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SOUTH AFRICAN CONSUMER KNOWLEDGE OF THE PAEDIATRIC FOOD-BASED DIETARY GUIDELINES

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A research project submitted to the University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Consumer Science Food Retail Management

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Abstract

The co-existence of undernutrition, overnutrition, and micronutrient deficiencies constitutes what is known as the *Triple Burden of Malnutrition* (Prentice, 2023). While the perception may persist that this phenomenon predominantly affects lower-income communities within developing nations, it is crucial to acknowledge its impact on consumers across all settings. Contributing factors extend beyond resource scarcity, often related to lower-income groups, and also encompass a lack of awareness of proactive measures (Govender, et al., 2021).

Within the framework of the United Nation's second Sustainable Development Goal (SDG) the "Zero Hunger" initiative strives to reduce the Triple Burden of Malnutrition by 2023. However, this goal will largely be missed if current consumer ignorance toward proactive measures endures. The Paediatric Food-based Dietary Guidelines (PFBDGs) are available to caregivers as an educational tool that has the potential to make targets, such as the second SDG, more realistic (Bourne, 2007).

Among the most vulnerable to the Triple Burden of Malnutrition are young children aged 0-5 years, whose nourishment directly depends on their caregiver's competence toward feeding. Although there are various proactive measures in place, such as the abovementioned guidelines, caregivers often put the health of young children at risk due to overestimating their abilities. The situation is described by the Dunning-Kruger Effect (DKE) (Dunning, 2011), which is a cognitive bias whereby people with low capability regarding a certain domain tend to overestimate their abilities or knowledge. The DKE theory suggests that overconfidence gradually decreases as one's accurate knowledge of a specific topic of interest increases. A threshold is eventually reached, where confidence and competence increase in a favourable direction and limitations are recognised and admitted (Dunning, 2011).

DKEs can be harmful, especially in the light of young, vulnerable children. Such occurrences will consequently contribute to the country's prevalence of the Triple Burden of Malnutrition. This study therefore aims to investigate the possibility of DKEs amongst South African caregivers when it comes to young child feeding by comparing their subjective knowledge with objective knowledge (i.e. the PFBDGs). If the subjective evaluation surpasses objective criteria, a DKE is recognised, which underscores the need for consumer education of proactive measures, such as the PFBDGs, in this context. A structured, self-administered questionnaire was designed and distributed to consumers electronically through a link that could be accessed on an internet-connected device.

Data was conveniently collected throughout Gauteng by strategically focusing on areas with a significant concentration of participants meeting the predefined inclusion criteria. The inclusion of the sample was driven by the prerequisites of being a caregiver of one or more children under the age of five, residing in Gauteng, and being over 18 years old.

Overall findings indicate that the vast majority of consumers were largely unaware of the PFBDGs. A significant 61% of consumers reported their unfamiliarity with the PFBDGs, highlighting a crucial requirement for heightened awareness efforts. It is essential to make this proactive approach better available to ensure all consumers can fully capitalise on its benefits. Retailers bear a corporate responsibility of assisting consumers in making well-informed decisions. An effective strategy is to enhance the accessibility of the PFBDGs to consumers by incorporating direct links to the guidelines on the packaging of food intended for young children.

Subjective knowledge scores were collected with a 5-point Likert scale, and consumers were asked to rate their level of knowledge out of five for each dimension of the PFBDGs. The objective knowledge of the PFBDGs was tested with a 5-point ‘true’ or ‘false’ questionnaire. This approach enabled the calculation of total mean scores i.e. subjective knowledge and percentage scores i.e. objective knowledge which received a rating ranging from poor to excellent. The outcomes facilitated a comprehensive comparison to determine whether an overall DKE existed. The investigation delved into each dimension of the PFBDGs, allowing for a detailed comparison between subjective and objective knowledge to pinpoint specific areas where DKEs may be present.

Interferential statistics strengthened these results through ANOVAs and Multiple Comparison tests. This analytic approach not only facilitated the identification of possible influential factors or predictors of consumers’ subjective and objective knowledge but also enabled the precise identification of demographic groups with a heightened requirement for education on proactive measures.

Overall, the subjective knowledge outcome (M = 3.2) was aligned with the objective criteria (58.9%), and both knowledge fields across all dimensions were of average quality. The key findings from the subjective knowledge assessment indicated that a significant number of respondents held an inflated perception of their knowledge. Respondents seemed to rate their knowledge of the Feeding Practices (M = 3.26) and Hygiene (M = 3.6) dimensions of the PFBDGs as higher than average. Nonetheless, a contrast emerged when comparing the subjective evaluations with the objective knowledge scores.

The latter provided an accurate reflection of the consumers' actual knowledge which was of poor quality for Feeding Practices (46.23%) and average quality for Hygiene (52.08%), suggesting DKEs within these fields. In essence, even though an overall DKE was not determined, an overestimation of knowledge was particularly identified within the Feeding Practices and Hygiene fields.

The study's outcomes inspired focus toward policymakers to adhere to their corporate responsibility by focusing education on the identified fields most in need of intervention. By tackling concern areas in young child feeding, targets such as the Zero Hunger SDG can significantly be amplified. This can lead to a reduction in the harsh effects of the Triple Burden of Malnutrition among South Africa's youngest and most vulnerable generation.

Keywords

- Dunning-Kruger Effect
- Objective Knowledge
- Subjective knowledge
- Sustainable Development Goals (SDGs)
- The Paediatric Food-based Dietary Guidelines (PFBDGs)
- Triple Burden of Malnutrition

STATEMENT BY THE CANDIDATE

I declare that the research report, which I hereby submit for the degree of a Master's degree in Consumer Science Food Management in the Faculty of Natural and Agricultural Sciences, Department of Consumer and Food Sciences at the University of Pretoria, is my work and has not previously been submitted by me for a degree at another University. Where secondary material is used, this has been carefully acknowledged and referenced following the University's requirements. I am aware of the University's policy and implications regarding plagiarism.

DATE: 12 February 2024

STATEMENT BY THE SUPERVISOR / CO-SUPERVISOR

I declare that I hereby approve that the above-mentioned student may submit her research report.

SIGNATURE (Supervisor): DATE: 14 February 2024

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CHAPTER 1: STUDY IN PERSPECTIVE

This chapter sets out the background that motivated this research, together with the selected research problem and justification of the study. The specific research design and methodology emphasising key dimensions pertinent to this research were briefly provided.

"Do we know what we need to know?" - (Scholder, 1994)

1.1 Introduction and Background

Food forms a critical part of human survival from as young as infant life; it is also important in the social environment and essential for developing and maintaining quality health. The term "food" is defined as a substance comprising proteins, carbohydrates, fats, and additional nutrients, which are utilised in an organism's body to support growth and essential operations (Rolfes & Whitney, 2013).

Although the definition of food portrays the importance thereof to the human body, an alarmingly high number of the global population was reported to be malnourished in 2019, specifically within developing countries (Adepoju & Allen, 2019). Malnutrition persists in all forms around the globe, with young children severely suffering because of inappropriate food intake.

In the year 2020, an unsettling estimate of over 149 million children below the age of five confronted the global issue of stunted growth. Within this cohort, 45 million children were underweight, and an additional 38 million were overweight (WHO, 2020). Moreover, the World Health Organization reported crucial statistics: malnutrition played a role in a substantial 45% of deaths among children in this age group during the year 2020.

The "Zero Hunger" initiative, the second Sustainable Development Goal (SDG) established by the United Nations, has outlined a range of objectives aimed at improving nutritional quality by 2030 (Bourne, 2007). Although there have been notable advancements towards this goal, the rates of micronutrient deficiencies, underweight conditions, and overweight or obesity among young South African children remain at levels insufficient to be on the right path for improved child nutrition (Moyer & Hedden, 2020).

The *Triple Burden of Global Malnutrition* explains the abovementioned co-existence of undernutrition, micronutrient deficiency and overweight or obesity (Prentice, 2023). A stigma existed of predominantly associating this phenomenon with economically disadvantaged consumers. However, the overweight facet of the malnutrition burden, often encompassing obesity and type 2 diabetes in young children, is especially surging within households across the middle to high-income brackets, as outlined by Templin, et al., (2019). This emerging trend underscores that malnutrition affects consumers across all economic settings, indicating that there are attributing factors in addition to resource scarcity.

The lack of knowledge among caregivers regarding the proper feeding of young children is a significant factor contributing to the *Triple Burden of Malnutrition.* Young children have to rely entirely on their caregivers for survival. If caregivers lack the vital knowledge of proper feeding principles, this can lead to negative consequences. Not only does malnutrition threaten the young child's human right to development and survival, but it could initiate a snowball effect, where poverty and disease form a cyclical repetition in future generations (Toro, et al., 2023). In an attempt to address these severe consequences and identify the challenges, the consumers' knowledge of a proactive measure was evaluated in this study.

Knowledge is multidimensional, with objective and subjective knowledge forming the key constructs for this study. Objective knowledge refers to the amount of knowledge a consumer has of a factual nature, with subjective knowledge being what the consumer perceives to know about a topic (Ellen, 1994). Prior studies have shown that when there is a discrepancy or imbalance between knowledge in favour of the subjective knowledge field, consumers tend to overestimate their abilities by a significant margin (Rahmani, 2020). The Dunning-Kruger Effect (DKE) explains the occurrence of misaligned knowledge when uneducated consumers are not competent in particular domains and greatly overestimate their knowledge relevant to objective criteria (Dunning, 2011). This phenomenon of assumed knowledge places reliant individuals at risk, especially young children, who are directly dependent on their caregivers for nourishment, and thus, survival.

Enhancing consumer knowledge on this subject involves promoting proactive measures. Notably, the Food-based Dietary Guidelines (FBDGs) play a crucial role. These guidelines are designed to offer informative dietary recommendations, aiding consumers in making health-conscious choices appropriate for their child's age and developmental stage (UNICEF, 2022).

The goal is to cultivate diets that fulfil nutritional requirements and mitigate the risk of non-communicable diseases (NCDs). Within this context, the proactive country-specific Paediatric Food-based Dietary Guidelines (PFBDGs) were introduced to address paediatric nutritional needs. These guidelines serve as a tool to support caregivers in adopting improved feeding practices in an attempt to reduce the *Triple Burden of Malnutrition* in South Africa (FAO, 2024).

A DKE presence, because of misaligned knowledge with subjective knowledge taking the lead, suggests not only that caregivers lack factual knowledge but are additionally in a state where they are unable to recognise their need for further education (Rahmani, 2020). This highlights the need to evaluate caregivers' knowledge of the PFBDGs, to first determine an overall possible DKE existence, before zooming into each dimension of the PFBDGs to emphasise the need for increased consumer education within fields.

This study explored knowledge of the PFBDGs among primary caregivers of young children. Inconsistencies of knowledge, particularly when the subjective domain is in favour, pinpoint a DKE that could potentially put children at risk of malnutrition. The "Zero Hunger" target implemented by the Sustainable Development Goals for South Africa seems unattainable if current trends of inappropriate feeding continue (UNICEF, 2022).

By scrutinising disparities between caregivers' subjective and objective knowledge regarding the PFBDGs, this research aimed to address the impact of the Triple Burden of Malnutrition in South Africa's youngest generation. From a broader view, it sought to investigate how ambitious targets, such as the second Sustainable Development Goal, could become more attainable through targeted educational approaches addressing exposed areas of concern.

1.2 Problem Statement

The issue of malnutrition among far too many children is a major concern for public health in South Africa. To address this issue, the South African government has propagated policies such as the National Program of Action (NPA), which includes the First Call for Children initiative. This initiative places the needs of children first and aims to promote children's well-being, with nutrition being the policy's priority (GOV, 2024).

Many additional integrated programs are orientated towards the improvement of child feeding. The “Development of a National Integrated Nutrition Program”, “Reduction of low-birth-weight rate”, and “Reduction of Micronutrient Deficiency Disorders” are examples of strategies with the mutual goal of fighting this public health concern (NPA, 2002).

Although there clearly has been national support to reduce child malnutrition, South Africa has been unsuccessful in significantly decreasing the mortality rates among young children under five, which, in most cases, is linked to poor nutrition (Matidza, et al., 2023). This lack of success may be attributed to caregivers being ignorant towards educational tools such as the PFBDGs. Prioritising effective caregiver education is crucial in preventing poor young child feeding. However, this should be initiated by exposing the areas most in need of intervention.

This study was designed to identify knowledge gaps by first comparing the overall subjective knowledge results to objective criteria for a comprehensive overview, before evaluating each dimension of the PFBDGs separately. Zooming into specific dimensions of the PFBDGs would determine particular high-risk areas in need of intervention to make critical targets set out by national health and child-feeding programs more realistic.

Once the specific gaps in knowledge or areas of concern have been established, consumer education within the specific dimensions will be suggested. The outcomes of this study will expose vulnerable categories relevant to South African consumer knowledge of the PFBDGs, which are significant in the healthy development of young children. This identification will guide government policies in their decision-making and promote effective consumer education in the PFBDGs’ dimensions where it is most needed.

1.3 Justification of the Study

Previous research demonstrated that malnutrition remains a major problem across the globe - especially so in developing countries (Muller & Krawinkel, 2005). Severe consequences stem from this, such as stunted growth (Laura E. Caulfield, et al., 2002). Insufficient progress has been made towards the achievement of the National Program of Action (NPA) goal set out in terms of infant nutrition (NPA, 2002). Appropriate nutrition during the paediatric period has been proven to result in superior overall physical development and well-being, thus creating finer performance and, in due course, a fit health system (Turka, et al., 2019).

Preventative measures such as the PFBDGs are implemented to assist South African caregivers with reducing child malnutrition. Unfortunately, there is a possibility of caregiver ignorance regarding their knowledge of young child feeding, causing such proactive measures to be overlooked. Possible misalignments between consumers' subjective and objective knowledge, in favour of the subjective field (occurrence of the DKE), will highlight a state where caregivers believe that they do not need proactive measures, resulting in a contributing factor to this public health concern. Awareness of the PFBDGs was first investigated before delving into consumers' knowledge. Testing of consumers' subjective and objective knowledge overall, followed by all identified dimensions within the PFBDGs commenced.

The study sought to evaluate consumers' subjective knowledge of the PFBDGs against objective criteria. This evaluation expanded into specific areas of concern within the guidelines' framework. The comprehensive aim of delving into individual dimensions within the guidelines was to expose specific high-risk areas. The identification of these focal points empowers retailers to leverage consumer education effectively, with the ultimate goal of fostering informed decision-making within consumers in primary caregiving roles.

1.4 Social and Consumer Contributions

The study's findings aim to positively affect caregivers of young children among all income groups of South Africa. The exposure of high-risk areas in young child feeding, ascribed to misalignment knowledge, will aim to create awareness of dimensions in need of intervention. Consumer education, as a result, will arm caregivers with the knowledge needed to better their feeding practices, leading to a crucial step in creating a healthier society.

1.5 Academic Contributions

The outcomes of this study will benefit researchers by supplying them with new and relevant literature to guide future research involved with various key concepts of this study. The findings of this study were presented at the 13th International Food Studies Conference in Guadalajara, Mexico. This distributed valuable findings on the current state of caregivers' feeding abilities to researchers in the same field. Opportunities were provided to build on this research and the exposure of problem areas motivated fellow researchers to further scrutinise the topic at hand. Annexure A verifies the conference where the study's work was presented.

1.6 Industry Contributions

The exposure of possible DKEs in consumer knowledge of the current PFBDGs will empower retailers and infant product manufacturers to educate consumers in a specialised manner. The recommendations based on the outcomes of this study, as outlined in Chapter 5, offer significant advantages to the industry. Implementing these insights can not only contribute to informed decisions but also enhance the competitiveness of retailers and infant product manufacturers.

1.7 Research Aims and Objectives

The primary aim of this research was to gain insight into consumers' (particularly primary caregivers of young children) knowledge and consumer practices. The goal was to identify not only areas of concern but also possible opportunities for future intervention. Specifically, the objectives of this study were:

Objective 1: To explore and describe consumer practices.
Objective 1.1: To explore and describe consumers' current procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding).
Objective 2: To explore consumers' knowledge of PFBDGs to identify possible elements of risk when feeding young children.
Objective 2.1: To explore consumers' subjective knowledge of the PFBDGs.
Objective 2.2: To explore consumers' objective knowledge of the PFBDGs.
Objective 2.3: To identify a possible misalignment between consumers' subjective and objective knowledge of the PFBDGs (i.e., DKEs), which could be considered a risk factor when feeding young children.

1.8 Area of Research: Gauteng, South Africa

The research project collected responses from consumers residing in South Africa's Gauteng Province. Although Gauteng is the most populous and rapidly developing province that serves as the commercial centre of the country, poverty and inequality persist (Everatt, 2014). This region of South Africa is home to a diverse group of consumers, and it reflects various ethnic groups, languages and cultures. Figure 1.1 displays a map of Gauteng.

Figure 1.1: Map of the Gauteng Province (Google Maps, 2024)

1.9 Research Design and Methodology

This study used a quantitative approach that involved descriptive and exploratory techniques, which will be discussed in Chapter 3. The selected quantitative method was suitable for investigating a research topic that has limited existing findings and a large number of variables (Thacker, 1990). By utilising this research approach, new and updated discoveries can aid in the development of current theories within the field of investigation.

The study had the main aim of exploring consumers' knowledge and the possibility of misaligned knowledge of the PFBDGs to expose problematic areas. This was done by assessing their subjective knowledge (Objective 2.1) and objective knowledge (Objective 2.2). The possibility of an overestimation of abilities and a higher subjective knowledge score compared to objective knowledge was investigated (Objective 2.3) to pinpoint major areas of concern as a result of DKEs. Consumers' procurement of food groceries and infant formula, together with feeding practices i.e. breastfeeding (Objective 1.1) were investigated to report on the current appropriateness thereof, in response to the recommendations outlined in the guidelines. To present accurate findings of child-feeding practices, a cross-sectional sampling approach commenced.

Descriptive statistics were used to profile the selected sample. Consumers' subjective knowledge was tested by using a 5-point Likert scale. Participants were asked to rate their self-perceived knowledge of each dimension of the PFBDGs (Health, Feeding Practices, Hygiene, Nu

trition and Food Safety) in comparison with the assumed knowledge of their friends and family.

Their objective knowledge was tested by using a "true" and "false" option questionnaire, which tested their factual knowledge of all the dimensions of the PFBDGs. The outcomes from both the subjective and objective fields received a rating ranging from poor to excellent. This made the comparison of the different knowledge fields feasible to determine possible misaligned knowledge in response to Objective 2.3 and potential DKEs.

Data collection took place in a single phase by fieldworkers electronically distributing a structured, self-administered questionnaire, which was accessed through any internet-connected device. The study targeted areas with a high concentration of relevant participants by using a convenience-sampling technique. Such areas included crèches, kindergartens and a paediatric clinic. Given the time constraints applicable to this research, it was appropriate to collect a large number of responses at specific times when most of the potential participants could be approached.

1.9.1 Inclusion Criteria for the Sample

All qualifying consumers, regardless of age, gender, income class, ethnic group, or educational attainment, were included in the sample if they were over 18 years of age, resided in Gauteng, and were the caregiver of a 0-5-year-old child.

1.9.2 Survey Platform and Analysis of Data

Qualtrics software was used to create and distribute the survey to the selected study participants. The process was easy to administer as the software provided a link that directed participants to the survey, where they could input their responses. Once their responses were gathered, data cleaning took place. After cleaning the data, the findings were analysed. Statistical analysis included descriptive statistics, One-way Analysis of Variance (ANOVAs) to demonstrate statistically significant differences, Multiple Comparison tests to determine differences among specific groups, a Pearson's Correlation table, and a scatter plot conveying individual outcomes of participants' results.

1.9.3 Ethics

The Ethics Committee from the University of Pretoria applies strict regulations when considering a new research project. The committee was approached for the review and consideration of this study. Once the proposal was accepted, additional ethical considerations were kept in mind. The Ethical Clearance letter (Reference number: NAS208/2022) is attached to the study’s Annexure B.

To fully ensure the study's ethicality, additional proceedings were carried out. The questionnaire provided the participants with important information. An informed voluntary consent form was presented to them, allowing the participants to consider giving consent to partake in the study. Participants had to indicate what their age was, to ensure that all were older than 18 years. All the participants' details and inputs were treated confidentially, and they stayed anonymous by not indicating their names on the questionnaire. The participants were also informed that they could, at any time, leave out a question or completely stop participation without any penalties.

1.10 Structure of the Study

This study is divided into five chapters.

In Chapter 1, the *Triple Burden of Malnutrition* is identified as a serious public health issue affecting young South African children. This inspires the objectives of the study. The theory presented in the chapter raises concerns about caregivers' knowledge of the correct measures to address this issue. Therefore, the main aim of the study is to identify and understand consumers' knowledge of the PFBDGs and identify any misalignment between their subjective and objective knowledge regarding young child-feeding. The problem statement and justification of the study, supported by literature, lead to the formulation of the study's main aims and sub-objectives. Chapter 1 furthermore includes the research design, methodology, ethical considerations, and conceptual framework.

Chapter 2 presents an in-depth literature review to gain insight into existing research on the topic under investigation. The review covers various aspects of consumer knowledge, including subjective and objective knowledge, and its relevance to the study's main objectives. The explanation of knowledge expands into reporting on the Dunning-Kruger phenomenon, a theory which was used to guide the study. Additionally, the review highlights the proactive PFBDGs, which are intended to provide a measure to combat the Triple Burden of Malnutrition among South African children. Each dimension of the PFBDGs is critically explained to understand the importance of each field. Past studies with similar constructs are listed to identify any gaps in the current literature. Chapter 2 is crucial in building the background and existing knowledge for the study.

Chapter 3 presents the carefully selected research design and methodology for the study. This includes sampling participants, data collection, the measuring instrument, ethical considerations and data analysis through SPSS.

In Chapter 4, the results derived from the electronic questionnaire and the data analysis are presented. The sample's demographic characteristics, together with the procurement and feeding practices (Objective 1.1) are described by using descriptive statistics. Discoveries pertaining to the consumers' subjective (Objective 2.1) and objective knowledge (Objective 2.2) are outlined, with subjective knowledge as mean scores and objective knowledge as percentages. ANOVAs are used to identify statistically significant effects of demographical factors (specifically ethnic, age, and education groups) on subjective and objective knowledge, which, is enhanced by post-hoc Multiple Comparison tests where possible. Chapter 4 concludes with a scatter plot to portray a holistic perspective of individual consumers' subjective and objective knowledge results, followed by Pearson's Correlation Table to assess the strength and direction of possible correlations between subjective and objective knowledge scores.

