

**INFLUENCE OF QUALITY CATERING SERVICES ON FOOD SAFETY IN
CHILDREN DAY CARE CENTRES, NYERI TOWN CONSTITUENCY,
NYERI KENYA**

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DECLARATION

This thesis is my original work and has not been presented for award of a degree in any other university or for any award.

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DEDICATION

Specifically dedicated to my adoring parents, late Paul Kinyingi and Lydia Kinyingi, my brothers and sister for understanding the value of education.

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LIST OF ABBREVIATIONS

CGMPs	Current Good Manufacturing Practices
CSIRO	Commonwealth Scientific and Industrial Research Organization
FAO	Food and Agriculture Organization
FSANZ	Food Standards Australia New Zealand
GMPs	Good Manufacturing Practices
HACCPs	Hazard Analysis Critical Control Points
NACOSTI	National Commission for Science Technology and Innovation
UNICEF	United Nations International Children's Emergency Fund

ABSTRACT

Globally, growth of childcare services is on the rise due to modernization and tough economic conditions, which require parents to be involved in different types of employment. Consequently, day care centres are becoming an important alternative possibility where children can spend part of their time. Many day-care centres are increasing their services in catering. The general objective of the study was to examine influence of quality of catering on food safety in children day care centres in Nyeri Town Constituency, Nyeri County. The specific objectives of the study were: to investigate the influence of government policies; influence of HACCP principles adherence; influence of level of staff training; and influence of quality of raw materials on quality of catering service on food safety. The study used descriptive research design. A census study approach of the 16 registered day-care centres was adopted and targeted 64 respondents comprising a manager and three catering staff from each of the centres. The study adopted a mixed method research approach. Self-administered questionnaires and an interview guide were the tools used to collect primary data. Secondary data was obtained through desk study of relevant documents including government policies, institutional strategic plans, minutes and admission lists. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) computer software program. Regression analysis showed that level of implementation of HACCP principle, the Staff training, the relevant government policies and the raw materials predict the food safety in children day care centres. The study found that: day care centres purchase food from reputable suppliers, at the right time and of good quality; children are served delicious and sufficient food; and that ingredients are readily available, well packed to ease delivery and of good quality. However, the study also found out that foods of different types were stored in the same storage rooms and average hygiene witnessed during food preparation. In addition, the study also found that most staff lacked the required skills and experience. All the day care centres recorded low adherence and enforcement of rules and regulations on food safety in children day care centres with some of the staff not being conversant with the government regulations. The study recommends that: Government of Kenya should enforce policies to ensure food safety in children day care centres; all day care centres should seek ISO HACCP standard certification, implement HACCP and equivalent systems on food handling control and hygiene; and that all staff should be sensitized and trained on food safety in children day care centres. This research advances knowledge on day care catering services on food safety, informs of best practice and management of day care services, and provides useful data and information to guide Government policy and regulations relevant to the handling and control on food safety. It has added new knowledge to hospitality industry and has advanced knowledge and theory in hospitality studies.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Day care services first appeared in France in 1840 and were recognized by the French Government 1869. In the United States of America, private charities established day care centres nearly three quarters of a century later. At children day centres, children are taken care of during daytime by individual(s) other than the child's lawful guardian. It is reported that there is a universal growth of childcare services in the world. This increase in childcare services is global with a substantial proportion of children in both United States and Canada receiving care in childcare centres (Garayoa & Vitas, 2017). This high level of participation in childcare centres is attributed to an increasing awareness that early childhood centres are considered critical in supporting the development of the child to become useful citizens (Griffith & Lues, 2017). In addition, more parents are engaged in employment and the prerequisite to equip their children with skills to cope with the upcoming growth needs as they develop through the human life cycle.

UNICEF (2007), attests that a family provides children with the most important environment in which to develop and flourish. This is by providing them with interactions from where they are socialized on their culture and values. This helps them to make sense of life. The upbringing lays a foundation for the child's later stages of development. As such, the critical role parenting plays in children's development cannot be overstated. Many parents understand the critical need for

appropriate childcare necessary for proper growth. Research has shown that, among other things, quality protection, motivation and learning opportunities provided at home by parents and caregivers, or through childcare centres have a positive and long-lasting effect on a young child's ability to develop its full potential. These findings make it essential that parents/guardians consider the quality of care their children receive.

A paper done by Simiyu, (2013) shows that the most important trends in developing countries in the modern world is the rise in number of females joining the workforce. This is because of modernization and tough economic conditions requiring women to get involved in either formal or informal employment. For many of these women, increased involvement in informal and formal employment, while bringing the much-needed income to their families, creates conflicts in reconciling income-earning activities and traditional childcare responsibilities. This, therefore, creates the need to come up with child day care services to assist working parents balance the two crucial roles of caring for the child while at the same time making a living without getting strained. For illustration, establishment of day care centres at workplace in Pakistan proved to be the best way for working mothers in facilitating them to balance work and family lives (Camino & Block, 2017).

In any day care centre, a setup of catering services is an important aspect. This entails purchasing, receiving, storing, preparation, cooking, holding, cooling, reheating, and serving food. This path that food starts at purchasing to serving is called the flow of food (Servsafe, 2012). Previous research has shown that catering setups must provide

foods that are gastronomically acceptable, covering the dietary needs of the persons intended for and conforming to a given price. However, the catering set ups should be safe for the consumer and under no circumstances should they serve as a cause/source of risk to human health, which could lead to illness. It is particularly relevant when one considers the high quantity of prepared meals served daily by the catering industry to children in schools, hospital patients, and elderly people living in nursing homes (Dolekoglu, 2017).

To obtain safe food, catering setups have to implement a food safety management system based on the principles of Hazard Analysis and Critical Control Points (HACCP). However, difficulties in implementing the system in small and medium catering enterprises are well-known. Therefore, a flexible application of HACCP in form of promoting the good manufacturing practices establishing prerequisite programmes such as cleaning and disinfection procedures for surfaces and equipment, and controlling truly decisive critical limits such as temperature/time during and after food dispensation. It has also been revealed that training of staff on the professional area is an important as part of self-control systems in order to improve food handlers on knowledge regarding food safety. Therefore, the need for training catering personnel is recognized by European legislation (EC, 2004) and by international organizations (Yang & Pei, 2019).

Babies need lots of care and affection in the early years since their outcomes are influenced by the multiple environments they encounter. Home-away-from-home environment of a child has a strong influence on a child's competences prior to

school's entry (Kerry& Akbari, 2015). Significantly, catering services offered in day-care centres help the development of a child. Therefore, all catering providers have a responsibility to promote food safety for children in their childcare centres. Childcare centres and all staff should be familiar with hygiene standards, nutrition principles for children, and food safety laws (Better Health, 2016). Intake of sufficient nutrients is of more importance to maintain normal growth and development of the child's body, thus meal time, type of food and quantities of food served to children is of great importance. Children are recommended to take small quantities of meals frequently during the day and a balanced diet with the level of hygiene observed at all times to ensure food safety.

The catering services offered in day-care centres are influenced by various factors, which include: implementation of Hazard Analysis Critical Control Point (HACCP) system (FAO, 2016); training of the staff or service providers on catering related courses; Government Policies and quality of raw materials.

However, literature from previous research studies does not give evidence of a study addressing the knowledge gap on influence of quality of catering services on food safety in children day-care centres in Nyeri Town Constituency. This study therefore sought to fill this gap by examining the influence of food safety in children day-care centres with a special focus in Nyeri Town Constituency, Nyeri County, Kenya.

1.2 Statement of the Problem

There is a universal increase in the growth of children day-care centres. Njage and Wambui (2018) have reported global increase of children day-care services with a

substantial proportion of children in both the United States of America and Canada receiving day-care services. Likewise, establishment of day-care centres at places of work in Pakistan have proved to be the best way for working mothers in facilitating them to balance work and family lives (Simiyu, 2013). This growing need for provision of day-care centres in developing countries including Kenya is on the rise. Due to increase in absenteeism of parents with young children, Safaricom limited experiences the same challenge and in 2010 it started a childcare support centre for their employees' children thus making it one of the world-wide companies to put-up day-care services for their employees. In other situations, working parents have to seek services of private day-care centres for their children when away for other jobs.

The provision of catering services in day-care centres raise a number of issues including quality of food, quantity of the food and safety of food served to children. Daily intake of meals plays significant role in child development. Quality of food entails a balanced diet, cooking method and appearance of the meal during presentation / service. The meals should be balanced, well-cooked to ensure all nutrients are retained in the process of cooking and food safety observed to avoid contamination. Food presentation should also be appealing to eyes and of good texture for the child. Quantity of the food entails the amount of servings for carbohydrates, proteins and vitamins required as the daily intake. From the daily intakes the day-care centre should have a well-designed schedule to ensure child development is not affected negatively. Safety of food is of great importance to ensure no contamination in the process of preparation, production and during service time.

In general, the continuing and changing nature of threats to food safety has had an impact, resulting in a sequence of food scares in Kenya recently (Kandeli, 2015). Yet, little research has been dedicated to examine influence of quality of catering services on food safety in day-care centres in Nyeri Constituency and Kenya as a whole. As a result, little is known about the quality of catering services in the day-care centres but to what extent is HACCP implementation, training of staff, National and County Government Policies and the raw materials influence on quality of catering service on food safety. Therefore, this research anticipated to examine influence of quality of catering services on food safety.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective was to examine the Influence of quality of catering services on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives:

- i) To determine how the level of implementation of HACCP principles influence food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.
- ii) To find out the influence of Staff training on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.

- iii) To evaluate the influence of Government Policies on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.
- iv) To examine the influence of raw materials on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.

1.4 Research Questions

- i) To what level does implementation of HACCP principles influence food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya ?
- ii) To what extent does staff training influence food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.?
- iii) How do relevant Government Policies influence food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.?
- iv) How do the raw materials influence food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.?

1.5 Significance of the Study

This study has significant influence on the knowledge and advancement of theory in the professional practice, national and county government policies and regulations as far as day-care operations and catering services on food safety are concerned. Implementation of its recommendations will benefit proprietors of day-care centres because it would equip them with knowledge on application of HACCP policies on quality of catering services on food safety in children day-care centres. With this information, they could provide control measures for the different operational aspects

and enhance adherence to HACCP principles thus improve on food safety, which would eventually lead to decrease on waterborne diseases, increase on the child health and subsequently and as well the child development. The research has also provided insights to the national and county governments on the need to streamline adherence to Government Policies on food safety as far as the day-care operations and catering services are concerned. The research has added knowledge to hospitality industry, which could benefit scholars interested in food safety in children day-care centres in the various sectors of the economy.

1.6 Justification of the Study

Development and growth of a child depends on what they consume as food. For good development of a child there is need to consider the quality of food, he or she takes. This is in relation to nutritional value, quantities per intake, hygiene in relation to preparation, production and service of food to the children. This study focused on day-care centres in Nyeri Town Constituency legally registered by County Government of Nyeri where most parents in the town take their young children to spend part of their day time. The study intended to find out the influence of quality of catering service on food safety in children day-care centres offered in these day-care centres.

