the street food sector. Utilizing video recordings and coding the data has provided more accurate detail on food safety behavior and practices of food handlers (Chapman et al., 2013). Although, the observation methodology is likely to provide only a short snapshot of food handlers' practices, but such observation methods seem to be more accurate than the self-reporting and inspection methods.

Literature shows that many qualitative studies seek to uncover food handlers and consumers knowledge on food safety, and relate it to their attitudes and practice (Baluka et al., 2015; Githiri et al., 2013; Henley et al., 2012; Rheinlander et al., 2008). There is however a gap in literature on how the hygiene beliefs and experiences of food handlers influence their food handling practices. The intent of this investigation is to explore the hygiene beliefs and attitudes that influence food-handling practice among suya operators in Abuja. Phenomenology was utilized to understand and describe the individual hygiene experiences of operators, identify needs and gaps, and recommend improvements in the

sector in this sector. Observation and face-to-face interview methods were used, which were coded for themes.

The Socio-Economic Role of the Street Food Sector

Street food vending is one of several economic activities in the informal economy. The informal economy, also referred to as a “shadow” economy, is one in which economic activities are not sufficiently covered by formal arrangements in law or in practice (Chen, 2006). Urban poverty, the need for incomes, and food and nutritional security has led to the expansion of the street food sector in Nigeria. Furthermore, the high cost of starting new businesses in urban areas, contribute to the decision by individuals to operate in the informal sector, where the start up capital is low and wages may not be part of overheads as most of such entrepreneurs are the sole staff in such businesses (Onwe, 2013; Williams, 2011). While the informal sector is capable of improving employment and generating tax revenues for nations, it is mostly unrecognized, unrecorded, unprotected, unregulated, and in some cases illegal. It is usually small-scale with low entry requirements, and utilizes labor-intensive production methods. Skills in this sector are acquired outside the formal education system.

Despite these challenges, the sector is estimated to provide employment for the workforce in developing countries, with estimates of 82% in South Asia and 51% in Latin American (Vaneck, Chen, Carre, Hernandez, & Hussman, 2012). In developed countries, such as the United States of America, the informal sector is estimated to generate over U.S\$8.1 billion, contribute 10% to the gross domestic product (GDP) and 40% to the overall workforce (Nightingale & Wandner, 2011). In Africa, the size of the

informal sector represents a percentage of the gross national income and is estimated at 30% in South Africa and 60% in Tanzania and Zimbabwe (Njaya, 2014). In Nigeria, accountability for activities in the street food sector remains a challenge. Onwe (2013) however has stated that 82% of the operations are single ownerships, with 46% of the operations owned by women, accounting for U.S\$179 million and a GDP of 35%. Suya production is however a male dominated operation (Hassan & Dimassi, 2014), but documentation of its contribution to the economy has been difficult to come by. However, organizing and integrating the informal sector into the formal sector is more likely to serve the economy of a country better. But such integration is also likely to produce its own set of policy challenges, particularly where poverty is a concern. In Nigeria, pro-poor and gender sensitive policies will be necessary if such integration is to be successful.

The rural-urban drift is just one of several reasons for the expansion of the informal sector in Nigeria. The increase in public sector retrenchments, poor policy implementation, and bad governance has further contributed to the expansion of the informal sector (Ogbuabor & Malaolu, 2013; Olajoke, Aina, Kehinde, & Ogini, 2013; Onwe, 2013). The informal sector is responsible for 83% of total employment, with 69% attributed to the food and beverages sub-sector that is estimated to contribute 38% to the GDP in Nigeria (Olajoke et al., 2013; Onwe, 2013). Furthermore, a cost and return analysis of street food vending shows marginal profits of 12.3% on sales, and 13.4% returns on investment per month, with the utilization of family labor at N125 (U.S \$1) per day (Dipeolu, Akinbode, & Okuneye, 2007). However, in spite of such contribution by

the informal food sector to employment generation and food security to the urban poor, it is yet to be comprehensively studied and understood. Therefore, a better understanding of the nature of the informal sector is necessary for its effective development and management in Nigeria.

Ogbuabor and Malaolu (2013) have argued that the informal sector takes away business from tax-paying organizations, pose a burden on public health due to inadequate regulation, and contribute to unhealthy eating habits and obesity. However, institutionalization of the sector, as well as the development and careful implementation of policies for its future development will serve to resolve unemployment, improve income generation, create wealth, and reduce poverty in Nigeria. The NBS (2010) estimated the population of the Federal Capital Territory (FCT), Abuja at 778,567 with half (366,148) of the population engaged in the informal sector, composed of 170,538 males and 195,610 females.

The informal sector is categorized into the productive, services and financial sub-sectors in Nigeria (Ekpo & Umoh, 2015; NBS, 2010). Street food is categorized into the services subsector, and is the third largest in Abuja, after agriculture and repairs (Ekpo & Umoh, 2015; NBS, 2010). The contribution of women to the informal sector in Abuja also aligns with the general outlook in Nigeria (Ekpo & Umoh, 2015; NBS, 2010; Onwe, 2013). The informal sector in Abuja is therefore well placed to absorb resources that are not utilized by the private or public sector. With adequate attention from government, and if well regulated and governed, the sector can easily become the production base of the economy in Abuja.

Public Health Significance of the Street Food Sector

The public health significance of street foods cannot be overemphasized. Contaminated food and water has been implicated in diarrhea in Africa resulting in 700,000 annual deaths, with children having at least five episodes per child per year, and microbial and chemical contaminants also a concern (Regional Committee for Africa, 2007). Food hygiene and safety practices among street vendors in Ghana (Dwumfour-Asare & Agyapong, 2013), Kenya (Muinde & Kuria, 2005), Uganda (Baluka et al., 2015), and Zimbabwe (Njaya, 2014), show a lack of knowledge of safe food handling, and therefore an exhibition of poor hygiene practice in the delivery of street foods.

Studies in Nigeria have isolated enteric bacteria in the stool of street food handlers (Ifeadike, Ironkwe, Adogu, et al., 2012; Mobolaji & Olubunmi, 2014). In one evaluation of street *suya*, unacceptable levels of aerobic bacteria and coliforms were isolated compared to *suya* produced in the laboratory (Apata et al., 2013). *Bacillus*, *Pseudomonas*, *Enterobacter*, *Staphylococcus*, *Corynebacteria*, and *Klebsiella* species of bacteria, as well as fungi including *Candida*, *Aspergillus*, *Fusarium*, and *Penicillium* specie have been isolated in *suya* stored at 28 degrees centigrade (Uzeh, Akinyemi & Nduaguba, 2012). However, microbial count decreased when *suya* was stored above 50 degrees centigrade (Uzeh et al., 2012). Poor storage of products by *suya* operators therefore poses a concern for food safety. It is important that *suya* operators become knowledgeable about safe storage of their products with regard to optimal storage temperatures and humidity to ensure safe products to the consuming public.

Shigella, *Escherichia coli*, and *Salmonellae* have also been isolated on prepared and stored suya (Adebiyi et al., 2008; Egbedi & Seidu, 2014; Madueke et al., 2014; Rheinlander et al., 2008). Exposure from metal grills, wood smoke, and street dust; as well as vehicular emissions and automobile debris has been implicated in the contamination of suya. Heavy metals have been isolated from suya including iron, zinc, lead; as well as manganese and copper (Adebiyi et al., 2008; Egbedi & Seidu, 2014; FAO/WHO, 2005; Madueke et al., 2014; Rheinlander et al., 2008). The toxicity and bioaccumulation of pollutants and heavy metals create concern regarding exposure to these substances. Ensuring exposure measurements for acceptable levels of such pollutants is essential for the protection of high-risk populations, particularly consumers of suya.

The public health significance of the preparation and consumption of suya as a street food in Nigeria cannot therefore be ignored. Diarrhea and deaths have been reported after a meal of suya, underscoring the importance of public health governance (Egbedi & Seidu, 2014; FAO/WHO, 2005; Madueke et al., 2014). The poor regulation of the street food industry, and therefore suya production in Nigeria has been attributed to several factors. The unstructured nature of the industry, inadequate public health infrastructure, the poor state of environmental health and sanitation, and a lack of enforcement of sanitary regulations have been implicated as factors for this state of affairs (Bredbemmer et al., 2006; Hassan & Dimassi, 2014; Rahman et al., 2012). A better-organized sector, operating from designated areas, with appropriate infrastructure and enlightened food handlers may be the panache for improved safety in street foods.

Street Food Vendors

Street food vendors are not a homogenous group, as they are different on socio-economic and demographic basis (Oridota, Ochulo, Akanmu, Olajide, & Soririyana, 2014). They can be broadly classified into two - mobile and stationary, based on their mode of selling. Mobile food handlers push their carts or carry their products around on their head, while stationary handlers sell their products from small stalls, kiosks, or makeshift facilities (Oridota et al., 2014). Street food vendors generally operate from strategic locations with high human traffic including bus and taxi stations, markets and shopping areas, commercial districts, corner shops, schools and hospitals, residential areas, construction sites and other areas where regular clientele can be found (Chukuezi, 2010). Such location also pose hygiene concerns with the movement of large numbers of people, generation of waste, deplorable sanitary conditions, as well as environmental contamination by dust due to human and vehicular movement.

Furthermore, vending sites in Nigeria are generally open spaces that food vendors find, occupy and begin their operations. Such spaces are characterized by inadequate public health infrastructure. Therefore, even where education may be a veritable tool in improving the outlook of food handlers on food safety, if such educated vendors are poorly resourced, they may still end up in the same open vending sites occupied by others in order to make the best of a bad situation. Changes in the environment may however influence improvements in hygiene and food safety. Therefore, while the safety of street foods may rely on education for improvement of safety, a holistic approach that transcends education to encompass health, economics, social, political, and

environmental aspects may be necessary in achieving improvements. In Nigeria, 23% of vendors are located around residential areas (FAO/WHO, 2005). Better regulation and monitoring of activities of the street food handlers is important for ensuring that they adhere to sanitary standards. Such regulation will also have positive effect on the economy of local authorities through generation of incomes.

A majority of street food vendors are females (67%) below 40 years old, with just primary level education (Oridota et al., 2014). Suya operators have however been found to be males in their 40s, with no formal education, and mainly from the Northern part of Nigeria (Nwaopara, Anibeze, Akpuaka, & Nwaopara, 2008; Oridota et al., 2014). The choice of environment and clothing in which food is prepared and sold is of concern. In Nigeria, 24% of street food vendors prepare food under unhygienic conditions, 48% handle food with their bare hands, 52% do not wear hair covering, and 62% handle money while serving food (Chukuezi, 2010). The hot weather in Abuja, concomitant with the high humidity levels makes appropriate clothing and hair cover important issues in ensuring food safety in Nigeria, and indeed other tropical zones of the world. Regulations on the appearance of street food handlers, taking cognizance of clothing that protect from dripping sweat and unwanted hair, into food should be a necessary feature of such protective clothing. Separating the role of food handler from handling money should necessarily be the outcome of an organized food sector, which should be enforced by regulators.

It is further reported that 19% wore jewelry while serving food, 29% blow into polythene bags meant for serving food, and 43% did not wear appropriate clothing such

as aprons (Chukuezi, 2010). Jewelry can easily become sources of metal contamination in foods as they usually contain components of such metals in their composition. They can also be a hazard if they drop into food and are mistakenly swallowed by consumers. Regulations on the appearance of food handlers should therefore take cognizance of every aspect of the food handlers' appearance to ensure wholesome products.

It is however pertinent to note that street food handlers encounter several challenges in their operations. This is particularly significant in developing countries where there is an acute lack of infrastructural support and inadequate regulation. Ifeadike et al. (2014) have argued that the use of improper environment and inappropriate clothing utilized by street suya operators may be due to the numerous challenges they confront in their operations. Physical hazards including attacks by street urchins, health and safety issues, as well as the irregularity of the incomes from their operations may be part of the challenges.

Dehydration, stress related headaches, and fatigue have been reported among street food operators due to the high tropical temperatures under which they operate (Mensah & Mwamakamba, 2012). In a study to determine the prevalence and pattern of bacteria and intestinal parasites among food handlers showed an abundance of bacteria in their fingernails and stool specimen (Ifeadike et al., 2012). Such adverse health reports will not only be detrimental to the food handlers themselves, but also to consumers of their products. Furthermore, in developing countries, harassment and extortion from authorities, a lack of policy support, and the unorganized nature of the street food sector have been reported as contributing factors to the stresses felt by operators (Mensah &

Mwamakamba, 2012). Structuring the street food sector and curtailing corrupt practices by public officials, with a focus on punishing bad behavior and rewarding performance may be worthwhile for the sector to succeed and be useful to the overall economy.

Street food vending operates largely in open spaces. This generates illegal and temporary structures such as sheds and kiosks, and results in unauthorized and indiscriminate occupation of public spaces in defiance of formal planning and land use arrangements (Adedeji, Fadamiro, & Adeoye, 2014). Operators therefore give scant regard to the intrinsic beauty and suitability of public spaces. Such disregard results in impediments to free flow of pedestrian and motorized traffic, causing congestion of the transportation networks. A further common feature of street food trading is the generation of high volumes of solid waste and the defacing of urban aesthetics (Adedeji et al., 2014). While street food vending has its benefits; it can be detrimental to the environment where it is not regulated. It is therefore important for governments to utilize inclusive approaches with operators in order to reduce the vices created by street food handling and vending for the preservation of the environment.