The main purpose of Chapter 5 is to present the findings from the data analysis and address the objectives formulated for the study. This chapter achieves its purpose by discussing the findings from Chapter 4, which are supported by statistical evidence. Additionally, Chapter 5 presents the limitations of the study and recommended areas for future research. The final chapter consolidates the previous ones and summarises the main findings of the research.

1.11 The Theory of Social Practices

Figure 1.3 presents the conceptual framework for the study by making use of the Theory of Social Practices. A conceptual framework is a relationship between variables or assumptions underpinning the research, often making use of an existing model or theory (Cheng, et al., 2021). The Theory of Social Practices, which guided this framework, is a theoretical perspective on behavioural changes with regard to adapting social practices rather than individual behaviours (McElhinny & Muehlmann, 2006). A core task for analysis involving this theory is understanding the configuration of components that form practices with the dynamic relations between them.

Consumers, specifically primary caregivers of 0-5-year-olds, residing in Gauteng, were the input for this framework. Their lifestyle had a direct impact on their social practices, which were identified as interpretation, subjective and objective knowledge, and possible DKEs, resulting in possible inappropriate young child feeding practices. The listed social practices were expected to have a direct influence on one another. Subjective knowledge, which possibly surpasses objective knowledge, results in an overconfident attitude described by the DKE, placing dependent children at risk of malnutrition.

The system of educational information provision through governmental policies and the PFBDGs could be valued as a proactive measure to challenge this issue. In order to tackle the public health issue of child malnutrition, it is important to take proactive measures. To do this effectively, it is necessary to explore consumers' social practices, including both their subjective and objective knowledge, to determine the influential factors that lead to the unsustainable feeding of young children.

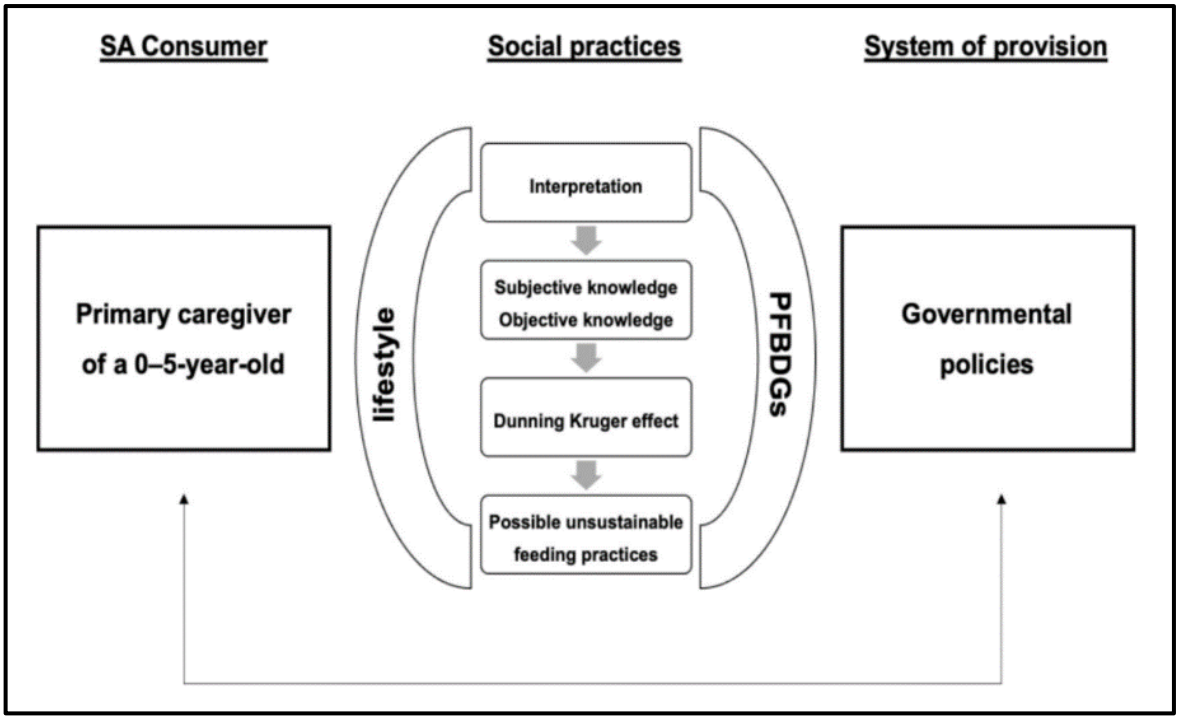

Figure 1.2 Conceptual Framework

1.12 Terminology

Section 1.12 provides valuable terms used throughout this research.

Table 1: Terminology

Term/Concept	Definition	References
Child wasting:	One of the main indicators used to evaluate the prevalence of childhood malnutrition in a country. A child can be classified as "wasted" if their weight is too low for their height.	(WHO, 2024).
Consumer questionnaire:	A series of questions specifically structured to gain information about certain topics of interest.	(Oncol, 2015).
Dunning-Kruger Effect:	A theory explaining a cognitive bias that indicates people's overestimation of competencies, often leading to the inability to recognise a need for interference, such as education from an objective source.	(Dunning, 2011).
Exclusive breastfeeding:	A feeding practice recommended by the PFBDGs for the first 0-6 months of an infant's life when infants receive breastmilk as their only form of nourishment, whereafter complementary feeding can be introduced with additional breastfeeding. The WHO described this feeding practice as the "most effective way to ensure child health and survival".	(WHO, 2024).
Health system:	The way all health services of a country are provided and the overall quality thereof.	(P. Yadav, 2014).

Term/Concept	Definition	References
Non-communicable diseases (NCDs):	A medical condition or disease that cannot be passed from one person to another. This type of disease is not caused by an acute infection but rather a result of a health consequence. This type of disease is also known as chronic.	(Calcaterra & Zuccotti, 2022).
Objective knowledge:	The amount of factual knowledge that a consumer possesses.	(Ellen, 1994).
Paediatric Food-Based Dietary Guidelines (PFBDGs):	In an attempt to address the effects of the Triple Burden of Malnutrition in South Africa, food-based guidelines were launched, with a specific focus on children from birth up to the age of seven. These guidelines were designed to be compatible with scientific and local public health concerns regarding nutrition, which should be practical in terms of numerous constraints for South African caregivers.	(FAO, 2024).
Pilot study:	An essential stage in research that aims to describe the importance of the steps involved with the execution of the study. The feasibility of the study is tested to ensure that the proposal is accurate. Additional aspects tested are the recruitment of subjects, research tools and data analysis, which will take place in the final study. A pilot study provides the groundwork for a research study.	(Ruel, et al., 2016).
Qualtrics:	A web-based software where users can build surveys and use numerous other tools for research goals. Responses can also be analysed on this software.	(Qualtrics, 2024).
Subjective knowledge:	The amount of knowledge that a consumer perceives to have about a topic or product, a form of self-assessed knowledge.	(Ellen, 1994).

Term/Concept	Definition	References
Stunting:	Impaired growth and development in children caused by poor nutrition, inadequate physical stimulation, or repeated infection. Children can be defined as stunted if their height for age is more than two standard deviations below the WHO's Child Growth Standards median.	(WHO, 2024).
Triple Burden of Malnutrition:	The co-existence of overnutrition, undernutrition and micronutrient deficiencies, which equally increases the risk of numerous health problems in humans.	(Chandy, 2020).
World Health Organization (WHO):	A section of the United Nations that handles health issues on a global level – from disasters to public nutrition and numerous additional health issues.	(WHO, 2024).

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CHAPTER 2: LITERATURE REVIEW

This chapter delves into the critical aspects relevant to the core constructs of this research. The concept of consumer knowledge will be introduced, followed by its relevance in terms of the Dunning-Kruger Effect and Imposter Syndrome. The South African PFBDGs will be placed in context, focusing on each dimension. This literature review concludes by discussing the present status of paediatric nutrition in South Africa, highlighting the significance of taking proactive steps pertinent to it, together with listing similar past studies.

2.1 Introduction

2.1.1 Consumer Knowledge

“Knowledge is power. Information is liberating. Education is the premise of progress, in every society, in every family” - (UN, 1997)

The nutritional knowledge of caregivers is a significant predictor of how well young South African children are fed (Motebejana, et al., 2022). The literature pinpoints the importance of accurate and comprehensive consumer knowledge when it comes to feeding young children. The following section will discuss the important forms of consumer knowledge and the effects of a misalignment thereof.

Understanding consumer knowledge is crucial when it comes to child feeding as it can provide insights into the potential risks of partial or inaccurate knowledge. Two types of knowledge were of the essence for this study: subjective and objective knowledge. Prior research suggests that objective and subjective knowledge are clear constructs, each with distinctive measuring techniques and various results in consumer behaviour (Han, 2019).

Subjective knowledge is perceived, assumed and self-assessed knowledge, or how much the consumer thinks they know about a product or concept, while objective knowledge entails the amount of accurate knowledge an individual has about a product or concept of interest (Carlson, 2024). Both underestimating and overestimating one’s knowledge can have negative consequences and pose a threat to the topic at hand. Therefore, it is vital for researchers to identify any potential knowledge discrepancies among the participants of a study.

2.1.2 Subjective Knowledge

Definitions of subjective knowledge in consumer behaviour literature are scarce, which can possibly be ascribed to the concept's simplicity, as Feldman (2016) states. Subjective knowledge is defined as the individual's perceived level of knowledge and is related to their self-confidence (Donoghue & Oordt, 2016). It forms a critical pillar in consumer knowledge as it strongly influences the decision-making process and consumers' ability to process information.

2.1.2.1 "A Short Reliable Measure of Subjective Knowledge": The Likert Scale

To measure subjective knowledge, consumers typically complete a self-reported scale in which they evaluate their perception of personal knowledge on a particular topic. When testing subjective knowledge, a 5-point Likert scale can be used (Flynn & Goldsmith, 1999). With reference to the abovementioned scale, consumers are required to select their agreeableness to options or phrases such as "not knowledgeable at all" or "extremely knowledgeable" while comparing their knowledge to that of others. Some scales require participants to select a scale number representing a level of agreeableness. A Likert scale is a rating scale used to estimate perceived knowledge, attitudes, or behaviour (Flynn & Goldsmith, 1999). The simplicity of this scale makes it a popular choice for survey research, especially when researchers are testing subjective knowledge. Figure 2.1 provides an example of the commonly used Likert scale when testing subjective knowledge, in this case, using a 7-point scale.

Table 1. Subjective Knowledge Items

*1.(1)	I know pretty much about *fashion clothing*.
2.	I know how to judge the quality of an *article of clothing*.
3.	I think I know enough about *fashionable clothing* to feel pretty confident when I make a purchase.
*4.(2)	I do not feel very knowledgeable about *fashions*. (reverse scored)
*5.(3)	Among my circle of friends, I'm one of the "experts" on *fashion clothing*.
*6.(4)	Compared to most other people, I know less about *fashion clothing*. (reverse scored)
7.	I have heard of most of the new *fashions* that are around.
*8.(5)	When it comes to *fashion*, I really don't know a lot. (reverse scored)
9.	I can tell if a *fashion item* is worth the price or not.

* (X) Item number in final scale.
Response format: 7 = strongly agree; 4 = neither agree nor disagree; 1 = strongly disagree.

Figure 2.1: Example of a Likert Scale Testing Consumers' Subjective Knowledge (Flynn & Goldsmith, 1999)

2.1.3 Objective Knowledge

Objective knowledge refers to the factual amount of knowledge an individual possesses of a particular topic. This knowledge is largely dependent on one's ability to retain information and reliable data stored in the memory (Mavodza, 2017).

2.1.3.1 A Measure of Objective Knowledge: True or False Test

Testing objective knowledge requires a thorough examination of every dimension of a topic (Han, 2019). A questionnaire using "true" or "false" questions is often included in a consumer survey that has the goal of testing consumers' objective knowledge (Brassil & Couch, 2019). This process requires consumers to evaluate given statements as true or false (Ponto, 2015). This system is advantageous as a wide area of knowledge can be tested due to the simplicity thereof, and it is appropriate in terms of time constraints which are often of the essence during data collection (Anaesth, et al., 2017). To improve accurate testing, researchers often add "Somewhat true", "I don't know", and "Somewhat false" options to the questionnaire (Chai, 2019). Figure 2.2 presents an example of a true or false test used in a recent study to evaluate consumers' objective knowledge, where "yes" portrayed a true answer, and "no" a false answer, using a 3-point scale.

Objective knowledge categories	**Response options Number of responses (%)**		
Agreements/Contracts	**Yes**	**No**	**Unsure**
You agree to a 24-month fixed-term cellphone contract with a cellphone service provider. After 18 months, you notify the service provider in writing that you want to cancel the contract. The service provider could refuse your cancellation.	181 (52.2)	**117 (33.7)**	49 (14.1)
You buy a second-hand car from a car dealer and discover that it has a defective gearbox. When you return it to the dealer, you are informed that there is a clause in your agreement that stipulates that the sale was *voetstoots* (i.e. you bought the car as is, with any defects it might have had at the time). The dealer may therefore refuse to repair the car.	162 (46.5)	**120 (34.5)**	66 (19.0)
A cellphone service provider phones you with a special offer on a cellphone contract. After signing the agreement for the cellphone contract, you decide that you want to cancel the contract. You may cancel the contract in writing within 10 days from signing and claim a full refund.	200 (57.0)	**59 (16.8)**	92 (26.2)

Figure 2.1: Example of a True or False Test, Measuring Consumers' Objective Knowledge (Donoghue & Oordt, 2016)

2.2 The Dunning-Kruger Effect (DKE) – *"Unskilled and Unaware of it"*

The Dunning-Kruger phenomenon derives its name from the pioneering researchers David Dunning and Justin Kruger, who initially defined this cognitive bias. This phenomenon characterises situations where individuals, despite lacking competence and exhibiting poor performance, encounter challenges in objectively assessing their knowledge (Kruger & Dunning, 1999).

With reference to Section 2.1.2 - 2.3.2, this bias arises when consumers' subjective knowledge surpasses their objective knowledge. It was reported that the effect is caused by a 'dual burden', which explains that although people are not always incompetent, the presence, for example, of some incompetence, robs them of the mental ability to realise their lack of skills (Dunning, 2011). Recent studies on this effect claim that anyone can be susceptible to the Dunning-Kruger Effect. While such an effect does not reflect low intelligence, it indicates a lack of insight and truthful reflection on one's abilities (Dunning, 2011).

Figure 2.3 presents the phases of the Dunning-Kruger Effect. The figure visually portrays the illusion of competence at the start of learning something new to the point of ignorance. The graph begins with an illusion of competence and develops over time; as the consumers recognise their incompetence, the graph develops towards the Valley of Despair phase. After this region of mediocrity, confidence and competence start to improve towards the "expert" phase of the slope. The Plateau of Sustainability is finally reached which, as the name suggests, gives rise to more responsible mindsets in consumers, as they are aware of their own inabilities (Dunning & Kruger, 1999).

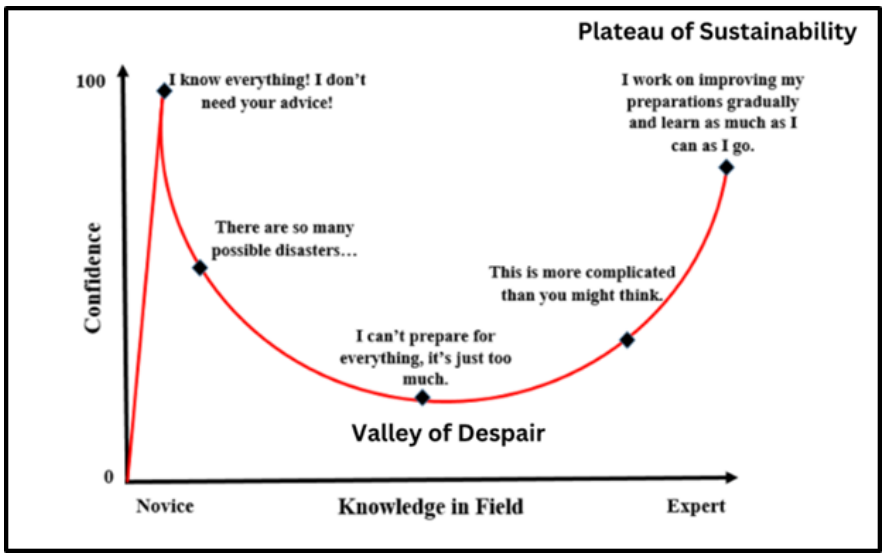

Figure 2.2: The Dunning-Kruger Effect Graph (Bryansullins, 2020)

2.2.1 The Imposter Syndrome

In contrast to the DKE, The Imposter Syndrome is a phenomenon describing instances where objective knowledge surpasses subjective knowledge. Clance & Imes (1978) first described this behavioural occurrence in 1978 as having self-doubt despite verifiable and objective evidence of success. This underestimation of skills has been identified to be most common among successful women and marginalised groups of consumers.

2.3 How Consumers Use Knowledge

According to a recent study aligning with a cognitive processing model, consumers with prior knowledge about feeding are more likely to use this information effectively and make better child-feeding decisions (Motebejana, et al., 2022). However, the source of knowledge must be reliable, as incorrect information or assumptions being made by consumers can lead to negative outcomes. Consumers acquire knowledge through their memory of product-related information that they received prior to the purchase of goods or products, as well as through brand data and past experiences that they trusted and adopted through cognitive learning (Batkoskaa & Koseskaa, 2012).

2.4 The Triple Burden of Malnutrition - *"21st Century Malnutrition"*

Saunders & Smith (2010) define malnutrition as a state where there is a lack, excess, or imbalance of nutrients in the body, which causes negative effects on the body's composition, functions, and overall health. Malnutrition has evolved into a burden with three pillars, known as the *Triple Burden of Malnutrition.* Section 2.4.1 - 2.4.3 describes each dimension of this phenomenon.

2.4.1 Undernourishment

A longstanding issue, specifically among children in developing countries, is undernourishment. Being underweight means having a low weight for one's height and age, which is usually a result of short-term weight loss (Babu & Gajanan, 2022). In children, undernourishment is measured by inadequate growth during their first five years of life. This is closely related to the terms *wasting* and *stunting,* which often occur because of undernourishment.

Stunting refers to poor linear development in children due to long-term deprivation, while wasting is measured as low weight for height, attributed to acute undernourishment caused by illness or a poor diet (Caulfield, et al., 2002).

Undernourishment not only affects a child's initial growth, but it also has long-term negative effects on their health and economic prospects. Studies show that it makes them more susceptible to obesity and metabolic disorders in adulthood, leading to the inter-generational transmission of malnutrition (Schoenbuchner, et al., 2019).

2.4.2 Overweight and Obesity

The World Health Organization (2021) defines obesity and overweight as abnormal fat accumulation that results in impaired growth. In many cultures, eating a lot and being overweight is regarded as a status symbol – an indication of wealth (Manafe, et al., 2022). Overnutrition is a widespread issue affecting children across all economic settings (WHO, 2021).

2.4.3 Hidden Hunger and Micronutrient Deficiency

An important health concern that is becoming more prevalent in public attention is hidden hunger. Many developing regions, and even some developed areas, have a widespread problem with not consuming enough of the important micronutrients, for example, vitamin A, zinc, iron, folate, and vitamin B12. This can lead to serious health problems, such as anaemia, which is especially common among young children and adolescents. In fact, the World Health Organization reported that nearly 40% of children under five years of age suffer from anaemia globally. Many children are also commonly deficient in zinc and vitamin A (WHO, 2023).

2.5 Malnutrition - "A Global Perspective on Paediatric Nutrition"

The 2018 Global Nutrition Report (GNR) highlights that malnutrition continues to be a major issue, with vulnerable children around the globe being the most affected (GNR, 2018). Despite some progress in reducing stunting, there are still concerning global trends in child malnutrition. A report highlighting key nutritional findings reveals that 22% of children under five years of age are stunted, while 50.5 million children in the same age bracket are wasted. Additionally, approximately 20 million new-borns are estimated to have a low birth weight as a result of inappropriate nourishment of the mother (UNICEF, 2023).

Although the overall situation may seem unsettling, there has been progress in reducing stunting in children under the age of five, which has been a major area of focus for health and nutrition efforts in recent years. The global prevalence of stunting has steadily declined from 32.6% in 2000 to 22.2% in 2017, with rates in specific regions also decreasing. For instance, Nepal has seen a decline from 57.1% to 36.0%, while Lesotho has declined stunting from 52.7% to 33.4% (UN, 2021). The prevalence of stunting has dropped from 38.1% to 23.2% in Asia, from 16.9% to 9.6% in Latin

America and the Caribbean, and from 38.3% to 30.3% in Africa (UN, 2021). However, despite the decrease in prevalence globally, the actual number of stunted children around the globe has increased from 50.6 million in 2000 to 58.7 million in 2017. South Asia has the highest burden of stunted children, accounting for 38.9% of the world's total.

Figure 2.4 compares the global rates of stunting, wasting, and overweight in children under five for the years 2000 and 2022. A relatively rapid reduction is seen within stunting and a small reduction in the wasting rate. However, the rate of overweight children has increased by a slight amount. Although the overall analysis seems hopeful, faster progress in stunting declines is needed to reach the UN's second SDG by 2030 (UNICEF, 2022).

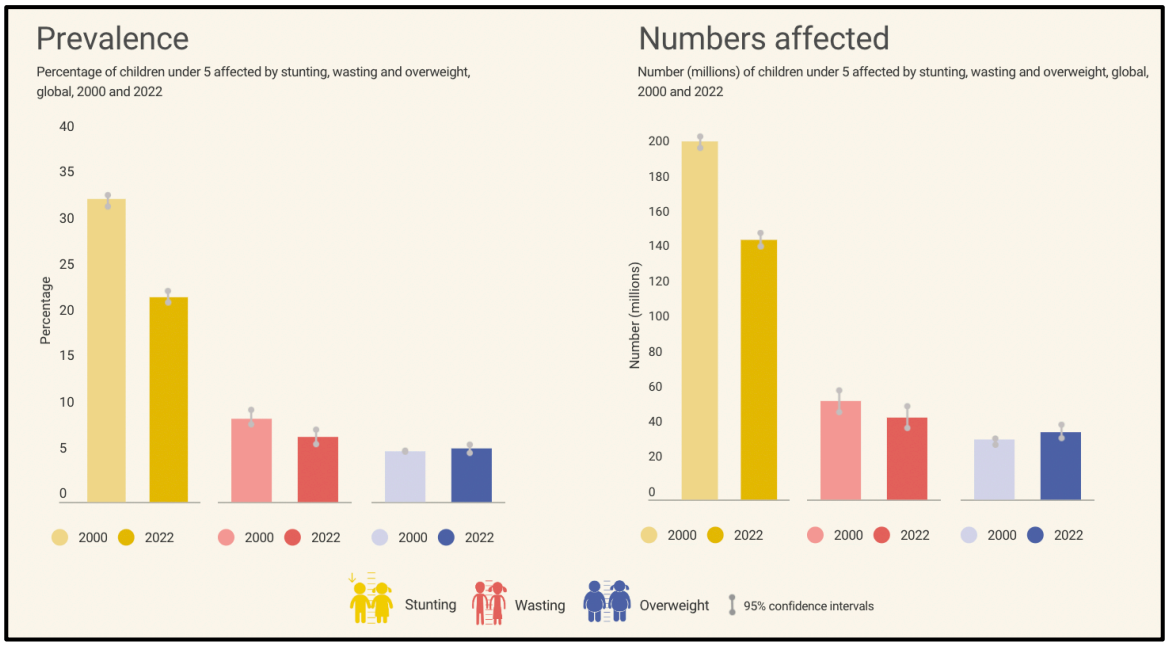

Figure 2.3: Stunting, Wasting, and Overweight Rates from a Global Perspective, (UNICEF, 2022)

2.6 The Current State of Paediatric Nutrition on a National Level

Few things have more impact on a child's ability to survive than nutrition (Chandy, 2020). South African children have benefited from several initiatives aimed at improving their nutrition, such as national school nutrition programs and breastfeeding awareness campaigns.