1.7 Scope of the Study

The study focuses on quality of catering services on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County, Kenya. Specifically, to examine the influence of: implementation of HACCP on food safety, staff training on food safety,

Government Policies on food safety, raw materials on food safety in children in day-care. The study was limited to licensed children day-care centres located within Nyeri Town Constituency, in Nyeri County, Kenya. The study targeted all sixteen -day-care centres in Nyeri Town Constituency, which are licensed to operate. The study respondents included manager and catering staff in stores, food production and service area. Therefore, caution must be exercised in generalizing the results or findings.

1.8 Limitation of the Study

The target group would be suspicious and decline to give essential information due to fear of using information against them by other daycares facilities administration. This would have made many respondents not to return their filled questionnaires affecting the accuracy of the study findings. However, the respondents were assured on confidentiality of the information they would provide. There was a letter of introduction for the study from the university to assure the respondents that the information provided would be used for academic purpose only and would thereby be treated with confidentiality. The respondents were given enough time to fill the questionnaires and ask for permission from the facility owners. The study was based on the perspective of on quality of catering services on food safety in children day-care centers.

1.9 Definition of Operational Terms

Child Category of human being who has not attained 18 years of age (Constitution of Kenya, 2010). In this study, this will refer to

children that attend day-care and those particularly below 5 years.

Day-care centres Licensed business premises where children are taken for supervision or care when parents or caregivers are engaged in other activities during the normal working time.

Quality The standard of something, how good or bad of a good or service (Oxford Advanced Learner's Dictionary). In this study, quality entails nutritional content of a meal, how it has been produced and served/ presented to the client.

Catering service centres Licensed business that prepares or provides and serves meals to clients at the provider's premises.

Catering Service Preparation or provision and the serving of food or drink by a food service facility for service at the provider's premises such as day-care.

Hazard Analysis Critical Control Points A system that identifies potential microbiological chemical or physical hazards and determines control measures to ensure food safety or assessment based on identifying significant biological chemical or physical hazards at specific points within a product's flow

HACCP certification Indication that a day-care centre satisfied ISO 9001-2005 HACCP requirements and recognized by substantial body such

as (KEBS).

HACCP adherence	Extent to which establishments or day-care centres abide with HACCP principles.
Government Policies	Rules and regulation lay down by the National or County Government.
Training	A process of imparting specialized knowledge and skills to learners. In this study, training entails formal or informal training of staff.
Raw materials	Ingredients or food items supplied to enhance production of a certain meal.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Quality of catering service in day-care centre is influenced by HACCP principles, level of staff training, Government policies and quality of raw materials. This chapter focuses on the theoretical literature, empirical literature and the conceptual framework. It identifies other studies carried out by different researchers on factors influencing food safety in children day-care centres in children day-care centres. The study was guided by system theory.

2.2 Theoretical Literature

System Theory was developed in 1973 by Ludwig Von Bertalanffy (1973). It states that accepting the essential reason or system that cause things to operate the way they do, is very important to any effort to change the system outcome. As observed by highlighted by Chikere and Nwoka (2015), while studying the systems theory of management in modern day organizations, any organizational management systems consist of many internal subsystems that need to be continually aligned with each other. These systems become more complex as the organizations grow and hence call for continued coordination of the sub-systems to ensure success in the process of transforming inputs to outputs. Who argues that organization receives inputs, transforms them and gets outputs as the final product whose level of quality can be determined? Similarly, Amobi and Nnabuife (1999), reveals that the systems theory has been likened by management experts to three stages of production process of an organization activity, which include pre-production, production and postproduction.

Systems on the other hand are made up of four major elements namely Input (the energy or material that goes into the system), Processes (the actions that happen within the system that transforms the input), Output (what results from the processes) and Feedback (the information that is produced that can be used to evaluate and monitor the system).

In system theory, it is important to remember the whole is more than the sum of its parts. Dynamic interactions among the parts can often result in characteristics of the whole that are not the same as the characteristics of the separate parts. Change in one part of the system may affect the other parts or the whole: for example, of a HACCP system and food safety (Emond & Taylor, 2018).

In the current research, the factors under consideration illustrate the input and transformation process all through to output. Input is represented by supply. Supply is where the food items originate (various sources of raw materials); this could be a farm where produce is grown, a sea from which fish are harvested, butchery, open air market, wholesalers or supermarkets. Distribution includes everything from storage and warehousing, repacking, reprocessing, and transport to the next point in the continuum. Sometimes distribution involves multiple points. Dispensation/Production includes all the steps along the food chain, which includes preparing food items to distribution. In produced food items, this encompasses everything from, receiving from the store, preparation and cooking. Point of final service includes every service of the final product of food item to the children (Dolekoglu, 2017).

According to this study food, flow is a system and if affected at any stage, the output shall be affected. This is highlighted in (Figure 2.1).

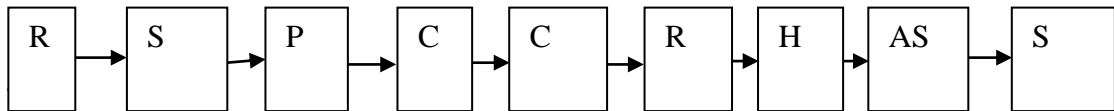


Figure 0.1 Food Flow Chart

KEY:

R- Receiving of goods

S- Storing of the goods

P-Preparation of goods

C-Cooking of the prepared food items

C –Cooling of the prepared food (where necessary)

R- Re-heat of the cooled food items

H-Holding the reheated food for service

A-Assembling of the food item to the service equipment, for instance a plate

S- Serving of food to patrons.

The flow of food service will enable evaluation of HACCP principles as a management system in day-care centres. The system ensures food safety is practiced in all stages to control hazard or risk for the product.

2.2 Empirical Literature

2.2.1 Hazard Analysis Critical Control Points (HACCPs)

The Hazard Analysis and Critical Control Point (HACCP) system was introduced approximately 20 years ago as a means to control food related hazards (Agyei, B. 2013). HACCP is a structured and rational approach to the analysis and prevention of potential hazard points at every stage of food operation. Nyamari (2013) argues that the HACCP principles require operators to enumerate and identify all steps in their activities that are critical to achieving food safety and to identify and evaluate safety measures.

The HACCP principles are categorized into seven stages namely: Identifying hazards and assessing their severity and risks; Identification of critical control points; establishment of critical limits for preventive measures associated with each critical control point; Establishing procedures to monitor critical control points; establishing corrective action to be taken when monitoring the critical control points; establishing effective record keeping system that document HACCP system; and establishing procedures to verify is operational. The HACCP principles are widely used as reference standard for safe food practices. HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product. For effective implementation of a HACCP plan, management must be strongly devoted to the HACCP concept. A firm obligation to HACCP by top management is to equip

business employees with a sense of the need for producing quality food which is safe. HACCP system is designed for use in all segments of the food industry from growing, harvesting, processing, manufacturing, distributing, merchandising and preparing food for consumption. The current study focus is on the production of food for consumption in the children day-care centres. Prerequisite programmes such as Current Good Manufacturing Practices (CGMPs) are an essential foundation for the development and implementation of successful HACCP plans (U.S Food & Drug Administration, 2014).

Before implementing HACCP principles, basic food hygiene conditions and practices (requirements / prerequisites) must be in place in a food catering setup. HACCP will then be used to manage steps in the catering businesses, which are critical in ensuring the preparation of safe food. Prerequisites include (where appropriate): Cleaning and Sanitation, Maintenance, Personnel Hygiene, Pest Control, Plant and Equipment, Premises and Structure Services (compressed air, ice, steam, ventilation, water, among others). In addition, it involves distribution and transport waste management zoning (physical separation of activities to prevent potential food contamination (FAO, 2016).

Agyei et al (2013) argues that the burden of food borne diseases though preventable remains huge contributing to worldwide morbidity. This concurs with the World Health Organization reports that each year over two billion people which is about one third of the global population get ill as a result of unsafe food. Developing countries Kenya included bear the brunt of the problem due to the presence of a wide range of

food borne diseases including those caused by parasites (Agyei B. et al, 2013). FAO of UN (paper 86) argues that implementation of hazard analysis and critical control point (HACCP) principles could contribute to reversing this negative trend relating to food borne diseases. This study seeks to investigate the level of implementation of HACCP principles in children day-care centres in Nyeri Town Constituency.

2.2.2 Level of Staff Training on Food Safety in Children Day-care centres

Similar to many careers, catering takes a mixture of training, hard work, and carefully improved skills to succeed. While there is much in common with being a chef, caterers face many challenges. Caterers have to handle such business matters as accounting, marketing and customer relations, in addition to those regarding the quality of the food (Collegegrad, 2016). Some hospitality specialised service providers such as chefs and head cook train on the job, where they learn the same skills as in a formal education programme. Some train through mentorship programmes, where they work under the direction of an experienced chef. Executive chefs, head cooks, and sous chefs who work in upscale restaurants often have many years of training and experience (Collegegrad, 2016). On the other hand, the Oxford Learners Dictionary defines caterers as business people who provide food products and service regardless of their professional background. Majority of the children day-care centres are operated by caterers.

In hospitality and catering industry, customer service training is possibly the most vital category of instruction that management and caterers ever receive. Businesses in this field include hotels and resorts, conference centres, cruise lines and restaurants all

of which exist to serve people. The patrons who frequent the business expect to be treated in specific ways, and employees need to know how to meet those expectations (Reynolds, 2016).

The importance of employee training does not end with new workers. Continuous Manager training and development is equally important to workplace safety, productivity, and satisfaction. Among the most useful skills that can be addressed are manager communication, employee motivation, and employee recognition (BLR, 2016). Firms should consider employing someone either part-time or full-time (consultancy) to train new staff members and run on-going training for regular staffers. The trainer's responsibility should not only be to provide basic training, but to provide role modelling training during actual events. This is an additional expense, but it will pay off in the long run with improved service levels and will ultimately lead to more revenue as patrons begin to talk about the great service they received from the firm (Hansen, 2013).

Major success would result in restoration and improvement of public trust and in increasing the satisfaction and pride that staff feel in their work. It is important to note that resource limitations and inequities, inadequacy of skills and motivation can result in failure to implement changes (Marshall & Msibi, 2013).

2.2.3 Government Policies on Food Safety in Children Day-care centres

Producing safe food is essential to any business's success, as customers will expect that your food products are safe. One must be able to verify the safety and quality of your products to export markets and other businesses that you supply your products

to, such as manufacturers, retailers and fast-food franchises (Queensland Government, 1995). The European Commission's food legislation 48 aims to ensure a high level of protection of human life and health and takes into account the protection of animal health and welfare, plant health and the environment. To ensure food safety, the European Council (EC) has legislation on food marketing, food standards, the labelling of food, food imports, and genetically modified foods, control measures for the prevention of food borne diseases The EC (2004) Regulation establishes the principle that the primary responsibility for ensuring compliance with food law, and in particular the safety of food, rests with food businesses. To complement and support this principle, adequate and effective controls are organized by the competent authorities of the EU Member (States Food Standards Agency, 2016).

The National Food Policy (2013) observes that food safety issue is of growing importance due to several global trends that contribute to increasing safety risks in the food systems including the increasing movement of people across borders, increased movement of agricultural and food products across borders; rapid urbanisation; changes in food processing and handling practices; and the re-emergence/emergence of diseases, pathogens, toxins and other issues. This calls for concerted efforts among the various players directed towards addressing improvement of the food systems.