Food Safety Knowledge and Consumer Awareness

Low level of education of street food vendors has been identified as a factor in their lack of appreciation of safe food handling in Nigeria (Oridota et al., 2014). The unsanitary conditions in which street food vendors operate, coupled with media reports on foodborne disease outbreaks seem to have created consumer mistrust of street foods (Rheinlander et al., 2008). Improving food safety is therefore predicated on knowledge of personal hygiene, adequately cooked foods, avoidance of cross contamination, safe

temperatures for stored foods, and avoidance of serving unsafe foods to consumers (Food Safety and Zoonoses, 2006).

Consumer spending on street foods could be significant in many poor households. In Ghana, 40% of the budget of poor families is utilized on the purchase of street foods compared to 2% for the medium income group, while in Cote d'Ivoire, the poor spend 20% of their household budgets on street foods (AFRO-WHO, 2015). For example, while experts appeared negative about the role of the media in influencing the management of risks in the food industry, consumers remained indifferent (van Kleef et al., 2006). It is important to address such differences in order to bridge the gap between stakeholders on relevant aspects of food safety, with the overall objective of enhancing consumer confidence in risk management in the food industry.

Although the United States of America, is adjudged to have one of the safest food supply chains worldwide, poor food handling still account for 48 million illnesses, with 128,000 hospitalizations and 3,000 fatalities annually (U.S Food and Drug Administration, 2014; Henley et al., 2012). In Africa, lack of knowledge on proper food handling practices has been implicated in the transfer of food causing pathogens leading to foodborne disease outbreaks that result in deaths that sometimes go unreported (Baluka et al., 2015; Githiri et al., 2013). The seriousness of foodborne illnesses therefore require that food handlers and consumers have knowledge of safe food handling in order to avoid the consequences of contamination in the food chain. A survey of street food handlers concluded that 60% of those surveyed never had food hygiene and safety training, 64% acquired food handling skills from their parents, 34% acquired skills through self

practice, while a third had no idea that contaminated food has health implications (Nurudeen, Lawal, & Ajayi, 2014).

Ifeadike et al. (2014) have concluded that the mistrust exhibited by consumers of street food in Nigeria is borne out of vendors' attitude toward food hygiene and their appearance. In a qualitative study in Ghana, several respondents stated that, "vendors don't care much about the food; they just serve it and want to make money", therefore consumers purchase street foods from vendors in whom they have developed trust (Rheinlander et al, 2008). Consumers have conceded that they have developed criteria for developing trust including recommendations by friends and relations or personal experience of a vendor's reputation, and/or relationship with the vendor (Ifeadike et al., 2014; Oridota et al., 2014; Rheinlander et al., 2008). This approach to judging safe food handling and hygiene seems to underestimate or ignore the risks of encountering the harmful effects of street foods although it provides an illusion of control by consumers by replacing trust for knowledge (Davies et al., 2014; Wright & Leach, 2013). This consumer attitude however does not indicate that consumer trust is based on knowledge of safe food handling practice by vendors.

Health education, appropriate regulatory frameworks, information and knowledge management, food control management and organization, inspection services, as well as the proper development of database of epidemiology, surveillance, laboratory and monitoring information are useful for safe food control systems (Githiri et al., 2013). A lack of such safe food control systems and the knowledge gaps on food hygiene and handling practices in developing countries such as Nigeria is a source of concern for

improving food safety. Furthermore, a clear understanding of the role of time and temperature for maintaining food quality is necessary for food handlers and consumers (Akpata et al., 2013), and significant differences have been recognized in food handling and hygiene practices between trained food handlers and non-trained handlers (Green & Selman, 2005). Knowledge by food operators, and consumer awareness is therefore important for ensuring safe foods.

While knowledge gaps may be part of the reason for the poor nature of the street food industry, it has been noted that even where there is good knowledge, poor food hygiene and safety practices have persisted. Oridota et al. (2014) stated that 82% of respondents were observed to exhibit unacceptable food hygiene and safety practices despite receiving food safety training. Therefore, while knowledge gaps may be an issue in food hygiene and safety, attitudes, inadequate regulations, a lack of enforcement, and consumer complacency further influence poor food handling practice among operators. Rheinlander et al. (2008) utilized focus group discussions and observation to investigate perceptions of food safety among street food vendors and their consumers in Kumasi, Ghana and found that vendors and consumers have basic food safety knowledge but do not utilize it in practice. Githiri et al. (2013) further stated that food handlers performed better at knowledge than at food hygiene practice, while Baluka et al. (2015) recommended continuing training and management improvements on environmental hygiene to improve food safety.

Cultural Aspects of Food Safety and Hygiene Behavior

Several elements constitute culture. These include values, norms, accepted behaviors, history, tradition, habits, and expectations (Ades, Leith, & Leith, 2014). Enhancing the food safety culture entails redirecting what currently shapes street food safety culture and consumer behavior, in order to create new acceptable behavior and norms. This will aim at encouraging new food safety habits and consumer expectations, and encompass what operators believe and do.

Food safety culture is the aggregation of prevailing, learned, shared attitudes, values and beliefs that contribute to the hygiene behaviors in a particular food-handling environment (Wright & Leach, 2013). Understanding of the concept of food safety is generally diverse, and culture has been identified to influence the practice of food handling, storage, and cooking (Davies et al., 2014). But while there is agreement that there is a cultural dimension to it, there is a dearth of knowledge on how culture influences food safety practices.

Language also affects the understanding, and communication of food safety regulations among low and uneducated groups (Department of Health & Human Services, 2001, 2003). Food safety is seen in many cultures as a 'common sense' issue (Lee & Pacheco, 2003). In this case, those that have handled and prepared food all their lives are generally trusted to have ingrained knowledge of safe food practices (Davies et al., 2014; Lee & Pacheco, 2003). Training in a relevant language is therefore considered key in closing the knowledge gap and understanding on issues of food safety and hygiene.

Food safety needs can also be glimpsed from the wider social perspective that require operators to contend with unfamiliar social and political conditions. For example, a suya operator that relocates from say Kano, in northern Nigeria, may quickly realize that the socio-political environment in Lagos, southern Nigeria are not the same (Onyenechere, 2011). Language and cultural barriers, as well as the social and political climate, can quickly become uphill challenges in operating the street food business (Onyenechere, 2011). However, the business is also necessary to provide an income, as well as supply the nutritional needs of the community where it is established.

Understanding the language and culture of individuals and communities is therefore important in supporting food safety management and training, technology and procedures, as well as in motivating operators to improve their food safety practice. Social and cultural practices, as well as the symbolic meanings of food indicate that consumers utilize a variety of strategies for dealing with food risks (Davies et al., 2014; Rheinlander et al., 2008; Wright & Leach, 2013). Culture change however requires commitment to change long-standing attitudes of individuals, organizations and communities. It should therefore be developed by, with, and for the people. The dearth of information on how street food vendors, including suya operators, perceive and prioritize food safety may however pose a challenge.

Summary

Although street foods provide nutrition, generate incomes and create employment, thereby improving the economy, the sector is beset with several challenges. Improper food handling and storage by operators, poor environmental sanitation, poor regulation,

and consumer apathy towards demand for better services have been identified as responsible for foodborne illnesses from street foods. While operators' attitude leaves much to be desired, consumers have also shown apathy with regards to food safety precautions, even where such consumers are aware of the risks. Several contaminants including bacteria, viruses, parasites, and chemicals have been identified in suya that cause foodborne illnesses.

Communication strategies that encompass awareness creation and education on the importance of personal hygiene, cleanliness of utensils and equipment, sanitary condition of vending sites, the use of quality ingredients for preparation of food, as well as implementation of the key steps to safe food preparation and storage. Furthermore, encouraging the development of appropriate infrastructure such as water supply, and food vendor networks as effective entry points for promoting food hygiene initiatives is pertinent in encouraging hygienic food handling and storage. Personal hygiene, adequately cooked food, avoiding cross contamination, ensuring food is kept at safe temperatures, and sourcing food from safe sources are contributors to safe food practices. Incorporating these elements and identifying food habits that are at variance with these food safety principles are necessary in training for safe foods.

Qualitative methods including observation, face-to-face interviews, and focus group discussions have been utilized to investigate the perceptions of food safety among vendors and consumers (Rheinlander et al., 2008). Food safety practices and perceptions of street food vendors and customers were extensively investigated utilizing semistructured questionnaires (Rheinlander et al., 2008). Observation and face-to-face

interviews provide opportunities for close interactions between participant and researcher to have a glimpse of the perceptions that influence their attitudes on food safety, food quality, and hygiene. In this study, I used observation and face-to-face interviews with semistructured questionnaires to investigate the hygiene beliefs, attitudes, and practice of suya producers in Nigeria. I will present the detailed methodology for this study in Chapter 3. I will provide the results of this study in Chapter 4 and will present my discussions on the results, my recommendations, and my conclusions in Chapter 5.

Chapter 3: Research Method

Introduction

In this study, I used phenomenological approaches to examine the beliefs and attitudes that influence the hygiene practice of suya producers in Nigeria. This qualitative approach helped in understanding the phenomenon of hygiene from the perspective of suya operators and helped clarify the factors that influence individual hygiene behavior. These individual experiences were collated, classified, analyzed, and described to identify needs and gaps in the delivery of hygienically prepared suya. In this study, I drew on the experiences of these individuals to arrive at conclusions that can enable evidence-based decision making for the improvement of hygiene in the suya production process and for further research on the subject matter.

In the first section of Chapter 3, I will present the research design, define the main concepts of the study, and identify the rationale and tradition I used for the study. The second section will include the role of the researcher in the study, while in the third section I will explain the methodology of the study through an in-depth description of the site, participants, instruments, and procedures used for data collection and analysis. In the fourth section I will elaborate on issues of trustworthiness and describe the credibility, reliability, transferability and ethical considerations of the study, while the fifth section will include a summary of the chapter.

Research Design and Rationale

Qualitative studies seek to answer questions on the why and how of human behavior utilizing unstructured forms of data collection that is focused on observable

qualities (Creswell, 2013; Patton, 2011). The central question in this study revolved around the hygiene beliefs, attitudes, and practices of suya producers in preparing safe foods for consumers in Nigeria. I used subquestions to deepen discussion and further clarify the hygiene perspectives of suya producers.

Research Questions

The overarching research question for the study was: What are the hygiene perspectives of suya producers in preparing suya for consumers in Nigeria? In this study, I further explored the following two subquestions:

1. How do suya producers describe hygiene?
2. How do beliefs and attitudes influence hygiene practice in suya production?

Few qualitative studies have explored the hygiene behavior of food handlers in Nigeria. Furthermore, even fewer qualitative studies have fully examined all the factors that influence hygiene practices among suya producers. In this study, I investigated the individual hygiene beliefs and attitudes of suya producers and how these influence hygiene practices. I examined the demographics of suya producers with respect to age, education, geographical area of origin, and incomes from operations. Factors that influence hygiene practice were explored including the regulatory status of the street food sector, hygiene literacy of suya operators, the institutional arrangements, as well as interlinkages between hygiene and family, religious, cultural, and peer influences. Barriers to hygiene practices among suya operators were also identified. The research

questions were helpful in enabling suya operators to provide their views and perspectives on hygiene in the suya production process.

Central Concepts/Phenomenon

In this study, I sought to gain a deeper understanding of what influences the hygiene practices of suya producers. The hygiene influences examined included the beliefs, attitudes, and lived experiences of suya producers. The demographics examined included age, literacy level, geo-political considerations, and incomes from operations. Hok-Eng Tan (2013) found that food-related experiences occur in several distinct ways including abstract thoughts and concepts, mental images and memory, feelings, moods, and emotions and that perceptual cues, internally generated triggers, sounds, or individual cognition, can trigger such experiences. Hok-Eng Tan concluded that experience should be viewed from the prism of a process rather than the often-used approach of the content of the experience, in understanding the subjective experiences of food-related thinking. For example, taste is considered to be only one of the components to the integrated experience of food flavor; however, an incorporation of information from the taste and olfactory receptors, ear hair cells, photoreceptors, and other stimuli in the brain, all combine to create the flavor stimuli (Hok-Eng Tan, 2013). In this sense, it can be reasoned that it takes more than the content of what happens to make sense of the experience of individuals. Therefore, there is a need to seek understanding of the process of arriving at such individual experiences.

Using phenomenology, Rheinlander et al. (2008) found that while food vendors and consumers exhibited basic knowledge of food safety, there was no emphasis on

hygiene practice such as hand washing, utensil cleaning, ingredient quality, and the washing of raw vegetables. It was further found that consumers utilized certain criteria for assuming that food was safe including aesthetics of vendor and vending site, trust, price, and accessibility to vending site (Rheinlander et al., 2008). Based on the use of phenomenology in Rheinlander et al.'s study, the design was useful for this study in understanding the habitual hygiene patterns of behavior of individuals that are engaged in street suya production through close interaction with them.

It has been argued that phenomenology is a natural science that makes sense of human activity but has been criticized not only for its lack of scientific rigor, but also for its assumption of phenomenological illusion (Heidegger, 1982). Phenomenological illusion assumes that what is not phenomenologically present is not real, while what is phenomenologically present is an adequate description of how things really are (Heidegger, 1962, 1982). Phenomenology studies how individuals experience what they experience (Husserl, 1970). Passive experiences, sensory perceptions, imagination, thought, emotion, desire, volition, and action are all weaved into what an individual lives through consciously (Heidegger, 1962).