However, the COVID-19 pandemic introduced a significant challenge to the continuation of such programs. With many children relying on school meals as their main source of nutrition, the closure of schools during the pandemic placed them at risk of not receiving the healthcare and nourishment they so desperately relied on (Matidza, et al., 2023).

As a result, many children became even more vulnerable and did not get enough food during the two years of the pandemic's lockdowns, which led to worse malnutrition rates occurring on a national level (Matidza, et al., 2023). While child malnutrition has been a longstanding issue in South Africa, its prevalence has increased again in recent years. Statistics show that childhood and household hunger increased significantly during the hard lockdown in 2020 (Hendricks, et al., 2023). High levels of unemployment and poverty, as well as rising prices of basic foodstuffs, led to many parents and caregivers being unable to provide essential food to their families.

While there has been a decrease in acute child malnutrition since 2016, the prevalence of stunting and wasting remains alarmingly high, especially in Gauteng and Free State, as depicted in Figure 2.4.

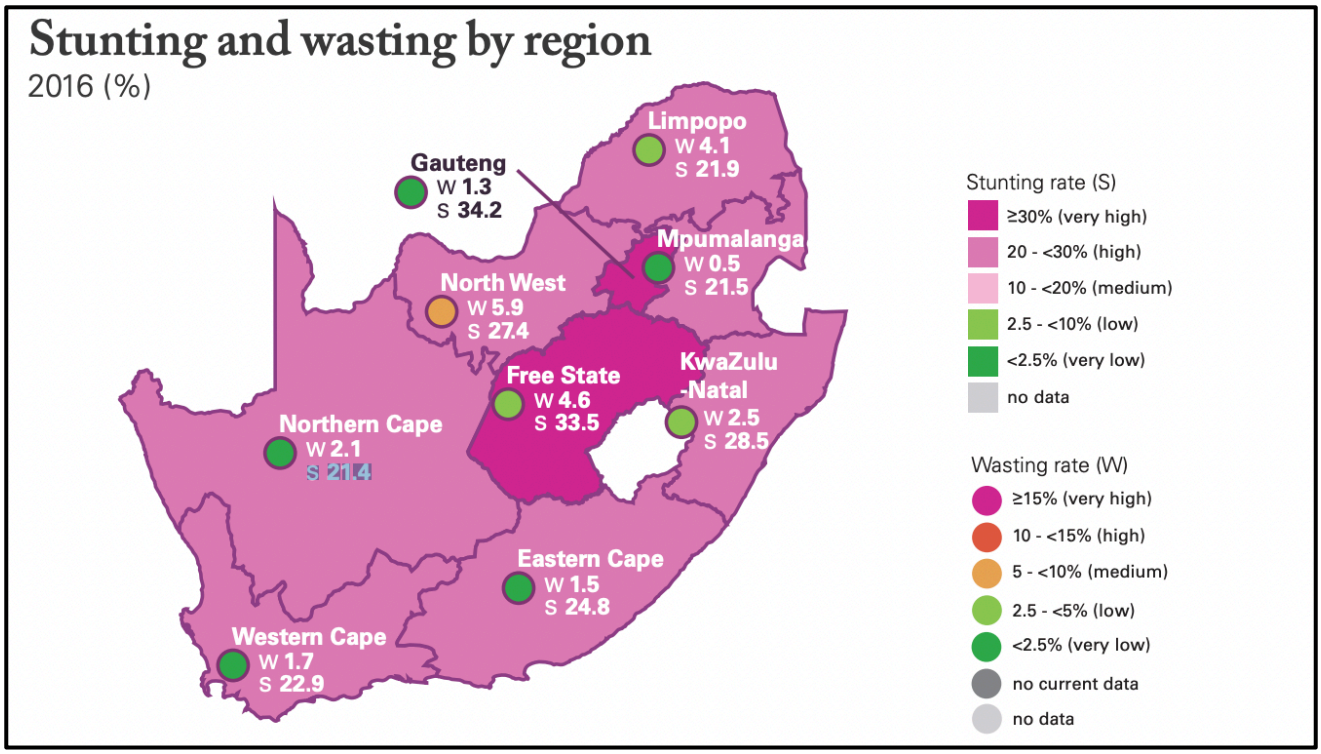

Figure 2.4: Stunting and Wasting by Province in 2016 (UNICEF, 2016)

2.7 Drivers of Malnutrition

Inadequate feeding practices can put a young child's health, growth, and development at risk. A new-born undergoes various stages of growth and development that determine their future health as an adult. The World Health Organization (2009) reported that any deviation during this critical period often causes developmental delays or disabilities. Malnutrition in developing countries or those facing war is primarily the result of poverty. The war between Russia and Ukraine has put millions of children in the Middle East and North Africa at risk of malnutrition because of the interruption to wheat supplies and the resulting rise in food prices (Devadoss & Ridley, 2024).

This problem is not exclusive to this region, or any other region affected by war, as the effects of increased food prices are felt globally. The World Bank (2023) reported that inflation higher than 5% is experienced among 61.9% of low-income countries around the globe. While individual physical factors play a role in child nutrition, it is evident that various socioeconomic factors can also lead to malnutrition. The International Food Policy Research Institute (2022) states the importance of socioeconomic factors, specifically inflation of food prices, as a predictor of child malnutrition causing widespread suffering.

Besides resource scarcity, there are many additional causes of malnutrition, which can include the caregiver having received insufficient education about health and nutrition (Yu, 2021). Although certain limiting factors may be unavoidable, educating consumers, especially so among vulnerable groups, can help mitigate some of the serious consequences of malnutrition in young children.

2.8 The PFBDGs

The revised Food-based Dietary Guidelines of South Africa are defined by The Food and Agriculture Organization of the United Nations (2012) as brief, positive recommendations in the form of guidelines that are published with the goal of informing consumers of food and beverage choices that will lead to optimal nutrition.

These guidelines are based on the most accurate scientific resources available on the correlation between what one consumes and one's health. South Africa was one of the very first countries to develop food-based dietary guidelines in line with the relevant suggestions made by the WHO and the Food and Agricultural Organization (FAO, 2012). It is important for consumers to have access to such guidelines that are specific to each country, as these guidelines consider factors such as income levels and natural resources. They are also designed to be realistic and achievable. By promoting better nutrition, these guidelines can help improve the overall health of citizens and contribute to a healthier society.

When implemented accurately, effectively, and broadly, country-specific guidelines can have a significant impact on the health and well-being of a country's population.

In 2012, the Department of Health revised these guidelines and tested them to assess whether consumers comprehended the content (FAO, 2012). The PFBDGs were created because of demands from the FAO and the WHO, to improve paediatric nutrition. These guidelines were meant to help parents provide the best possible nutrition for their children. By closely following the guidelines, even previously uneducated consumers can improve their children's nutrition. The guidelines were designed to benefit all parents, regardless of income. Figure 2.6 displays the cover of these guidelines.

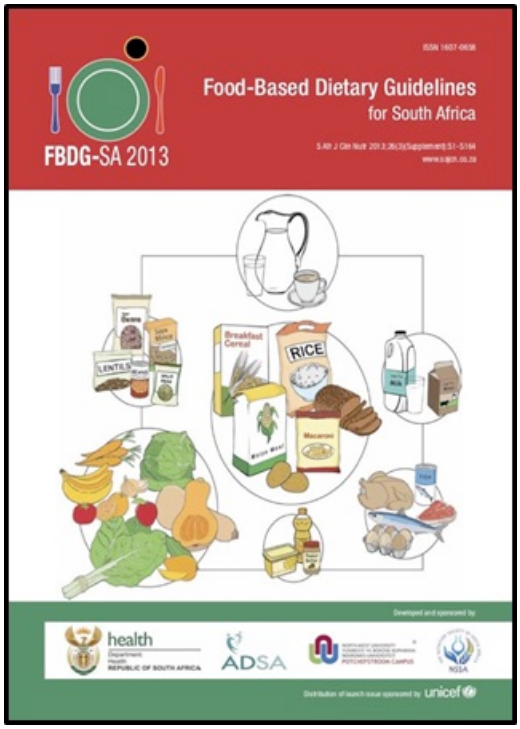

Figure 2.5: Cover of the Most-recent South African FBDGs (UNICEF, 2013)

2.8.1 The current PFBDGs available in South Africa

In 2013, the Department of Health requested that the PFBDGs be included as a part of the general recommendations for healthy eating alongside the FBDGs, leading to their adjustment (UNICEF, 2013). Among South African children, the main nutrition-related risks include being underweight, experiencing stunted growth, lacking vitamin A, not getting enough micronutrients, being overweight or obese, and facing early risks for NCD's (UNICEF, 2013). These nutrient-related conditions further motivated the need to adjust the PFBDGs.

Available literature indicated that while the initiation rate of breastfeeding was around 88%, only 8% of babies were exclusively breastfed at six months, and over 70% of infants received solid foods before the age of six months (WHO, 2023). A study investigating the prevalence of reasons for introducing infants too early to solid foods indicated that the mothers justified this by stating that "their baby was old enough", hinting towards a lack of caregiver education in this region (Clayton, et al., 2013).

Therefore, specific PFBDGs are necessary to inform the parents or caregivers of the correct way to feed infants. There are four age categories and associated PFBDGs to be considered: children aged 0-6 months, 6-12 months, 12-36 months, and 3-5 years. The Paediatric Working Group concluded that a single set of PFBDGs was inappropriate for these different age brackets (Bourne, 2007).

This study considers multiple dimensions of young-child feeding identified within the guidelines. The different dimensions include Health, Nutrition, Feeding Practices, Food Safety, and Hygiene, all of which are equally important in the nourishment of young children. Table 2.1 provides the current PFBDGs available to the public, as amended in 2013. The particular age categories and selected dimensions are included in the table.

Table 2.1: The PFBDGs, (UNICEF, 2013)

0-6 months	
Give only breast milk, and no other foods or liquids, to your baby for the first six months of life	Nutrition
6-12 months	
At six months, start giving your baby small amounts of complementary foods, while continuing to breastfeed for two years and beyond.	Feeding Practices
Gradually increase the amount of food, number of feeds and variety as your baby gets older.	Feeding Practices
Feed slowly and patiently and encourage your baby to eat, but do not force him or her.	Feeding Practices
From six months of age, give your baby meat, chicken, fish, or egg every day, or as often as possible.	Nutrition
Give your baby dark-green leafy vegetables and orange-coloured vegetables and fruit every day.	Nutrition
Start spoon feeding your baby with pureed thick foods, and gradually increase to the consistency of family food.	Feeding Practices

6-12 months	
Hands should be washed with soap and clean water before preparing or eating food.	Food Safety
Avoid giving tea, coffee and sugary drinks and high-sugar, high-fat or salty snacks to your baby.	Health
12-36 months	
Continue to breastfeed for two years and beyond.	Nutrition
Gradually increase the amount of solid food, number of feedings and variety as your child gets older.	Feeding Practices
Give your child meat, chicken, fish or egg every day, or as often as possible.	Nutrition
Give your baby dark-green leafy vegetables and orange–coloured vegetables and fruit every day.	Nutrition
Avoid giving tea, coffee and sugary drinks and high-sugar, high-fat or salty snacks to your baby.	Health
Hands should be washed with soap and clean water before preparing or eating food.	Hygiene
Encourage your child to be active.	Health
Feed your child five small meals during the day.	Feeding Practices
Make starchy foods part of most meals.	Nutrition
Give your child milk, maas or yoghurt every day.	Nutrition
3-5 years	
Enjoy a variety of foods.	Health
Make starchy foods part of most meals.	Nutrition
It is recommended to consume lean chicken, lean meat, fish, or eggs on a daily basis.	Nutrition
Eat plenty of vegetables and fruit every day.	Nutrition
Eat dry beans, split peas, lentils and soya regularly.	Nutrition
Consume milk, maas, or yoghurt every day.	Nutrition
Feed your child regular small meals and healthy snacks.	Feeding Practices
Use salt and foods that are high in salt sparingly.	Health
Use fats sparingly. Choose vegetable oils, rather than hard fats.	Health
Use sugar and food and drinks that are high in sugar sparingly.	Nutrition
Drink lots of clean, safe water and make it the beverage of choice.	Health
Be active!	Health
3-5 years	
Hands should be washed with soap and clean water before preparing or eating food.	Food Safety

2.8.2 Dimensions of the PFBDGs

Feeding young children requires attention to various dimensions recognised within the PFBDGs that are equally important. Section 2.8.2 discusses the dimensions pertinent to this study.

i) Hygiene

Hygiene refers to the necessary conditions and actions taken to control potential hazards and guarantee that the food is safe for human consumption based on its intended purpose (Heggum, 2016). Children under five are most susceptible to infection because of their developing immune systems (Lu, 2021). Globally, any infections infants are exposed to are a significant cause of death, with diarrheal disease being the second leading cause of death in children under five years old (Lu, 2021).

Fortunately, food-borne illnesses are preventable through practising good hygiene habits. Caregivers have the important responsibility of feeding young children. Optimal hygiene practices are necessary for vulnerable groups, such as children under five, to achieve proper nutrition for their growth and development. Therefore, hygiene is an essential proactive dimension in the PFBDGs, and caregivers' knowledge of this dimension is extremely important to prevent food-borne diseases in young children.

ii) Food Safety

With reference to the feeding of young children, food safety is the caregiver's responsibility to appropriately handle food in a manner that prevents the spread of harmful bacteria that can cause illnesses related to contaminated food (WHO, 2022). Young children have developed immune systems and less stomach acid, making them more vulnerable to food-borne illnesses caused by poor food safety practices. Inappropriate purchasing (including food that is too old, contaminated, exposed to insects and animals, or already showing signs of fungus or rot), incorrect preparation or cooking (with specific reference to internal temperatures and cross-contamination), and incorrect storing of raw or prepared foodstuffs will have serious consequences on a young child's health.

Children who are under five years old are at a higher risk of developing haemolytic uremic syndrome (HUS) from *E. coli* infections (Tserenpuntsag, et al., 2005). These severe complications can result in chronic kidney disease, kidney failure, and even death. As it is extremely important to practise appropriate food safety when feeding young children, caregivers should place high value on the crucial messages about food safety communicated in the PFBDGs.

iii) Feeding Practices

Feeding Practices refer to the methods caregivers use to modify a child's diet through specific goals, procedures, and behaviours (WHO, 2023). This includes breastfeeding and introducing complementary foods. According to the WHO, mothers should breastfeed their infants exclusively for the first six months to promote optimal growth, development, and health of the infant. It also promotes better bonding between mother and child (Liu, et al., 2014). Breastfeeding practices are highlighted in the PFBDGs because of their advantageous results if exclusively applied for the first six months of the infant's life. This includes benefits for both the mother and infant: a lower risk of gastrointestinal infection for the baby, more rapid maternal weight loss after birth, and a delayed return of menstrual periods (Dieterich, et al., 2013).

Once a baby reaches the age of six months, breast milk alone is not sufficient to meet their nutritional needs. It is recommended for caregivers to then start introducing complementary foods, such as solid, semi-solid or soft foods. Introducing complementary foods too early, in other words, before the baby is six months old, can have negative effects, including interference with the infant's feeding behaviour, reduced breast milk production, decreased iron absorption from breast milk, and an increased risk of infections and allergies in infants (Dieterich, et al., 2013). This highlights the importance of caregivers being educated on feeding practices employing the PFBDGs. If caregivers are not knowledgeable about the subject, it may have adverse effects on both the mother and the child.

iv) Health

Health, in terms of the feeding of young children, refers to feeding the child various foods to supply adequate nutrients which will support the child's growth and development. This term further refers to a child's physical and mental state as a result of having received appropriate nourishment (Berti & Socha, 2023).

Unhealthy feeding principles applied to young children can have serious consequences such as weakened immune systems and increased risk of contracting various illnesses. Prolonged exposure to unhealthy food or feeding practices can furthermore lead to long-term health issues, for example, osteoporosis, cardiovascular disease, type 2 diabetes, asthma, and mental health concerns (Tserenpuntsag, et al., 2005). As children have a right to good health, it is crucial for caregivers to understand healthy practices for feeding. The PFBDGs provide the necessary guidelines for caregivers on principles for promoting a young child's health through appropriate nourishment (Bourne, 2007).

v) Nutrition

Nutrition refers to the intake of food and liquids, or breastmilk in the case of infants, and the conversion of these into essential energy necessary for life (Faizan & Rouster., 2023). Providing infants with appropriate nourishment is crucial for their overall health and growth. The physical benefits of proper nutrition are endless, including giving children the energy to live life to the fullest, preventing malnutrition, maintaining their immune system, preventing obesity, and lowering the risk of chronic disease (Reverri, 2022).

Additionally, proper nutrition enhances learning ability, resulting in better chances for employment in later life, thereby creating pathways to escape the vicious cycle of poverty and hunger (Alderman, et al., 2007). Caregivers are responsible for providing infants with optimal nutrition, not only to avoid the severe causes of malnutrition but also to provide the child with the physical and emotional benefits derived from receiving optimal nutrition. Guidelines that fall under the dimension of nutrition in the PFBDGs were designed to guide caregivers in a positive direction to enhance their nutritional status.

2.9 The Impact of Lifestyles on Feeding Habits in South Africa

The term “consumer lifestyle” refers to a person’s way of living, including their hobbies, interests, habits, attitudes, purchasing and consumption behaviours. These factors help researchers to group people based on their age, location, income, and gender (Akkaya, 2021). A recent study discovered that regardless of a consumer’s lifestyle, most people prioritise the quality, nutritional value, and safety of the food they purchase. The study also revealed that many people are adopting healthier lifestyles, which is evident in their food choices (Djer, 2020).

However, while most parents desire to feed their children more healthily, they lack the basic knowledge of how to do so, or how to utilise informational resources such as food labels and guidelines (Begley, et al., 2019). This emphasises the need for greater consumer education through resources such as the PFBDGs. The goal of improving South African eating and feeding practices and the proper use of the PFBDGs faces several challenges, including poor consumer knowledge and constraints, such as current consumer lifestyles (Begley, et al., 2019).

Despite the clear benefits of exclusive breastfeeding for the first six months of age, which provides all the essential nutrients for an infant’s growth and health, it is often disregarded as an option (Doku, 2020). Clinical research shows that this practice is vital, yet up to 80% of mothers globally do not adhere to this recommendation.

They may avoid breastfeeding their infant because of a range of factors; in some cases, as they return to work very soon, or they fear the loss of an attractive figure, or they find breastfeeding painful or do not produce enough milk; some even have the belief of viewing breastmilk as an “expired substance” that causes abdominal pain in the infant (Hamilton, 2020).

Additionally, only 57% of mothers initiate breastfeeding within the first hour of delivery either because the child was premature and was in intensive care, or the mother is in intensive care and cannot even pump off some milk, or it is due to the mother’s lack of knowledge, caused by her not having attended pre-natal educational classes (Gohal, et al., 2023). Work schedules, cultural beliefs, and privacy concerns are additional lifestyle factors serving as barriers to the guidelines pertaining to exclusive breastfeeding (Lauer, et al., 2019).

Financial constraints and the expense of protein products may make it difficult for many caregivers to follow dietary guidelines properly (Brooks, et al., 2010). This can lead to severe challenges caregivers face when trying to apply recommendations such as “Give your child meat, chicken, fish or egg every day, or as often as possible”. This is particularly true for low-income South African consumers who face numerous challenges when trying to follow the PFBDGs (Mphasha, et al., 2023). High numbers of unemployment, poverty and a lack of education additionally add up to disregarding valuable recommendations concerning protein intake (Wimmer†, et al., 2023).

2.10 Region of Investigation: Gauteng, South Africa

The Gauteng province was selected for this study due to several factors. According to Statistics South Africa (2019) Gauteng has the highest population number in South Africa, even though this province only occupies 1.5% of the country’s land area.

This sizeable population comprises diverse consumer groups with varying cultures, ethnicities, incomes, ages and educational backgrounds, making Gauteng a suitable representation of South Africa as a whole. Figure 2.7 indicates Gauteng’s large population size compared to the other provinces in South Africa.