FAO (2017) argues that safe food is critical to the achievement of food and nutrition security as well as improved public health outcomes, which fosters opportunities for improved livelihoods and economic development. WHO (2020) argues that foodborne diseases are a global concern with approximately 600 million people in the world

falling ill every year from eating contaminated food with an estimated 420,000 deaths being related to food borne diseases? Further, WHO (2020) argues that Children under 5 years of age carry 40% of the foodborne disease burden, with 125 000 deaths every year. It is observed that the risk of getting food borne diseases is higher and most severe in low- and middle-income countries as compared to high income countries. This is highly attributed to preparing food with unsafe water, poor hygiene practices, poor food production and storage conditions, low levels of literacy and education, insufficient food safety legislation and lack of enforcement of food safety legislation.

According to GoK (2013), the responsibility for national food safety control is shared among the different government ministries and agencies. There are 22 legislations for food safety and quality under the various Acts of parliament including Public Health Act Cap 242(Rev.2002), Food Drugs Chemical Substances Act Cap 254, Occupiers liability Act Cap 34, Liquor Licensing Act Cap 121, Traditional Liquor Act Cap 122, Meat Control Act Cap 356, amongst others, implemented by the different agencies. These sectors address food safety concerns in the broad areas of legislation, institutional framework, monitoring and evaluation, traceability, resources, information, education and communication. The administration of the varied laws by different agencies makes the food control systems fragmented and hence not conducive for doing business in Kenya (www.gainhealth.org). To militate against any negative impacts of the fragmented policies, stakeholders must stay abreast with the dynamic changes that have an impact in the business including the labour laws, the food safety the anti-smoking rules as well as labelling. Continuous dialogue between

different parties in the sector is therefore crucial for defining the sector's own policy objectives in order to inform the sector's representatives, such as Hotels in the wake of growing regulations for the sector. Beyond this, the challenges would be to lobby for legislation to be as favourable to the sector as possible, and then implement it as efficiently as possible (Garayoa & Vitas, 2017).

The quality policy is the framework for determining and reviewing objectives. The policy is carried out as part of regular annual management reviews. Quality policy is fulfilled by achieving the following long-term objectives; better planning, consistent adherence to priority tasks, improving documentation, ensuring systematic monitoring and directing processes, results and tasks, increasing employee and client satisfaction (ARSO, 2016).

Caterer warrants, represents, and agrees that caterer and all individuals assigned to provide Services will obtain and maintain, at Caterer's own cost, any and all approvals, licenses, filings, registrations and permits required by Applicable Law for the performance of the Services including, but not limited to, all required food handling permits (Utsa Catering Terms of Agreement, 2016).

2.2.4 Quality of Raw Materials

Raw materials in this case refer to all ingredients required in order to produce a certain food item. Water should not be wasted, running and leaky taps should be switched off. Fuel should not be wasted. Gas cylinders, charcoal firewood and other sources of fuel should be controlled on how they are being used to save on cost. In addition, food should not be wasted (Need Resource Management, 2016).

One of the fundamental principles of good cuisine is the use of high-quality ingredients. Even if you have a great recipe with the steps, ingredients, and cooking methods and conditions clearly stated, the dish will not turn out quite right, or even safely, if the ingredients used are not what they purport to be and if they are not fresh (that is, not expired) and clean (that is, not contaminated with chemicals or microbes). The span of ingredients can include the main ingredient (for instance chicken) as well as all the spices. Sometimes just changing the brand (that is, changing the supplier) of an ingredient may be enough to affect the “quality,” or taste, of the food (MARS, 2012). The use of the Best Environmental Practices Guide for hotels is intended to be simple and practical. The Guide provides the means to identify, in the different departments of a hotel, opportunities for optimizing its activities while reducing its operating costs and its environmental impacts (Johnson, 2017).

Software programs such as Cater ease are available to assist with catering planning, sales, booking and marketing. Many programs can generate letters, quotes and invoices as well. If one offers off-site catering, they might consider partnerships with full-time caterers. These professionals can manage off-site catering more challenging aspects while acting as a joint partner in marketing efforts. With the right knowledge, planning and execution, one can grow in a way that caters to both your business and your customers (NRA, 2012).

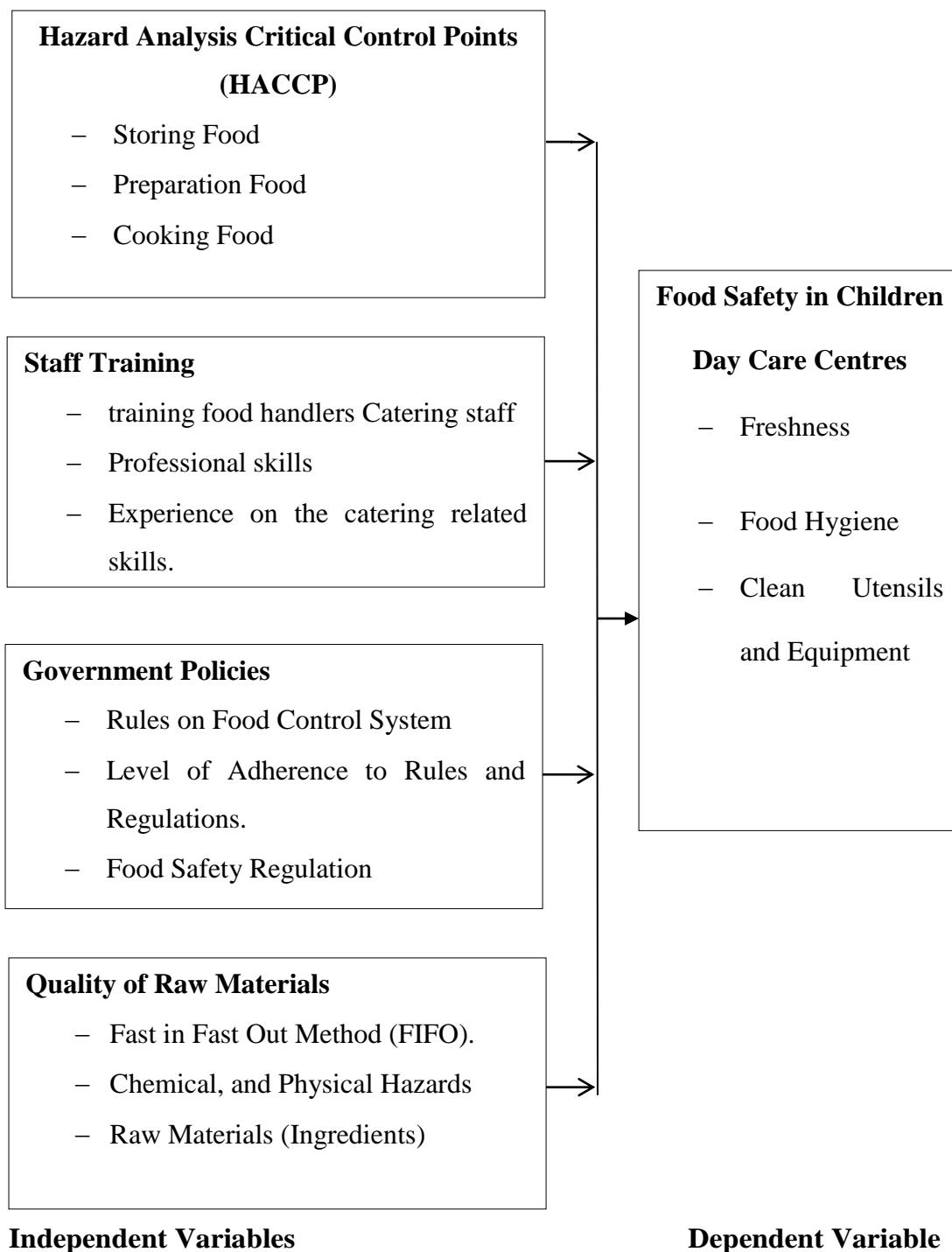


Figure 2.2 Conceptual framework

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter covers the research design, the study area, target population, how data was collected, means of ensuring validity and reliability of data collected as well as data analysis and presentation.

3.2 Research Philosophy

According to Bell and O'Hare, (2020). a research philosophy is a belief about the way in which data about a phenomenon should be gathered, analysed and used. There are three research philosophies that dominate the business and management research field. They include the paradigms of positivism, realism and interpretivism (Orodho, 2005). This study will adopt the positivism philosophy. Positivism adheres to the view that only factual knowledge gained through observation, including measurement is trust worthy

3.3 Research Design

Research design is defined as the plan, structure of investigation conceived to obtain answers to research questions and to control for variance (Ng'ang'a & Gathuthi, 2009). According to Royse (2011), a research design is a "blue print" of the research. It is the "action plan for getting from here to there" where "here" is the question to be answered and "there" is the conclusion "answers about these questions. Royse notes that an action plan should guide the researcher in the process of collecting, analyzing and interpreting data. Further, he argues that a research design is the logic that links

the data to be collected and the conclusion to be made to the initial questions of study.

The current study adopted descriptive research design Descriptive research design is a method of collecting information by interviewing or administering questionnaires to the sample of individuals (Orodho, 2005). The study made use of self-administered questionnaires and interviews using interview checklist, as instruments for primary data collection. Secondary data was collected through desk study analysis of existing literature on existing government policies that relate to food safety in children day-care centres in children day-care centres.

3.3 Study Area

This study was carried out in Nyeri Town Constituency, Nyeri County, Kenya. Nyeri Town Constituency was selected because the area is diverse and cosmopolitan in nature. In addition, the constituency hosts the headquarters for Nyeri County and hence houses most of the key offices of the devolved unit as compared to other constituencies in the county. The constituencies also have a high concentration of institutions of higher learning, banks, and major business enterprises including children day-care centres. Hence, it offered rich ground for data collection for the research.

3.4 Target Population

The study targeted all sixteen (16) day-care centres in Nyeri Town Constituency, which are licensed to operate. 64 persons comprising a manager and three catering Staff (stores, production and service area) from each day care Centres formed the

respondents. These were the key staff involved in handling of food from receiving raw materials, producing the meals and serving to the children.

3.5 Sampling Design

The study employed purposive sampling technique in selecting the constituency in the county where research was carried out. A purposive sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study. Given that there are only 16 legally registered day-care centres in the selected constituency, a census survey was employed in carrying out the research. A census is the procedure of systematically acquiring and recording information from all the members of a given population. Data collected through census takes into account the entire targeted population and is likely to be more accurate. In addition, a population of 16-day-care centres is very small to be sampled further.

Probability sampling was used to identify respondents from the selected population of study. A representative sample provides valid and credible results since they reflect the characteristics of the population from which they are selected. The current study aimed at reaching the manager, and three staff members working in the catering department as follows: stores, production and service area respectively in each of the day-care centres. The study targeted sixty-four (64) respondents comprising of four (4) respondents from each of the sixteen (16) legally licensed day-care centres in Nyeri Town Constituency, Nyeri County, Kenya.

3.6 Data Collection

In carrying out this research, mixed methods of data collection were employed to collect quantitative and qualitative data (interview data). Whereas quantitative data may be collected, via measures such as self-reports and physiological tests, qualitative data are collected via focus groups, structured or semi structured interviews, and other forms (Creswell, 2013).