Research Tradition

Husserl described phenomenology as a process and method of investigation (Creswell, 2013; Husserl, 1963, 1970; Patton, 2011). In this study, I used phenomenological processes to extensively engage with a small number of suya operators to develop patterns, themes, and interlinkages. This qualitative method supports the view that there are several truths and multiple realities and focuses on the holistic perspective

of an individual and the environment (Husserl, 1963, 1970). Phenomenological studies are, therefore, important in understanding the personal experiences of individuals. The design provides researchers with insight into what motivates individuals and their resultant actions within a context, which is then described without prejudice. Phenomenology is useful in informing, supporting, and/or challenging policy, and therefore, its utility in this study cannot be overemphasized.

Rationale for Research Tradition

Observation and focus group approaches have previously been used in research to investigate knowledge, practices, and beliefs on food safety (Rheinlander et al., 2012; Sterger et al., 2012). I used phenomenology in exhaustively describing the structure of hygiene in suya production with a focus on the lived experiences of operators and how such experiences influence practice. It was important in this process to set aside my personal experiences and judgment as a researcher and to understand the individual experiences of the participants (Creswell, 2013; Patton, 2011). Using the Husserlian phenomenology strategy in this investigation helped me to identify the structure of individual participants' lived experiences on hygiene as described by them. Participants were selected based on their unique experiences and knowledge of suya production, and their responses to questions provided the essence of the investigation.

Role of the Researcher

Phenomenological approaches stress the importance of understanding the individual in an existential world but caution that observers cannot have a detached viewpoint (Heidegger, 1962). As researcher, my role entailed recruiting participants,

collecting and analyzing data, and ensuring the trustworthiness of the research process, as well as ensuring the dissemination of the results of the study. I used good judgment and ensured rigor in the process through careful documentation, triangulation, bracketing, and continuous evaluation. It was important for me to consciously put aside my personal beliefs, feelings, and perceptions and pay attention to participants' individual experiences and description of their hygiene beliefs. This required openness, close observation, and the avoidance of bias. My main focus was the participants' individual views and experiences.

Biases

I had no preexisting personal involvement or professional relationships with the target population that impacted my neutrality and subjectivity. It is noteworthy that neutrality and subjectivity can impact bias (Mehra, 2002). It was important for me to keep records of subjectivity and other issues of neutrality that arose. For example, during observation, I consciously completely detached from the operations and observed and took note of relevant hygiene processes.

While I have no official or social relations with any individual or collective suya operators, I have worked extensively on food safety issues and may have developed some personal beliefs on hygiene. Therefore taking cognizance of researcher bias and effectively dealing with it was important. I took this into cognizance and consciously detached myself from the data collection and analysis process while undertaking this study. Using semistructured questionnaires, recording responses in the face-to-face interviews, and carefully storing the records on password-protected personal computers

were all measures taken to reduce bias. The technology I used for analysis was also helpful in removing human interference and reducing bias.

These approaches helped me remain objective while conducting this study despite my wide knowledge on food safety, my experience in training and policy development in this area, as well as my personal belief in the idea of maintaining individual hygiene standards. My effort to be consciously neutral helped me reduce researcher bias and kept the study focused on the participants. Keeping an open mind that was ready to learn, avoiding bias in the selection of participants, and keeping my personal belief on hygiene in check were helpful in the effective implementation of the research plan, implementation, and evaluation. As a researcher, I viewed each participant as a knowledgeable individual who was providing valuable input to the study. It was important to carefully document encounters with individual participants at each session.

Incentives

Participants in this study included individuals that made varying incomes from the business of producing suya and had different socio-economic statuses. Studies have shown that incentives can be used to improve the response rate of participants (Bonke & Fallesen, 2009; Singer, 2012). Incentives to facilitate the study included purchasing suya from the operator worth two U.S.\$2 or purchasing top up credit on the participants' mobile phone for two U.S.\$2 in appreciation of their time.

Methodology

I used a phenomenological qualitative method in this study for descriptive approaches to glimpse the lived hygiene experiences of suya producers. In the

methodology section, I described the setting and population of interest, the participant recruitment and selection process. I also described the inclusion and exclusion criteria, as well as the data collection and analysis process.

Setting and Population

Abuja is the capital city located within the FCT of Nigeria, in the geographical center of Nigeria. Abuja is a relatively new city having been built mainly in the 1980s and assumed the mantle of Nigeria's capital city in 1991 from Lagos (Oridota et al., 2014). The city occupies a land space of 713 km² with a population of 979,876 (NBS 2013). Abuja was planned mainly as a city for government official business but has witnessed an influx of people resulting in the emergence of densely populated satellite towns (Oridota et al., 2014). This has resulted in inadequate public health infrastructure including poor environment and sanitation. Abuja is located 9° 4¹N 7° 29¹E, and is geographically defined by Aso Rock – a 400-meter monolith caused by water erosion, with a tropical wet and dry climate and falls within the Guinean forest-savanna (NBS, 2013).

Thirty-one percent of Abuja's population is in the age bracket of 25–54 years with 52% females and 48% males (NBS, 2013). The socio-demographic characteristic of food handlers in Abuja metropolis is estimated to be 42% men and 58% women with most of the men married (Ifiadike et al., 2012). It is further estimated that 64% of the food handling population has attained a secondary education, with 76% residing in the satellite towns around Abuja (Ifiadike et al., 2012). I recruited participants for this study from the low, medium, and high-density areas of Abuja among varying sizes of suya operations.

Selection of Participants

Local leaders, who are gatekeepers, were utilized to assist in the interactions with identified participants in the areas where the research were conducted. The purpose of the research was explained to the local leaders to enable them assist in spreading the word on the research. Flyers inviting individuals to participate in the research, and spreading information about the research by word of mouth in the community by local leaders helped generate a list of interested participants. The local leaders were further requested to deliver the letters of request for an interview, in respecting the culture of suya producers who are usually men from the northern part of Nigeria who prefer limited interactions with women. I thereafter contacted the individuals by phone to ascertain they received my letter of request for an interview, and if they were willing to be interviewed by me. Those willing to participate in the process accepted to schedule an appointment for an interview with the individual participant.

Study Eligibility

Inclusion criteria were required for eligibility to participate in this study. Participants were males involved in suya operations. They were required to be 18 years old and over, and be involved in the suya production process. Participants were required to be able to describe their experiences in English or pidgin, and participation was voluntary. Interviews were conducted face-to-face, with follow ups where necessary. Participants were required to reside in Abuja or the satellite towns around. Eligible participants were required to be mentally healthy and not institutionalized. Individuals that did not meet the criteria were excluded from the study. These criteria were included in the flyers that were circulated.

Sampling Strategy

Purposive sampling was utilized for this study. Purposive sampling is nonprobability sampling in which decisions can be taken by the researcher based on various criteria including the participant's specialized knowledge of the research issue, as well as the capacity and willingness by an individual to participate in the research (Creswell, 2013). Suya operators are usually males that are of the Muslim faith from the geographical north of Nigeria (Hassan & Dimassi, 2014). These communities usually prefer limited interactions with women and therefore sampling was based on the convenience of those that did not object to working with women. Criterion sampling was further utilized as a purposive strategy of recruiting for participants with experience on the subject matter (Creswell, 2013). Therefore, criterion and convenience purposive sampling were useful in sampling for this study to provide further understanding of the hygiene behavior of suya processors.

Qualitative studies may not necessarily be useful for generalization but do provide an understanding of the phenomenon being studied (Creswell, 2013). Qualitative approaches explore the deeper meanings of life and situations and therefore require deep continuing and fruitful engagement (Crouch & McKenzie, 2006). Furthermore, qualitative studies can be labor intensive and analyzing large samples can be expensive, time consuming, and indeed impractical. Therefore, a small sample size was necessary to enable close association with participants and enhance the validity of the inquiry. A sample size of 10 participants was utilized for this study. The small sample size I utilized was in tandem with the qualitative approach I used in this study.

The concept of saturation is important in determining sample size in qualitative studies. It is important to ensure that the sample is adequate for investigating the issue under consideration and capturing the beliefs and perceptions, but also ensuring that it is not too large as to become repetitive and redundant (Crouch & McKenzie, 2006). Themes were elaborated from participants in this study until saturation where no new themes came up.

Instrumentation

Data Collection

Phenomenology approaches aim at obtaining descriptive information of the lived experiences of participants (Creswell, 2013). Face-to-face interviews utilizing semistructured, open-ended questionnaires were utilized for data collection from participants. Questions were posed face-to-face, and the individual answers recorded on a Sony tape recorder, which was thereafter transferred to my password protected personal computer. Face-to-face recorded interviews enabled me to avoid dealing with issues of missing, misplaced, misunderstood, and undelivered questionnaires and responses (Creswell, 2013). Follow-up interviews were conducted for clarification where it is needed.

Interviews are an effective method of obtaining rich and descriptive experiences from participants (Creswell, 2013; Patton, 2010). The interview sessions with participants lasted 30–45 minutes with breaks of 5 minutes, and for maximum of 1.5 hours per session. Notes of salient observations were taken where it was necessary, and transferred to the password-protected computer after the interview. Observation was also used for

data collection. Participants were requested and consented to discreet observation, and notes taken of relevant hygiene behaviors. Participants were encouraged to share their personal hygiene experiences during the interview, thus enhancing the data collection process. The interview questions were aimed at stimulating thought and encouraging dialogue and action, thus enhancing the data collection process.

Data Analysis

Data analysis entailed the reading, organizing, storage, transcription, coding, and retrieval of collected data using the NVivo for Mac (Version 11) software technology (QSR, 2015). The NVivo software was utilized to compare, identify linkages, and extract significant themes and subthemes, phrases, and statements in the phenomenon of hygiene in suya production. New information was continuously included until there was none, and meanings were then formulated from the information (Creswell, 2013; Patton, 2011). The meanings were organized into themes that evolved into clusters and categories. Specific themes and categories were highlighted for analysis.

I put aside my personal beliefs, feelings, pre-judgment, preconceived assumptions and perceptions and was open to participants' individual experiences. Relevant information was described as presented by participants in order to understand their essence, and to reflect their thoughts on their hygiene beliefs. An analysis of the range of experiences of each participant was carried out, and an overall description of the participants' views and experiences on the phenomenon of hygiene beliefs was provided. Information was organized to enable tracing the progress of study from the beginning to the end of the study on a password secured computer.

Trustworthiness/Authenticity of Study

It is noteworthy that qualitative research is only as good as the demonstration of its trustworthiness (Creswell, 2013; Patton, 2011). The trustworthiness of this study has been demonstrated in other sections of this work including the sections on the rationale of study, data collection procedures, and data analysis; the importance of trustworthiness to qualitative studies is underscored by its meriting its own section. Ascertaining that throughout this study, the integrity of the data was preserved ensured trustworthiness. Detailed presentation of the research methods was ensured thereby allowing for the replication of the study (Creswell, 2013).

Credibility

Adequate sample data were collected taking cognizance of demographics and individual suya operators' viewpoints on hygiene (Patton, 2011). Follow up interviews were conducted where further clarification was required from the participants. Internal consistency and acceptability was determined from participants by finding out their feelings on answering the questions during testing for validity (Creswell, 2013). Triangulation was utilized to build a coherent justification for the themes from the different data sources including interview and observation, and thereby improving integrity (Creswell, 2013; Patton, 2011). Furthermore, interpretation of results reflected the data collected and contained quotes and responses of individuals while also differentiating between participants' statement and my interpretation. Bracketing was utilized to ensure this approach by maintaining an ongoing journal, and inspiring confidence in participants to be open (Creswell, 2013; Patton, 2011).

Transferability

The thorough description of the context of the research, as well as the presentation of the assumptions provided needed information to enable transferability of the research to other identified setting (Creswell, 2013; Patton, 2011; Trochim, 2006). I provided detailed description of the study context, purpose, assumptions and other information provided in the study support its transferability. This study can therefore be transferable in line with the description provided in the context and purpose in similar situations.

Dependability

Careful steps were taken and presented in detail in the methodology to the extent possible, to ensure that this study presents participants preferences. The detailed presentation of the methodology also allows an assessment of the research by readers that good research practices were followed (Shenton, 2004; Trochim, 2006). It is to be noted that despite such precaution, the result of the duplicated study in a different setting may not be exactly the same.

Confirmability

Triangulation is the utilization of more than one method to collect data (Creswell, 2013). Triangulation of data collection was useful in minimizing research bias and careful documentation and continuous crosschecking of procedures provided dependable and confirmable results. As a researcher, I took care to ensure that the study findings are not based on personal preferences.

Ethical Consideration

Ethical considerations were not treated with levity. The dignity of participants was maintained by keeping to strict ethical considerations. The Institutional Review

Board process culminated in the approval number 06 13 16 0294021 and further ensured that ethical procedures were maintained. The study was explained to individual participants, and thereafter I sought their consent. Those that accepted to participate were requested to sign the consent form. Participants were informed of their right to withdraw from the study whenever they wished to do so.

Permission for the study was also obtained from the Department of the Public Health of the Federal Ministry of Health. This department has responsibility for overseeing the food sector. Participants were made aware of their right to the confidentiality of the information they will be providing. They were further informed of the voluntary nature of the study, and their right to avoid answering any questions that make them uncomfortable. Only participants that are not under legal guardianship and custody and are also self-sufficient and functional were selected.