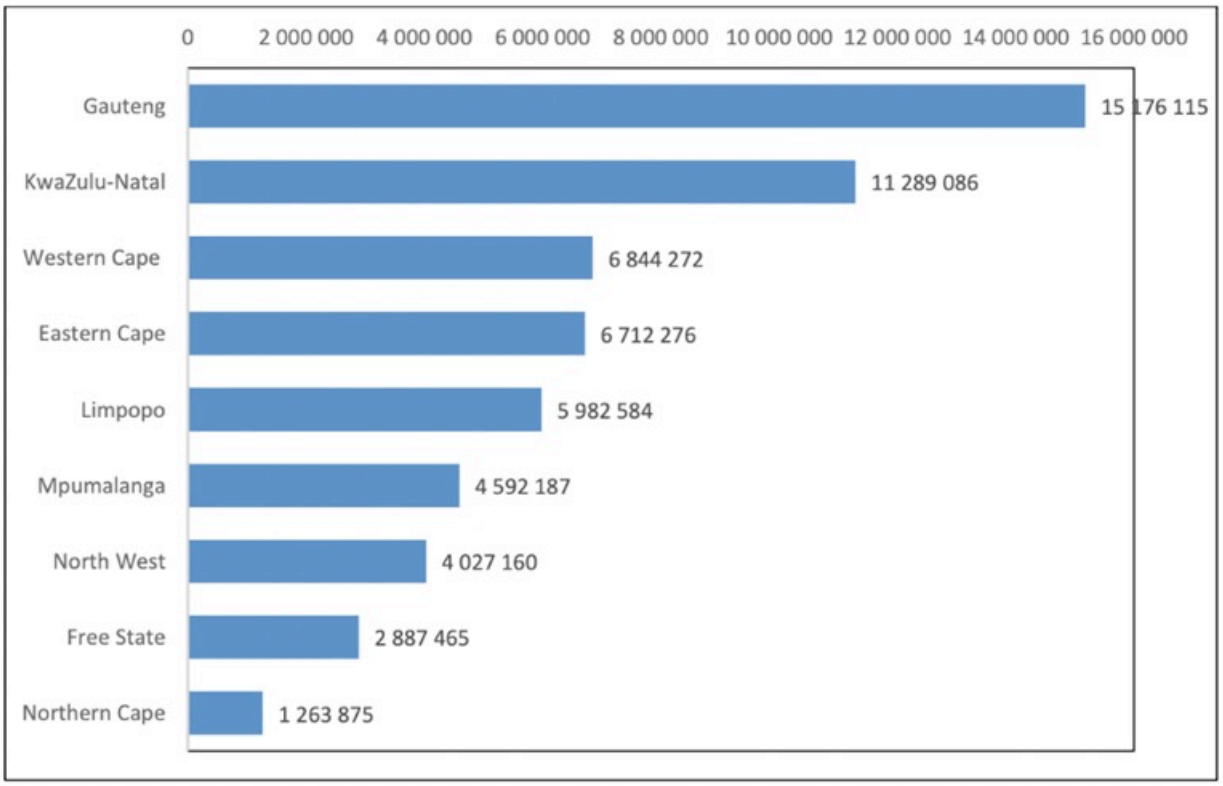

Figure 2.6: Mid-year Population Estimates for South Africa by Province (StatsSA, 2019)

2.11 Similar Studies Conducted in South Africa

Table 2.2 presents data on comparable studies conducted in South Africa, serving as a valuable tool for researchers to identify gaps in the existing literature. This resource facilitates the identification of areas where new concepts can be inspired within the field of study.

Table 2.2: Similar Studies Conducted in South Africa

Title of the Study	Outcomes	Reference
An assessment of the comprehension of the preliminary 2007 version of the South African paediatric food-based dietary guidelines for Northern Sotho infants 6–12 months of age in Soshanguve and Ga-Rankuwa	No previous exposure was noted within participants when asking them about the PFBDGs. Overall, guidelines were well understood with a few exceptions. Guidelines which needed possible adjustments included “enjoy time with your baby”, “increase your baby’s meals to five times a day”, and “teach your baby to drink from a cup”.	(Pretorius, 2015)
Challenges to implementing the food-based dietary guidelines in the South African primary school curriculum: a qualitative study exploring the perceptions of principals and curriculum advisors	A lack of knowledge regarding the FBDGs of educators was exposed. Influential factors included time constraints, lifestyle-related factors, and a lack of resources.	(Nguyena, et al., 2017)
An introduction to the Food-Based Dietary Guidelines for the Elderly in South Africa	Food-based Dietary Guidelines have been determined to be a valuable tool for community members. These guidelines have the potential to empower and educate the elderly in an affordable manner. Healthcare workers are encouraged to take advantage of these guidelines.	(Napierab, et al., 2021)

Title of the Study	Outcomes	Reference
South African food-based dietary guidelines: testing of the preliminary guidelines among women in KwaZulu-Natal and the Western Cape	Concern areas were confusion among participants concerning certain terms used within the guidelines. Such terms included “legumes”, “foods from animals”, and “healthier snacks”. Additional constraints identified to implementing the guidelines were cost and availability of food, food preferences of the household, procurement habits, cultural beliefs, time constraints, and underlying attitudes toward nutrition and health.	(Love, et al., 2001)
Adherence to the South African food based dietary guidelines may reduce breast cancer risk in black South African women: The South African Breast Cancer (SABC) study.	Higher adherence to the South African Food-based Dietary Guidelines may reduce breast cancer risk among the population. It was however exposed that there was a dire need for educational campaigns and to increase the adherence of these guidelines.	(Jacobs, et al., 2022)
Food-based Dietary Guidelines as Nutrition Education Tool Among Tswana Women in the Northwest Province.	Various groups of participants interpreted the messages of the guidelines differently. Influential factors of adhering to the guidelines were determined as individual and household preferences, affordability, availability of food, and prior knowledge.	(Kgengweny, 2006)

Title of the Study	Outcomes	Reference
An assessment of preliminary food-based dietary guidelines for infants 6–12 months of age in the Little Karoo area of the Western Cape Province of South Africa	The majority of participants perceived the guidelines as important. However, some guidelines were not well comprehended without prior explanation, these included guidelines involving meal frequency and cup feeding, with the guideline pertaining to prolonged breastfeeding as most concerning.	(Merwe, et al., 2007)

Table 2.2 presents a comprehensive list of previous research that share common constructs with this study. While there are many studies dedicated to Food-based Dietary Guidelines (FBDGs), it is noteworthy that the exploration of the paediatric division within these guidelines (PFBDGs) remains relatively limited. There is also a scarcity of research specifically delving into the geographic region selected for this study.

2.12 Conclusion of Literature Review

The South African Child Gauge (2020) has drawn attention to the issue of nutrition and food security, highlighting the high prevalence of stunting rates, overnutrition, and micronutrient deficiencies in the country. Despite global efforts to tackle this issue, and South Africa having several programs and initiatives to address this challenge, only minor progress had been made prior to the onset of the COVID-19 pandemic (Hart, et al., 2022).

While the proportion of children under five suffering from undernutrition has decreased by one-third, which is a positive sign (UN, 2021), far too many young children are still malnourished. Unfortunately, the number of stunted children in South Africa reached 1.7 million in 2021, almost double the already high number of 900,000, which had been targeted for 2025. The literature has identified proactive measures as strategies to achieve crucial goals. One such measure is educating caregivers on the correct way to feed young children, by use of the PFBDGs (Clayton, et al., 2013).

The theory behind consumer knowledge was examined and presented in the literature. It has been found that the Dunning-Kruger Effect, which refers to elevated subjective knowledge in comparison to objective knowledge, can have detrimental consequences, particularly in the context of nourishing young children (Ehrlinger, et al., 2008). In this scenario, it becomes evident that ignorance is far from bliss, as young children rely fully on their caregivers for nourishment, making them vulnerable to the effects of overestimated abilities (WHO, 2023).

This chapter supported the need to evaluate consumers' knowledge of the PFBDGs. The importance of all dimensions of the PFBDGs has been established and inspired the need to investigate consumers' knowledge of all such fields, especially the possibility of misaligned knowledge, in favour of the subjective construct, resulting in an overestimation of competence. Chapter 3 delves into the research design and methodology selected for this study.

CHAPTER 3: METHODOLOGY

Chapter 3 provides a comprehensive overview of the research design employed for this study. The methodology is discussed, encompassing the utilisation of a self-developed measuring instrument and existing scales for data collection. Each method selected has been carefully considered for its appropriateness in addressing the specified objectives of this study.

3.1 The Research Design - *"A Roadmap for the Study"*

Miller & Salkind (2002) define the research design as the overall approach adopted for conducting a study to address specific research questions. This framework provides a roadmap for the entire research process, from formulating research questions to accurately reporting final findings. Quantitative research is advocated in the literature, particularly when the goal is to identify and explain specific areas of concern through numeric data (Myer & Avison, 2002). A quantitative research approach was deemed appropriate as the initial focus was on subjective knowledge, which was introduced and analysed through mean scores for specific dimensions. Subsequently, objective knowledge was analysed and presented through percentage scores for each dimension. Implementing a cross-sectional research approach, the study investigated a diverse group of caregivers at a single point in time, capturing data based on their current knowledge (Hunziker, 2021). Given the limited existing research on consumers' subjective and objective knowledge of the PFBDGs in the geographical area under study, an exploratory-descriptive approach was deemed appropriate. Jones & Goldring (2022) recommended the exploratory-descriptive approach when the investigated topic faces limitations in terms of prior research.

To contribute to new and relevant knowledge in this context (Jones, et al., 2013), study participants completed a structured, self-administered online questionnaire. This questionnaire, developed specifically for this study, initiated data collection by addressing consumers' demographical characteristics. Subsequent sections focus on questions related to consumer practices, specifically, their procurement of food groceries and infant formula, followed by feeding practices i.e. breastfeeding (Objective 1.1).

Objective 2.1 involved testing consumers' subjective knowledge, followed by an examination of their objective knowledge (Objective 2.2). This sequential strategy facilitated the examination of potential DKEs by first comparing the average subjective domain against the average objective field.

Subsequently, it allowed for the comprehensive exploration of possible DKEs across all dimensions of the PFBDGs, in response to concluding Objective 2.3. A thorough discussion of this custom-developed measuring instrument is provided in Section 3.6.

3.2 Population and Study Area

The study area is defined explicitly as a subset of the targeted population, in this case, focussed on the Gauteng province of South Africa (Wieczorek & Hanson, 1997). In this study, the unit of analysis comprises consumers, particularly caregivers responsible for the caretaking of children under the age of five, residing in Gauteng. Although the PFBDGs include guidelines for children up to the age of seven, this study focused on children up to five years of age, with reference to the definition of *paediatric* (Leung, 2015). The study welcomed the participation of all individuals, irrespective of gender, income, or ethnic group. It is important to clarify that while food insecurity may be more prevalent among specific population groups and lower-income individuals, this study did not aim to confirm or explore these aspects. Instead, the primary aim was to delve into consumers' knowledge, both subjective and objective, concerning the PFBDG, with a specific focus on possible DKEs, to expose problem areas.

Notably, Gauteng exhibited the highest stunting rate nationwide, emphasising the need to enhance paediatric nutritional education among caregivers in this region (Kubela & Mojadji, 2023). Figure 3.1 provides a visual representation of the study area in relation to South Africa, offering a comprehensive perspective.

Figure 3.1: Map of Gauteng South Africa, (Thompson, 2015)

3.3 Sampling

Sampling, defined as a technique used to collect smaller units from a larger population for accurate generalisation (Dhivyadeepa, 2015). A convenient method was employed for this study. The convenience sampling method is typically employed when a specific purpose is targeted or when researching the required population is challenging (Jager, et al., 2017). Given the potential challenges in engaging caregivers of children, the convenience sampling approach proved advantageous for its efficiency in terms of time and cost.

Convenience sampling, a non-probability method, involves selecting individuals from a targeted population based on their availability, meeting inclusion criteria, willingness to participate, and proximity to the researcher (Jager, et al., 2017). In this study, inclusive criteria were specifically defined as (i) being a caregiver of a young child (0-5 years old), (ii) residing in Gauteng, and (iii) being older than 18 years.

Specific locations were strategically selected to maximise the likelihood of encountering a significant number of relevant consumers who met the inclusive criteria. These locations included venues such as a paediatric clinic, crèches, kindergartens, and shopping centres across various regions of Gauteng. It is important to note that the selection of these locations did not aim to be representative of South Africa or Gauteng statistics, and no quota controls were applied. This method proved convenient as these locations often housed potential participants, offering time and cost savings due to their concentrated accessibility.

3.3.1 Sample Size

The sample size, defined as the number of subjects selected from a population for a study, represents a larger population of similar consumers (Andrade, 2020). Selecting an appropriate sample size is crucial, as too few participants may limit statistical outcomes, while an excessively large sample size can deplete valuable resources such as time and money (Mumtaz, et al., 2022). Therefore, careful consideration was given to selecting an appropriate sample size.

To ensure data integrity, the SPSS data validation function was employed to assess the completeness of responses. Any responses deemed insufficient to contribute to the main objective of the study were excluded. The final count of successfully valid questionnaires was suitable and included for subsequent data analysis.

Following the general rule proposed by Willner & Brush (1990), sample sizes consisting of 200-300 participants provide an acceptable margin of error and fall within the range before the point of diminishing returns. This literature supports the chosen sample size for this study, deeming it appropriate for achieving meaningful and reliable results (Ganesha, 2022).

3.3.2 Data Collection

A fieldworker is an appointed investigator assisting with data collection. For this study, fieldworkers were purposefully selected to devote themselves to data collection on behalf of the primary researcher (Thomas, et al., 2015).

Data collection was simplified through the appointment of 10 fieldworkers. These fieldworkers were relevant to the research as all of them were completing their studies in the Department of Food and Consumer Science at the University of Pretoria. The process was simplified as each fieldworker was required to gather at least 10 responses, with the end goal of obtaining 300 responses.

Sampling occurred at the Paediatric clinic of Kalafong (visited twice), taxi ranks, kindergartens, crèches, shopping centres, and through direct electronic distribution to relevant consumers. Figure 3.2 presents fieldworkers on one of their data collection trips to Kalafong's Paediatric Clinic.

The selected fieldworkers underwent the following training:

a) An online training session took place, which was recorded for the fieldworkers to be able to refer to if needed. This session explained the definition and role of a fieldworker, what was expected of them, and their ethical research responsibilities. Annexure C provides the manner in which the fieldworker training session commenced.

b) The questionnaire was critically discussed – from the voluntary consent form to each question in the final questionnaire. Fieldworkers were encouraged to ask questions about the questionnaire to ensure they understood the meaning and purpose of each question.

c) All fieldworkers received a training manual (available in Annexure D) designed by the primary researcher.

3.4 The Pilot Study - *"If you don't trust the pilot, don't go..."*

Before the final comprehensive study, a pilot study was conducted to assess the suitability of the methodology, questionnaire length, and specific questions. This pre-study evaluation aimed to determine whether these components could effectively yield the desired outcomes in the main study (Ruel, et al., 2016). From a broader perspective, the pilot study was crucial as it tested not only the validity and reliability of the project but also the appropriateness of the research design and practicality thereof.

The pilot study was conducted among five individuals who fell within the appropriate inclusion criteria of the sample but were not included in the final sample. This prompted a modification of the true or false question, "It is healthy for children to play outside." One participant misinterpreted this question, associating the term "outside" with danger rather than the intended dimension of Health. Consequently, the question was rephrased to read, "It is healthy for children to play outside, in a safe environment," aiming to prevent misinterpretation and accurately assess the intended dimension.

It was determined that the length of the questionnaire was acceptable. No changes were made to the questionnaire's length, and it was established that all additional questions were perceived by participants as intended. The "pilot" was trusted, and the study commenced.

3.5 Questionnaire Distribution

Qualtrics software was used as a platform for designing and distributing the questionnaire. This software is a cloud-based application developed for creating and distributing electronically based questionnaires (Quatrics, 2023). The program allowed the distribution of the questionnaire through an electronic link, which could be accessed through any internet-based connected computer or mobile phone. In cases where participants were illiterate, fieldworkers assisted with reading and filling out the questionnaire. Figure 3.2 presents the manner in which links were electronically sent to potential participants, making use of WhatsApp, a cross-platform instant messaging program (Meta, 2023).

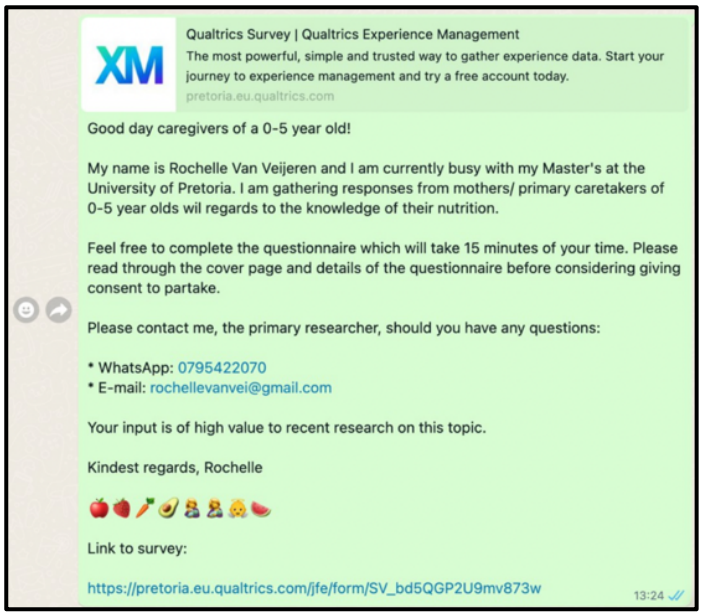

Figure 3.2: Link to questionnaire distribution through WhatsApp

3.6 Self-developed Measuring Instrument

A measuring instrument is a tool, in this case, a self-developed, online consumer questionnaire, that researchers use to measure variables (Mari, et al., 2023). The questionnaire layout is presented in Table 3.2, discussing all aspects, from the cover page to the last section, with the full questionnaire available in Annexure E. Each section was designed in response to the stipulated objectives of the study. While the questionnaire was self-crafted, established measurement tools such as the Likert scale and a true or false test were incorporated. The questionnaire was meticulously structured, drawing inspiration from similar employed in other studies that followed the same assessment method (Tsang, et al., 2017).

Table 3.2: Questionnaire Design

Section of questionnaire	Questionnaire category
Cover page	Potential participants were introduced to the study by familiarising them with its purpose. Subsequently, they were requested to confirm or deny their willingness to participate, as outlined in the informed consent form presented in Annexure E. Ethical considerations were discussed, emphasising their freedom to skip questions or decline participation without incurring penalties. Additionally, potential participants were assured of the confidentiality of their responses and their contribution to the study being entirely anonymous.
Questionnaire questions 1-7	Potential participants were queried about their eligibility based on the inclusion criteria for the study. These criteria included whether they functioned as the primary caregiver of a young child (0-5 years), their place of residence, and whether they were aged 18 years or older. This approach was employed to ensure the validity of responses by strictly adhering to all specified inclusion criteria for the study. This section additionally examined the awareness of the PFBDGs and the source thereof. It aimed to provide insights into both the extent of awareness and the reliability of the sources thereof.

Please view Annexure E for the full questionnaire

Section of questionnaire	Questionnaire category
Section A: Demographics Questionnaire questions 8-16	Questions relating to the participants' demographical characteristics were asked to profile the sample. This was collected through a combination of two-point dichotomous, multiple choice, and linear numeric scales. The questions pertaining to the demographical characteristics of the sample included the following: a) Gender b) Highest level of education: This section included options ranging from below Grade 7 to a postgraduate degree, in line with the educational system of South Africa supplied by the National Department of Basic Education (DBE, 2021) c) Number of household members d) Ethnic group, in terms of all ethnic groups categorised by Statistics South Africa (SSA, 2021) e) Preferred home language f) Number of dependent children in household g) Age cohort: Participants were asked to select the age of their most recent birthday. The relevant ages in line with the age cohorts (Generation Z, Millennials, Generation X, and Baby Boomers), were provided. This research is a consumer science study which often uses cohorts to profile consumers. Each cohort's consumer and purchasing behaviour are unique due to their age-specific exposure or susceptibility to an event (Herbert & Johnson, 2020) h) Approximate monthly household income: the options of income distributions were presented to the participants according to the Bareau of Market Research, (2012) i) Age of oldest child

Please view Annexure E for the full questionnaire

Section of questionnaire	Questionnaire category
Section B: Consumer practices Questionnaire questions 17-23 *Objective 1.1: To explore and describe consumer procurement (i.e. food groceries and formula feeding) and feeding practices (i.e. breastfeeding)*	Objective 1.1 was split into two categories, (i) procurement and (ii) feeding practices. The examination of consumers' procurement was specifically focused on food groceries and infant formula. Participants were asked about their frequency of procurement, person responsible for procurement, and choice of retailer (i.e. formal or informal retailer) for food groceries and infant formula. Investigating caregiver feeding practices was targeted towards the breastfeeding practice of caregivers. Participants were asked about their initial feeding practice (nourishment for the first six months of the infant's life) and options included exclusive formula feeding, exclusive breastfeeding, and a combination method. This investigation aimed at assessing the appropriateness of current practices in alignment with the recommendations outlined in the PFBDGs.
Section C: Knowledge Questionnaire questions 24-25	The participants' subjective and objective knowledge of the current PFBDGs were tested in this section. The subjective knowledge was tested with a 5-point Likert scale, where answers were given by comparing their perceived level of knowledge with that of friends or family.
Objective 2.1: To explore consumers' subjective knowledge of the PFBDGs.	Participants were asked to agree to a level of knowledge of each dimension of the PFBDGs (Health, Food Safety, Nutrition, Feeding Practices, and Hygiene), resulting in a mean score (maximum = 5).
Objective 2.2: To explore consumers' objective knowledge of the PFBDGs.	Objective knowledge of the same dimensions were tested through a "true" or "false" test, resulting in a percentage score (maximum = 100%).

Please view Annexure E for the full questionnaire

Section of questionnaire	Questionnaire category
Objective 2.3: To identify a possible misalignment between consumers' subjective and objective knowledge of the PFBDGs (i.e., DKEs), which could be considered a risk factor when feeding young children	These scores were given a rating/classification which aided in drawing conclusions for the last objective, Objective 2.3. If the average rating for subjective knowledge surpassed the average rating for objective knowledge, and overall DKE would be identified. The same process followed within individual dimensions for a more detailed exploration.

Please view Annexure E for the full questionnaire

3.6.1 Creation of Dimensions within the PFBDGs

The PFBDGs comprise various topics related to the nourishment of young children (Plessis, et al., 2021). By considering the terms outlined in Section 2.8.2 of Chapter 2, diverse dimensions within the guidelines were identified. These five dimensions consist of Food Safety, Hygiene, Feeding Practices Health, and Nutrition. Recognising the importance of each dimension in the context of feeding young children, it is crucial for caregivers to possess sufficient knowledge across all these aspects, thereby entirely embracing the PFBDGs.

3.7 Operationalisation

Operationalisation is the process during quantitative research where researchers explain each concept of the study, together with the selected measuring instrument of a reliable and valid nature (Haucke, et al., 2021). The specific procedures employed to address the study's main objectives are detailed in Table 3.3, accompanied by relevant indicators representing key ideas in the field of the study. Scott & Marshall (2015) define the operationalisation table's broad aim as translating theoretical concepts into measurable observations.

Given the quantitative research approach adopted in this study, precisely identifying all variables was crucial (Kuhar, 2010). This systematic process mitigates the risk of measuring irrelevant concepts and ensures consistent application of methods (Hauche, et al., 2021). Consequently, the operationalisation table minimises subjectivity and potential research bias, thereby enhancing the overall reliability of the study.

Table 3.3 initially lists constructs pivotal to the study, forming the foundational pillars that offer a comprehensive and holistic overview. The first construct delves into consumer practices, focusing on the dimensions of procurement and feeding practices, ensuring a thorough exploration of this construct. Objectives are subsequently outlined to provide a more focused exploration of the broader construct. The indicator column highlights specific areas to be tested, aligning with the dimensions of the study.

For the first construct, the dimensions of food procurement include frequency of purchase, the decision-maker for food procurement, and the choice of retailer for food and infant formula procurement (i.e. formal/informal retailer). Additionally, within the same construct but specific to the feeding practices dimension, indicators encompass the initial feeding practice of the mother (i.e. exclusive breastfeeding/ combination feeding/ exclusive formula feeding).