The study employed questionnaires and interview schedule as the instrument to carry out the research. Questionnaires were open and closed ended. Likert's five-point scale was used to measure implementation of HACCP, staff's level of training, Government policies and quality of available raw materials. Open-ended questions were used to give an open discussion on other areas related to the research that had not been addressed by the closed ended questions.

Questionnaires are appropriate as they provided a standard set of questions for all the respondents regarding the sought information. Only one questionnaire was administered to each target respondent. Drop and pick methods were used to distribute and collect the completed questionnaires. An interview standard checklist was used to gather more information related on food safety and measures put in place to enhance food safety in children day-care centres offered. An interview is an oral administration of a questionnaires or an interview schedule. This is a face-to-face encounter between the researcher and respondents (Mugenda & Mugenda, 1999).

3.6 Validity and Reliability

According to Royse (2011), an instrument is said to be valid when it measures the construct it was designed to measure, which in practice means it helps to demonstrate the scale performance. On the other hand, Odesso defines reliability as “the extent that the instrument measures whatever it is measuring consistently, or after repeated tests (Odesso, 2012).

3.6.1 Validity

A pilot study was conducted before the actual data was collected. The pilot study was done from other areas not included in the actual research area. This was with the aim of testing the validity and reliability of the research instruments. The pre-test was used to make necessary changes in the questionnaire and the interview checklist in order to enhance its validity. In addition, the questionnaire and interviews were shared with experts for their expert opinion and recommendations upon which arising there with were incorporated.

3.6.2 Reliability

Best and Kahn (2005), defines reliability as “the extent that the instrument measures whatever it is measuring consistently”. Reliability of the scales used in the research instrument was evaluated for consistency. This was achieved through a statistical analysis for reliability of the construct. Split-half technique was appropriate for the study over other methods like test retest because it takes care of changes in times and circumstance. The Cronbach’s reliability coefficient of 0.7 and above was considered adequate for the study. This is in line with the rule of thumb in research that reliability

should be at least 0.70 (Orodho, 2005). This study obtained a Cronbach value of 0.76, which was within the acceptable threshold.

3.7 Data Analysis and Presentation

Data presentation is method by which people summarize, organize and communicate information using a variety of tools, such as diagrams, distribution charts, histograms and graphs (Best & Khan, 2006). Presentation of data was done in form of quantitative and qualitative reports, which was presented in forms of tables and essay. For the quantitative reports, the tables consisted of mean and standard deviation values that were used to make interpretation of the analysis. Percentage, mean and standard deviation was used to show the frequency of responses. Tables were used to display the rate of responses and to facilitate comparison. Qualitative reports were presented in form of essay, which was discussed as per the study objectives aligned with the theories and empirical study. The collected research data was checked for any errors and omissions, coded, defined and then entered into Statistical Package for Social Science (SPSS Version 24).

Quantitative data was coded into numerical codes, which represented various variables. These codes then were being captured into computer for analysis. These data were analyzed using descriptive analysis such as frequency, percentage, mean and standard deviation. Qualitative data was collected from open-ended questionnaires. Qualitative data was transcribed and summarized according to themes and contents (Chih-Pei & Chang, 2017). These themes and contents were used to confirm or refute quantitative responses drawn from closed ended questions in the questionnaire.

Inferential statistics include both correlation, to show the strength of the relationship between strategy compliance and multivariate regression analysis to show the nature of the relationship between quality catering services on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. food safety in children day-care centres was regressed against the four variables namely: HACCP principle, government policies, staff training and the raw materials. The equation was being expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

- ✓ Y=the dependent variable (food safety in children day-care centres)
- ✓ β_0 =the intercept, i.e. $Y = \beta_0$, when $X_1, X_2, X_3, X_4 = 0$
- ✓ $\beta_1, \beta_2, \beta_3$ and β_4 are the regression coefficients describing the size of contribution of the representative independent variable (HACCP, government policies, staff training and quality of raw materials)
- ✓ X_1, X_2, X_3 , and X_4 represent HACCP principles, government policies, staff training respectively and quality of raw materials
- ✓ ϵ is the error term

Coefficient of determination was calculated to indicate the explained variations in the dependent variable as caused by the independent variable. An alpha level of 0.05 was used as the level of significance in this study. Results were presented in tables.

3.8 Ethical Considerations

The researcher sought and was issued with an approval letter from the University to carry out the research for academic purpose and a government permit by NACOSTI to carry out the research in Nyeri Town Constituency, Nyeri County, Kenya. The researcher treated the information given by the respondents as strictly confidential. The intended respondents were the day-care managers and the Staff working in the catering sections in each day-care centre. Data collected was used solely for the purpose of the said study and not for any other self-serving reason. The researcher also sought to explain as much as possible the purpose of the research to the respondents.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter interprets and analyses data gathered in the study, in line with the objectives of the study. This chapter focuses on the presentation of data collected from the field and interpretation of the results thereof. Data analysis was done in accordance with the objectives of the study, which was determining the level of implementation of HACCP principles; finding out the effect of Staff training, evaluating the effect of relevant government policies and examining the effect of raw materials on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The chapter presents the data in the form of tables and discussions.

4.2 Response Rate

The study had a sample size of 64 respondents. All the questionnaires were given out but at the end of the research period, only 61 had responded which means the response rate was 95.31%. According to Chukhrova and Johannssen, (2019), a 50% response rate is considered adequate, while 60% good and above 70% very good. In view of this, the response rate was considered very good and exceeded the threshold postulated by Best and Khan, and therefore the researcher went ahead to analyse data.

4.3. Background Information

The researcher obtained data on background information on the respondents in the Study as shown in here below.

4.3.1. Gender of the Respondents

The study obtained data on the gender of the respondents.

Table 0.1 Gender of Respondents

Gender	Frequency	Percent
Male	3	4.92
Female	61	95.08
Total	64	100

Source: (Author, 2020).

The findings in Table 4.1 indicates that majority (95.08%) of the respondents were female while 4.92% were male. This implies that majority of individuals in day-care centres in Nyeri Town Constituency who serve in catering sections were females. This situation is similar to that in the United Kingdom, where Rachel (2012) showed that in the department for education in UK only two per cent of the early year's work force is male, and which is attributed to the perception that working with children is predominantly a female occupation.

4.3.2 Education Level of Respondents

The study obtained data on education level of the respondent.

Table 0.2 Education Level of Respondents

Level of Education	Frequency	Percent
Diploma/Certificate	52	81.96
Bachelor 's Degree	7	12.5
Postgraduate Diploma	3	4.7
Master's Degree	1	1.64
Total	64	100

Source: (Author, 2020).

The findings as highlighted in Table 4.2 show that majority (81.96%) of the respondents had diploma/certificate as their highest education level of education while those with Bachelor's Degree, postgraduate Diploma and Master's Degree were 12.5%, 4.7%, 1.6% of the respondents respectively. This implies that majority of the respondents were literate and sufficiently trained on catering services and management of the day-care centres. This suggests that their responses were informed and could thus be relied upon.

4.3.3 Operation Period of Day-care Centre

The study sought data to determine how old the day-care centres were

Table 0.3 Age of Day-care Centre

Age (Years)	Frequency	Percent
< 4 Years)	34	52.46
4-8 Years)	25	39.34
9-12 Years)	1	1.64
12-16 Years)	2	3.28
>16 Years)	2	3.28
Total	64	100

Source: (Author, 2020).

The finding as indicated in Table 4.3 shows that more than half (52.46%) of the respondents said that their day-care centres had been in existence for less than four years while a significant percentage of 39.34% said that their day-care centres had

been in existence for 4-8 years. Another 3.28% had been in existence for 12-16 years and 3.28% for 16 years or more. This implies that majority of the respondents' day-care are relatively new in the area however their period of stay in the business was considered sufficient to provide responses that could support making of reliable conclusions.

4.3.4 Respondents' Working Experience

The study sought to establish the number of years the staff has worked as catering staff in the day-care centres.

Table 0.4 Respondents' Working Experience

Working Experience (Years)	Frequency	Percent
< 4 Years	39	60.65
4-8 Years	20	31.15
9-12 Years	4	6.56
12-16 Years	1	1.64
Total	64	100

The findings as shown in Table 4.4 indicate that majority (60.65%) of the respondents said they had worked as catering staff in their day-care centres for a period of less than 4 years while a good number (31.15%) had worked for between 4-8 years. A small number, that is, 6.56% said that they had worked for 9-12 years while 1.64% said they worked for 12-16 years. This implies that majority of the respondents could be relatively new in the catering service, but having worked for more than 3 years, they are considered to have enough experience to give reliable data.

4.5 Descriptive Statistics

4.5.1 HACCP Principles on food safety in children day-care centres

The first objective of the study aimed at determining the level of implementation of HACCP principles on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The study presented the findings in the section below.

Table 0.5 HACCP Principles on food safety in children day-care centres

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Food is always purchased from reputable supplier.	27.9	39.3	3.3	16.4	13.1
Food is always received at the right time.	32.8	26.2	1.6	21.3	18
Food always received is of good quality.	31.1	24.6	8.2	23	13.1
Food of different types is stored in different storage rooms.	3.3	32.8	8.2	42.6	13.1
Hygiene is observed in the preparations of food in day care.	36.1	14.8	3.3	23	23
Cooking in the day-care centre is done until all the ingredients are ready to be served.	19.7	26.2	3.3	39.3	11.5
Food Hygiene is observed when Handling Food items before being served in day-care	27.9	29.5	4.9	21.3	16.4

Source: (Author, 2020)

The findings as highlighted in Table 4.6 shows that majority (67.2%) of the respondents agreed that food was always purchased from reputable suppliers (39.3% agreed and 27.9% strongly agreed) while 29.5% disagreed, this implies that foods in day-care centres are bought from reliable/reputable suppliers the findings are that majority (59.0%) of the respondents agreed that food was always purchased at the right time (32.8% strongly agreed and 26.2% agreed) while 39.3% disagreed (21.3% disagreed and 18.0% strongly disagreed). findings show e respondent agreed that food received was always of good quality (31.1% strongly agreed and 24.6% agreed). Another 36.1% disagreed (23.0% disagreed and 13.1% strongly disagreed. The findings as highlighted in Table 4.6 indicate that majority (55.7%) of the respondents disagreed that food of different types was stored in different storage rooms (42.6% disagreed, 13.1% strongly disagreed= this implies that in most of the day-care centres, different types of food are not stored in different storage rooms.

Findings captured in Table 4.6 show that more than half (50.9%) of the respondents agreed that hygiene is observed in the preparations of food in their day-care centres (strongly agreed 36.1% and 14.8% agreed) while a reasonable percentage of 46.0% disagreed (strongly disagreed 23.0% and 23.0% disagreed. This implies that majority of the day-care centres observed hygiene in the preparations of food. The respondent disagreed that cooking was done until all the ingredients were ready to be served in day-care centres while 45.9% agreed. This implies that majority of the day-care centres did not have all their food cooked until all ingredients were ready to be served. Cooking of some food items were done while serving was on going. Majority (57.4%) of the respondents agreed that food hygiene is observed when handling food items

before being served in day-care centres while 37.7% disagreed. This implies that majority of the day-care centres observed hygiene when handling food items before being served.