Protecting Confidentiality

Ensuring participant confidentiality and maintaining ethical considerations was important in the conduct of research (Creswell, 2013; Patton, 2011). To ensure confidentiality and privacy, it was necessary to put safeguards in place. Interviews were conducted privately with individual participants in a secluded location provided by the participant within their area of operation. Participants were designated by numbers rather than by names. The recorded interviews were transferred to my password secured personal computer. The interview was thereafter deleted from the audio recorder to avoid unauthorized access and use. Furthermore, after transcription, all identifying information was deleted.

Summary

In this chapter, I discussed the research design, the researcher's role and the research method. I further explored issues of confidentiality, the trustworthiness of study, and ethical considerations. Techniques for participant selection, data collection, and instrumentation were included as well as the efforts made to ensure confidentiality and maintain ethics in the study. Finally, I provided a detailed explanation on ensuring trustworthiness and authenticity. I presented the detailed results of the data analysis in Chapter 4 and my discussion of the findings, recommendations and conclusions in Chapter 5.

Chapter 4: Results

Introduction

The purpose of this study was to explore how beliefs and attitudes influence hygiene practices among suya producers in Nigeria. I examined the understanding that suya producers have of hygiene and how this understanding informs their suya production process. I also designed the study to gain insights into how hygiene knowledge can help self-regulation of hygiene practices among suya producers

In this chapter, I will describe the setting of the study and the demographics of the participants. I will also elaborate on the data collection and analysis process and provide evidence of the trustworthiness of the study. In Chapter 4, I will present the participants' perspectives on hygiene using their own words for emphasis where necessary. The chapter will also include a summary and transition to Chapter 5.

Setting

Abuja is the planned FCT of Nigeria, with a population of 2.4 million citizens constituting 1.4% of the population of Nigeria and with an annual growth of 35% (World Bank, 2010). An influx of people has rapidly expanded with satellite towns and smaller settlements around, making Abuja the fourth largest metropolitan area in Nigeria (Onyenechere, 2011). Neighborhoods around Abuja are easily recognized as high, medium, and low-density areas. Suya operators can be found in all of these areas, and my participant selection took cognizance of this spread. Abuja is administered through districts that are subdivided into phases for developmental purposes (Onyenechere,

2011). Humid rainy, intense dry, and brief dusty harmattan constitutes the weather conditions experienced in the city.

Despite a lot of effort at providing physical infrastructure for citizens, such provision has been lopsided, and in many districts, public health infrastructure remains a challenge in Abuja (Ifeadike et al., 2014). Inadequate sanitary infrastructure, inadequate quality water supply, and inadequate environmental protection have been reported (Ifeadike et al., 2014). Participants maintained that public health infrastructural inadequacy has significance on the practice of hygiene at suya operations. For example, I observed a lack of running tap water at several suya operations resulting in water stored in open containers. Such inadequacy of quality running tap water at suya operations has implications for hygiene practice.

Demographics

I collected data from 10 participants in seven districts within the Abuja metropolis from June 2016 to August 2016 and aimed to explore the hygiene perspectives of these suya producers. The age, education, the area of operations in Abuja, incomes earned from the operation, and the state and zone of origin were important to provide a holistic view of the background of participants. All the 10 participants were men, nine were within the age range of 20–29 years, and the youngest was 20 years old and the oldest 40 years old, with a median age of 26.3 years. Furthermore, one participant attained a tertiary level education, six acquired secondary level education, and one had primary level education, while two had no formal education. Eight participants were from Northern Nigeria, with

six from the northwest Zone of the country, and the income per day earned from the sale of suya was below U.S. \$180. Table 1 shows the demographics of the participants.

Table 1

Participant Demographics

Participant	Age	Education	Area of Operation	State of Origin	Zone	Income per day
A-1	20	Primary	Gwarinpa	Katsina	North West	\$173
A-2	40	Secondary	Gwarinpa	Kaduna	North Central	\$87
A-3	29	Secondary	Asokoro	Katsina	North West	\$130
A-4	28	Secondary	Asokoro	Kano	North East	\$22
A-5	28	Tertiary	Garki	Anambra	South East	\$173
A-6	24	Secondary	Wuse	Cross River	South South	\$54
A-7	21	Secondary	Gwarinpa	Katsina	North West	\$43

Table continue

Participant	Age	Education	Area of Operation	State of Origin	Zone	Income per day
A-8	25	None	Garki	Sokoto	North West	\$43
A-9	20	None	Garki	Katsina	North West	\$22
A-10	28	Secondary	Wuse	Katsina	North West	\$130

Research Procedures

Data Collection

During my contact with participants to deliver consent forms and a copy of the demographic and open-ended questions that would be asked of them, I scheduled appointments to hold an interview with each participant in person. Five participants rescheduled at least once, with one participant rescheduling five times. I conducted face-to-face interviews with all 10 participants on their business premises. The interviews lasted 60 minutes to 1.5 hours, with participants excusing themselves for brief moments to attend to their business during the interviews.

The face-to-face interviews yielded detailed, descriptive information shedding light on the hygiene perspectives of participants. I recorded the face-to-face interviews and took reflective notes to enable me to clearly remember the context of specific points that were made by a participant. I transferred my notes to my computer immediately after

the interviews. I also asked follow-up questions during the face-to-face interviews to clarify responses, but the main questions remained the same for all participants. I then transcribed the information obtained and analyzed the data.

Additionally, I used observation methods to align the descriptions of hygiene and its practice by the participants and maintained detailed notes of my observations. I transferred the notes to my password-protected personal computer immediately after the interviews to protect the information and participants. Observation is examining individuals in their natural environmental settings to systematically collect data (Creswell, 2013). I arrived at the participant's site of suya operations at 13.00 hours GMT, when suya operators start operations for the day. This enabled me to observe the operations from start to end. While the face-to-face interviews lasted for 1 hour to 1.50 hours, I sat around and observed the on-going hygiene behavior in the operations for another 1.50 hours to 2 hours and took detailed notes. I informed participants that I would be observing their processes but would not interfere in anyway.

Data Analysis

I individually transcribed the information from the recorded interviews and observation notes manually and with the help of Dragon 5.0 Naturally Speaking software for Mac (NUANCE, 2015). I read the transcribed information several times and made further notes on novel ideas and thoughts. The NVivo for Mac (Version 11) software assisted with my analysis. I identified the common words, phrases, statements, and themes for the data collected (Qualitative Software Research International, 2015). The coding process was completed at three levels. On the first level, I carried out the initial

coding where the whole data transcript was coded and labeled. The second level coding process allowed me to further examine the first level with a focus on producing codes that symbolized emerging themes identified from the data and document them. The third level coding enabled me to reexamine the initial and focused coding in the first and second levels, in order to further align the emerging themes. My documentation through this coding process entailed maintaining a manual on my password-protected personal computer with themes that represented the participants' perspectives and experiences.

The main themes on the hygiene perspectives of suya producers that emerged are presented in the words and phrases utilized by participants to describe hygiene in response to Research Question 1 on how suya producers describe hygiene. The themes include: cleanliness, tidiness, orderliness and neatness. Also washing, keeping food covered, clean behavior, keeping away flies and taking care of environment.

On Research Question 2 on how beliefs and attitudes influence hygiene practice, the responses elaborate several themes that influence hygiene practices among suya producers. These themes included: religious beliefs on ablution and the concept of cleanliness is next to godliness, the culture of "Tsapta" (Hausa word)– the art of personal hygiene and being well turned out and family influences on hygiene such as keeping the home tidy, regular bathing, washing cloths, covering food and cooking food well. Other themes included: environmental influences such as sanitary inspection and regulation, as well as customer influences related to the fear of loosing customers and income. Further themes included relationship with other suya producers and barriers to hygiene practice.

Trustworthiness of Data

The trustworthiness of this study was based on the criteria of confirmability, credibility, dependability, and transferability (Creswell, 2013; Patton, 2011). In the following subsections, I will discuss these criteria and how they have been applied in this study.

Credibility

Credibility has to do with the quality of a study and helps make the results obtained from a study believable, allowing readers to form opinions on the study's integrity (Creswell, 2013; Patton, 2011). Therefore, the richness of the information obtained from participants is useful for establishing the credibility of the findings of the study. For example, I conducted interviews for 1–1.5 hours, allowing participants to provide detailed, recorded description of their experiences and perspectives on hygiene to feed into the findings and results of the study. Participants were also asked the same set of demographic and open-ended questions, and notes were maintained to ensure clarity and context.

Triangulation is useful for credibility and includes using multiple types of data analysis and examining data consistency. I used both the manual approach and the NVivo for Mac (Version 11) for analysis. I also used face-to-face and phone interviews methods for data collection. Observations were also used as well as notes taken diligently for data collection in this study. Participants varied in their demographics including their religious beliefs, cultural and educational backgrounds, and varying incomes. The variations in participant demographics provided varying perspectives and viewpoints on hygiene that

enriched the study and improved its quality and credibility. Interviews were scheduled at the convenience of participants and conducted on the premises of their operations to make them comfortable in their environment. The approach of meeting participants on their premises for interview allowed interaction with the researcher in an environment they were comfortable with, built trust, deepened the interaction, and hence improved the quality of the study.

I verified the information provided by participants with those provided by other participants operating in the same community. For example, information on the activities of regulatory officials was crosschecked with that provided by other participants in the same community to see if it aligned. Follow-ups were conducted on the phone where clarifications were needed. For example, I had phone follow-up interviews with Participants A-1, A-4, and A-8 to seek clarifications on issues with regulatory authorities.

I hand-delivered consent forms in person, explained their importance, and allowed time for participants to decide if they wished to sign and participate in the scheduled interview appointment. I further informed each participant that they were not obligated to participate in the study, and even if they sign the form, they could withdraw at any time. I explained that if they agreed to participate, they could sign the form and return it during the scheduled interview.

Transferability

Transferability is the possibility of a study to be utilized in a different context outlined by readers' ability to examine the details of research methods and be able to compare with similar situations (Creswell, 2013; Patton, 2011). My process in this study

has been described in detail in earlier chapters. The purpose of the study, the context, the assumptions made, the software used, and other salient information has been provided to support the study's transferability.

Dependability

For qualitative research to be dependable, the findings need to be consistent and be able to be repeated (Creswell, 2013; Patton, 2011). Achieving this dependability includes a clear, detailed, and rational manner, in a presentation worthy of the standard of a research process (Creswell, 2013; Patton, 2011). In this way, researchers can understand the methods used in the study and decide on its effectiveness. The processes I used in this study have been carried out with this idea in mind. I maintained clear and accurate documentation throughout the research process including the study design, data collection and analysis process, as well as a plan for handling unexpected occurrences. For example, in the recruitment process, whereas I needed 10 participants to make my sample size; however, I had 15 participants that met the eligibility criteria from the phone sampling on my shortlist. I kept this higher number to avoid unpleasant surprises in case when I met the participants face-to-face, I found they did not in reality meet the criteria or if some participants decided to withdraw, then I could contact others on the list.

Confirmability

Confirmability ensures that empirical evidence is utilized to support the findings of a study (Creswell, 2013; Patton, 2011). Attaining confirmability was deliberately pursued for this study to ensure that the study findings were solely based on the experiences and perspectives of participants and not on my inclinations as the researcher.

For example, I developed the demographic questionnaire to identify individual participants, and the interview questions were based on the gap identified in the literature review.

Avoiding personal biases is important for a researcher to remain on the outside and only look-in to find answers to the research subject (Creswell, 2013; Patton, 2011). I avoided personal biases by recording the face-to-face interviews in the participants' own voices. Furthermore, I listened intently to the viewpoint of participants and remained detached, allowing them to freely express their individual experiences and perspectives. I did not venture suggestions to them, but simply asked for clarification whenever a participant's presentation of an issue was not clear to me. For example, I sought for detailed clarification from participants in my attempt to understand the culture of *tsapta*, a Hausa word that participants explained influence their hygiene practice, but which is not restricted to hygiene alone but the overall wellbeing of an individual.

Triangulation also enabled me to further curtail bias. For example, in order to avoid selection bias, I selected potential participants through phone contact and fulfillment of the eligibility criteria without meeting them. This approach enabled me to avoid basing the selection of individuals on their physical appearance. Community leaders distributed the recruitment flyers, which contained the eligibility criteria. The criteria were further explained to participants by the researcher during the first face-to-face contact to hand deliver the consent forms and schedule an interview. NVivo for Mac (Version 11) software was used to organize and analyze the data collected and enabled consistency for the study findings.

Results

The responses obtained from the participant interviews were organized in line with the research questions. The information presented by participants were described using direct quotes and paraphrases that closely represent participants' perspectives on hygiene. This approach is aimed at improving validity, and ensuring clarity of the study. This study explored the overarching question: What are the hygiene perspectives of suya producers in Nigeria? The study examined two secondary questions to further explain the overarching question and identified emerging themes from the data that are presented accordingly. Two participants provided discrepant information on hygiene practice stating that when the workload is "too much," they do not always pay attention to "cleanliness." This aligned with some of the observations of the researcher.

Research Question 1: Description of Hygiene by Suya Producers

Research Question 1 explored the understanding of suya producers on the concept of hygiene with the research question: How do suya producers describe hygiene? This question was further elaborated into specific questions. Specific questions for Research Question 1 were as follows:

Please explain what you understand by hygiene.