The measurement column initially pinpoints the specific section of the questionnaire (questions 17-23) dedicated to the analysis of the first construct, and the analysis column presents the statistical technique employed for portraying the results of the objectives, which, in this case, is descriptive statistics.

The second construct underwent a detailed examination in questions 24-25 within the consumer questionnaire. This construct relevant to consumer knowledge encompassed subjective and objective knowledge, with possible DKEs as dimensions. The specific objectives for this construct were individually listed, emphasising the indicators found in Section C of the questionnaire. Subjective knowledge was indicated using a 5-point Likert scale, and objective knowledge with a true or false test. If subjective knowledge surpassed objective knowledge, a DKE would be determined. The statistical analysis employed a comprehensive approach, incorporating up to five distinct techniques to ensure ample statistical evidence: descriptive statistics, ANOVAs, post-hoc tests, a Pearson's Correlation graph, and a scatter plot. Table 3.3 presents the summary of the operationalisation behind this study.

Table 3.3: Operationalisation Table

Construct(s)	Dimensions	Objectives	Indicators	Measurements	Analysis
To explore and describe consumer practices	• Procurement (food groceries and infant formula) • Feeding practices (breastfeeding)	**Objective 1:** To explore and describe consumer procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding)	**Procurement:** • Choice of retailer for grocery procurement • Choice of retailer for infant formula procurement • Frequency of grocery procurement • Primary food procurement decision-maker **Feeding practices:** • Initial feeding practice of mother (exclusive breastfeeding/ exclusive formula feeding/ combination method)	Consumer questionnaire Section B: Consumer practices (questions 17-23)	• Descriptive statistics

Construct(s)	Dimensions	Objectives	Indicators	Measurements	Analysis
To explore consumers' knowledge of the PFBDGs to identify elements of risk when feeding young children	• Consumers' subjective knowledge of the PFBDGs • Consumers' objective knowledge of the PFBDGs • Possible DKEs in consumer knowledge of the PFBDGs	**Objective 2.1:** To explore consumers' subjective knowledge of the PFBDGs. **Objective 2.2:** To explore consumers' objective knowledge of the PFBDGs. **Objective 2.3:** To identify a possible misalignment between consumers' subjective and objective knowledge of the PFBDGs (i.e., DKEs), which could be considered risk factors when feeding young children	**Subjective knowledge** • 5-point Likert scale **Objective knowledge** • True or false test **Possible DKE** • Overall instance where subjective knowledge surpasses objective knowledge or more specifically measured the same within dimensions	Consumer questionnaire Section C: Knowledge (questions 24-25)	• Descriptive statistics • ANOVAs • Multiple Comparison Tests • Pearson's Correlation Table • Scatter plot

3.8 Analysis of Quantitative Data

A statistician at the University of Pretoria was approached to approve the planned analysis procedure. In addition to using Qualtrics software, SPSS, the Statistical Package for Social Sciences, was used to analyse and delve deeper into the data. SPSS is a statistical software used primarily by researchers for more complex statistical data analysis (IBM, 2024).

3.8.1 Data Cleaning

The initial phase of quantitative data analysis in this study involved data cleaning. Given the common occurrence of inaccuracies in data collected from various sources, prioritising data cleaning before any statistical analysis was deemed necessary to enhance the quality of the outcomes (Ridzuan & Zainon, 2019).

The following steps were undertaken for data cleaning in the study to optimise the accuracy of the results:

a) To ensure an unbiased outcome, it was imperative to eliminate responses where only sections of the questionnaire were completed. Given the study's focus on testing consumers' knowledge, participants might have selectively completed questions based on their knowledge, potentially introducing bias to the results. Sacrificing such responses was crucial to ensure high-quality data.
b) To be included in the study, participants had to meet particular criteria. Specifically, they had to reside in Gauteng and be the primary caregiver of a child aged 0-5 years. If participants did not meet these criteria, their responses were not included.
c) The study's ethical guidelines mandated that participants complete an informed consent form before taking part. Results from participants who did not give consent but still completed the questionnaire were not used.

3.8.2 Colour Coding for Simplified Presentation of Data

A colour system was used to simplify the visual presentation of results. Figure 3.3 presents the colour system designed for the presentation of the results throughout Chapter 4.

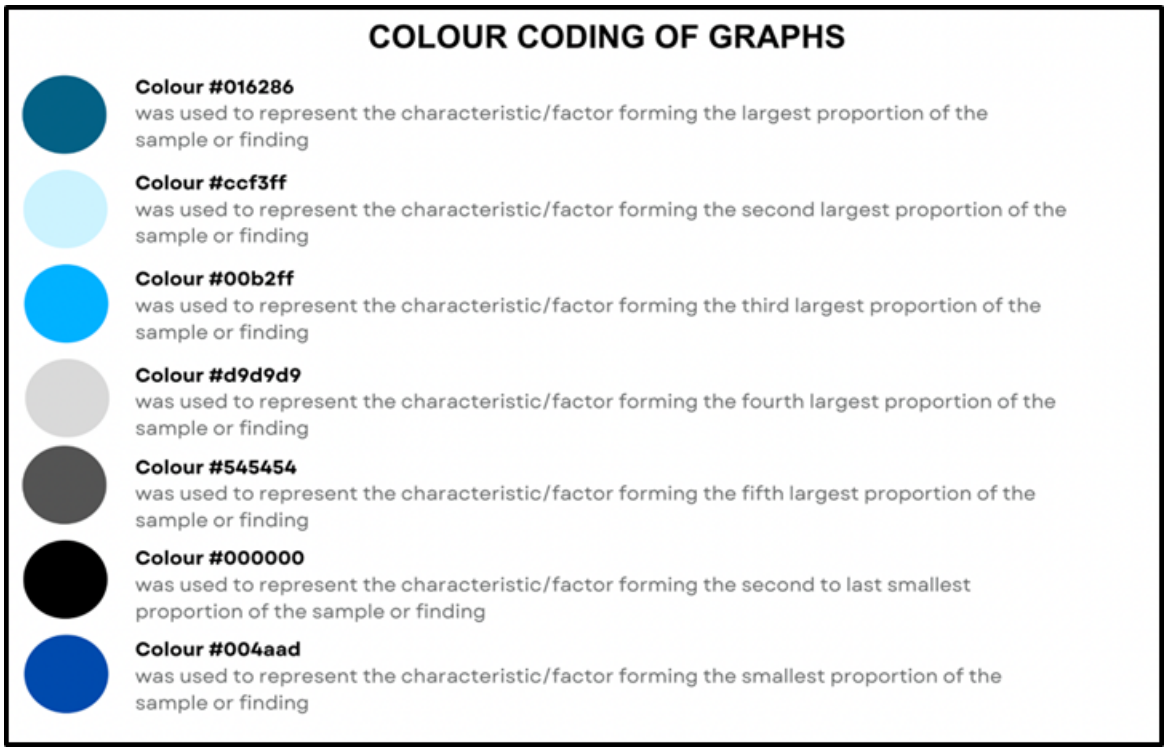

Figure 3.3: Colour Coding of Graphs

3.8.3 Analysis of Demographical Characteristics, Consumer Practices (Objective 1.1), and Awareness of the PFBDGs

The sections in Chapter 4 pertaining to the demographical characteristics of the sample, consumer practices and awareness of the PFBDGs are conveyed through descriptive statistics with bar graphs and percentages to offer a straightforward overview. Descriptive statistics serve to summarise data, providing a condensed representation of the specific characteristics and distribution of values within one or more dataset (Vetter, 2017).

This format allows analysts to quickly grasp the central tendency and degree of dispersion of values in the datasets. Using descriptive statistics to present the results in this section is deemed appropriate as it summarises the sample for easy, yet precise comprehension (Cooksey, 2020).

Means were employed throughout this section for numerical variables concerning central locations and standard deviations. The colour system in Figure 3.4 was suitable for illustrating the distribution of data points and facilitating comparative analysis of values across distinct subgroups within the dataset.

3.8.4 Analysis of Consumers' Subjective Knowledge of the PFBDGs (Objective 2.1)

A 5-point Likert scale was used to collect and interpret data from the consumers' viewpoint concerning their knowledge of the PFBDGs, with separately tested dimensions. The inclusion of a diverse array of options provided to consumers, as opposed to a simple binary choice of "yes" or "no", helped mitigate the potential for biased outcomes (Quatrics, 2023).

Consumer responses were then summated, and the total mean scores were calculated. A higher mean score was indicative of a positive assessment of a respondent's subjective knowledge. The means for the subjective knowledge test (maximum = 5) were interpreted based on the respondent's level of agreement, with 1 (extreme lack of knowledge) being the lowest possible score and 5 (extremely knowledgeable) the highest. A mean score of 3 (neutral anchor point) was referred to as an average subjective knowledge rating.

Figure 3.4 presents the Likert scale with options consumers were given.

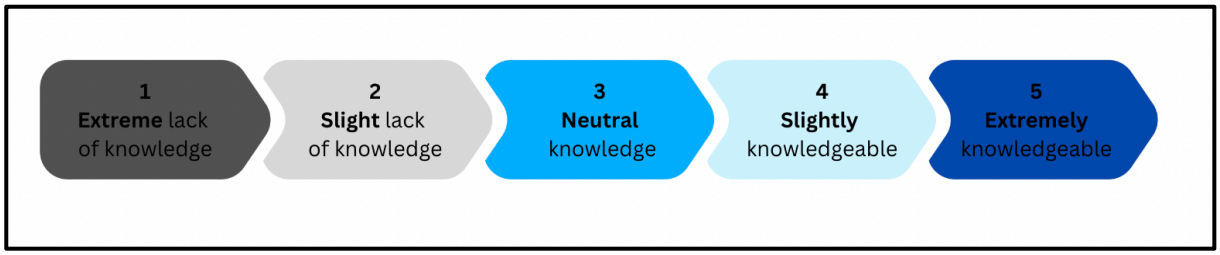

Figure 3.4: Likert Scale for Testing Subjective Knowledge

3.8.5 Analysis of Consumers' Objective Knowledge of the PFBDGs (Objective 2.2)

Objective knowledge was assessed in the form of a true or false test, wherein statements were presented as true or false, and participants indicated their knowledge by selecting their responses (Storey, 2023). Each dimension of the PFBDGs was randomly tested at least five times. Participants were provided with a 5-point scale and asked to choose an answer from the following options: false, somewhat false, I don't know, somewhat true, or true. The use of a 5-point scale was suitable, aligning closely with the subjective knowledge testing.

For incorrect or somewhat incorrect answers (choosing “somewhat true” or “somewhat false”), or selecting the “I don’t know” option, participants received 0 marks. Suppose the participants selected the correct answer but expressed uncertainty (choosing “somewhat true” or “somewhat false”), 1 mark was allocated. A fully correct answer resulted in 2 marks. These scores were summed, and each individual’s score was calculated as a percentage. To interpret results, each dimension received an overall score based on its total correct answers.

3.8.6 Classification of Knowledge Results

Table 3.4 presents the system which enabled the comparison of subjective and objective knowledge by using a rating system ranging from poor to excellent, inspired by Jamaludin (2018).

Table 3.4: Rating System Designed for Consumers’ Objective Knowledge

Percentage score	Mean score	Classification
< 50%	< 3	Poor
50 > 59%	3	Medium/average
60 > 69%	3.5	Above average
70 > 79%	4	Good
80 > 100%	5	Very good to excellent

3.8.7 Inferential statistics: *An in-depth investigation*

Inferential statistics is a complex manner of data analysis where the researcher can draw conclusions and predictions relevant to the study as one goes beyond the extent of immediate data alone (Guetterman, 2019). Initially, inferential statistics in the form of one-way Analysis of Variance (ANOVA) was employed. ANOVAs can give a significant result, indicating that at least one group differs from the other groups (Williams & Abdi, 2010). This approach aimed to examine the demographical characteristics (focussed on ethnicity, age, and level of education groups) of the sample concerning both subjective and objective knowledge, with each field independently investigated. Table 3.5 provides critical definitions found in the ANOVA tables in Chapter 4.

Table 3.5: ANOVA table definitions

Analysis of Variance (ANOVA)	The statistical procedure where means of three or more groups are tested. The variance between or within groups is tested to determine whether a statistical significance between means is present (Kim, 2017).
Sum of Squares (SS)	An expression of the total variation that can be attributed to numerous factors. More specifically, a measurement of the deviation of data points away from the mean value. A higher SS indicates a higher variability from the mean, and vice versa (Riffenburgh, 2012).
Degrees of Freedom (df)	The number of independent values that can vary in an analysis, despite not breaking constraints (Rodríguez, et al., 2019).
Mean Square	The sum of squares is divided by the degrees of freedom to estimate the variance within the groups and between the groups (Matsuura, 2005).
Within Groups	An indication of differences among subjects who are in the same group (Drummond & Vowler, 2012).
Between Groups	An indication of how two or more groups vary (Drummond & Vowler, 2012).
F-statistic (F)	A measure used to determine whether the variances between group means are statistically significant, by comparing the variability among group means to the variability within the groups (Riffenburgh, 2012).
Significance (Sig)	If a group differs significantly from the overall group mean, the ANOVA will report a statistically significant result, defined by a 0.05 significant level (McDonough, 2024).

3.8.8 Post Hoc Analysis - *"Ergo Propter Hoc"*

The examination of findings related to consumers' subjective and objective knowledge of the PFBDGs extended beyond the ANOVAs to include post-hoc analysis. In instances where statistical significance was observed, further exploration through post-hoc multiple comparison tests commenced where possible. The term "post-hoc" comes from the Latin phrase "post hoc ergo propter hoc", which means "after this, therefore because of this" (LII, 2020). In statistics, it refers to the assumption that because one event occurred after another event, it must have been caused by it (Lenth, 2016). The post-hoc included for this study was the Bonferroni Multiple Comparison. Post-hoc analysis aims to identify differences between groups based on mean differences, making it a suitable method for detecting variations in subjective and objective knowledge scores among demographical categories. Table 3.6 displays key definitions of concepts found in the Multiple Comparison Test tables

Table 3.6: Multiple Comparison Test definitions

Bonferroni test	A method used in statistical analysis which divides the desired alpha (0.05) by the number of comparisons being made. This determines the statistical significance of each individual comparison. The test allows comparisons of several variables, which limits false data appearing statistically significant (Lee & Lee, 2018).
Mean	The average tendency of a set of data points within each group or condition being compared (Hurley & Tenny, 2023).
Mean difference	The average variation in values between two or more groups compared (Hurley & Tenny, 2023).
Standard error	A measure of the variability or precision associated with the mean difference estimates between groups (Wooldridg, 2023).
Significance (Sig)	The p-value or significance associated with a test. This value helps determine whether the observed differences between groups are statistically significant or occurred by random chance (Hurley & Tenny, 2023).

3.8.9 Analysis of possible DKEs within Consumer Knowledge of the current PFBDGs (Objective 2.3)

Referring to the definition of the Dunning-Kruger Effect (DKE), a higher subjective knowledge score compared to the objective knowledge result suggests a misalignment of consumer knowledge (Duignan, 2024). Keeping this theory in mind, possible DKEs were identified by comparing consumers' subjective outcomes with their objective results.

This comparison was facilitated by the rating system outlined in Figure 3.4, and outcomes could range from poor to excellent. Initially, the average score for subjective knowledge was compared to the average of objective knowledge for a holistic overview. Subsequently, a more in-depth analysis was conducted on individual dimensions to pinpoint specific areas of misaligned knowledge and potential instances of DKEs.

Table 3.6 provides terms used in Chapter 4's Multiple Comparison Test tables.

Conversely, a score with a higher objective knowledge percentage, compared to subjective knowledge scores, could suggest the presence of the Imposter Syndrome in consumers. This cognitive bias involves individuals doubting their level of knowledge and feeling incompetent despite having objective evidence of competence (Eldridge, 2023).

3.8.9.1 An Overview of a Scatter Plot Illustrating Individual Participants' Subjective and Objective Knowledge - Expanding Perspectives

Individual participants' scores reflecting their subjective knowledge mean and objective knowledge percentage score was visually represented on a scatter plot, providing a comprehensive overview of the prevailing knowledge landscape among consumers. Each quadrant signifies a distinct state of knowledge of the current PFBDGs, with further details available in Figure 3.6.

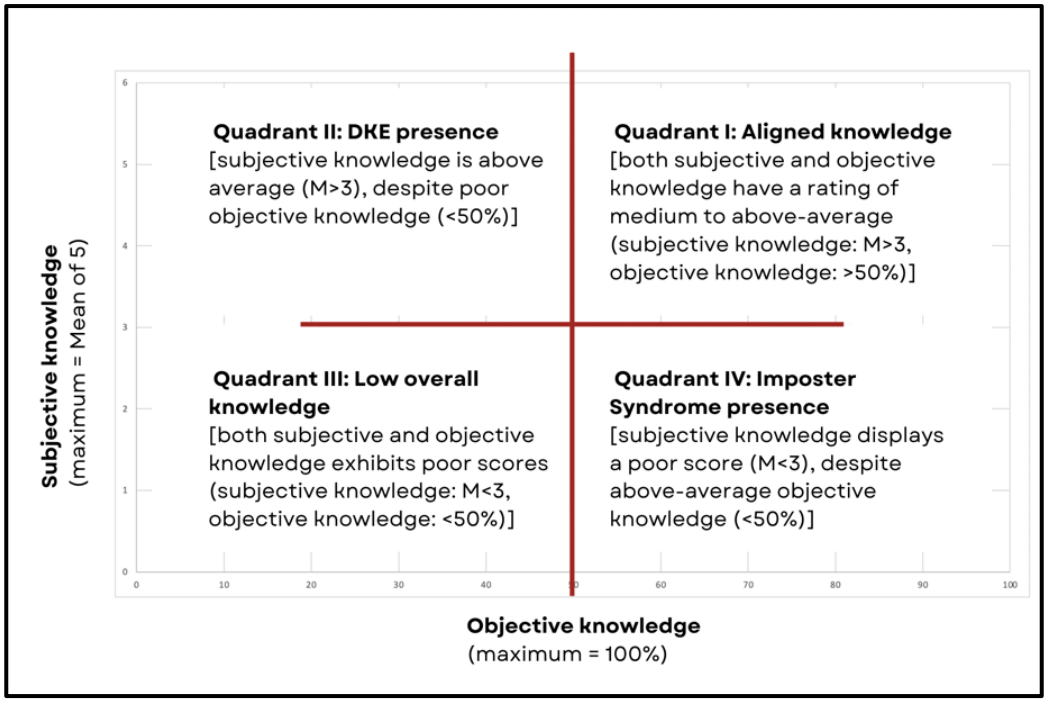

Figure 3.5: Scatter plot indicating Individual Consumers' Knowledge of the Current PFBDGs

3.8.9.2 Pearson's Correlation Table

Pearson's Correlation Table is a statistical tool used to measure the strength of a linear relationship between two variables, specifically, in this case, subjective and objective knowledge of the PFBDGs dimensions (Mukaka, 2012). This inferential statistic helps to determine the strength of correlations, particularly in cases where DKE may be present.

3.9 Validity

The validity of a study pertains to how effectively it captures accurate findings among individuals who share similar characteristics external to the study (George, et al., 2003). This study attempted to measure the results as truthfully, accurately, and transparently as possible.

3.9.1 Internal Validity

Andrade, (2018) defines internal validity as the extent to which the results are accurate in terms of the population. Internal validity was supported in this study by providing the participants in the study with questions that did not lead them towards a certain favourable or unfavourable answer but rather made them feel comfortable to answer each question truthfully. Once internal validity has been established, a judgement can be made regarding the external validity of a study by indicating whether the results apply to similar individuals within a different setting.

3.9.2 Construct Validity

Construct validity ensures that the procedure of measurement matches the main constructs of the study (Strauss, 2009). Construct validity was reached in this study by ensuring the questionnaire asked questions directly related to the main objectives and elements of the study. This was supported by the operationalisation presented in Table 3.3. Furthermore, the PFBDGs were split into numerous dimensions independently tested in the questionnaire.

3.9.3 Content Validity

Content validity is the extent to which the measure used in the study includes all content of the construct (Zamanzadeh, et al., 2015). This was achieved by identifying critical dimensions in the PFBDGs, and asking questions directly related to each (Food Safety, Health, Nutrition, Hygiene and Feeding Practices). Consumers' subjective and objective knowledge was tested by asking questions related to their knowledge. Objective knowledge was examined through a "true and false" test, while subjective knowledge questions were asked, using words such as "compared to your friends and family", to test the consumers' self-perceived or assumed level of knowledge.

3.10 Reliability

Reliability refers to the consistency of results derived from a measuring instrument when measuring an unadjusted issue (Leung, 2015).

The reliability of this study was increased by carefully selecting a research design with a relevant measuring instrument, pilot testing the study, and having an appropriate sample size.

3.11 Ethical Consideration

Research often involves comprehensive or real-life phenomena and human behaviours. Ethical considerations involve going through the above-mentioned process in a morally right manner (Resnik, 2020). This study took measures to ensure that participants were fully informed about the objectives before agreeing to participate voluntarily. The following steps were implemented to uphold ethical standards throughout the study:

a) Each participant received a consent form prior to participation. Participant names were anonymised by Qualtrics as responses were categorised into items instead of names.
b) The cover page provided potential participants with a brief overview of the research aims.
c) The cover page also ensured the participants that their information was kept anonymous and that they were not required to record their names.
d) Participants could skip questions or quit without penalty.
e) The Ethics Committee of the Natural and Agricultural Sciences Department approved the study at the University of Pretoria with the reference number NAS208/2022.
f) None of the questions or the nature of the study was misleading. Questions did not guide participants towards specific favourable answers.
g) The research design and methodology were disclosed to the participants.
h) No results or outcomes of the data analysis were manipulated or changed by the researcher or fieldworkers.

3.12 Chapter 3 in a Nutshell

This chapter provided a comprehensive explanation of the study's research design and methodology. The development of the measuring instrument was a meticulous process carried out over several weeks, incorporating both carefully self-developed items and selected existing scales to ensure robust data. Data collection spanned several months, using a self-administered electronic consumer questionnaire and convenience sampling in Gauteng.

Ensuring validity and reliability was paramount throughout the study, aiming for replicable and trustworthy data to yield accurate findings. Chapter 4 will delve into the findings derived from the statistical processes discussed in this chapter, providing insights into the outcomes of the study.

CHAPTER 4: RESULTS

This chapter unveils the results aligned with the study's predefined objectives.