The findings as shown in Table 4.6 point that majority (49.2%) of the respondents agreed that cooked food is heated a few minutes before time of serving in day-care centres (41.0% strongly agreed, 8.2% agreed). This implies that majority of day-care centres had their cooked food being heated few minutes before the time of serving. Similar views were obtained from Key Informant whose opinions showed that food is warmed before serving to ensure that the food is healthy for the children. According to Mucky Pups Childcare (2014), reheating cooked food is important for children since it is necessary to feed them with warm food. Reheating food is done using the temperature probe while ensuring the food has reached to the desired level of 75 degrees 4.2.3

4.5.2 Staff Training on Food Safety in Children Day-care Centres

The findings as captured in Table 4.7 indicate majority (70.5%) of the respondents disagreed that the catering staff training was of high level at their day-care centres (42.6% disagreed and 27.9% strongly disagreed) while 23.0% agreed (13.1% agreed and 9.8% strongly agreed). This implies that majority of the respondents' day-care centres catering staff have not received high level of formal training in terms of Bachelor, Postgraduate Diploma and Masters certificates.

Table 0.6 Staff Training on Food Safety in Children Day-care centres

Statement	Strongly	Agree	Not	Disagree	Strongly
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	Agree		sure		Disagree
The level of training of catering staff is high	9.8	13.1	6.6	42.6	27.9
Catering staff have high professional skills in day-care centres	14.8	29.5	9.8	26.2	19.7
Catering staff have experience on the catering related skills	21.3	18	6.6	29.5	24.5
Catering staff understand the government requirement on quality of catering service in the day-care	19.7	16.4	16.4	31.1	16.4
train food handlers in food hygiene matters commensurate with their work activity.	43.3	29.2	16.2	7.2	4.1
Training food handlers to understand how food can become contaminated and the different types of food contamination	39.3	21.3	26.1	12.1	1.2
Catering staff serves delicious and sufficient food to children in day-care centres	26.2	246	3.3	23	23

Source: (Author, 2020)

The findings as captured in Table 4.7 indicate majority (70.5%) of the respondents disagreed that the catering staff training was of high level at their day-care centres (42.6% disagreed and 27.9% strongly disagreed) while 23.0% agreed (13.1% agreed and 9.8% strongly agreed). This implies that majority of the respondents' day-care centres catering staff have not received high level of formal training in terms of

bachelor, postgraduate diploma and Masters certificates. The findings as indicated in Table 4.7 show that majority (45.9%) of the respondents disagreed that the catering staff in day-care centres had - high professional skills (26.2% disagreed while 19.7% strongly disagreed) while 44.3% agreed (14.8% strongly agreed and 29.5% agreed). This implies that in most of the day-care centre, catering staff do not high professional skills. The respondents strongly agreed that Training food handlers to understand how food can become contaminated and the different types of food contamination enhanced food safety with 39.3% of the respondent strongly agreeing, 21.3 % of the respondents agreeing and only 1.2 % of the respondents disagreed.

The findings highlighted in Table 4.7 indicates that that majority (54.1%) of the respondents disagreed that the catering staff in day-care have experience on catering related skills (29.5% disagreed and 24.5% strongly disagreed), while 39.3% agreed (21.3% strongly agreed and 18.0% agreed). This implies that majority of employees who work in the catering department of day-care centres do not have sufficient catering related skills. The findings in the Table 4.7 indicates that majority (47.5%) of the respondents disagreed that the catering staff understood the government requirement on food safety in children day-care centres (31.1% disagreed and 16.4% strongly disagreed) while a significant percentage of 36.1% agreed (19.7% strongly agreed and 16.4% agreed). Majority (50.8%) of the respondents agreed that the catering staff serves delicious and sufficient food to children in their respective day-care centres (26.2% strongly agreed and 24.6% agreed). However, 46.0% disagreed (23.0% strongly disagreed and 23.0% disagreed). This implies that majority of day-care centres serve delicious and sufficient food to in the day-care centres. According

to the Department of Affairs of the Australian Government (2016), the dietary patterns and practices of individuals are affected by many variables that may be categorized as physiological factors, food accessibility, food characteristics, environmental influences, and psychological influences. It is the combination of these factors that ultimately determines what, how, and why foods are consumed as well as the amount.

4.5.3 Government Policies on Food Safety in Children Day-care centres

The third objective of the study aimed at evaluating the effect of relevant Government Policies on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The study presented the findings in the sections here below.

Table 0.7 Government Policies on food safety in children day-care centres

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
There are rules and regulations from the government on quality of catering service	24.6	47.5	21.3	4.9	1.6
The level of adherence of rules and regulations on food safety in children day-care centres	8.2	14.8	6.6	41	26.2
Promoting the adoption of the risk analysis approach for improving food control systems	63.2	23.7	2.6	6.6	3.9
Developing tools and guides related to various technical and managerial aspects of food control.	23.7	68.4	2.6	1.3	3.9
Food safety regulators distributed at all levels of the food supply chain.	32.9	53.9	2.6	5.3	5.3
Applicability of Government Policies on food safety in children day -care centres	6.6	8.2	19.7	4.4	31.1
The Government Policies of catering services is enforced in day-care centres	11.5	24.6	8.2	29.5	26.2

Source: (Author, 2020)

The findings in the Table 4.8 show that majority (72.1%) of the respondents agreed that there are rules and regulations from the government on food safety in children day-care centres (47.5% agreed and 24.6% strongly agreed) while a reasonable

percentage of 21.3% were not sure. This indicates that in most of day-care centres the Staff working in the catering department was of the opinion that there are rules and regulations from the government on food safety in children day-care centres. However, comparing these findings with those in section 4.2.3.1 it means although the Staff were aware of the existence of government policies relating to food safety in children day-care centres, most of them had not been exposed to the policies hence the low levels of understanding of their content. The study revealed that Food safety regulators distributed at all levels of the food supply chain enhanced better understanding of food safety codes with 32.9 % of the respondents strongly agreeing and 53.9 % agreeing with only 5.3 % of the respondents disagreeing.

Findings highlighted in the Table 4.8 shows that majority (67.2.0%) of the respondents disagreed that the level of adherence of rules and regulations on food safety in children day-care centres is high (41% disagreed and 26.2% strongly disagreed). The respondents indicated that developing tools and guides related to various technical and managerial aspects of food control increased food safety with 23.7% of the respondents strongly agreeing and 68.4 of the respondents agreeing

However, a significant percentage 23% agreed (8.2% strongly agreed and 14.8 % agreed). The findings in the Table 4.8 show that majority (65.5%) of the respondents disagreed that there is applicability of government policies on food safety in children day-care centres (34.4% disagreed and 31.1% strongly disagreed) while another 14.8% agreed (8.2% agreed and 6.6% strongly agreed) this implies that applicability of government policies on food safety in children day-care centres is limited. Findings

in the Table 4.8 show that majority (55.7%) of the respondents disagreed that the government policy on food safety in children day-care centres is being enforced in day-care centres (29.5% disagreed and 26.2% strongly disagreed) while 36.1% agreed (32.8% strongly agreed and 26.2% agreed). This implies that majority of day-care centres in the study area disagree that the government policy on food safety in children day-care centres is being enforced. This agrees with the findings of Kilonzo & Gathura, 2010). To do this, enforcement officers may directly visit the business premises to inspect them. These officers might come on routine inspection or in response to a complaint by a patron and they have the right to enter and inspect premises at any reasonable time and will usually come without telling the owner first.).

4.5.4 Raw Materials on Food Safety in Children Day-care centres

The fourth objective of the study aimed at examining the effect of raw materials on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The study presented the findings below.

Table 0.8 Raw Materials on Food Safety in Children Day-care Centres

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Raw materials (ingredients) are readily available	34.4	23	4.9	18	19.7
The raw materials are outsourced	36.1	31.1	16.4	13.1	3.3
Handles the raw materials and	59.2	17.1	5.3	9.2	9.2

in-process and finished product material present a potential safety or handling concern to the employees or the facility	63.2	10.5	1.3	19.7	5.3
Raw materials are affordable	21.3	14.8	8.2	34.4	21.3
Raw materials purchased are of high quality	27.9	21.3	4.9	21.3	24.6
Raw materials are easily transported in the correct package	44.3	41	11.5	1.6	1.6

Source: (Author, 2020)

The findings indicated on the Table 4.9 show that majority (57.4%) of the respondents agreed that raw materials (ingredients) are readily available at the day-care centres (34.4% strongly agreed, 23.0% agreed). This implies that majority of respondents were of the opinion that raw materials (ingredients) are readily available at day-care centres. Findings highlighted on the Table 4.9 show that majority (67.2%) of the respondents agreed that raw materials are outsourced at day-care centres (36.1% strongly agreed, 31.1% agreed) while a reasonable percentage (16.4%) were not sure. This implies that majority of the respondents were of the opinion that raw materials are outsourced at day-care. Respondents moderately agreed that Handling of the raw materials and in-process and finished product in an appropriate manner including equipment capability with 59.2 % of the respondents strongly agreeing, 17.1% of the respondents agreeing and 9.2% of the responding been neutral. This report collaborates with that of qualitative key informant who reported to be supplying most

of the foodstuff from his farm hence making a small population of those not outsourcing.

The findings highlighted in the Table 4.9 show that majority (55.7%) of the respondents disagreed that raw materials are affordable at day-care centres (34.4% disagreed, 21.3% strongly disagreed) while a significant percentage of 36.1% agreed .The finding as indicated in the Table 4.9 shows that majority (49.2%) of the respondents agreed that the raw materials purchased at day-care centres were of high quality (27.9% strongly agreed and 21.3% agreed) while 45.9% disagreed (24.6% strongly disagreed and 21.3% disagreed) .

The findings highlighted in the Table 4.9 shows that majority (85.30%) of the respondents agreed that raw materials at day-care centres are easily transported in the correct package (44.30% strongly agreed, 41.0% agreed). These findings corroborate with those of FSANZ, (2015) any food handlers should have in mind that it is always important to protect food from contamination by keeping it covered at all times and this case also applies to food in transit.

4.6 Qualitative Analysis

The study obtained qualitative data from the respondents through structured interviews. The results of findings are categorized into thematic areas.

4.6.1 Food Handling Medical Certificate

Majority of the respondents agreed to have food handling medical certificate which is a key requirement for any person handling food. It was further reported that some

staff renewed their medical certificate after every six months while a few renewed after a year. The current practice in Kenya is to have the food handling certificate renewed after every six months. It was noted that public health personnel in the County made impromptu visits and anyone found lacking the medical certificate could lead to having the business premises closed. This concurs with the globally accepted requirement in relation to food handling. According to Utsa Catering Terms of Agreement (2016) individuals assigned to provide food Services should obtain and maintain all approvals, licenses, medical certificate, filings, registrations and permits required by Applicable Law for the performance of the Services including, but not limited to, all required food handling permits. According to 360 Training (2016), across the USA an always-present hazard of food-borne illness outbreaks has compelled public-health authorities to require food safety credentials, including HACCP certification, from food establishments. In practice, even though HACCP certification is yet legally mandatory to food handlers and food service employees many employers already require it for employment. In UK, food handlers don't have to hold a food hygiene certificate to prepare or sell food, although many food businesses will prefer that they do (Food Standards Agency, UK, 2016).