Explain to me your first conscious realization of the meaning of hygiene.

Why is hygiene important to you?

In explaining the understanding of hygiene by participants, the themes emerging from the data include: hygiene relates to "cleanliness," being "tidy, neat, and orderly," keeping "food covered and washing the food ingredients and utensils." Furthermore,

hygiene is a “behavior by individuals of avoiding flies” and “taking care of the environment.” These themes are discussed in the following subsections.

Hygiene: Cleanliness, Tidy, Neat, and Orderly

All 10 participants described hygiene as the attitude of being clean. However, despite describing hygiene as “clean behavior,” two participants (A-4 and A-9) described cleanliness as “having a bath.” When I asked for an explanation to how having a bath relates to cleanliness in the suya production process, they got irritated and insisted that a “person that bathes is clean.” While all 10 participants used the word “cleanliness” to describe hygiene, five participants additionally described hygiene in terms of being “tidy,” “neat,” and “orderly.” They explained that their mothers taught them that being clean means appearing neat, and keeping things tidy.

A-1 quietly explained over and over that his mother raised him to be clean and to keep his room tidy. This was his first realization that to be clean means to be tidy, he stated. He also stated that although he understand the need to be clean when producing suya, it is hard to maintain this standard all the time in his suya production process as there is usually too much work to do.

A-2 explained that hygiene is cleanliness. He stated that he tries to be clean by keeping his suya workplace neat and tidy. He added that he washes and cleans his utensils and sweeps his suya production area everyday before he starts working. He also stated that he arranges the ingredients he uses in a way that enables him to access them easily.

A-5 participant stated, “My mother taught me how to be clean when I was a child, and told me that being clean is hygienic and keeps away disease. She taught me to wash utensils, keep food covered, wash my hands before touching food, bath after in the morning and after playing, and to brush my teeth.”

A-6 participant stated, “I lost my mum early, and was taught by my maternal aunt that hygiene is being clean, and that being clean keeps away germs. My aunt taught me to bath twice a day, and ensured that I wash my hands before eating.”

My observation was that participants had assistants that prepared the area by washing and cleaning their utensils, arranging the charcoal for the metal grills, as well as soaking and cleaning the skewers for the suya processing operations. Four participants (A-1, A-3, A-5, and A-10) had four assistants; four of the participants (A-2, A-6, A-7, and A-8) had two assistants each, and two participants (A-4 and A-9) had one assistant each, and this depended on the size of the operation. From my observation, the assistants were not under supervision in the discharge of their duty.

While the assistant went about those preparations, the participant was engaged in cleaning, cutting, drying, spicing, and skewing the meat. The arranged meat remained uncovered for long periods of time before it went on the hot grill. The participant prepared the meat with bare hands, and sweat dripping while preparing the meat. The source of water utilized for the preparation was stored uncovered in large container, from where assistants dipped buckets to fetch. Flies perched on utensils, the raw and skewered meat, and on the work surfaces.

Hygiene: Covering Food and Maintaining the Environment

Three participants additionally described hygiene in terms of keeping food covered and keeping the environment clean. The participants informed me that the environment and keeping food covered was also necessary to maintain hygiene. This description of hygiene was additional to their earlier description in terms of cleanliness, tidiness, neatness and orderliness, not in isolation of it.

A-3 participant stated, “Hygiene is cleanliness and keeping food covered to prevent flies from falling on the food. This is because flies cause sickness. My mother told me this when I was little.”

A-8 participant explained that, “Hygiene is keeping the environment clean. My mother made me sweep the house and compound many times. She told me that keeping the surroundings clean keeps away disease.”

A-10 participant stated, “When I was growing up, I was taught to keep my food covered to prevent flies from sitting on it. My responsibility as the only son in my family was to keep our surroundings clean. I always kept the compound clean by sweeping and packing all the dirt, and cutting the grass.”

Clean Behavior

In describing clean behavior, all participants stated that it entails washing hands, keeping utensils clean, and wearing clean cloths. Participants further stated that clean behavior includes bathing, keeping ingredients and products covered and using clean water. Participants added that clean behavior entails keeping the environment clean.

Research Question 2: Beliefs and Attitudes in Hygiene Practice of Suya Producers

Research question 2 explored the beliefs and attitudes that influence the hygiene practice of suya producers with the question: How do beliefs and attitudes influence hygiene practice among suya producers? This question was further expanded into specific questions as follows:

Please tell me about your family's hygiene beliefs and practices.

Please tell me how such influences have aided your practice of hygiene.

Tell me how aspects of your culture have influenced your hygiene beliefs, attitudes, and practice.

Talk to me about how consumers have influenced your hygiene practices in your suya operations.

Explain your views about hygiene practice among other suya producers in general.

Please explain to me if there is a hygiene procedure that suya producers are required to follow in their production process.

How do environmental factors influence hygiene practice?

Based on the specific questions enumerated, participants explained that beliefs and attitudes that influence hygiene practice are related to a number of factors in the society. These factors were identified through themes from the analysis of the data. Such themes include: family beliefs and practices related to religion such as "ablution" and "cleanliness is next to godliness", the culture of "tsapta," customer influences; suya producers influences; environmental influences; and the barriers to the practice of hygiene.

Family Hygiene Beliefs and Practices

All participants linked their family hygiene beliefs and practices to their religious beliefs. Seven (A-1, A-2, A-3, A-4, A-7, A-8, and A-9) participants that identified with the Islamic faith belief that “ablution” is the main point of reference and anchor for cleanliness, and therefore hygiene. Participant A-2 stressed that ablution implies “cleanliness before Allah and man.” Participants further explained that performing the ablution ceremony five times a day means that they maintain cleanliness throughout the day by washing their hands and other parts of their body, and this is hygienic. One participant stated that although he did not perform ablution five times a day, he believes that the times he performs the ceremony makes him clean. Two participants (A-3 and A-7) who are of the Islamic faith also believe that “cleanliness is next to godliness.”

A-1 participant explained that he washes each time he to be clean.

A-2 participant described, “Ablution means cleanliness before God and man”

A-3 participant stated, “During ablution, I wash my hands and other parts of the body. This makes me clean because cleanliness is next to godliness.”

A-4 participant explained that his five times a day prayer enables him to perform ablution to for cleanliness.

A-7 participant stated believes ablution keeps him clean even though he does not perform it five times a day.

A-8 participant reiterated that he washes several times a day to keep clean.

A-9 participant responded that he prays five times a day, and perform ablution to keep clean.

Three respondents (A-5, A-6, and A-10) that identified with the Christian faith, point to the phrase “cleanliness is next to godliness” as their belief in the need to be clean. One participant added that he wanted to be clean to make God happy. Another stated that to be clean externally, one first has to be clean internally.

A-5 reiterated that his hygiene behavior stems from the adage cleanliness is next to godliness

A-6 explained that his mother taught him that cleanliness is next to godliness, by linking God’s satisfaction with him through his hygiene behavior.

A-10 stressed that, “Cleanliness is next to godliness, so I have to be clean internally, before I can be clean externally, as cleanliness is next to godliness.”

All 10 participants described their mothers or other family caregivers’ influence on their hygiene belief. Participants stated that while growing up, mothers and other caregivers instilled the discipline of keeping the home and surroundings clean and tidy, and stressed the need for regular baths and washing of cloths. Participant A-6 stated that his mother insisted that he eats cooked food only when it is hot because heat “keeps away the germs.”

Participants stressed that they were taught to always keep cooked food covered, and store food items well covered. Participants stated that family hygiene knowledge and teaching of basic principles of cleanliness at an early age has influence on their hygiene belief. Participants explained that the family teaching on cleanliness was aimed essentially at keeping the home free of germs, and keep family members healthy, as

“unclean places cause disease.” The information from participants therefore indicates that families have great influence on the hygiene beliefs of participants.

At four of the suya operation sites, I observed participants leave the suya preparation process to perform ablution for prayers. Participants return from prayers and straight back to preparing meat, and serving customers. I did not observe frequent hand washing in the operations. There was also a lot of talking across the meat during meat preparation.

Culture

Seven respondents (A-1, A-3, A-4, A-7, and A-10) from the northern, predominantly Hausa speaking areas of Nigeria believe that the culture of tsapta sums up their hygiene belief and attitude. Tsapta therefore constitutes a large influence on the hygiene approach to their suya production business. The art of personal hygiene, neatness, and “appearing well turned out” is described in the Hausa language as “tsapta.”

A-1 participant stated, “Tsapta is a hygiene attitude that has been passed on among my family members for generations, and my mother told me she married my father because of his tsapta, and I should be like my father in order to find a good girl to marry.” This description of the culture of tsapta indicates that it is deeply rooted in the hygiene behavior of participants. Hygiene interventions that are built around this culture are therefore likely to be more easily accepted and successful among this target audience.

A-3 participant elaborated, that his older brother taught him to be neat and well turned out in white clean cloths that signify cleanliness. It is noteworthy that the

passing on of this culture from generation to generation among family members makes it pertinent to evolve hygiene policies that teach families basic hygiene theory in order for them to pass it on.

A-4 participant explained, “My mother always told me to bath well, wear clean cloths, and smell nicely. She called this tsapta, and told me it will keep me healthy and happy. I believed her.” This participants’ simple explanation sums up the complete belief in the culture of tsapta among participants of Hausa north. Using this culture as the basis for teaching hygiene to this group is therefore pertinent.

A-7 participant described tsapta as a culture in the community that encourages young people to compete on attracting girls based on their neatness and consistently appearing well turned out

A-10 participant described tsapta as an important teaching on how to be neat.

Customer/Consumer Influences

All participants stated that customers/consumers influence their hygiene practice, and the fear of loosing customers and therefore income pushes them to keep their suya operations space clean and welcoming. This approach is aimed at keeping the customers they have gained and inviting new customers to increase their incomes. Participants explained that consumers remained the focus of their operations as suya production is their only source of income and they do not want to be out of business. Two participants stated that they have received commendation for keeping their suya operation premises clean and tidy, two stated that they received advice from customers on how to improve the hygiene standards of their operations, two emphasized the influence of customers on

their hygiene practice, while one informed that he has never received customer complaints related to hygiene.

A-2 participant explained that he made effort to ensure cleanliness and hygienic in his operation and received commendation from consumers that also referred new customers.

A-4 participant stated, “No customer has complained about my hygiene.” It is noteworthy that while this participant eagerly answered earlier questions, he was not keen on answering consumer related questions.

A-5 participant stated that he received both commendation and advice on how to improve his operations from his consumers.

A-6 participant stated that he keeps his operations clean and hygienic to ensure customer satisfaction.

A-7 participant agreed that consumers influence hygiene practice in his operation and consumers offer advice on improvements.

A-8 participant stated that consumers influenced hygiene practice in his operation and further stated it is important to satisfy consumers as the operations depend on their patronage

A10 participant stated, “I make my suya very hot for my customers so that all germs are killed.” This belief aligns with the family belief and teaching that hot food keeps away contaminants.

At six of the suya processing operations I observed, suya was packaged in aluminum foil, and then wrapped in old newspaper. In four of the suya operations, suya

was wrapped in old newspapers. I observed that participants did not wash hands before serving the next customer. At three operations, participants stepped away from serving and returned to serve customers without washing hands. I did not observe the use of gloves at any of the operations.

Influences Among Suya Producers

Participants stated that suya operators are organized into groups that support each other, and present a common front for resolving issues that affect their business operations. The group also influences individual operators on issues of cleanliness in their production process by providing guidelines on cleanliness in the production process, as well as basic training on the suya production process. Of the ten participants, one stated that he has formal training in public health at the tertiary level, while other participants stated that their hygiene knowledge is based on lessons learnt on cleanliness from their family and culture. One participant further stated that he provides basic hygiene training to other suya operators at no cost during

A-6 participant explained, “My parents encouraged me to study public health at the tertiary level. I encourage hygiene practice among suya producers and persuaded the suya producer association to let me teach simple hygiene procedures such as appropriate storage of raw meat and other ingredients, utilizing gloves when serving customers, ensuring appropriate storage of products, as well as utilizing appropriate packaging materials. This participants’ food safety knowledge was exhibited in the organization of his operations. He used appropriate apparels with aprons and hats and a cashier that did not handle

the suya product. The participant explained that he educated other suya producers whenever he could out of a desire to see improvements in hygiene practice, but will be happy if hygiene training was compulsory for suya producers.

Environmental Influences

Respondents described environmental influences to include government regulation of their operations including sanitary and environmental inspections conducted by officials. Eight participants stated that sanitary and environmental officials pay frequent visits to their premises for inspections, and provide hygiene information and guidelines. One participant stated that regulators visit his premises “without adding any value,” while two participants informed that sanitary regulators do not visit often.

A-1 participant stated that environmental officers visited for inspection of the premises.

A-2 participant stated that sanitary inspectors also visited to conduct health checks, and request for medical certificate of fitness.

A-3 participant stated that in addition to hygiene inspection officials also provided information on hygiene standards.

A-4 participant confirmed that regulators conduct sanitary inspection.

A-5 participant explained that sanitary inspection is conducted on and off, but inspectors provide guidance on hygiene practice and standards whenever they visit.

A-6 participant stated that regulators provide guidelines on hygiene but do not provide specific training.