4.1. Introduction

The key research results in terms of the specified objectives and sub-objectives are presented in this chapter. Chapter 4 initiates with a brief presentation of the sample's demographical characteristics. Results with specific reference to Objective 1 commence in Section 4.3, focusing on consumers' procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding). This is followed by results pertaining to Objective 2 which introduces different fields of consumer knowledge: subjective and objective knowledge (Section 4.4). Chapter 4 concludes with a presentation of possible DKEs, that stem from instances where misaligned knowledge in the previous section may have occurred, in favour of consumers' subjective knowledge (available in Section 4.5).

4.2 The Sample: A Demographical Overview

This section delves into an analysis of the various demographical characteristics within the sample. These characteristics encompassed gender, age, ethnic group, educational attainment, average monthly household income, number of dependent children, and the oldest child's age. Table 4.1 provides an overview of the demographical characteristics of the study's sample.

The majority of the sample was female (89.8%), with a substantial portion belonging to the Millennial generation (83.3%). In terms of ethnicity, the sample was predominantly composed of individuals from the White ethnic group (63.9%), and a large proportion held degrees or diplomas (39.4%). Afrikaans emerged as the primary spoken language among participants, accounting for 48.9% of respondents. The average monthly household income was distributed relatively evenly among various income brackets, with the R50 0001 – R75 000 earning group being the most prevalent at 19.7%. Notably, a trend of having two dependent children was observed in the sample (42.3%), and the oldest child's age typically exceeded 36 months (62.6%).

Table 4.1: Demographic Characteristics (N = 264)

DEMOGRAPHIC FACTORS		
Dimension	**Frequency**	**Percentage**
Gender (N=264)		
Male	0	0
Female	237	89.8
Prefer not to say	26	9.8
Other	1	0.4
Age (N=264)		
Generation Z (18-24 years)	23	8.7
Millennials (25-41 years)	220	83.3
Generation X (42-57 years)	18	6.8
Baby Boomers (58-76 years)	3	1.1
Population group (N=264)		
African	83	31.6
Coloured	2	0.8
Indian	8	3
White	168	63.6
Other	2	0.8
Level of education (N=264)		
Grade 7	2	0.8
Lower than grade 7	1	0.4
Grade 12	74	28
Lower than grade 12	12	4.5
Degree / diploma	104	39.4
Post graduate	71	26.9
Home language (n=262)		
Afrikaans	128	48.9
English	72	27.5
Ndebele	13	5
Northern Sotho	4	1.5
Sotho	9	3.4
Swazi	2	0.8
Tsonga	1	0.4

DEMOGRAPHIC FACTORS		
Dimension	**Frequency**	**Percentage**
Home language (n=262)		
Tswana	4	1.5
Venda	4	1.5
Xhosa	7	2.7
Zulu	12	4.6
Other	6	2.3
Average monthly household income (n=259)		
Less than R5000	42	16.2
R5001 – R15 000	33	12.7
R15 001 – R30 000	49	18.9
R30 001 – R50 000	44	17
R50 001 – R75 000	51	19.7
R75 001 – R110 000	22	8.5
More than R110 000	18	6.9
Number of dependent children in household (n=260)		
1	91	35
2	110	42.3
3	36	13.8
4-10	23	3.9
Age of eldest child (n=262)		
0-6 months	13	5
6-12 months	23	8.8
12-36 months	62	23.7
Older than 36 months	164	62.6

4.2.1 Gender

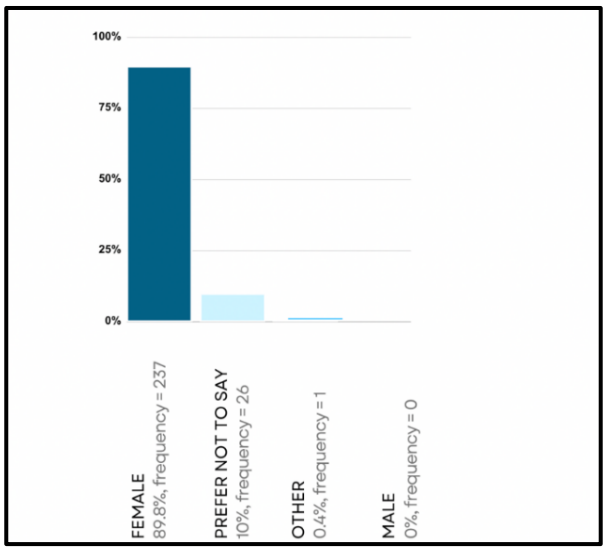

Figure 4.1: Gender Distribution (N=264)

The study predominantly featured participants from the female gender, constituting a substantial majority with a total of 237 individuals (89.8%). This group comprised nearly 90% of the sample, representing a significant proportion. It was noteworthy that there were no reported males in the sample and the remaining selected the “other”, or “prefer not to say” categories.

4.2.2 Age Cohorts

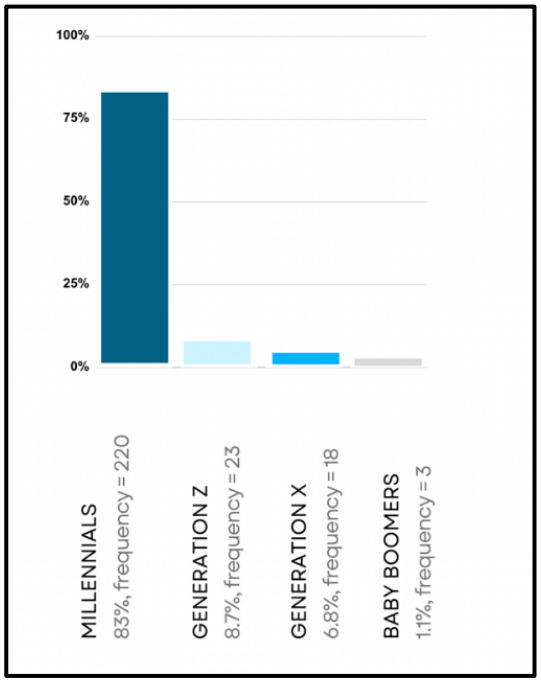

Figure 4.2: Age Cohort Distribution (N=264)

As illustrated in Figure 4.2, the Millennials (24 - 41 years) are the largest group in the sample, comprising 220 (83.3%) participants. The smallest proportion of the sample fell within the oldest age cohort, specifically, the Baby Boomers, comprising only 1.1%. A parallel study conducted to explore the comprehension of the preliminary 2007 PFBDGs in Soshanguve and Ga-Rankuwa revealed that, much like this study's sample, most of the participants also fell within the Millennial age cohort (Pretorius, 2015).

4.2.3 Ethnic Group

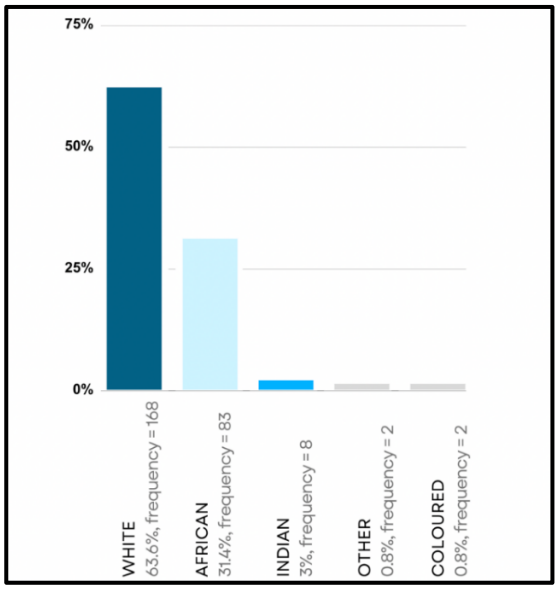

Figure 4.3: Ethnic Distribution (n=263)

The study's primary ethnic group was White, comprising 168 participants, accounting for 63.6% of the total sample. This was followed by the African group, consisting of 31.4% of participants. Coloured and those falling into other ethnicities collectively only made up 1.6% of the sample.

Prior to data cleaning, which involved the removal of incomplete surveys, it was evident that the African population group was significantly bigger. However, due to incompleteness in their submissions, only 69% of responses from the African group made it into the final sample. The low completion number for the African group excluded a substantial amount of their responses from the final dataset. In contrast, a more significant 83% of the initial surveys from the white ethnic group were retained in the final sample.

4.2.4 Educational Attainment

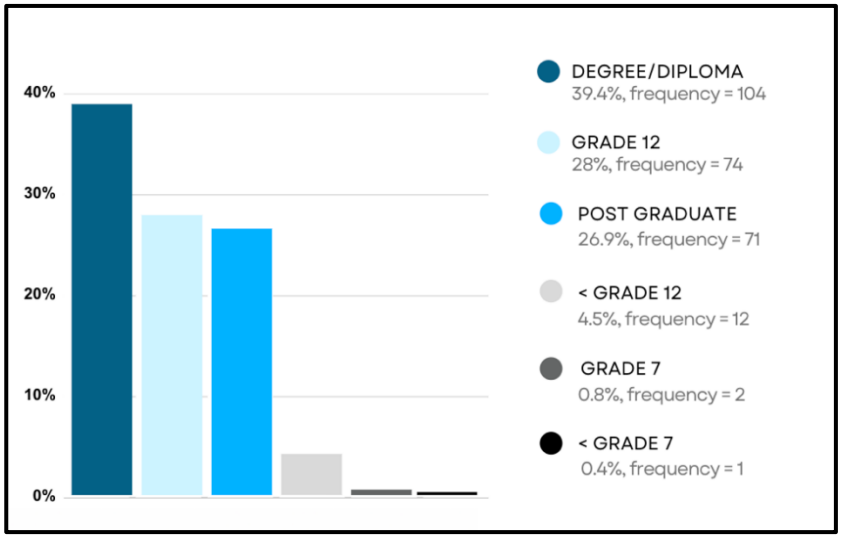

Figure 4.4: Educational Attainment Distribution (N=264)

More than a third of the sample (n=104, 39.4%) had a degree or diploma. Educational attainment of Grade 12 was reported at 28% (n=74), closely followed by participants with a postgraduate degree (n=71, 26.9%). Only 0.4% (n=1) of the sample had the lowest educational attainment of below grade 7, signifying that the sample primarily consisted of individuals with higher educational attainment.

4.2.5 Home Language

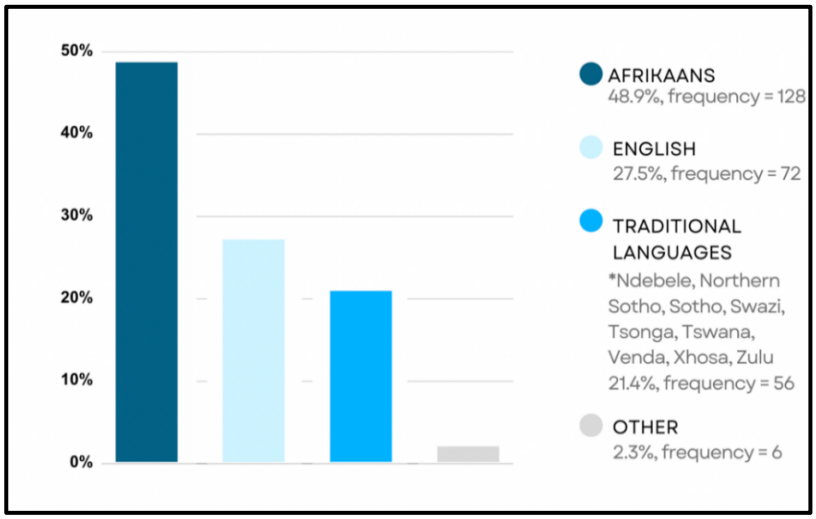

Figure 4.5: Language Distribution (n=262)

Figure 4.5 presents the home language distribution of the sample. Afrikaans-speaking participants formed the most significant proportion of the sample (48.9%, n=128). This was followed by English (27.5%, n=72). Traditional languages were grouped due to their small prevalence in the sample; this

included Ndebele, Northern Sotho, Sotho, Swazi, Tsonga, Tswana, Venda, Xhosa and Zulu, which formed 21.4% (n=56) of the sample.

4.2.6 Average Monthly Household Income

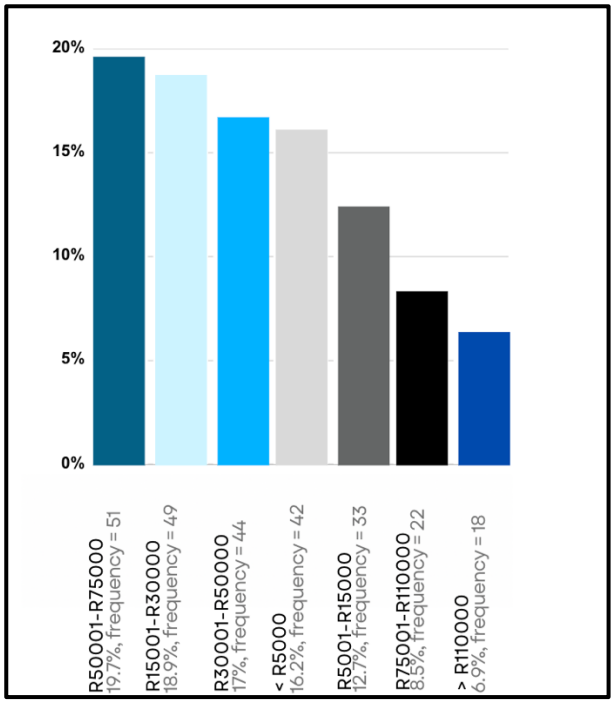

Figure 4.6: Income Characteristics Distribution (n=259)

Figure 4.6 illustrates the average monthly household income of the sample. The percentage distributions across income classes exhibit a notable similarity, suggesting a fairly even distribution of income within the sample. The South African Bureau of Market Research (2012) indicated that a household income of more than R45 000 per month is classified as upper middle class to emerging affluent. This suggests that most of the sample (19%, n=51) fell within this income category. The least prominent affluent income group only formed 6.9% of the sample.

4.2.7 Number of Dependent Children in the Household

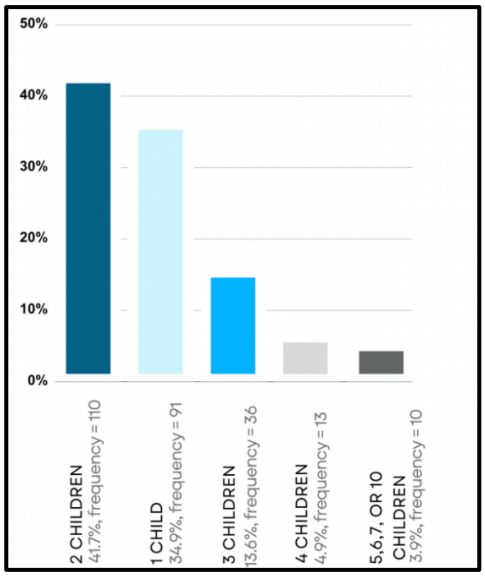

Figure 4.7: Number of Dependent Children in the Sample's Household (n=260)

Figure 4.7 presents a trend in the sample's participants of having two dependent children (42.3%, n=110). Having 5,6,7, or 10 dependent children was relatively scarce, and these cases were thus grouped, constituting 3.9% (n=10).

4.2.8 Age of Oldest Child

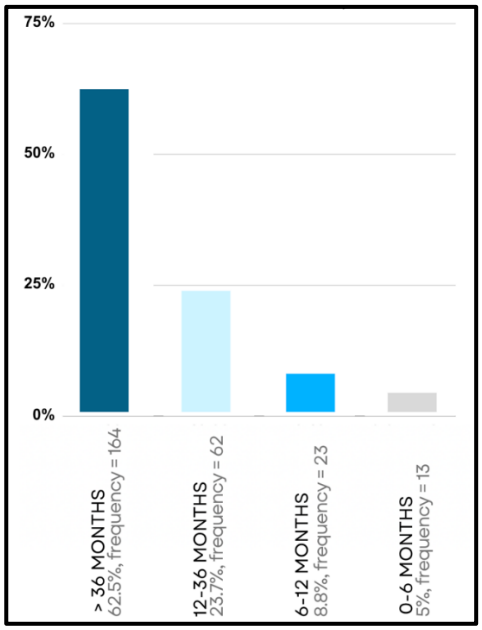

Figure 4.8: Age of Oldest Child Distribution (n=262)

Over half (n=164, 62.5%) of the sample's oldest child was older than 36 months. Only 5% of the sample's oldest child was 0-6 months, indicating a general trend of older first-borns.

I) OBJECTIVE 1: TO EXPLORE AND DESCRIBE CONSUMER PRACTICES

4.3. Investigating Consumers' Procurement and Feeding Practices

Section 4.3. provides results in accordance with consumer procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding) which aims to identify possible trends and areas of concern due to the significance of the appropriateness of these practices advocated by the PFBDGS (Department of Health, 2013). This section was guided by sub-objective 1.1 [To explore and describe consumers' current procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding)].

i) Caregivers' Procurement (i.e. food groceries and infant formula)

4.3.1. The Primary Decision-maker for Food Groceries

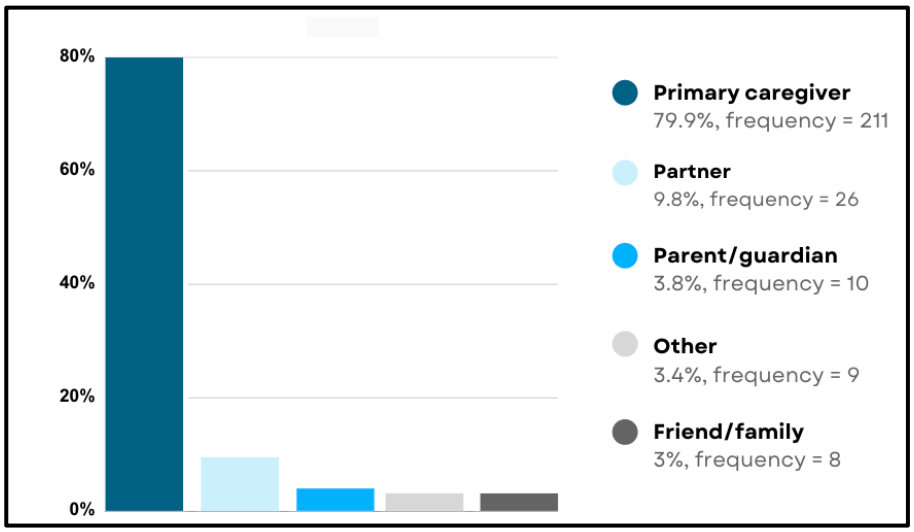

Figure 4.9: Primary Decision-maker for Food Groceries (N=264)

The role of primary decision-makers for food groceries was dominated by the primary caregivers of young children (n=221, 79.9%). The data shows that only 3% of food grocery decisions were made by friends or family members, indicating their low involvement.

4.3.2 Food Shopping Frequency

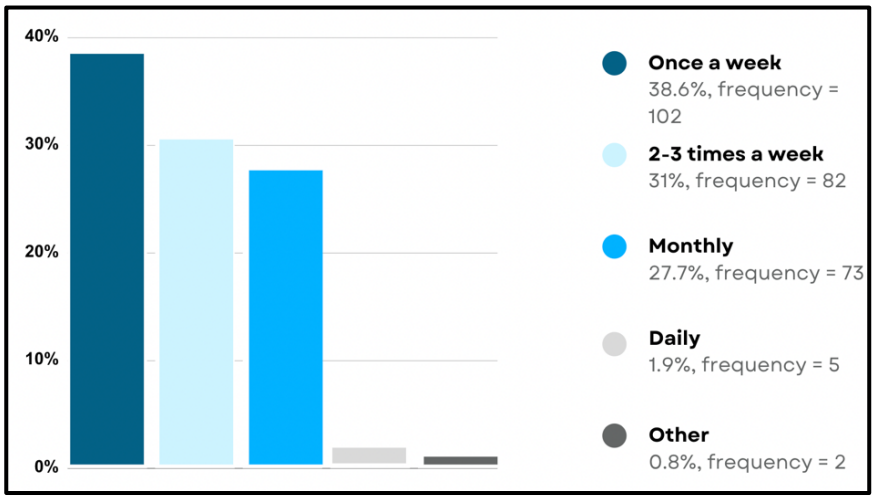

Figure 4.10: Food Shopping Frequency (N=264)

As per the study's results, 38.6% (n=102) of participants engage in weekly food shopping, while a mere 1.9% shopped daily.

4.3.3 Caregiver's Choice of Retailer for Food Groceries and Infant Formula Procurement (i.e. Formal and Informal Retailers)

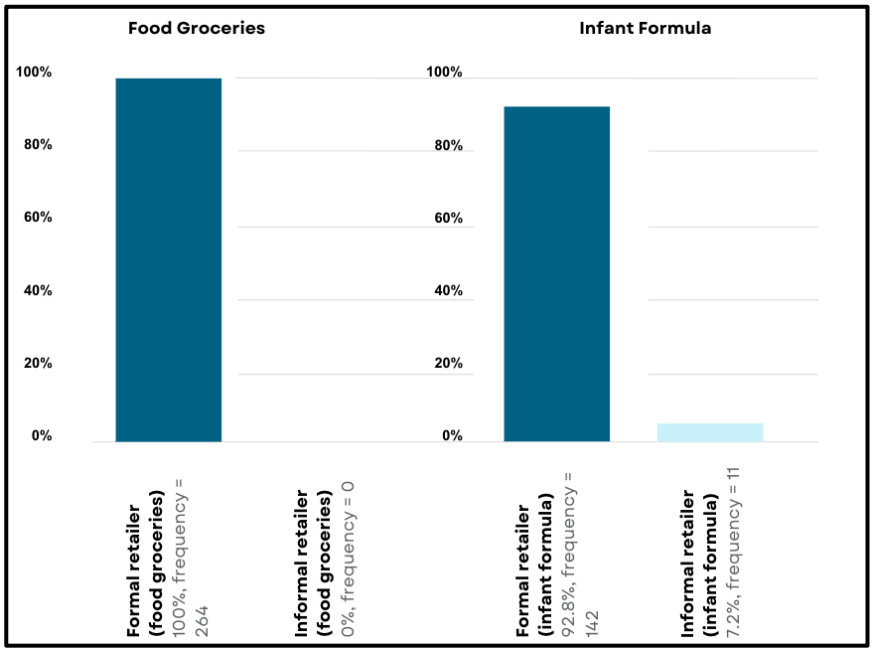

Figure 4.11: Caregiver's Choice of Retailer for Food Groceries (N=264) and Infant Formula (n=153)

Figure 4.11 firstly presents the sample's choice of retailer for food grocery procurement. All consumers in the sample (N=264, 100%) used formal retailers for their food grocery shopping. However, when it came to infant formula procurement there were cases of consumers opting for informal retailers (n=11, 7.2%).

ii) Caregivers' Breastfeeding Practices

4.3.4 Feeding Practice of the Mother

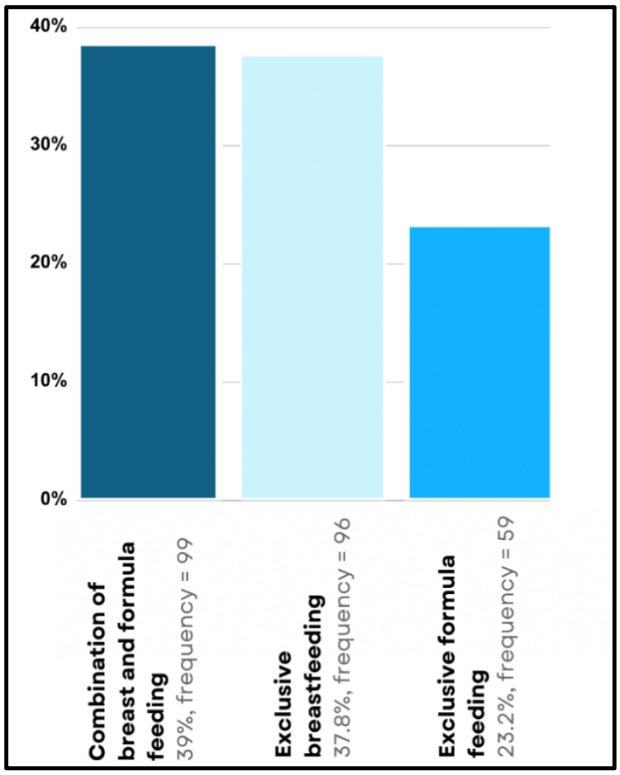

Figure 4.12: Feeding Practice of the mother (n=254)

Figure 4.12 presents the mothers' initial feeding practice employed for the first six months of the infant's life. The PFBDGs encourage mothers to make use of exclusive breastfeeding for the first six months of nourishment (UN, 2013). Despite this, caregivers who used a combination of breast and formula milk were most prominent in the sample at 39% (n=99). Out of the sample, exclusive formula feeding was claimed to be the least used initial feeding practice, at only 23.2% (n=59).