In Kenya, it is necessary to obtain a medical certificate of good health to reduce the challenges faced while working in the hospitality industry. Different authorities do this across the country; for example, in Nairobi, the Nairobi County Government issues it. Before certification, an individual is subjected to a series of tests that include inspecting for a contagious bacterial infection in the blood and stool to ensure that the individual does not have any disease that can be spread through the handling of water

and foods after which one pays required fees before certificate issuance (Kandeli, 2015). Certification has become a concern especially in the year 2017 when the country has experienced outbreaks of cholera in which 381 cases including 4 deaths were reported in Nairobi County (Ministry of Health, 2017). Governments around the world are acting swiftly to update and modernize their legislation. To achieve this and in order to adopt industry-leading best practices, food safety regulations are increasingly outcome-based and transparent across borders

4.6.2 Type of Water Used to Clean Utensils and Equipment

The study revealed that the two main types of water were used including hot and cold water. Majority of the respondents reported to use hot water, which they indicated, removed the dirt with ease, which made the cleaning easier and faster. It was also noted that for the respondents who used hot water, it was warmed after all the cooking had been done and water was left to warm as they served the children. Those who used cold water noted that this was done to save energy as their business were using electricity. All the respondents agreed to be using detergents while cleaning the utensils and equipment. Washing dishes in hot water lifts away food grease and grime from dirty dishes, which reduces the amount of time, spent scrubbing the dishes. Hot water is also needed to effectively kill bacteria on dishes (Aguirre, 2017); implying most of the respondents are doing it right. Hot water is soft water and thus more effective in ensuring cleanliness.

4.6.3 Designated Facilities for Washing Hands

Most of the premises visited had water tanks outside the kitchen while others had sinks right in the kitchen. Then respondents reported that the facilities were meant to ensure cleanliness while handling food. Some said it was mandatory to clean hands in the morning upon arrival before starting on any duty. On a regular basis the staff were required to clean their hands including after visiting toilet, after assisting a child who could be stranded outside of their class, after blowing nose and even after clearing the working stations. It was also observed that in most premises' children were provided with sinks and taps to wash their hands regularly. In a few where no taps and sinks were not available, a staff was designated to assist the children wash their hands before taking their meals. According to Food Standards Agency-UK, (2013) a food handling facility must have an adequate number of washbasins, suitably located and used only for cleaning hands. Washbasins for cleaning hands must have hot and cold running water, soap and materials for hygienic drying, while where necessary, there should be separate sink for washing food.

4.6.4 Hygiene

Views from majority of the Key Informants showed that they cleaned the kitchen utensils and Equipment after every use with water and detergents. Most of the respondent reported that their taps were used for kitchen use as well as ordinary hand washing with two key Information reporting that their day care centre had two different taps for kitchen use and for ordinary hand washing. On personal hygiene, views from four key informants showed that the respondent observed personal hygiene, which is very important in preventing food poisoning and illness. This was

through cleaning of hands and regular food handling test. According to Orenstein (2017), personal hygiene habits such as washing of hands while preparing food or eating and handling sanitary items, and brushing and flossing of teeth will help in minimizing risk of infection and enhance overall health. Food handlers if infected can easily spread the bacteria to food consumers. A major cause of food poisoning is the lack of personal hygiene practiced by food handler's, therefore poor personal hygiene, such as a food handler coughing or sneezing over food or not washing hands before eating or after using the toilet should be avoided at all.

On kitchen hygiene, the findings from three key informants revealed that respondents observed kitchen hygiene through regular cleaning of kitchen surfaces and equipment's with the use of hot water and detergents. This was also enhanced through spot check by supervisors where 2 key informants showed that respondent's supervisors observed the kitchen hygiene by checking regularly. Further reporting was made in terms of cleaning of ingredients from 5 key informants' who indicated that all the food ingredients were cleaned before cooking.

4.6.5 Food Storage Management

Qualitative data showed food care was done through covering food while cooking and already cooked food through views from 5 key informants who observed that food was covered with clean lid while cooking and that cooked food was covered too, thus helping prevent food contamination. Another important food storage management that was revealed in the study included appropriate storage of cooked food.

According to response from six Key Information purchased food ingredients were stored in the same room. The challenge identified was lack of sufficient space and storage equipment's. Most of the day-care centres investigated were on rental premises and this made their expansion difficult as they had to pay some extra fee for any extra space. According to Mucky Pups Childcare Ltd, (2014) different foods have different storage requirements and hence should be stored immediately after the delivery has been checked. Highly perishable food should be attended first, then dry and canned foods. A different storage area for kitchen non-food equipment's should be equipped with hooks for hanging mops, brooms, and other cleaning tools, a utility sink for filling buckets and cleaning tools, and a floor drain. The responses showed that there was hygienic handling of food between cooking and serving. Furthermore, findings from 3 key informants showed that they purchased food from reliable suppliers as a way of ensuring hygiene and quality.

4.3.6 Food Serving Care Management

Responses from two Key Informants showed that at the time of serving, food at room temperature was heated few minutes before it was served. This was to ensure that the children were served with warm food. In regard to food, cooking some informants noted that all food items were cooked before serving commenced while others indicated that cooking of some food items was on-going as serving commenced. Serving food before all food items are ready may lead to poor cooking methods being used such as - food items that requires boiling, which can lead to health hazard. Thorough cooking of food significantly decreases the risk for food borne illness while

improper cooking allows harmful micro-organisms to survive (Gauci, 2016). Eating food that isn't properly cooked could give you food poisoning.

In addition, the responses showed that cleaning of the serving environment was done. The response from two key informants showed that serving areas including the serving utensils were kept clean at all times. Cleaning of working service area is important because these areas must be kept clean and hygienic; that is, free from dangerous germs that could cause food poisoning. If high standard of cleaning is not maintained, dangerous bacteria can grow and contaminate food. There are many types of surfaces found in food handling areas. These include stainless steel and laminated plastic for counters, tables and chairs. The cleaning techniques that are used for each working service area will depend on what is to be cleaned and how often it is to be cleaned. The cleaning requirements should be set out in writing in the cleaning schedule for each particular area (Hospitality Institute of Australasia, 2014).

4.7 Inferential Statistics

The study did inferential statistics based on independent variable against the dependent variable. The results obtained are presented in the section below.

4.7.1 HACCP Principles and Food Safety in Children Day- care centres

The study sought to determine the strength of the relationship between the levels of implementation of HACCP principles on food safety in children day-care centres in children day-care centres.

Table 0.9 Regression between HACCP Principles and Food Safety Centres

Model 1	Unstandardized		Standardized	T	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	1.732	.857			2.021.048
Level of implementation of HACCP principles	.315	.135	.314		2.339.023

a. Dependent Variable: food safety in children day-care centres

Source: (Author, 2020)

Table 4.10 provides the information needed to predict food safety in children day-care centres from level of implementation of HACCP principles. Both the constant and level of implementation of HACCP principles contribute significantly to the model. The regression equation is presented as follows;

$$(Y) \text{ Food safety in children day-care centres} = 1.732 + .315 (\text{Level of implementation of HACCP principles})$$

The study obtained the model summary of the level of implementation of HACCP principles on food safety in children day-care centres in children day-care centres and presented the results in the Table 4.11

Table 0.10 HACCP Principles and Food Safety

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.508 ^a	.459	.144	1.296

a. Predictors: (Constant), level of implementation of HACCP principles

Source: (Author, 2020)

The regression model in Table 4.11 shows the R and R2 value representing the simple correlation. The R-value is 0.508, which indicates and above average correlation. The R2 value indicates how much of the dependent variable (food safety in children day-care centres), can be explained by the independent variable (level of implementation of HACCP principles). In this case, 45.9% can be explained. This therefore implies that there is an association between levels of implementation of HACCP principles that can predict food safety in children day-care centres.

The Study further sought to find out how level of implementation of HACCP principles affects food safety in children day-care centres in children day-care centres. ANOVA analysis yielded the results in Table 4.12

Table 0.11 Regression between HACCP Principles and food safety

Model 1	Sum of Squares	of Df	Mean Square	F	Sig.
Regression	30.439	8	3.805	2.266	.037 ^b
Residual	87.298	52	1.679		
Total	117.738	60			

a. Dependent Variable: food safety in children day-care centres

b. Predictors: (Constant), Level of implementation of HACCP principles

Source: (Author, 2020)

ANOVA results in Table 4.12 indicate that the regression model predicts the outcome variable significantly. This indicates the statistical significance of the regression

model that was applied. An F statistic of 2.266 indicated that the model was significant. This was supported by a probability value of 0.037. This is below 0.05, and indicates that on overall, the model applied can significantly predict the outcome variable.

4.7.2 Effect of Staff Training and Food Safety in Children Day care centres

The study did inferential statistics based on independent variable (Staff Training) on against the dependent variable (food safety in children day-care centres). The results of data analysis are presented in the section below. The study sought to determine the strength of the relationship between the effects of Staff training on food safety in children day-care centres. The results are presented in Table 4:13

Table 0.12 Coefficients Determination of Staff Training and food safety

Model 1	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	1.883	.678		2.774	.008
Staff training	-.253	.129	-.284	-1.954	.056

a. Dependent Variable: food safety in children day-care centres at Day care Centers

Source: (Author, 2020)

Table 4.13 provides the information needed to predict food safety in children day-care centres from Staff' level of training. Both the constant and Staff training contributes significantly to the model. The regression equation is presented as follows; (Y) food safety in children day-care centres = 1.883 - .253 (Effects of Staff

training) The study obtained the model summary of the effects of Staff training on food safety in children day-care centres in children day-care centres and presented the results in the Table 4.14

Table 0.13 Model Summary

Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.396 ^a	.157	.096	1.332

a. Predictors: (Constant), Effects of Staff training

Source: (Author, 2020)

The regression model in Table 4.15 shows the R and R² value representing the simple correlation. The R-value is 0.396, which indicates a weak correlation. The R² value indicates how much of the dependent variable (food safety in children day-care centres), can be explained by the independent variable (Effects of Staff training). In this case, 15.7% can be explained. This therefore implies that there is an association between effects of Staff training that can predict food safety in children day-care centres.

The study further sought to find out how level of implementation of Staff training affects food safety in children day-care centres in children day-care centres. ANOVA analysis yielded the results in Table 4.15

Table 0.14 Staff training against Food Safety in Children Day-care centres

Model 1	Sum of Squares	df	Mean Square	F	Sig.
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Regression	18.440	4	4.610	2.600	.046 ^b
Residual	99.298	56	1.773		
Total	117.738	60			

a. Dependent Variable: food safety in children day-care centres

b. Predictors: (Constant), Level of implementation of HACCP principles

Source: (Author, 2020)

ANOVA results in Table 4.15 indicate that the regression model predicts the outcome variable significantly. An F statistic of 2.600 indicated that the model was significant. This was supported by a probability value of 0.046. This is below 0.05, and indicates that on overall, the model applied can significantly predict the outcome variable.

4.7.3 Government Policies and Food Safety in Children Day-care centres

The study did inferential statistics based on independent variable (Relevant Government Policies) and the dependent variable (food safety in children day-care centres). The results of the data analysis are presented in the section below. The study sought to determine the strength of the relationship between the effects of relevant Government Policies and food safety in children day-care centres. The results are presented in Table 4.16

Table 0.15 Coefficients of Government Policies and Food Safety

Model 1	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.001	.665		3.011	.004

Effects of relevant government policies	.345	.132	.336	2.603	.012
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a. Dependent Variable: food safety in children day-care centres

Source: (Author, 2020).