A-7 agreed that inspectors visit and inspect his premises often.

A-8 participant was unhappy with the role of regulators and stated that their visit to his operation had no value addition as he was not educated on how to improve his operations.

A-9 could not remember when regulators visited his premises and stated that he will be happy if they visited often and educated him on improving hygiene practice in his operation.

A-10 agreed that sanitary and environmental inspectors visit for inspection often and encourage hygiene practice.

Barriers to Hygiene Practice

Participants identified several barriers to the practice of hygiene. Barriers include inadequate regulation and enforcement, a lack of encouragement by sanitary and environment health personnel, inadequate sanitary health information dissemination, unhelpful family sanitary influences, strong belief in the inter-linkages between religion and hygiene standards, a lack of resources for hygiene infrastructure, and a lack of education. Three participants expressed regrets at their lack of formal education, and informed that this poses a barrier to their understanding of the guidelines provided by sanitary and environmental regulators.

A-1 participant lamented his low education level that interferes with understanding the sanitary guidelines provided by regulators.

A-8 participant admitted that his lack of ability to read and stated that this has consequences on his understanding the information provided by regulators

A-9 participant stated that although he cannot read and understand the guidelines, he enjoys the practical training on the rare occasions that it is conducted.

Discrepant Findings

Findings among participants on their practice of hygiene were not all consistent. Two participants stated that during periods when there was much to do, cleanliness was not a priority. Furthermore, the researchers' observations of operations at the suya operations site aligned with this information. For example, during the face-to-face interview of Participant A-7, he seemed displeased with the service his assistant provided to a customer. He got up and left the interview and went directly to take over serving the customer without washing or cleaning his hands, and returned to the interview to explain to the researcher that the "boys" are sometimes "too slow" for his liking. Asked if it was important for him to always wash his hands before serving customers, he explained that sometimes when there is too much work, he has to attend to his customer first. After some thought, he added "but my hands are clean."

Participant A-10 served customers and collected the money at the same time. When asked about the practice of handling food and money at the same time, he explained that when there are "many customers," I have to attend to them first. I then asked if this constituted "clean behavior," and he responded by asking me, "what am I supposed to do?"

I further observed several instances of contradictory information on hygiene, and the observed practice. For example, although all participants stated that regulatory officials visit and provide them guidelines on hygiene practice, none could show

evidence of such guidelines. Furthermore, there was no step-by-step process of the production process that was followed by operators as each participant followed a regime that was suitable to him.

Summary

The demographics of participants in this research include age, education, and area of operation, State of origin, geo-political zone, and income per day. The answers provided to interview questions, as well as the specific responses provided by participants were also explored. The chapter also recorded the research procedures utilized including the data collection and analysis methods, and the main themes identified from the analysis. The trustworthiness of the data was examined and reviewed on the basis of credibility, transferability, dependability, and confirmability.

On the Research Question 1: How do suya producers describe hygiene? Nine words and phrases emerged from the question to describe hygiene. These include cleanliness, tidy, orderly, neat, washing, keeping food covered, clean behavior, keeping away flies, and taking care of the environment. Clean behavior was described in terms of several actions that are taken to show cleanliness.

Research Question 2 was: How do beliefs and attitudes influence hygiene practice among suya producers? Six main themes emerged from this question. These themes included religious influences, family hygiene beliefs and practices, cultural practices, consumer influences, influences among suya producers as well as environmental influences.

Participants were all male suya operators with eight from the northern geo-political zones, and two from southern geo-political zones of Nigeria. All 10 participants explained that suya production is their only job and source of income. All participants showed an understanding of the idea of hygiene, and described hygiene as “cleanliness” and “clean behavior,” Four participants additionally described hygiene as “tidy,” “neat,” and “orderly,” while three participants additionally described hygiene as “covering food” and “taking care of the environment.” All participants acknowledged the influence of family and religious beliefs, customers, other suya operators, and environmental in their practice of hygiene. Seven participants also acknowledged the influence of customers/consumers, while five acknowledged the influence of culture on their hygiene beliefs and practice.

Participants identified several barriers to the practice of hygiene. These include inadequate regulation and enforcement, lack of support by sanitary and environment health officials and inadequate sanitary health information dissemination. Furthermore, unhelpful family sanitary practices, the linkages between religion and hygiene, inadequate hygiene infrastructure, and low levels of education among suya producers constitute barriers to the practice of hygiene. Three participants believed strongly that low educational levels was a major barrier to understanding the practice of hygiene.

There were also discrepant findings among participants. Two participants provided conflicting information on their practice of hygiene. Their views were divergent with their earlier statements and ideas of hygiene as cleanliness, as they exempted hygiene under certain situations. For example, they believed they could cut corners with

respect to hygiene if need be, to provide quick service to customers. This aligned with my observations during suya operations at the premises.

I have presented a detailed analysis of the data collected in Chapter 4. I will provide a comprehensive and thorough discussion of the study findings in Chapter 5. The limitations of the study, the social change implications, recommendations for future research, and the conclusion will also be included in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In Chapter 5, I will provide a discussion of the findings and my recommendations and conclusions for this phenomenological study. In the study, I investigated the deeper meaning and understanding of hygiene beliefs, attitudes, and practice among suya producers in Nigeria. Suya is meat that is immersed in local spices and roasted on open charcoal grills. It is produced and sold on the streets in most parts of Nigeria. Suya is an easily accessible source of protein to consumers, and therefore, it is pertinent for suya to be a wholesome and safe product for consumers.

Understanding the perspectives of individual suya producers on what constitutes wholesome and safe suya is important to providing them with needed guidance on hygiene. Furthermore, a deeper understanding of the beliefs and attitudes that shape the hygiene practice of suya operators is relevant in shaping interventions on hygiene. Previous qualitative researchers on suya examined the hygiene knowledge of food handlers and how such knowledge influenced their practice of hygiene. The hygiene beliefs and attitudes that shape individual perspectives on hygiene practice have rarely been examined. With this study, I may bridge this gap in literature as it has examined the beliefs and attitudes that influence hygiene practice among suya producers in Nigeria.

The central research question that guided the study surrounding the hygiene perspectives of suya producers in the preparation of suya for consumers was aimed at understanding what influences individual hygiene practice among suya producers. Understanding such individual perspectives enabled me to gain a comprehension of the

meaning of hygiene and what motivates the individual hygiene practice of suya producers. I also asked specific questions to obtain insights into participants' beliefs, attitudes, and practices on hygiene. The insights gained from their individual descriptions of hygiene beliefs, attitudes, and practices enabled me to make recommendations on ways of improving hygiene practices among suya producers for the production of safe products for consumers in Nigeria.

In this study, I found that popular culture influenced participants' understanding of hygiene. I further found that beliefs and attitudes also influenced the hygiene practice of suya operators. Such influences included religion, culture, family, customers, the environment, and the attitudes of other operators.

In this chapter, I will provide an interpretation of the findings, identify barriers militating against appropriate hygiene practices and describe the limitations of the study. I will also elaborate on the study's implications on positive social change and make suggestions for further research. I will end the chapter and the study with a conclusion for the study.

Interpretation of Findings

In this qualitative study, I used phenomenological approaches to provide suya producers an opportunity to share the beliefs and attitudes that influence their hygiene practices. I listened to participants in their natural settings and recorded the conversations. I also observed the hygiene practices of participants in their natural settings and took notes. This approach further enhanced the information provided by participants.

I collected data using open-ended, semistructured questions in interviews and encouraged participants to share personal stories and provide examples if they felt this would provide more clarity. I recorded the interviews as the primary source of data. These face-to-face interviews were enabled participants to provide a rich description of their beliefs and personal experiences on the hygiene subject. I further used observation techniques to enable me to align participants' understanding of hygiene and their practice of it.

To ensure the integrity of the study, I ensured its trustworthiness based on the criteria of confirmability, credibility, dependability, and transferability throughout (Creswell, 2013; Patton, 2011). For example, to ensure credibility, participants were given the opportunity to provide a detailed, recorded description of their perspectives on hygiene, and I took notes to give clarity and context to the recordings. Furthermore, I described the process used in detail including the assumptions made, the tools used for data collection and analysis, and other necessary salient information that will enable transferability of the study.

Participants expressed interest and excitement during the interview sessions and provided rich information and insights on the subject matter of hygiene perspectives. However, two participants felt irritated with my probing of their understanding of hygiene, even though they later explained that their irritation was not with me, but other issues in their lives simply manifested during the interview. All participants had a good understanding of hygiene, and their responses to interview questions were similar. Six participants provided their responses to interview questions in English, while four

communicated in pidgin. Speaking English or pidgin was a criterion for recruitment, and questions were readily available in pidgin.

I developed Question 1 of the research interview questions with the aim of finding out the level of understanding of hygiene among participants. The participant responses demonstrated that participants of this study appeared to have a good understanding of hygiene. Such understanding of hygiene relates to the common practices undertaken by participants. This finding collaborates with the findings of previous literature that I reviewed in Chapter 2. Previous research indicates that while suya vendors have an understanding of hygiene, suya products still presented with unacceptable levels of microbial, fungal, physical, and chemical contaminants in suya (Apata et al., 2013; Dwumfour-Asare & Agyapong, 2014; Egbedi & Seidu, 2014; Madueke et al., 2014; Odeh et al., 2013; Okojie & Isah, 2014). This is remarkable as it indicates that participants' perceptions of hygiene do not translate to its proper practice in the production of hygienically safe products.

In the following subsections, I will provide analysis of the research findings using the descriptions and explanations provided by participants to the research questions posed. Such descriptions will be presented in the themes and subthemes that were identified from the explanations of participants. I will present the findings in the context of the theoretical framework as they confirm, disagree, or expand existing knowledge on hygiene as presented in the peer-reviewed literature explained in Chapter 2.

Hygiene is Cleanliness, Tidiness, Orderliness, and Neatness

Participants described hygiene as cleanliness, tidiness, orderliness, and neatness.

These descriptive words are often commonly used interchangeably in popular culture to describe hygiene. The belief among participants is that hygiene entails being clean, tidy, orderly, and neat. While the concept of hygiene relates to all these, it also encompasses health, medicine, personal, and professional care. The WHO (2013) defined hygiene as “conditions and practices that help to maintain health and prevent the spread of diseases” (p. 1). Therefore, hygiene encompasses much more than what participants understand it to be. It entails lifestyle and environmental factors that can result in safe and healthy living.

In this study, I found that participants’ understanding of hygiene falls short of the overall concept of hygiene found in research, and therefore, poses a problem for its practice among suya operators. This is a noteworthy finding as research shows that learning based on SCT deducts that when the premise of learning is faulty, individuals observing and modeling the faulty behavior retain the wrong models (Bandura, 2001). Hence, suya producers have learned the popular version of hygiene but have failed to imbibe its deeper meanings and align it to the health aspects in their role as food processors. This lopsided understanding of hygiene raises concerns about the application of the practices, as this further has implications on the attitudes of the operators.

The attitudes and practices of suya operators has not risen above the popular perceptions of hygiene, due to the limited understanding of the important role they have in the delivery of safe foods (Buchanan, 2011; Kwitoski, 2014). Furthermore, while regulators have tried to fulfill their regulatory role through regular inspections and the provision of guidelines on hygiene, it has been difficult for participants to comprehend

such guidelines with their limited understanding of hygiene, which is aligned to the popular understanding of everyone else. It is, therefore, pertinent that participants get a deeper understanding of hygiene with a better appreciation of their role in the delivery of safer foods in order for their hygiene attitudes and practices to improve. Such deeper understanding of the concept of hygiene and their roles in the food chain may enable suya operators to learn and model appropriate hygiene practices that can involve cleanliness, tidiness, orderliness, and neatness for processing of safe and quality suya.

Washing

For centuries, many cultures have recognized washing as part of spiritual purity. A participant identified washing as part of the cleanliness routine, and research shows that hand washing is a common hygiene practice that is encouraged for the prevention of infectious disease and in minimizing the spread of disease (Freeman et al., 2014). Incidences of foodborne diseases in the 1980s led to more active promotion of hand hygiene (Freeman et al., 2014).

In this study, I found that suya operators understood that washing encompasses washing the hands, body, cloths, utensils, and work surfaces and see it as an important practice of cleanliness. I also found that while participants recognized the need for washing, water was not easily accessible at their premises, and the cost of purchasing water for the processing and production of suya was a challenge in ensuring cleanliness from washing. Furthermore, participants did not show an understanding of the medical benefits of the practice of washing and its linkages to human health. Participants used water stored in open containers for washing.

Clean hands, utensils, and work surfaces are pertinent to improving hygiene and minimizing contamination with pathogens. Therefore, it is important that food handlers are knowledgeable about the health implications of washing, its linkages to the quality of water, and its health benefits. Behavior change related to hand hygiene has been found to reduce mortality rates by 50% in certain communities in developing countries (Curtis et al., 2010). Washing practices can be effective only to the extent that participants realize its relevance to the health of consumers and its impact on their incomes.

Keeping Food Covered and Keeping Away Flies

Food covering is a basic hygiene rule that is useful in the prevention of food contamination and its consequences (Ifeadike et al., 2012). The twin concepts of keeping food covered and keeping away flies is interrelated. Many pathogens originate from animal and human faeces and reach food through several routes including flies and other insects and rodents (Ifeadike et al., 2012). Research shows that contaminated food can result in food poisoning, which is a major cause of diarrhea and vomiting in exposed individuals (Adebiyi et al., 2008; Egbedi & Seidu, 2014; Mobolaji & Olubunmi, 2014). Therefore, food is covered to avoid contamination from harmful pathogens and physical contaminants. Keeping *suya* covered is pertinent to ensuring its safety and hygiene.