Formal retailers include registered retailers, and informal retailers unlicensed retailers, such as street vendors (SME, 2023).

II) OBJECTIVE 2: TO EXPLORE CONSUMERS' KNOWLEDGE OF THE PFBDGS TO IDENTIFY POSSIBLE ELEMENTS OF RISK WHEN FEEDING YOUNG CHILDREN

4.4 Exploring Consumers' Subjective Knowledge of the PFBDGs

The following section initiates with background information on the PFBDGs, particularly highlighting awareness surrounding it. This section then commences with consumers' knowledge, defined as what the consumer thinks they know, and what the consumer factually knows (Bolisani & Bratianu, 2017).

However, the primary aim of Section 4.4. is to present consumers' subjective knowledge about the topic at hand. Consumers' subjective knowledge is the consumer's perception of how much they know about a field of interest (Han, 2019) in this case in the South African PFBDGs. The analysis of consumers' subjective knowledge extends beyond a broad overview and delves into individual dimensions of this primary construct.

Section 4.4 concludes with ANOVAs. This aims at identifying potential statistically significant differences pertaining to consumers' subjective knowledge that might be present within different demographical categories (focussed on ethnicity, age, and level of education groups). Subsequently, in cases where statistically significant differences were identified, post-hoc tests were considered to specify differences explicitly.

4.4.1 Awareness of the PFBDGs

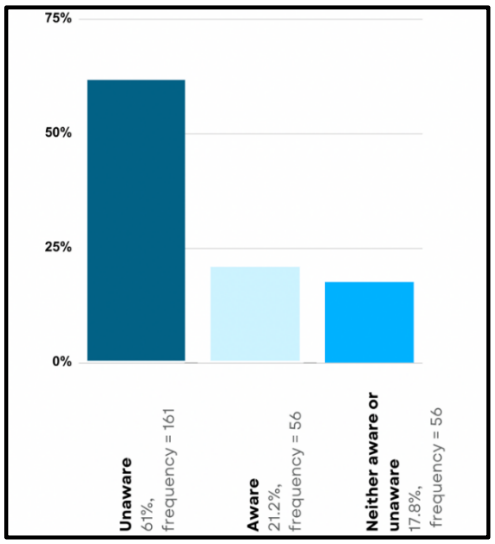

Figure 4.13: Awareness of the PFBDGs (N=264)

Figure 4.13 presents the awareness of the PFBDGs among caregivers. Most of the sample was unaware of the guidelines (n=161, 61%), and only 21.2% (n=56) were aware. The remainder of the sample (n=46, 17.8%) was unsure as to whether they had heard of the PFBDGs or not.

4.4.2 Source of Awareness of the PFBDGs

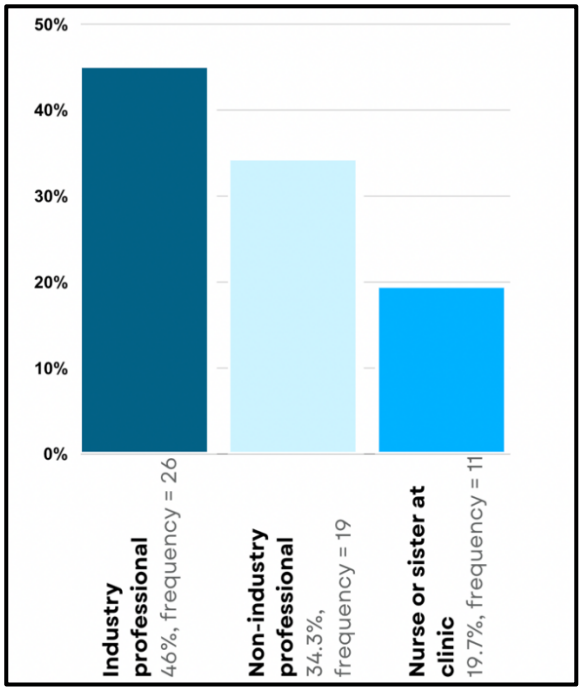

Figure 4.14: Awareness of the PFBDGs (n=56)

From the previous question, the 56 participants who were aware of the PFBDGs were presented in Figure 4.14. Almost half (n=26, 46%) obtained their awareness of the PFBDGs from a professional in the field, i.e. a paediatrician. This was followed by a non-industry professional (including non-medically reviewed websites, the child's place of education, friends or family members, acquaintances, and any additional source that does not include a nurse at a clinic or paediatrician at 34.4% (n=19). The minority of the sample (n=11, 19.7%) obtained their awareness of the PFBDGs from a nurse or sister at a clinic.

4.4.3 Consumers' Subjective Knowledge of the PFBDGs

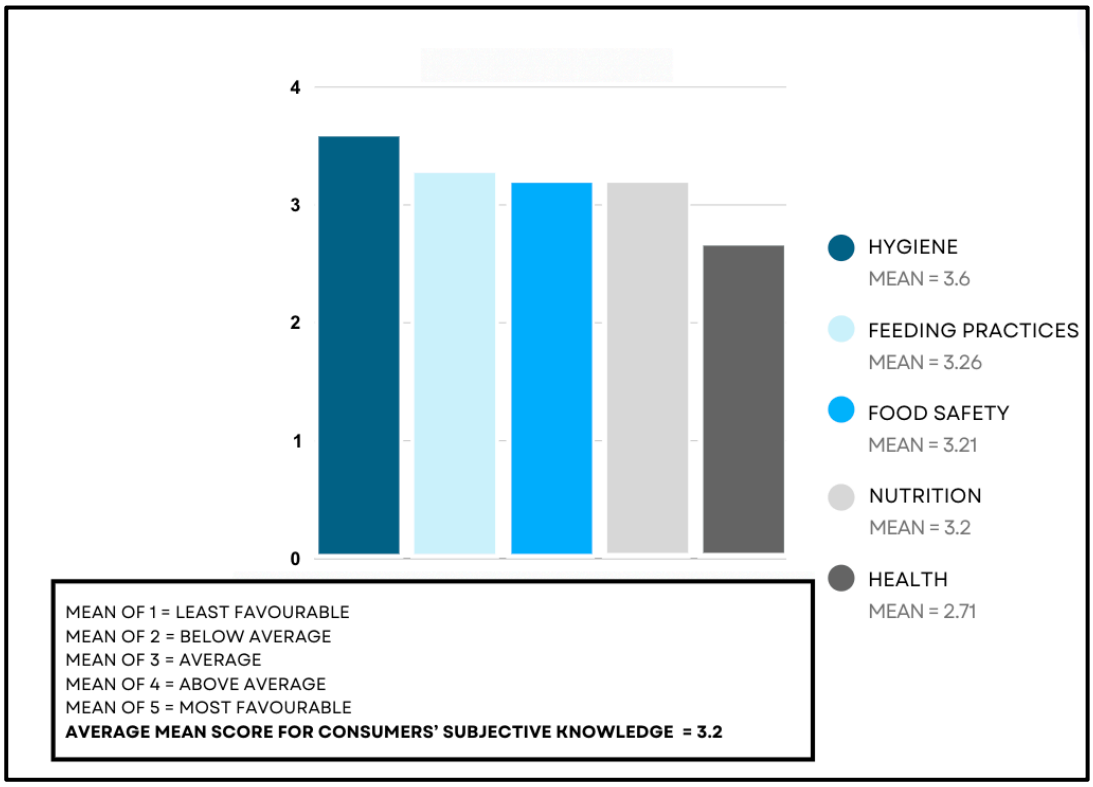

Figure 4.15: Subjective Knowledge Mean Scores for the Dimensions of the PFBDGs (Maximum = 5)

Figure 4.15 presents an insightful overview of the mean scores across the dimensions of the PFBDGs. The overall mean for the sample's subjective knowledge results is 3.2, indicating a level of self-perceived knowledge which leans more towards the favourable anchor of the average classification.

In terms of the specific dimensions that make up the primary construct (i.e. subjective knowledge), it was interesting to note that the Hygiene dimension stands out with the most favourable mean score of 3.6, indicating a high level of the consumers' self-perceived knowledge. In comparison, the Feeding Practices, Food Safety, and Nutrition dimensions exhibit similar mean scores, all slightly above average, signifying an average degree of subjective knowledge. However, the Health dimension lags behind, characterised by a below-average mean score of 2.7. This dimension stands as the only one in the analysis to fall below average and exhibits a lower than average confidence level among consumers.

Table 4.2: Subjective Knowledge Mean Scores for the Dimensions of the PFBDGs

Subjective knowledge results, (N=264) Gathered employing a 5-point Likert scale with options: far too little, slightly too little, neither too little or a lot, quite a lot, and a vast amount		
Dimension	**Frequency**	**Percentage**
Hygiene (mean=3.6)		
Quite a lot	129	48.9%
Neither too little or a lot	49	18.6%
A vast amount	44	16.7%
Slightly too little	24	9.1%
Far too little	17	6.4%
Feeding practices (mean=3.26)		
Quite a lot	94	35.6%
Neither too little or a lot	83	31.4%
Slightly too little	35	13.3%
A vast amount	27	10.2%
Far too little	22	8.3%
Food safety (mean=3.21)		
Quite a lot	113	42.8%
Neither too little or a lot	62	23.5%
Far too little	32	12.1%
Slightly too little	31	11.7%
A vast amount	18	6.8%
Nutrition (mean=3.2)		
Quite a lot	91	34.5%
Neither too little or a lot	84	31.8%
Slightly too little	35	13.3%
Far too little	24	9.1%
A vast amount	22	8.3%
Health (mean=2.71)		
Neither too little or a lot	79	29.9%
Quite a lot	71	26.9%
Far too little	57	21.6%
Slightly too little	48	18.2%
A vast amount	8	3%

Table 4.2 provides mean scores associated with the different anchor points on the Likert scale. These represent consumers' selection based on their level of agreement with the knowledge they persist of each dimension. In terms of Hygiene, nearly half of the participants (48.95%) selected "quite a lot" as their response, while only 6.4% reported knowing far too little about this aspect.

Consumers' perceived level of knowledge towards Feeding Practices was in close proximity with the subjective results of the Hygiene dimension; about a third of consumers also selected to know quite a lot about this field (35.6%), with only 8.3% of the sample reporting to know far too little, indicating high confidence levels in these fields.

The prevailing consumer response regarding subjective knowledge of the Food Safety dimension, as observed across all dimensions except Health, was "quite a lot" (42.8%); however, only 6.8% of the sample reported having a vast amount of knowledge in this field. It was noted that Nutrition followed a similar structure of response as Food Safety; the majority of the sample perceived to have quite a lot of knowledge in this sector (34.5%), and the smallest proportion of the sample reported having a vast amount of knowledge on this topic (8.3%).

Notably, the subjective knowledge scores for the health dimension diverged significantly from the other dimensions. A considerable majority of consumers held a neutral, or average, perception of their knowledge towards this dimension (29.95%), closely trailed by those who saw themselves as slightly above average, marked as "quite a lot" (26.9%). Only a mere 3% of the sample reported having an extensive or "vast amount" of knowledge within this field, indicating that consumers, for the most part, did not view their knowledge in the health dimension as exceptionally high.

4.4.4 Identified Differences Pertaining to Consumers' Subjective Knowledge (Specifically Highlighting Differences in terms of the Dimensions of the PFBDGs)

To explore potential statistically significant differences regarding the sample's subjective knowledge when it comes to PFBDGs, ANOVAs was conducted. Due to this section of the study specifically attempting to identify areas of concern within the subjective knowledge domain of the PFBDGs, ANOVAs were performed on each of the specific dimensions (i.e. consumers' subjective knowledge of Health, Food Safety, Nutrition, Feeding Practices, and Hygiene). This allowed for a more detailed understanding and possible identification of specific areas that might need attention, instead of simply identifying a difference amongst the primary construct (i.e. subjective knowledge in general).

The following section presents the results of the ANOVAs. Where significant differences were identified, post-hoc tests were considered. Table 4.3 reflects the results for those dimensions where statistically significant differences were revealed. For a complete presentation of all the ANOVAs, please refer to Annexure F.

Table 4.3: Consumers' Subjective Knowledge of the PFBDGs (ANOVA)

ANOVA: Subjective knowledge (N=264)							
			Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Food Safety	Level of Education	Between Groups	19.022	5	3.804	3.033	**.011**
		Within Groups	313.587	250	1.254		
Nutrition	Age	Between Groups	9.234	3	3.078	2.673	**.048**
		Within Groups	290.203	252	1.152		
Hygiene	Level of Education	Between Groups	15.814	5	3.163	2.852	**.016**
		Within Groups	285.060	257	1.109		

(p-values are statistically significant at the 0.05 level)

4.4.5 ANOVA Analysis: Presentation of Significant Differences per Dimension in terms of Subjective Knowledge

a) Health

The ANOVA could not identify a significant difference among the age, ethnic, or level of education groups. Hence, one could not state that any of these demographical categories are therefore a useful predictor of consumers' subjective knowledge of the PFBDGs in specific aspects that relate to Health.

b) Food Safety

Although the ANOVA could not identify a significant difference among the age or ethnic groups, it revealed a significant difference among the level of education groups. However, on performing the post-hoc Bonferroni Multiple Analysis Test, no significant differences could be observed between the different levels of education groups. When reviewing the mean scores of the different levels of education it was possible to deduce that the difference might be between the group labelled as Degree/Diploma (M=3.36) which was higher than Grade 7 (M=1).

In essence, although the ANOVA revealed a statistical difference, the significance could not be confirmed by the post-hoc. Hence, the level of education could not be viewed as a possible predictor or area of concern when addressing consumers' subjective knowledge of the PFBDGs that relate to Food Safety.

c) Nutrition

The results from the ANOVA analysis could not identify a significant difference among the ethnic groups or level of education groups. A statistically significant difference was however identified among the age groups. Results from the post-hoc Bonferroni Multiple Comparison Test in Table 4.4. indicated that the group labelled as 42-57 years (Generation X) differed significantly from the group labelled 25-41 years (Millennials). Generation X portrayed a subjective knowledge mean of 3.78, and the Millennials a mean of 3.13.

Hence, age could be viewed as a possible predictor or area of concern when addressing consumers' subjective knowledge of the PFBDGs, specifically in the Nutrition field.

Table 4.4: Consumers' Subjective Knowledge in terms of Age Groups Pertaining to the PFBDGs related to Nutrition (Bonferroni Multiple Comparison Test)

	What was your age at your most recent birthday?		Mean	Mean Difference (I-J)	Std. Error	Sig.
Subjective knowledge: Nutrition	42 - 57 years M=3.78	18 – 24 years	3.32	.460	.341	.179
		25 – 41 years	3.13	.646*	.263	**.015**
		58 - 76 years	4.00	-.222	.669	.740

d) Feeding Practices

The ANOVA could not identify a significant difference among any of the demographical categories, i.e. age, ethnic, or level of education groups. As a result, one could not state that any of these demographical categories are a useful predictor of consumers' subjective knowledge of PFBDGs, particularly aspects that relate to Feeding Practices.

e) Hygiene

The ANOVA presented in Table 4.3 did not identify a significant difference among the age or ethnic groups. However, it revealed a significant difference among the level of education groups. The post-hoc analysis did not confirm these differences. By evaluating the mean scores of the group labelled Degree/Diploma (M=3.82) which was higher than the group labelled Lower than grade 7 (M=1), one could reason that the differences were between these categories.

To conclude, although the ANOVA revealed a statistically significant difference between levels of education groups, the post-hoc did not support this and the level of education could thus not be considered a predictor or area of concern regarding consumers' subjective knowledge of Hygiene.

4.5 Exploring Consumers' Objective Knowledge of the PFBDGs

Section 4.5 delves into the participants' objective knowledge of the PFBDGs, which is characterised by the information and understanding consumers acquire from factual sources, such as the PFBDGs (Raju, et al., 1995). This section presents findings in response to *Objective* 2.2 (*To explore consumers' objective knowledge of the PFBDGs).* To shed light on potential areas of concern, this section will commence with an overview of the objective knowledge scores. Subsequently, a table that organises the scores for each true or false question in descending order will be presented, offering insights into the specific aspects of consumers' objective knowledge related to the PFBDGs.

Table 4.5: Summary of Objective Knowledge Scores (N=264)

Dimension of the PFBDGs	**% Overall score for dimension** Depicted from the number of correctly answered items per category/dimension	**Classification of knowledge**
Health	71.52	Good
Food safety	67.34	Above average
Nutrition	57.42	Medium/average
Hygiene	52.08	Medium/average
Feeding practices	46.23	Poor
Overall objective knowledge for all dimensions	58.92	Medium/average

Table 4.5 provides a summary of the outcomes derived from the consumers' objective knowledge assessments, utilising the scoring classification system described in Chapter 3. The overall objective knowledge of participants falls in the medium/average range, with an average score of 58.92%.

In terms of the specific dimensions, it was interesting to note that the health dimension had the highest number of correctly answered questions (71.52%) and consequently received a good rating, followed by Food Safety (67.34%), which was assigned an above-average rating. Both Nutrition (57.42%) and Hygiene (52.08%) achieved a medium/average score classification. A poor rating was assigned to Feeding Practices, which was identified as the lowest-scoring dimension, with an average of a mere 46.23%.

The outcomes reveal that none of the dimensions attained an overall score classification of "very good" to "excellent". Instead, most dimensions received an average rating, and one even extended to a rating of poor classification.

Table 4.6: Objective Knowledge Results

Objective knowledge results (N=264)		
Evaluation statements	**Dimension of the PFBDGs**	**% of respondents who answered correct**
Items classified as very good to excellent (80>100%)		
Your baby's hands should be washed once a day (n = 262)	Hygiene	99.2
It is healthy for all children to play outside, in a safe environment (n = 263)	Health	91.7
Clean, safe water is essential when feeding young children (n = 260)	Food safety	89.4
It is important to take care of your baby's gums (n = 263)	Health	88.6
Excessive salty foods are not good for your child's health (n = 261)	Health	82.2
It is healthy for young children to eat a variety of foods each day (n = 263)	Nutrition	81.8
Items classified as good (70>79.9%)		
It is healthy to feed your baby at a fast pace (n = 261)	Health	79.2
It is not necessary to include fruit and veg in young children's diet every day (n = 260)	Nutrition	79.2
Children can start drinking caffeinated drinks from the age of 12 months (n = 261)	Nutrition	78.8
It is acceptable to dilute formula milk with milk powder (n = 262)	Feeding practices	74.6
Your child should not be allowed to touch or play with raw chicken, meat or eggs (n = 258)	Food safety	72.3
Items classified as above average (60>69.9%)		
It is acceptable to reuse your child's utensils for follow-up feeding if they did not eat everything the first time (n = 259)	Food safety	67.8
Beans and lentils are a good alternative to feed your child if meat is unavailable (n = 263)	Nutrition	66.7
Giving young children sugary, caffeinated, fatty snacks is allowed (n = 262)	Nutrition	64.8
Breastfeeding should be discontinued after the age of 12 months (n = 264)	Feeding practices	63.3

Objective knowledge results (N=264)		
Evaluation statements	**Dimension of the PFBDGs**	**% of respondents who answered correct**
Items classified as medium/average (50>59%)		
Formula milk products that are not sold by general retailers are safe to drink (n = 263)	Food safety	56.8
Hands should be washed once a day in order to be clean when preparing your child's meals (n = 263)	Hygiene	55.7
It is healthier to use butter instead of olive oil when preparing your child's meals (n = 261)	Nutrition	54.9
All babies should be encouraged to start eating with or from a spoon from the age of 6 months (n = 260)	Feeding practices	52.7
Utensils and bowls can be cleaned with lukewarm water (n = 262)	Food safety	50.4
Items classified as poor (<50%)		
When feeding a baby, his/her mouth should be cleaned regularly (n = 261)	Hygiene	48.1
You should only teach your baby to drink from a cup after 12 months (n = 264)	Feeding practices	45.5
Young children should drink 0-5 cups of water a day (n = 263)	Nutrition	41.7
Complementary foods should be introduced from the age of 4 months (n = 260)	Feeding practices	34.1
From 6 month of age all babies should be given protein foods every day, such as chicken, fish or eggs (n = 261)	Nutrition	29.2
Dairy products, such as yoghurt or maas, should be given to children sparingly (n = 264)	Nutrition	19.7
Young children should be forced to consume healthy food (n = 263)	Health	15.9
Items classified as poor (<50%)		
It is good practice to gradually increase the number of meals per day after the age of 12 months (n = 263)	Feeding practices	7.2
Exclusive breastfeeding for the first three months is best for your baby's healthy nutritional development (n = 261)	Feeding practices	5.3

Table 4.6 presents the objective knowledge scores of the PFBDGs across all dimensions, arranged from highest to lowest percentage correctness.