Table 4.16 provides the information needed to predict food safety in children day-care centres from effects of relevant government policies. Both the constant and effect of relevant government policies contribute significantly to the model. The regression equation is presented as follows;

$$(Y) \text{ Food safety in children day-care centres} = 2.001 + .345 (\text{Effect of relevant Government Policies})$$

The study obtained the model summary of the effects of relevant government policies on food safety in children day-care centres in children day-care centres and presented the results in the Table 4.17

Table 0.16 Model of Summary on Government Policies and Food Safety

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.421 ^a	.178	.119	1.315

a. Predictors: (Constant), effects of Government Policies

Source: (Author, 2020)

The regression model in Table 4.17 shows the R and R² value representing the simple correlation. The R value is 0.421, which indicates a weak correlation. The R² value indicates how much of the dependent variable (food safety in children day-care centres), can be explained by the independent variable (effects of relevant government policies). In this case, 17.8% can be explained. This therefore implies that there is an association between effects of relevant government policies that can predict food safety in children day-care centres.

The study further sought to find out how relevant government policies affect food safety in children day-care centres in children day-care centres. ANOVA analysis yielded the results in Table 4.18

Table 0.17 ANOVA, Government Policies on Food Safety

Model 1	Sum of Squares	Df	Mean Square	F	Sig.
Regression	20.916	4	5.229	3.024	.025 ^b
Residual	96.822	56	1.729		
Total	117.738	60			

a. Dependent Variable: food safety in children day-care centres

b. Predictors: (Constant), effects of relevant government policies

Source: (Author, 2020)

ANOVA results in Table 4.18 indicate that the regression model predicts the outcome variable significantly. An F statistic of 3.024 indicated that the model was significant. This was supported by a probability value of 0.025. This is below 0.05, and indicates

that on overall, the model applied can statistically significantly predict the outcome variable.

4.7.4 Effects of Raw Materials on Food Safety in Children Day-care centres

The study did inferential statistics based on independent variable (Raw Materials) and the dependent variable (food safety in children day-care centres). The results of data analysis are presented in the section below. The study sought to determine the strength of the relationship between the effects of raw materials on food safety in children day-care centres on food safety in children day-care centres. The results are presented in Table 4.19

Table 0.18 Coefficients Determination of Raw Materials and Food Safety

Model 1	Unstandardized		Standardized	T	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	2.279	.631		3.614	.001
Effects of raw Materials	.189	.117	.213	1.612	.113

a. Dependent Variable: food safety in children day-care centres

Source: (Author, 2020)

Table 4.19 provides the information needed to predict food safety in children day-care centres from effects of raw materials. Both the constant and effects of raw materials contribute significantly to the model. The regression equation is presented as follows;

(Y) Food safety in children day care centres = 2.279 + .189 (Effects of raw Materials)

The study obtained the model summary of the effects of raw materials on food safety in children day-care centres in children day care centres and presented the results in the Table 4.20

Table 0.19 Model Summary on Raw Materials and Food Safety in Children

Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.399 ^a	.159	.082	1.342

a. Predictors: (Constant), effects of raw materials

Source: (Author, 2020)

The regression model in Table 4.20 shows the R and R² value representing the simple correlation. The R value is 0.399, which indicates a weak correlation. The R² value indicates how much of the dependent variable (food safety in children day-care centres), can be explained by the independent variable (effects of raw Materials). In this case, 15.9% can be explained. This therefore implies that there is an association between effects of raw Materials that can predict food safety in children day-care centres.

The Study further sought to find out how raw materials affect food safety in children day-care centres in children day care centres. ANOVA analysis yielded the results in - +2le 4:20

Table 212.20 ANOVA on Raw Materials and Food Safety

Model 1	Sum of Squares	Df	Mean Square	F	Sig.
Regression	18.698	5	3.740	2.077	.048 ^b
Residual	99.040	55	1.801		
Total	117.738	60			

a. Dependent Variable: food safety in children day-care centres

b. Predictors: (Constant), effects of raw materials

Source: (Author, 2020)

ANOVA results in Table 4.21 indicate that the regression model predicts the outcome variable significantly. An F statistic of 2.077 indicated that the model was significant. This was supported by a probability value of 0.048 and indicates that on overall, the model applied can statistically significantly predict the outcome variable.

4.8.5 Multiple Regression Analysis

The study did a multiple regression on the data and presented the findings in Table 4:

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Table 0.21 Quality of catering on food safety in children day-care centres

Model 1	Unstandardized		Standardized t	Sig.
	Coefficients			
	B	Std. Error	Beta	
(Constant)-Overall	.337	.302	1.114	.001
HACCP Principles	.315	.135	.314	.000

Staff Training	.253	.129	.284	1.954	.002
Government Policies	.345	.132	.336	2.603	.003
Raw Materials	.189	.117	.213	1.612	.000

a. Dependent Variable: food safety in children day-care centres

From regression results in Table 4.22, the .337 represented the constant, which predicted value of food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya when all Quality catering services remain constant at zero (0). This implied that Food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya Would be at 337 holding effects of), HACCP Principles, Staff Training, Government Policies and Raw Materials constant

The study found that HACCP Principles has significance positive influence on Food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya as indicated by $\beta_1=0.315$, $p=0.000<0.05$, $t=2.339$. The implication is that a unit increase in HACCP Principles would led to a significant increase in on Food safety in children day-care centres, Nyeri Town Constituency by $\beta_1=0.315$. From coefficient results the study found that Staff Training has a significance positive influence on Food safety in children day-care centres, Nyeri Town Constituency as indicated by $\beta_2= 0.253$, $p=0.002<0.05$, $t=1.954$. The implication was that a unit increase in Staff Training would result into increase in On Food safety in children day-care centres, Nyeri Town Constituency by $\beta_2= 0.253$.

From the regression coefficient findings, the study revealed that Government Policies, would have a significant positive influence on performance of Public Health Facilities

as indicated by $\beta_3 = 0.345$, $p = 0.003 < 0.05$, $t = 2.603$. The implication is that an increase in Government Policies, would lead to an increase in Food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The regression as indicated by $\beta_4 = 0.189$, $p = 0.000 > 0.05$, $t = 1.612$. This implied that an increase in Raw Materials constant would lead to an increase on Food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya.

$$\text{Food safety in children day-care centres (Y)} = 0.337 + 0.315 X_1 - 0.253 X_2 + 0.345 X_3 + 0.189 X_4 + \epsilon_i$$

Where

- X_1 = HACCP Principles
- X_2 = Staff Training
- X_3 = Government Policies
- X_4 = Raw Materials and
- ϵ_i = error term.

The results revealed that Government policies had highest influence on provision of quality in catering services, followed by implementation of HACCP principles, then raw materials. However, level of staff training had a negative influence on food safety in children day-care centres.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATIONS.

5.1 Introduction

This chapter summarizes the results gathered in the course of the study along the specific objectives. The chapter also draws conclusions and recommendations in line with the study objectives. The chapter finally suggests topics for further studies.

5.2 Summary of Results

The purpose of this study was to examine the factors influencing quality of catering service in day-care centres in Nyeri Town Constituency, Nyeri County, Kenya. The study sought the effect of implementation of HACCP principles, government policies, staff training levels and the raw materials in relation to the quality of catering service. The following is a summary of the main results of the study.

5.2.1 HACCP Principles on Food Safety in Children Day-care Centres

The study objective was to determine how the level of implementation of HACCP principles influences food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The study found that HACCP Principles has significance positive influence on Food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya as indicated by $\beta_1=0.315$, $p=0.000<0.05$, $t=2.339$. The study revealed that element of verification focused on collecting and evaluating scientific and technical information to determine if the HACCP plan, when properly implemented, will effectively control the hazards. Verification: Those

activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan.

5.2.2 Effect of Staff Training on Food Safety in Children Day-Care Centres

The study objective was to find out the influence of Staff training on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. From coefficient results the study found that Staff Training has a significance positive influence on Food safety in children day-care centres, Nyeri Town Constituency as indicated by $\beta_2 = 0.253$, $p = 0.002 < 0.05$, $t = 1.954$. From the study findings, majority of day-care centre catering staff formal training was to the level of Diploma and certificates. Further, a majority of day-care centres catering staff did not have high professional skills. The study also revealed that in majority of day-care centres, the catering staff did not have a lot of experience on catering related skills. In addition, majority of day-care centres, catering staff did not understand the government requirement on food safety in children day-care centres in day-care. Regression analysis showed that Staff training was significant in predicting food safety in children day-care centres in children day-care centres.

5.2.3 Government Policies on Food Safety in Children Day-care centres

The study objective was to evaluate the influence of Government Policies on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. As indicated by $\beta_3 = 0.345$, $p = 0.003 < 0.05$, $t = 2.603$. The implication is that an increase in Government Policies, would lead to an increase in food safety in children day-care centres. The established policy will include all public and private entities

involved in the scientific, technical, operational and management aspects of food safety and control systems in the country Governments must then ensure that food businesses comply with these requirements through training, inspection and enforcement. By implementing national food surveillance and monitoring programs, governments can verify if the controls in place are sufficient to maintain a safe food supply. Finally, to ensure that day-care centres health and interests are truly protected, governments must ensure that consumers are provided with timely, factual and balanced information on food safety issues.

5.2. Raw Materials on Food Safety in Children Day-care centres

The study objective was to examine the influence of raw materials on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The regression as indicated by $\beta_4=0.189$, $p=0.000>0.05$, $t=1.612$. This implied that an increase in Raw Materials constant would lead to an increase on Food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. The study revealed Food handlers should be effectively supervised and instructed to ensure the work in a hygienic manner. Less experience staff and those handling high-risk foods may require a higher level of supervision. Once trained, if staffs are not effectively supervised, poor habits will re-emerge.

5.3 Conclusion

The study concludes that the level of implementation of HACCP principles effects on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. There was a high level of implementation of HACCP which enhanced food

safety in children day-care centres. From the findings, it is clear that majority of day-care centres catering Staff always purchased food meant for the day-care from reputable or reliable suppliers and majority of these food commodities are being purchased at the right time. Additionally, majority day-care centres received food of good quality though food of different types was not stored in different storage rooms. Majority of the respondents agreed that hygiene was observed in the preparations of food as well as food hygiene was observed when handling food items before being served in day-care. However, cooking in most day-care centres was not done until all the ingredients were ready to be served in day-care. Finally, in most of day-care centres cooked food was being heated few minutes before time of serving.

The researcher can conclude that Staff training influence on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. At the day-care centres, the catering staff level of formal training was considered low as it was mainly at diploma and certificate level while majority of catering staff lacked high professional skills and experience on catering related skills. Majority of catering staff in the day-care centres reported low level of understanding of the government requirement on food safety in children day-care centres. However, the catering staff served delicious and sufficient food to children in their respective day-care centres.