In this study, I found that participants keep prepared *suya* covered to prevent contamination from flies. This is an action that is borne out of habit learned from their homes. Participants related covering food directly with preventing germ-causing flies from contaminating it. The broader perspectives of maintaining *suya* covered and safe at an appropriate temperature and humidity levels are not clearly understood by participants.

Researchers have found that suya operators failed to understand the linkages between temperature and humidity levels to storage underscores the various studies that have found covered and stored suya to be highly contaminated (Adebiyi et al., 2008; Egbedi & Seidu, 2014; Madueke et al., 2014; Rheinlander et al., 2008). It is important for suya producers to have a deeper understanding of covering and storing suya as relates to food safety and the concept of hygiene.

The Environment

The environment entails the physical and regulatory factors that affect the delivery of hygienic products. Inadequate and lack of enforcement of existing public health regulations, inadequate public health infrastructure, inappropriate apparel worn by suya operators, and lack of knowledge on sanitary and environmental health all constitute environmental factors that affect the hygienic preparation and production of suya (Bredbemmer et al., 2006; Hassan & Dimassi, 2014; Rahman et al., 2012). In this study, I found that the perception of participants on the description of hygiene as it relates to the environment aligns with the extant literature.

Researchers have demonstrated that 72% of street food is prepared under unhygienic conditions in Nigeria (Chukuezi, 2010). Furthermore, 62% of street food operators handle money and food simultaneously, and 52% do not have head covers during food preparation (Chukuezi, 2010). Previous researchers have further shown that 64% of food handlers have no food hygiene and safety training, 34% acquired skills through self-practice, and a third were not aware that food contamination had implications on human health (Nurudeen et al., 2014). This lack of adequate knowledge

of public health has implications on the understanding of participants on hygiene and its practice. The findings from this study corroborate those of previous studies on the understanding of hygiene by suya operators. Suya operators simultaneously handled money while serving consumers, continuously talked, and lacked appropriate clothing and head covers while carrying out their operations.

Participants recognized the need to keep their environment clean and stated that they swept their surroundings and washed their utensils but blamed the lack of public health infrastructure as a major challenge. This argument by participants is corroborated by the previous research on environmental factors that influence hygiene practice (Ifeadike et al., 2014). For example, it is estimated that only 30% of Nigerians have access to adequate quality water supply (National Water Resources Institute, 2016). The lack of adequate quality running water is clearly a challenge to the practice of washing hygiene at suya operations.

Clean Behavior

Cleanliness has been related to godliness for generations. Seemingly innocuous daily expressions of hygiene routines such as hand or body washing have been found in literature to enable morality (Zhong & Liljenquist, 2014). Such behavior further relates to personal hygiene, cleaning the physical environment, washing utensils, appearing well turned out, cleaning toilets, and keeping food and food ingredients covered. Furthermore, clean behavior engenders social acceptance, and is therefore a source of encouragement to individuals to exhibit the behavior. This study finds that participants' description of clean behavior aligns with previous descriptions in literature.

However, the criteria on which participants assess levels of clean behavior are not clear. Clean behavior, as a description of hygiene is therefore a fuzzy concept that relates to popular culture but is difficult to measure. Education of participants on the fundamentals of hygiene and hygienic practice and behavior is therefore critical in ensuring clear and measurable criteria for hygiene assessment. Utilizing the SCT to acknowledge participants' perceptions regarding clean behavior, modeling specific hygiene behavior, and establishing clearly expected consequences should an individual fall outside of the hygiene behavior model is therefore needful.

On Research Question 2 on how beliefs and attitudes influence hygiene practice among suya producers. Subquestions were developed from this main question to encourage in-depth discussions by participants. Several themes emerged on the beliefs and values that influence hygiene among participants including religious beliefs, family and cultural values, environmental influences, as well as economic concerns.

Religious Beliefs

Participants' demographics demonstrated that suya producers generally come from the mainly Muslim north of Nigeria. The Islamic belief on hygiene is therefore a consideration among Muslim participants. Participants of other faiths also have beliefs on hygiene that are rooted in their religious beliefs. Participants described the root of their belief in hygiene with the phrase 'cleanliness is next to godliness'. Participants also rooted their hygiene belief in the act of ablution.

Ablution

The religious act of ablution cuts across different beliefs and faiths. Ablution involves the act of washing as an expression of hygiene or for purification. In the Christian religion, ablution involves the washing of the body and other material possessions including clothing and objects of worship. In the New Testament bible however, the concept of absolution for purity, and involves prayers rather than washing for cleansing. The Islamic faith also emphasizes hygiene and ritual purification as contained in the Islamic jurisprudence (Yusuf & Yaqub, 1997), and ablution provides the means to uphold the standards set for followers of the religion. Ablution is therefore central to religious worship.

Cleanliness is Next to Godliness

Physical cleanliness has been a focal point of religious ceremonies for decades. The prevalence of the practice suggests a psychological association between bodily and moral purity, and studies have explored the Macbeth effect (Zhong & Liljenquist, 2014). The Macbeth effect indicates that a threat to an individual's moral purity elicits a desire for cleansing. Physical cleansing is seen as upsetting the consequences of unethical behavior, thus reducing the threat of an individual's moral self-image. Cleanliness is next to godliness is therefore invoked as an admonishment to wash or clean up, and is seen as an important human endeavor. However, research linking this maxim to hygiene belief and practice has been scarce. This study finding on the maxim cleanliness is next to godliness therefore constitutes an important belief system to participants.

Furthermore, while cleanliness is inherent in religious beliefs, and accorded high standards and values in human endeavors, research does not support the levels of external

hygiene practice that are proportionate to such beliefs resulting in unhealthy and unhygienic environmental conditions (Majeed, 2014). This study is in agreement with previous research on the unhygienic conditions prevalent in suya operations despite the belief that cleanliness is next to godliness. These findings however provide a basis for utilizing the SCT in motivating individuals to learn the application of their inherent beliefs on cleanliness for attaining the levels of hygiene required for food safety. Interventions on hygiene teachings that encourage beliefs on cleanliness, aligned with basic hygiene science can be utilized to encourage higher standards of hygiene among suya operators.

The Culture of Tsapta

The culture of tsapta is a tradition passed down to generations through folklore among Hausa populations of Northern Nigeria. The Hausa dictionary description of tsapta encompasses the concept of cleanliness, personal hygiene, and the thorough washing of hair, garments, hands, and house utensils (Robinson, 1913). Tsapta is predicated on the belief that he who is afraid of soap and water cannot keep healthy. One rare research concluded that proverbs, myths, and folklore were utilized in emphasizing the importance of proper food handling and personal hygiene in Nigeria (Oladejo & Sridhar, 1987). Tsapta encourages the washing of hands and the face, frequent baths, and wearing clean cloths as prerequisites for good health. The culture stresses the importance of cleanliness for physical health, as dirt and disease are believed to go hand-in-hand. This study finds that cultural beliefs and traditions are important in hygiene practices among suya producers in Nigeria.

The culture of tsapta therefore has inherent elements that can support hygiene training for suya producers. Integrating cultural and traditional beliefs with modern hygiene practices can therefore be useful in developing SCT interventions for effectively delivering training among suya operators in Nigeria. Such cultural beliefs will also be useful in complementing modern health promotion practices.

Family Influences

Families impact the social and cultural dimensions of the practice of hygiene. Research shows that parenting play a critical role in the development of the immune system, and the risk of childhood disease that has implications on adulthood (Assefa & Kumie, 2014; Lissau, Sorensen, & Lissau, 1994). Research shows that the correlation between parents and children shared time and bonding has implications on learning, and 64% of food handlers acquired their food handling skills from their parents (Nurudeen et al., 2014; Song, Kim, & Park, 2013). Research examined further shows that physical and environmental conditions, rather than the socioeconomic situation of a family, have implications on hygiene practice (Dehghanzadeh et al., 2015). This study therefore aligns with literature review on the influence of families on hygiene beliefs, attitudes, and practice.

Hygiene practices vary widely between societies and cultures. Family units constitute societies, and therefore acceptable hygiene practices and lifestyles are taught in families, and unacceptable habits are discouraged. Participants have identified keeping the home tidy, regular baths, washing cloths, covering food, and cooking food well, as hygiene habits they learned from home. This finding aligns with literature on the role of

families in teaching, reinforcing and motivating the attitudes of children and young adults on hygiene including hand washing, avoiding dirt and obnoxious smells, accepting fresh smells, and avoiding disease risks (Assefa & Kumie, 2014). Families therefore encourage disease prevention through hygiene practices, and the implication of failure of implementing such practices.

Research further shows that appropriate education enables improved knowledge and attitudes on food safety (Baluka et al., 2015; Dwumfour-Asare & Agyapong, 2013; Okojie & Isah, 2014; Oridota, 2014). The SCT modeling of learning (Bandura, 1977) through observation is pertinent in teaching children and young adults hygiene attitudes and behaviors. It is also pertinent to develop hygiene promotion and education policies that involve families for effective delivery and sustainable delivery of health care.

Environmental Influences

Environmental health includes physical, chemical, and biological factors that are independent of individuals, but impact hygiene and health (Pruss-Ustuh et al., 2016). Literature review shows that environments with improved sanitation, and drinking water resulted in reduced morbidity from diarrhea by 23% and 45% respectively (Freeman et al., 2014; Pruss-Ustuh et al., 2014). Furthermore, an integrated environmental management strategy including improved quality of domestic water supply and sanitary facilities, as well as health education reduced infection rates and prevalence of schistosomiasis (Wang et al., 2009). This study finds that environmental influences align with the definition of the environment in literature. Two aspects of environmental influences that impact participants include sanitary inspection and regulation.

Sanitary Inspection

Sanitary inspection encompasses the examination and assessment of facilities by officials to ensure that public health systems and conditions for preventing health hazards are adequate (WHO, 2015). Reviewed literature shows that environmental and public health inspectors are responsible for carrying out measures for protecting public health (Pruss-Ustuh et al., 2016). The role of officials include ensuring public health measures including inspecting food facilities, investigating public health nuisances, public health education and promotion, and maintaining a safe public health environment (Pruss-Ustuh et al., 2016; WHO, 2015). Participants stated that environmental and sanitary inspectors visit suya operation premises for inspections, and provide guidance and education on sanitary standards. The findings from this study align with literature review on the role of environment and public health officials in the protection of public health systems.

Previous research examined shows an improper hygiene operational environment, the use of inappropriate apparels, physical hazards, and other health safety issues as part of the challenges confronting suya operators (Ifeadike et al., 2014). Findings in this study align with previous research on the use of inappropriate apparels and improper operational environments in suya operations. Participants stated that there is inadequate public health infrastructure for enhancing the operational environment for improving suya operations.

My observations of the suya production operations showed improper operational environment and the use of inappropriate apparels for operations. For example, operators utilize the day-to-day clothing for production and processing operations and stated that they have not been required to use specific apparels for operations. Therefore, despite the

role of environmental and sanitary inspectors in the inspection of suya operation premises, and the provision of technical guidelines and education, the safe production of suya has not met hygiene expectation. There may therefore be need for officials to shift the emphasis from the legal and technical to the human aspects of public health, taking cognizance of the fact that awakening the sanitary conscience can lead the way to improvements in food safety.

Regulation

Regulations play a critical role in ensuring the safety of food, the control of disease, and the prevention of needless death. Such laws therefore constitute an important public health tool. Compliance to regulations is based on good hygiene practices, and quality assurance remains the basis on which regulatory agencies assess the quality of manufactured products. Several studies however assert that the lack of regulatory controls in ensuring hygienic practices in the production of street foods remains the bane of poor hygiene practices in the sector (Bredbemmer et al., 2006; Hassan & Dimassi, 2014; Ogbuabor & Malaolu, 2013; Rahman et al., 2012). This study aligns with research on the lack of adequate regulatory controls among suya operators.

The core of public health law is to empower officials to ensure the delivery of improved hygiene in populations (Gostin, 2010). This study finds that participants have this common understanding of the definition of regulations, and further understand that sanitary and environment officials have authority to regulate their activities. While acknowledging the role of regulators in the suya production process, participants argue that officials do not do enough to ensure that they understand appropriate hygiene

practice. Participants contend that the unscheduled visits by officials are punitive, rather than helpful. Participants believe that the role of regulatory officials will be better appreciated if it is viewed as supporting hygiene practice. Establishing a feedback mechanism that will enable timely reporting of suya operators concerns and challenges to officials for support can be useful in improving hygiene practice.

Customer/Consumer Influences

Research examined links the unsanitary conditions under which street foods are produced to the low levels of education on safe food handling among operators (Oridota et al., 2014). Low education of operators has implications on their understanding of the role of time, temperature, handling of cooked and uncooked products, as well as appropriate storage for maintaining food quality (Akpata et al., 2013). It is also pertinent to note that significant differences exist in the sanitary outlook of trained and untrained food handlers (Green & Selman, 2005). This study collaborates previous studies on the usefulness of public health and food handling knowledge for improved hygiene practice. For example, observation and discussions with participant A-6 who has public health knowledge showed that knowledge has implications on improved hygiene practices in the production processes the premises. Discussions with this participant showed his knowledge and understanding of the food handling processes, and he utilized tools such as temperature control, separating uncooked meat from other ingredients, utilizing appropriate apparels, as well as sterilizing the dry suya ingredients he served to his clients.