Relevant Government Policies influence on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. Government Policies reduced on food safety in children day-care centres. Majority of catering staff in the day-care centres agreed that there were rules and regulations from the government on food

safety in children day-care centres. However, the level of adherence of these rules and regulations on food safety in children day-care centres in day-care was low. Furthermore, in majority of the day-care centres the Government Policies on food safety in children day-care centres were not fully applied due to the low levels of understanding by the stakeholders and neither were they enforced by the County Government?

The study also concludes that raw materials effect on food safety in children day-care centres, Nyeri Town Constituency, Nyeri County Kenya. Availability of raw materials at a fair price enhanced food safety in children day-care centres. A significant number of the respondents agreed that raw materials (ingredients) were readily available for day-care centres but were not affordable. The outsourced raw materials purchased at day-care centres were easily transported in the correct package and therefore were of high quality.

5.4 Recommendations

The study recommends HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product. For successful implementation of a HACCP plan, management must be strongly committed to the HACCP concept. A firm commitment to HACCP by top management provides company employees with a sense of the importance of producing safe food.

The study recommends that Catering staff should be encouraged to further their formal training as well as attend refresher courses. This will contribute to improving their level of professional skills to enhance on the quality of services at the day-care. With food safety concerns over the alarming increase in food poisoning cases attributed to food eaten outside of the home, it is essential that every caterer take steps to ensure that all food-handling staff are supervised and/or trained in food hygiene matters.

Day-care centres managers should sensitize the catering staff on existing Government Policies requirements on food safety in children day-care centres. The catering staff should apply the Government Policies on food safety in children day-care centres. Government officers should also enforce rules and regulations on food safety in children day-care centres in the day-care centres by regularly visiting the business premises for inspection.

Management of the catering departments in day-care centres should ensure different types of food are stored in different rooms

5.5 Suggestions for Further Studies

Based on the findings of the study, the researcher suggested the following studies to be carried in order to complement this study: Similar studies could be conducted in other sub-counties. A study on the effects of day-care on catering services to child development. A research into the effect of changing market costs on balanced food provision for day-care centres in the area

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APPENDIX I: QUESTIONNAIRE

Section A: Background Information

Kindly consider the questions concerning your background information and answer them by ticking the box that applies to you.

1. What is your gender?

Male Female

2. What is your education level?

Diploma/Certificate Bachelor's Degree Postgraduate

Diploma Master's Degree

Other

3. How old is your day-care ?

Less than 4 years 4-8 years 9-12 years

12-16 years 16 years or more

4. How many years have you worked as a catering staff in this day care

Less than 4 years 4-8 years 9-12 years

12-16 years 16 years or more

5. How many Children does the day care have?

Section B: food safety in children day-care centres

Hazard Analysis Critical Control Points (HACCP)

Kindly indicate by use of a tick in the table below the extent to which you agree or disagree with the statement concerning Hazard Analysis Critical Control Points (HACCPs) in your day care .

KEY: 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree

Statement	1	2	3	4	5
Food is always purchased from reputable supplier.					
Food is always received at the right time.					
Food always received is of good quality.					
Food of different types is stored in different storage rooms.					
Hygiene is observed in the preparations of food in day-care					
Cooking is done until all the ingredients are ready to be served in day care.					
Food hygiene is observed when holding food items before being served in day-care					
Cooked food is heated few minutes before time of service in day care					

How is the cooling of cooked food done in your institution.....

Section C: Staff training

Kindly indicate by use of a tick in the table below the extent to which you agree or disagree with the statement concerning Staff training on food safety in children day-care centres in your day-care ..

KEY: 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree

Statement	1	2	3	4	5
The level of training of catering staff is high					
Catering staff have high professional skills in day-care centres					
Catering staff have experience on the catering related skills					
Catering staff understand the government requirement on quality of catering service in the day-care					
Train food handlers in food hygiene matters commensurate with their work activity.					
Training food handlers to understand how food can become contaminated and the different types of food contamination					
Catering staff serves delicious and sufficient food to children in day-care centres					

In an effort to enhance, further the food safety in children day-care centres offered in your institution, clearly list the trainings needed for staff in the catering department.

Section D: Government Policies.

Kindly indicate by use of a tick in the table below the extent to which you agree or disagree with the statement concerning of catering services in your day-care

KEY: 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree

Statement	1	2	3	4	5
There are rules and regulations from the government on quality of catering service					
The level of adherence of rules and regulations on food safety in children day-care centres					
Promoting the adoption of the risk analysis approach for improving food control systems					
Developing tools and guides related to various technical and managerial aspects of food control.					
Food safety regulators distributed at all levels of the food supply chain.					
Applicability of Government Policies on food safety in children day-care centres					
The Government Policies of catering services is enforced in day-care centres					

List the Government Policies on food safety in children day-care centres.

Section E: Raw Materials Available

Kindly fill in the table below with data concerning raw materials availability on food safety in children day-care centres in your day-care and tick the box which indicates how much you agree or disagree with them.

KEY: 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree

Statement	1	2	3	4	5
Raw materials (ingredients) are readily available					
The raw materials are outsourced					
Handling of the raw materials and in-process and finished product in an appropriate manner including equipment capability material present a potential safety or handling concern to the employees or the facility					
Raw materials are affordable					
Raw materials purchased are of high quality					
Raw materials are easily transported in the correct package					

How regularly do you receive perishable goods in a week's time.....

Thank you very much for taking your time.

APPENDIX II: INTERVIEW CHECKLIST

- 1) Do you have medical certificate?
- 2) How regularly do you go for food handling test.?
- 3) What type of water do you use to clean your utensils and equipment?
- 4) Is there a designated facility to clean hands?
- 5) How do you ensure safety of food when preparing, cooking, storing and serving?

APPENDIX III: DAY-CARE CENTRES

The listed below are the day-care centre in Nyeri Town Constituency as per the time of research.

- 1) Skuta junior daycare centre
- 2) First fruit daycare
- 3) Clean Scheme daycare
- 4) New life home daycare
- 5) Cathedral nursery and daycare
- 6) Home of glory daycare
- 7) Baby care day-care
- 8) Joy dove daycare
- 9) P.C.E.A Ruringu daycare
- 10) Kids corner day-care
- 11) Precious daycare
- 12) Good hope day-care
- 13) Tamalaki day-care
- 14) Swan kindergaden and day-care
- 15) Kiddie land daycare
- 16) Jowan day-care

APPENDIX IV: COVER LETTER

Jacinta Kinyingi

Po Box 62756-00200

Nairobi.

Dear Respondent

RE: REQUEST FOR DATA COLLECTION IN YOUR DAY-CARE.

I am a post graduate student from Karatina University, Registration number **B304/2210P/15** per suing Masters in Hospitality management. I humbly request your assistance in collecting data towards my research topic on “**Influence of Quality of catering service on food safety in children day-care centres in children day-care Centre’s, Nyeri County, Kenya.**”

Any information collected shall be collated with other responses from all day-care centres. No reference will be made on you or your institution. I promise that the information given shall be treated with paramount confidentiality and the finding will be used only for the academic purpose towards achieving my degree. Nevertheless, a soft copy can be given to your day-care upon request.

Thank you for taking your time

Jacinta Kinyingi

Student, Karatina University.

APPENDIX V: PRINCIPLES OF HACCP AND APPLICATION

PRINCIPLE 1 - CONDUCT A HAZARD ANALYSIS

The application of this principle involves listing the steps in the process and identifying where significant hazards are likely to occur. The HACCP team will focus on hazards that can be prevented, eliminated or controlled by the HACCP plan. A justification for including or excluding the hazard is reported and possible control measures are identified.

PRINCIPLE 2 - IDENTIFY THE CRITICAL CONTROL POINTS

A critical control point (CCP) is a point, step or procedure at which control can be applied to prevent food safety hazard, eliminated or reduced to acceptable levels. The HACCP team will use a CCP decision tree to help identify the critical control points in the process. A critical control point may control more than one food safety hazard or in some cases, more than one CCP is needed to control a single hazard. The number of CCP's needed depends on the processing steps and the control needed to assure food safety.

PRINCIPLE 3 - ESTABLISH CRITICAL LIMITS

A critical limit (CL) is the maximum and/or minimum value to which a biological, chemical, or physical parameter must be controlled at a CCP to prevent, eliminate, or reduce to an acceptable level the occurrence of a food safety hazard. The critical limit is usually a measure such as time, temperature, water activity (Aw), pH, weight, or some other measure that is based on scientific literature and/or regulatory standards.

PRINCIPLE 4- MONITOR CCP

The HACCP team will describe monitoring procedures for the measurement of the critical limit at each critical control point. Monitoring procedures should describe how the measurement will be taken, when the measurement is taken, who is responsible for the measurement and how frequently the measurement is taken during production.

PRINCIPLE 5 - ESTABLISH CORRECTIVE ACTION

Corrective actions are the procedures that are followed when a deviation in a critical limit occurs. The HACCP team will identify the steps that will be taken to prevent potentially hazardous food from entering the food chain and the steps that are needed to correct the process. This usually includes identification of the problems and the steps taken to assure that the problem will not occur again.


PRINCIPLE 6 - VERIFICATION

Those activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan. The HACCP team may identify activities such as auditing of CCP's, record review, prior shipment review, instrument calibration and product testing as part of the verification activities.

PRINCIPLE 7 - RECORDKEEPING

A key component of the HACCP plan is recording information that can be used to prove that the food was produced safely. The records also need to include information about the HACCP plan. Record should include information on the HACCP Team, product description, flow diagrams, the hazard analysis, the CCP's identified, Critical Limits, Monitoring System, Corrective Actions, Record keeping Procedures, and Verification Procedures.

APPENDIX VI: LETTER OF AUTHORIZATION


KARATINA UNIVERSITY
SCHOOL OF BUSINESS
Email: deansub@karu.ac.ke / sobbps@karu.ac.ke

Tel. +254-(0) 0729721200

P.O. BOX 1957 - 10101
KARATINA
KENYA
2nd MARCH, 2017


TO WHOM IT MAY CONCERN

RE: KINYINGI JACINTA WANJIKU - B304/2210P/15

This is to confirm that the above is a bonafide student at Karatina University School of Business pursuing a Master of Hospitality Management (MHM) course leading to the award of degree in Master of Hospitality Management.

The student has defended her proposal (Factors Influencing Quality of Catering Services in Children Daycare Centers, Nyeri County) and passed, she is expected proceed to data collection.

Any assistance accorded to her will be highly appreciated.



Dr. David Gichuhi
DEAN, SCHOOL OF BUSINESS


APPENDIX VII:: PERMIT

THIS IS TO CERTIFY THAT:
MISS. JACINTA WANJIKU KINYINGI
of KARATINA UNIVERSITY , 1957-10101
karatina,has been permitted to conduct
research in Nyeri County

on the topic: FACTORS INFLUENCING
QUALITY OF CATERING SERVICES IN
CHILDREN DAY CARE CENTRES, NYERI
COUNTY, KENYA.

for the period ending:
27th March,2018

Permit No : NACOSTI/P/17/51910/16370
Date Of Issue : 27th March,2017
Fee Received :Ksh 1000




Jacinta
Applicant's Signature


[Signature]
Director General
National Commission for Science,
Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officer will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one (1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice



REPUBLIC OF KENYA



NACOSTI
National Commission for Science,
Technology and Innovation

RESEACH CLEARANCE
PERMIT

Serial No.A **13468**

CONDITIONS: see back page.