Knowledge by food handlers is therefore critical for the production and processing of safe foods. The general lack of knowledge and poor sanitary conditions among street food operators remains a source of concern. Previous studies show that consumers mistrust the hygienic quality of *suya* due to the unsanitary conditions of operations, but continue their patronage based only on their instincts and the physical appearance of producers (Ifeadike et al., 2014; Rheinlander et al., 2008). The inadequacy of safe food control systems and the existing hygiene knowledge gaps among food handlers pose concerns to consumers. This study finds that operators believe they mitigate these concerns by following hygiene practices learnt from religious beliefs, family, and culture..

Suya operators however place premium on consumer confidence in their production process, as they fear losing customers, and therefore their source of income (Ifeadike et al., 2014). This study collaborates previous findings, and is useful in utilizing the self-efficacy approach of the SCT that encourages learning in a systematic manner to influence behavior change (Bandura, 1977, 2001; Schunk, 1990). Positive hygiene behavior change will enable the production of safer *suya*, and retain, if not improve incomes for producers. Such outcomes can be attained utilizing peer coping models. The SCT is therefore useful in bridging the knowledge gap on hygiene and food safety among *suya* operators that is critical to achieving food risk management, and enhancing consumer confidence in the street food industry.

Operator Influences

Self-regulation requires self-observation, judgment, and reaction on hygiene attitude and practice in order to reinforce, adapt, and reward hygiene behavior (Nurudeen et al., 2014; Paris & Paris, 2001). The lack of understanding of hygiene and food safety by food handlers that was earlier noted in this study, has consequences on the influence suya operators have over each other regarding appropriate hygiene practices, and therefore on the concept of self-regulation as well (Zimmerman et al., 1996). This study finds that suya operators share knowledge, and influence each other on the hygiene beliefs, attitudes, and practices that they understand. Such knowledge is based on the religious, cultural, and family beliefs that they presume constitute appropriate hygiene practice. It is therefore pertinent for suya operators to have adequate knowledge of good hygiene practice in order to appropriately influence each other on acceptable practices. The concept of self-regulation is therefore challenging under such conditions with consequences on adherence to public health laws, and hygiene guidelines. It is however noteworthy that one participant had appropriate public health training, and stated that he educates other interested suya operators on appropriate hygiene practices. Self-regulation can be encouraged utilizing a training-of-trainer approach among operators who can train others in a sustainable manner.

Barriers to Hygiene Practice

There are many, and varied barriers to achieving acceptable and safe levels of hygiene in suya operations in Nigeria. Research examined identifies social, physical, institutional, regulatory, knowledge, and infrastructural barriers (Akpata et al., 2013; Githri et al., 2013; Gostin, 2010; Ladan, 2009; Nurudeen et al., 2014). This study

collaborates with other studies on the barriers identified to the administration of safe levels of hygiene in suya operations, and further finds that culture, family, religion, operator relationships, and customer influences has the potential of posing barriers to hygiene practice.

There is therefore need to address these barriers through public health infrastructural policy and management, legal and institutional frameworks, as well as knowledge management. It is also pertinent to encourage parenting and childcare practices, religious and cultural beliefs, as well as customer attitudes that enhance, rather than create barriers to hygiene practices. The inter-linkages of the barriers on all aspects of hygiene beliefs, attitudes, and practices need to be understood in order to utilize SCT for learning on hygiene.

Limitations of the Study

Limitations to this study were identified in Chapter 1. These limitations will be discussed in further details as encountered during the conduct of the study. While there is an abundance of literature on quantitative studies including laboratory analysis that are specific to the quality of suya products, there is a dearth of qualitative studies related to hygiene beliefs, attitudes, and practices among suya operators. Finding current qualitative studies on hygiene beliefs and practices was challenging. This study may be useful in filling the existing gap on qualitative research related to hygiene beliefs and practice among suya operators. There is also a need for further qualitative studies on other aspects of hygiene among suya operators to add to knowledge in this area.

Data were collected for this study directly from participants utilizing semi-structured open-ended questionnaires in face-to-face interviews for data collection. Every effort was made to collect accurate information, and avoid deception and exaggeration. As a result, further questions were asked for clarification and deeper understanding, where necessary investigation. While this interview approach enabled participants to provide rich descriptions of the subject matter to help deeper understanding of their perspectives, it seemed unfair as some participants gave more of their time and effort than others, in answering more questions where necessary. I explained participants' free will to discontinue the interview whenever they wished, as contained in the consent forms. Additionally, where unusually extended time was needed, the compensation for participants was increased by purchasing mobile airtime or suya products for U.S.\$4 rather U.S.\$2. This was the case for Participants A-6, A-7, and A-10.

Observation was utilized to triangulate the information collected through semi-structured questionnaires during face-to-face interviews. This approach was useful for improving accuracy of information collected in face-to-face interviews with actual hygiene practice in order to arrive at conclusions, and ensure credibility of the study. To avoid the Hawthorne effect, I took an innocuous position at the suya operations, allowed time for operators to fall back into their routines, and consciously detach myself from the ongoing activities.

Being the only researcher involved in this study, the findings and conclusions are the result of my interpretation, which may be subject to my biases. However, I made conscious effort to remain detached from the data collection and analysis process. I

recorded the face-to-face interviews, transferred and stored the information on my password-protected personal computer, and utilized NVivo for Mac (Version 11) technology for analysis. I diligently kept notes of observations of hygiene practices such as hand washing and cleaning of utensils, storage of wet and dry products, and the sanitary conditions and infrastructure on the premises. The appearance of the operators, the food handling practices, and the attitudes of operators in the presence of customers was also observed.

Recommendations for Further Research

There is need for more qualitative research on hygiene practices of suya operators. Religion, cultural and family beliefs, attitudes of suya operators and consumers has been found to influence hygiene practice among suya operators. The study further collaborates previous research on the influence of public health institutional and infrastructural deficits, regulatory inadequacies, and knowledge influences on hygiene practices of suya operators. There is need to continue investigations on the extent of the role of these factors in influencing the attitude of suya operators on hygiene practice.

Furthermore, I have found that the attitude of consumers towards the hygiene practices of suya operators has the potential of improving their hygiene approaches. This is in recognition of the role of consumers in ensuring the sustainability of the business. This has the potential to impact the self-regulation of hygiene practices by suya operators. Research examined however shows that there is indifference of consumers to food risk assessment and hygiene practice among food operators (van Kleef et al., 2006; AFRO-WHO, 2015). More research to understand consumer apathy to hygiene issues, and how

improving consumer concerns about hygiene can improve hygiene practice is critical for formulating programs that encourage self-regulation.

More studies on the legal and institutional arrangements in public health, as well as on knowledge management in hygiene utilizing SCT are also pertinent. The lack of formal knowledge on hygiene by suya operators, coupled with the absence of public health institutions and laws has serious implications on the safety of suya operation processes. Studies that provide further evidence for policy makers and legislatures to take appropriate action will be helpful.

Implications for Positive Social Change

Suya operators operate in less than ideal hygienic conditions. Understanding the beliefs and attitudes that influence suya operators is critical for improving hygiene practice. Improvements in hygiene practices can impact the quality of suya products and therefore human health. The results of this study therefore have implications for positive social change in improving hygiene, and consequently human health. The study can be useful evidence for decision-making and the formulation of interventions that can improve hygiene practices among suya producers. Such interventions can facilitate positive social change through the protection of the health of consumers through the consumption of safe suya products.

Furthermore, this study enabled me to identify gaps on institutional, infrastructural and regulatory arrangements in the public health sector. The results of this study can lead to positive social change as designed or upgraded public health tools and frameworks can close the existing gaps and improve hygiene practices among suya

producers that will be beneficial to the health of consumers. Improving public health infrastructural and institutional gaps is also pertinent in supporting improved hygiene practice that has implications on social change.

New knowledge has been gained in this study on the role of family, fellow operators, and consumer influence on hygiene practice. Utilizing this information to develop training materials that incorporate basic hygiene elements will impart hygiene knowledge can support self-regulation to suya operators, parents, and caregivers and create positive social change in society on hygiene. Such training can be imparted utilizing the SCT framework that will enable parents and caregivers deliver knowledge-based early training to children and build their confidence on hygiene that will enable the demand for hygienically prepared suya as adult consumers.

Conclusion

This study was aimed at understanding hygiene beliefs, attitudes, and practices among suya operators and utilized the overarching research question: What are the hygiene perspectives of suya producers in Nigeria? In order to answer the overarching question, two secondary questions were explored. These included: How do suya producers describe hygiene? and How do beliefs and attitudes influence hygiene practice among suya producers?

Ten participants were recruited for this study. Participants articulated hygiene to mean cleanliness, neatness, tidiness, and washing but were not knowledgeable on the deeper meanings of hygiene that are science-based. Participants further expressed that religious beliefs, family, and culture, as well as the operational environment influenced

their hygiene attitudes and practice. Participants identified the barriers to hygiene practice to include institutional and regulatory inadequacies, lack of hygiene knowledge, and inadequate public health infrastructure.

New variables that can impact hygiene practice were identified in this study. These variables include operators, family, and consumer influences. The influence of fellow suya operators can be useful in supporting knowledge-based self-regulation efforts. However, it is pertinent that the hygiene knowledge shared among suya operators be accurate in order to improve hygiene practices. Furthermore, I found in this study that participants were more willing to make effort to produce hygienic suya out of the fear of losing customers and therefore their source of income. Consumer awareness of hygiene knowledge is therefore imperative for encouraging self-regulation of suya operators. The influence of family members on instilling hygiene beliefs and practices are also useful in improving hygiene practices in suya production, particularly if such knowledge is accurate. Interventions that incorporate efforts at disseminating hygiene knowledge to suya operators, family members, and caregivers can be a useful approach at improving hygiene attitudes and practice.

Participants' trust enabled the sharing of deep personal insights on hygiene beliefs, attitudes, and practices with me. These insights are useful for improving hygiene efforts in the formulation of interventions on public health. The insights glimpsed from this study on the interlinkages that influence hygiene beliefs, attitudes, and practices can be useful in encouraging hygiene learning utilizing SCT.

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Appendix A: Interview Questions

Qualitative interview questions for administration to all participants.

Please explain what you understand by hygiene. With this question I sought to understand the knowledge of participants on hygiene and as it relates to their age and educational status.

Please tell me about your family's hygiene beliefs and practices. This question is focused on family and with it, I sought to understand their influences on individuals with regards to hygiene. Questions specifically related to the hygiene attitudes will be explored.

- Please describe your early hygiene influences
- Have such influences aided your hygiene practice in the suya production process?

Please elaborate

- Describe to what extent consumers have influenced your practice of hygiene

Has culture influenced your hygiene beliefs, attitudes and practice? Please elaborate. Culture, including race, religion, geographical location, what society thinks, and others; tend to influence individual behavior. This question was aimed at identifying such cultural influences on hygiene practice.

Talk to me about your perspectives on hygiene practice among suya producers in general. With this question I sought to understand the hygiene perceptions of suya producers about their industry and takes cognizance of the overarching research question.

Do you think that environmental factors such as regulatory policies influence hygiene practice? Please explain with example. Poor general sanitary conditions in

developing countries such as Nigeria could also influence hygiene practice. This question was aimed at finding out if such conditions are also a factor in hygiene practice among suya producers.

Appendix B: Demographic Questions

Understanding the demographics of participants will enable me to draw relevant conclusions about the participant, and input into the overarching question of the study.

Please check the correct answer.

1. How old are you?

18–29 years -----

30–39 years -----

40–49 years -----

50–59 years -----

60 and over -----

2. Which part of Nigeria are you?

North East -----

North West -----

North Central -----

South East -----

South West -----

South South -----

3. What is your level of education?

Did not attend any school -----

Did not complete school -----

Primary school level -----

Secondary school level -----

Undergraduate level -----

Postgraduate level -----

4. What is your marital status?

Single -----

Married -----

Separated -----

Divorced -----

Widowed -----

5. How much do you make from your suya business?

Less than \$100 [19 925 Naira (N)] -----

\$100–\$199 (N19 925 – N39 650) -----

\$200–\$299 (N39 850 – N59 575) -----

\$300–\$399 (N59 775 – N79 500) -----

\$400–\$499 (N79 700 – N99 425) -----

\$500 (N99 624) or more -----

6. Is your business insured?

Yes -----

No -----

7. How many hours do you work per day? -----

8. How does your culture influence your hygiene practice? Culture here includes beliefs and traditions that are passed down through generations.

9. Contact information

Name -----

Address -----

Phone Number -----

Appendix C: Recruitment Flyer

Seeking Participants

Research is now being undertaken for PhD project

Hygiene beliefs, attitudes and practices of Suya producers in Nigeria

- Participants must be 18 years or over and be involved in suya production
- Participants should be proficient in either English or pidgin
- Participants should be resident in Abuja
- Face-to-face interviews will last about 30–45 minutes and interviews will be tape recorded to preserve the integrity of answers
- Photographs will be taken during the interview session
- A small incentive will be provided

Contact:

Vivian Iwar

XXXXXXXXXXXXXXXXXX