This table indicates that items exhibited considerable variation, ranging from an excellent number of correctly answered responses (99.2% success rate) to a poor 5.3%. Notably, the Feeding Practices dimension primarily fell into the “poor” category, with four items situated in this concerning range. A substantial majority of the items received a classification of less than 50%, signifying a general trend towards lower scores for objective knowledge of the PFBDGs.

4.5.1 Identified Differences Pertaining to Consumers’ Objective Knowledge (Specifically Highlighting Differences in terms of the Dimensions of the PFBDGs)

To explore potential statistically significant differences regarding the sample’s objective knowledge when it comes to the PFBGDs, ANOVAs was conducted. Due to this section of the study specifically attempting to identify concern areas within the objective knowledge domain of the PFBDGs, ANOVAs were performed on each of the specific dimensions (i.e. consumers’ objective knowledge of Health, Food Safety, Nutrition, Feeding Practices and Hygiene). This allowed for a more detailed understanding and possible identification of specific areas that might need attention, instead of simply identifying a difference among the primary construct as a whole (i.e. objective knowledge in general).

The following section presents the results of the ANOVAs. Where significant differences were identified, post-hoc tests were considered. Please refer to Annexure F for the complete presentation of all ANOVAs.

Table 4.7: Consumers' Objective Knowledge of the PFBDGs (ANOVA)

ANOVA: Objective knowledge (N=264)							
			Sum of Squares	df	Mean Square	F	Sig.
Health	Level of Education	Between Groups	253.237	5	50.647	10.471	**.000**
		Within Groups	1185.090	245	4.837		
	Ethnic group	Between categories	274.161	4	68.540	14.477	**.000**
		Within groups	1159.939	245	4.734		
Food Safety	Ethnic group	Between Groups	115.894	4	28.974	4.911	**.001**
		Within Groups	1439.624	244	5.900		
	Age	Between groups	71.101	3	23.700	3.912	**.009**
		Within groups	1490.375	246	6.058		
Nutrition	Level of Education	Between Groups	186.923	5	37.385	5.404	**.000**
		Within Groups	1701.923	246	6.918		
	Age	Between groups	73.236	3	24.412	3.334	**.020**
		Within groups	1815.621	248	7.321		
Feeding Practices	Level of Education	Between groups	31.860	5	6.372	2.071	**.000**
		Within groups	762.849	248	3.076		
Hygiene	Age	Between groups	31.564	3	10.521	3.142	**.026**
		Within groups	833.748	249	3.348		

(p-values are statistically significant at the 0.05 level)

4.5.2 ANOVA Analysis: Presentation of Significant Differences per Dimension in terms of Objective Knowledge

a) Health

Although the ANOVA could not identify a significant difference among the age groups, it exposed a significant difference among the level of education and ethnic groups. Results from the post-hoc Bonferroni Multiple Comparison Test presented in Table 4.8 confirmed statistical differences among ethnic groups. The group labelled as White (M=11.679) differed significantly from the Black African group (M=9.416).

On performing the post-hoc Bonferroni Multiple Comparison Test, no significant differences could be observed between the different levels of education groups. However, when reviewing the means of the different levels of education groups, it was possible to deduce that the difference might be between the group labelled as Degree/Diploma (M=11.657) and Lower than grade 7 (M=5). In essence, although the ANOVA revealed a difference, the significance could not be confirmed with the post-hoc. This indicates that ethnic groups stood as the only predictor or area of concern when it came to consumers' objective knowledge of Health.

Table 4.8: Consumers' Objective Knowledge in terms of Ethnic Groups Pertaining to the PFBDGs related to Health (Bonferroni Multiple Comparison Test)

Objective knowledge: Health	**Ethnic group**		**Mean**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
	White M = 11.679	Black African	9.416	2.263*	.301	**.000**
		Coloured	12.000	-.321	1.548	1.000
		Indian	10.714	.965	.840	1.000
		Other	9.500	2.179	1.548	1.000

b) Food Safety

The ANOVA analysis could not identify significant differences among the level of education groups. However, it revealed a significant difference among the ethnic and age group categories. Results from the Bonferroni Multiple Comparison Test indicated that the group labelled as White (M=8.908) differed significantly from the Black African group (M=7.434), confirming that ethnic groups could be considered a predictor or area of concern when it comes to consumers' objective knowledge of Food Safety.

Table 4.9: Consumers' Objective Knowledge in terms of Ethnic Groups Pertaining to the PFBDGs related to Food Safety (Bonferroni Multiple Comparison Test)

	Ethnic group		**Mean**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
Objective knowledge: Food Safety	White M = 8.908	Black African	7.434	1.474*	.337	**.000**
		Coloured	7.500	1.408	1.728	1.000
		Indian	8.833	.075	1.010	1.000
		Other	9.000	-.092	1.728	1.000

Similarly, the Bonferroni Multiple Comparison Test, confirmed significant differences among age groups when it comes to Food Safety. The post-hoc test first revealed a significant difference between the group labelled as 25-41 years (Millennials), with a mean of 8.510, and 18-24 years (Generation Z) with a mean of 6.957.

A significant difference was further identified between the group labelled as 42-57 years (Generation X) with a mean of 9.313, and the group labelled 18-24 years (Generation Z) with a mean of 6.957. This indicates that the demographical category of age was identified as a possible predictor or area of concern in terms of consumers' objective knowledge of Feeding Practices, as observed in two cases.

Table 4.10: Consumers' Objective Knowledge in terms of Age Groups pertaining to the PFBDGs, particularly aspects related to Food Safety (Bonferroni Multiple Comparison Test)

	What was your age at your most recent birthday?		Mean	Mean Difference (I-J)	Std. Error	Sig.
Objective knowledge: Food Safety	25 – 41 M = 8.510	18 - 24	6.957	1.553*	.541	**.027**
		42 - 57	9.313	-.803	.639	1.000
		58 - 76	10.000	-1.490	1.431	1.000
	42 – 57 M = 9.313	18 - 24	6.957	2.356*	.801	**.022**
		25 – 41	8.510	.803	.639	1.000
		58 - 76	10.000	-.688	1.549	1.000

c) Nutrition

Although the ANOVA did not indicate statistical differences among the ethnic groups, the age and level of education groups had statistical significance when it came to consumers' objective knowledge of Nutrition. The post-hoc Multiple Comparison Test indicated that the group labelled as 42-57 years, or Generation X, had a mean score of 9.924, whilst the group labelled 18-24 years, or Generation Z, obtained a mean score of 6.783. This indicates that age was identified as a possible predictor or area of concern when it comes to consumers' objective knowledge of the PFBDGs, specifically elements associated with the Nutrition dimension.

Despite the ANOVA indicating significance among educational groups and Nutrition, the post-hoc analysis could not indicate specific significant differences. However, the means deduced possible areas of differences when it came to the group labelled as Postgraduate (M=9.058) and Grade 7 (M=4.5). Essentially, despite the ANOVA's outcomes, the sample's education level could not be viewed as a possible predictor or area of concern concerning consumers' objective knowledge of Nutrition.

Table 4.11: Consumers' Objective Knowledge in terms of Age Groups pertaining to the PFBDGs related to Nutrition (Bonferroni Multiple Comparison Test)

	What was your age at your most recent birthday?		Mean (M)	Mean Difference (I-J)	Std. Error	Sig.
Objective knowledge: Nutrition	42 – 57 M= 9.294	18 - 24	6.783	2.512*	.865	**.024**
		25 - 41	8.234	1.060	.682	.730
		58 - 76	9.667	-.373	1.694	1.000

d) Feeding Practices

The ANOVA analysis did not indicate any statistical significance among the age or ethnic groups. However, statistical significance was identified among different levels of education groups. Although the ANOVA determined significance, the post-hoc Multiple Comparison Test did not reveal any significant differences between different levels of education groups. The mean score of the group labelled as Postgraduate (M=4.073) and Lower than grade 7 (M=0.000) could potentially indicate where the significant difference occurred. In essence, although the ANOVA revealed significance, the post-hoc test could not confirm it and different levels of education groups could consequently not be seen as a potential predictor or area of concern when it comes to consumers' objective knowledge of Feeding Practices.

e) Hygiene

The ANOVA analysis presented in Table 4.7 did not reveal any statistical significance among the level of education or ethnic groups. However, statistical significance was determined among different age groups when it came to the sample's objective knowledge of Hygiene.

Table 4.12 presents the Multiple Comparison Test confirming this significance. The post-hoc test revealed a significant difference between the group labelled as 42-57 years, or Generation X (M=6.722) and the group labelled as 18-24 years, or Generation Z (M=5.130). This significant

difference indicated that the age demographical category could be a possible indicator or area of concern when it comes to consumers' objective knowledge of Hygiene.

Table 4.12: Consumers' Objective Knowledge in terms of Age Groups pertaining to the PFBDGs, particularly aspects relating to Hygiene (Bonferroni Multiple Comparison Test)

	What was your age at your most recent birthday?		**Mean**	**Mean Difference (I-J)**	**Std. Error**	**Sig.**
Objective knowledge: Hygiene	42 – 57 M= 6.722	18 - 24	5.130	1.592*	.576	**.037**
		25 - 41	5.771	.951	.449	.212
		58 - 76	7.500	-.778	1.364	1.000

4.6 Possible Dunning-Kruger Effects (DKEs) between Consumers' Subjective and Objective Knowledge of the Current PFBDGs

The Dunning-Kruger Effect (DKE) is a cognitive bias where individuals with limited knowledge in a specific domain tend to overestimate their competence relative to objective criteria (Magnus & Peresetsky, 2022). Section 4.6 will present the results of potential instances of the Dunning-Kruger Effect (DKE) in consumers' knowledge of the current PFBDGs. These results align with objective 2.3: *To identify a possible misalignment between consumers' subjective and objective knowledge of the PFBDGs (i.e., DKEs), which could be considered a risk factor when feeding young children.*

4.6.1 Subjective Knowledge vs Objective Knowledge: A broad overview

Table 4.13: Classification of Subjective and Objective Knowledge Scores (N=264)

Mean score **Subjective Knowledge**	Percentage score **Objective Knowledge**
3.2	58.92%

Table 4.13 indicates that the mean score for subjective knowledge averaged at 3.2, being classified as medium/average as it scored slightly above the middle anchor mean of 3. Similar to the subjective knowledge score, the objective knowledge average also fell within the medium/average range of

58.92%. The overall comparison between subjective and objective knowledge results suggests moderately aligned subjective and objective knowledge.

4.6.2 *A Holistic Perspective:* Individual Outcomes of Participants

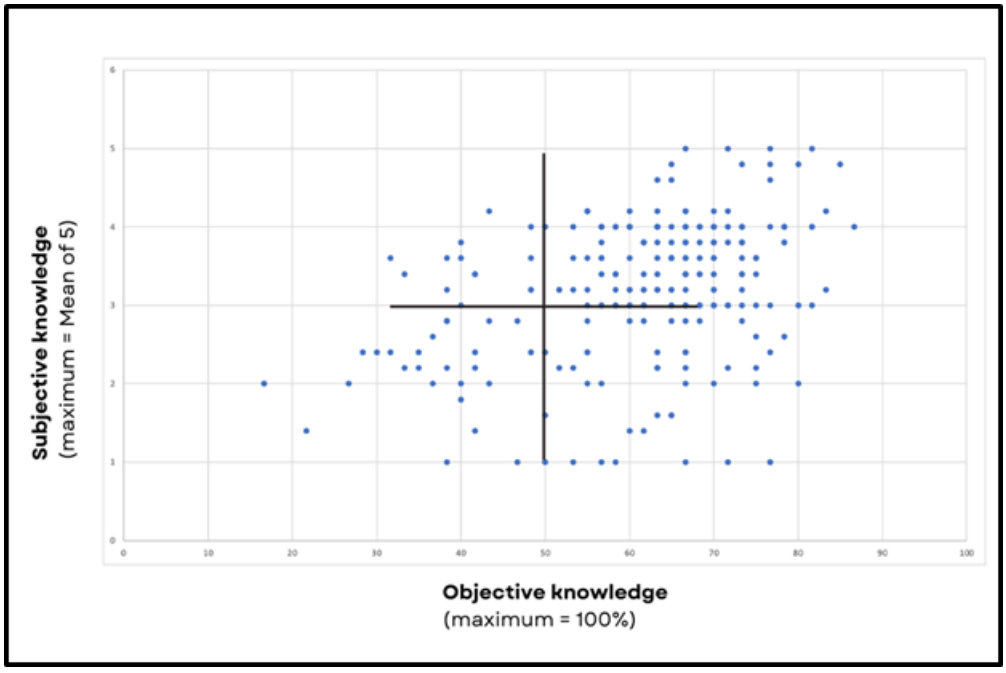

Figure 4.16: Individual Results from Participants (N=264)

The scatter plot represented in Figure 4.16 illustrates individual outcomes for each participant, with points plotted according to their subjective and objective knowledge scores concerning the PFBDGs. This visual representation reveals a predominant concentration of plots in the first quadrant, indicating both above-average subjective knowledge (M > 3) and objective knowledge (> 50%). The alignment observed in this graph suggests a coherence in knowledge regarding the PFBDGs.

The second quadrant of the graph signifies the presence of DKEs attributed to elevated subjective knowledge (M > 3) coupled with diminished objective knowledge (< 50%). Within this quadrant, only a few data points are evident, highlighting isolated instances of the DKE when scrutinising individual responses across subjective and objective knowledge metrics.

Moving to the third quadrant, the graph indicates cases characterised by both reduced subjective knowledge (M < 3) and objective knowledge (< 50%). This zone encompasses a marginally higher frequency of cases compared to quadrant two, where DKEs are present.

The final quadrant, quadrant four, captures scenarios where caregivers exhibited low subjective knowledge results (M < 3) despite possessing elevated objective knowledge scores (> 50%). This area suggests an occurrence of the Imposter Syndrome. Quadrant four emerges as the second most populated region of the graph, emphasising the prevalence of cases demonstrating this cognitive bias.

Section 4.6.3 will provide a more in-depth exploration of specific dimensions where potential DKEs are present.

4.6.3 Exploring Potential DKEs in Specific Dimensions of the PFBDGs: A Focused Analysis on Health, Food Safety, Nutrition, Hygiene, and Feeding Practices

Table 4.14: Classification of Subjective and Objective Knowledge Scores

PFBDGs dimension	Mean score **Subjective Knowledge**	Percentage score **Objective Knowledge**
Health	2.71 (poor)	71.52 (good)
Food Safety	3.21 (medium/average)	67.34 (above average)
Nutrition	3.2 (medium/average)	57.42% (medium/average)
Hygiene	3.6 (above average)	52.08% (medium/average)
Feeding Practices	3.26 (medium/average)	46.23% (poor)

Table 4.14 matches the subjective knowledge mean scores with the objective knowledge outcomes. If subjective knowledge had a higher score classification than objective knowledge, it would indicate a DKE occurrence.

Feeding Practices obtained the lowest objective knowledge score, with a poor rating of 46.23%, despite a subjective knowledge mean score within the medium/average range (M = 3.26). This major discrepancy in knowledge pinpoints a DKE within the Feeding Practices dimension of the PFBDGs.

Hygiene registered a medium/average score for consumers' objective knowing, leaning more towards the unfavourable side of 52.08%. In contrast, subjective knowledge demonstrated an above-average mean score of 3.6, giving rise to a DKE within this field.

Both objective (57.42%) and subjective knowledge (M = 3.2) scores for the Nutrition dimension fell within the medium/average scoring range. This suggests that consumers did not overestimate their abilities in this field, and knowledge of the Nutrition dimension is well-aligned.

Food Safety's results were misaligned in the opposite direction than previously discussed. The above-average objective knowledge score of 67.34% surpassed the medium/average subjective knowledge mean score of 3.21. This knowledge discrepancy underscores an Imposter Syndrome occurrence due to higher objective outcomes. Rather than overestimating abilities towards this dimension, consumers tended to underestimate themselves (Huecker, et al., 2023).

The health dimension's objective knowledge results were of good classification: 71.52%. Despite this score being the highest among objective knowledge results of all dimensions, the subjective knowledge mean score was the lowest and received a poor rating (M = 2.71). This misalignment pinpointed an Imposter Syndrome occurrence within the health dimension of consumers' knowledge.

4.6.4 Pearson's Correlation between Subjective and Objective Knowledge

Further analysis includes an examination of the correlation (or absence) of consumers' objective and subjective knowledge regarding the PFBDGs. Additionally, this section investigates the potential directions of any statistically significant findings. These findings were substantiated through the application of the Pearson Correlation Table, a statistical tool used to calculate a sample correlation coefficient (Vaughn, 2023).

In this context, this coefficient measures the strength and direction of linear relationships between variables between the subjective and objective knowledge scores pertaining to the dimensions of the PFBDGs. Furthermore, this table assessed statistical evidence for a linear relationship among the abovementioned variables, offering insights into the sample correlation coefficients. Table 4.15 provides these findings.

Table 4.15: Pearson's Correlation between Subjective and Objective Knowledge and the DKE

			SUBJECTIVE KNOWLEDGE					OBJECTIVE KNOWLEDGE				
			HEALTH	FOOD SAFETY	NUTRITION	HYGIENE	FEEDING PRACTICES	HEALTH	FOOD SAFETY	NUTRITION	HYGIENE	FEEDING PRACTICES
SUBJECTIVE KNOWLEDGE	**Health**	Pearson Correlation	1	.607**	.478**	.486**	.455**	.200**	.194**	.336**	.178**	.254**
		Sig. (2-tailed)		.000	.000	.000	.000	.002	.002	.000	.004	.000
		N	263	255	262	255	260	250	249	251	252	253
	Food safety	Pearson Correlation	.607**	1	.733**	.572**	.525**	.301**	.293**	.327**	.271**	.314**
		Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000
		N	255	256	255	252	253	245	244	245	246	247
	Hygiene	Pearson Correlation	.478**	.733**	1	.577**	.499**	.259**	.259**	.213**	.228**	.258**
		Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.001	.000	.000
		N	262	255	263	256	261	250	249	251	252	253

			SUBJECTIVE KNOWLEDGE					OBJECTIVE KNOWLEDGE				
			HEALTH	FOOD SAFETY	NUTRITION	HYGIENE	FEEDING PRACTICES	HEALTH	FOOD SAFETY	NUTRITION	HYGIENE	FEEDING PRACTICES
SUBJECTIVE KNOWLEDGE	Nutrition	Pearson Correlation	.486**	.572**	.577**	1	.691**	.219**	.156*	.216**	.125	.121
		Sig. (2-tailed)	.000	.000	.000		.000	.001	.015	.001	.051	.059
		N	255	252	256	256	255	244	244	244	245	246
	Feeding practice	Pearson Correlation	.455**	.525**	.499**	.691**	1	.114	.054	.153*	.133*	.148*
		Sig. (2-tailed)	.000	.000	.000	.000		.073	.396	.016	.036	.019
		N	260	253	261	255	261	248	248	249	250	251

*Sig. (2-tailed) = p-value, N = number of observations, Pearson correlation of >0.6 = correlation, <0.2 correlation too small to report, 1 = 100% correlation (Vaughn, 2023)

Pearson's Correlation Table revealed statistically significant ($p<0.05$) yet low positive correlations in the dimensions of Food Safety, Hygiene, Nutrition, and Health. In context to the DKE, these weak positive correlations imply that there is not a robust association between consumers' subjective and objective knowledge across these dimensions. This suggests that subjective knowledge might be high when objective knowledge is low and the other way around, hinting at the potential existence of DKEs.

The individual outcomes for each dimension of the PFBDGs, as observed in Pearson's Correlation Table 4.15, are summarised as follows:

- Pearson's correlation table first indicated a statistically significant difference ($p<0.05$), with a very low positive correlation (0.200) between consumers' subjective and objective knowledge within the health dimension.
- Food Safety's subjective and objective knowledge also had a low, positive correlation of 0.293 with a statistically significant difference ($p<0.05$).
- A statistically significant difference was noted ($p<0.05$), with a low positive correlation of 0.228 using Pearson's Correlation table between consumers' subjective and objective knowledge of Hygiene.
- Pearson's Correlation Table indicated a statistically significant difference in consumers' subjective and objective Nutrition knowledge at 0.05. However, the correlation was negligibly low at 0.216.
- Pearson's Correlation table concluded with a statistically significant difference at the 0.05 level, with a negligibly low positive correlation of 0.148 concerning the respondents' subjective and objective knowledge of the Feeding Practices dimension. This correlation was too weak to consider as it was less than 0.200.

4.6.5 Concluding Remarks on Chapter 4

This research employed a quantitative approach to data collection, addressing sub-objectives related to the main constructs of the study. The sample for this study was first profiled. Objective 1 commenced by looking into consumer practices, specifically in terms of procurement of food groceries and infant formula and exploring breastfeeding practices. The outcomes did not align with practices advocated by the PFBDGs, which will be elaborated on in Chapter 5.

Results pertaining to Objective 2 revealed consumers heightened subjective knowledge of the PFBDGs, particularly in the Hygiene dimension. Objective knowledge outcomes indicated that consumers' knowledge was of overall medium/average quality with the Feeding Practices dimension standing as the only field which obtained a poor classification.

This chapter concluded by aligning the consumers' subjective and objective knowledge in pursuit of possible DKEs and areas where consumers tend to overestimate their abilities. Hygiene and Feeding Practices were exposed as such areas due to their elevated subjective knowledge scores in comparison with the objective knowledge outcomes. Inferential statistics were used to strengthen the quality of the results and to pinpoint specific demographical groups which performed better than others.

Chapter 5 will discuss the results and limitations of the study. Recommendations for future research in the field of this study will also be provided to equip researchers with opportunities.

CHAPTER 5: CONCLUSION OF STUDY

This chapter addresses the study's conclusions by aligning them with the objectives formulated for the study. The recommendations presented in this chapter strategically emphasise priority areas for decision-makers who aim to mitigate malnutrition among young South African children. By pinpointing specific focal points, this chapter aims to significantly contribute to the ongoing conversation surrounding the battle against malnutrition among young children.

5.1 The Research in Retrospect: Introduction

Numerous studies underscore the critical nature of child malnutrition as a prevailing public health issue in South Africa (Mkhize & Sibanda, 2020). This issue is attributed not solely to a scarcity of resources in a developing country but also to inadequate utilisation of existing resources, a challenge caused by knowledge gaps (Reverri, et al., 2022). The findings of this study substantiate the literature by confirming specific knowledge gaps among South African consumers.

Chapter 5 provides coherence in all preceding chapters by addressing the study's objectives. It commences with a brief discussion of the study's sample before uncovering consumers' current practices. The South African Government undertook proactive steps and launched PFBDGs, valuable resources for primary caregivers to address the public health issue of child malnutrition (FAO, 2024). These guidelines are designed to prevent inappropriate feeding of young children by enhancing knowledge of all feeding dimensions. The consumer practices were evaluated in response to sub-objective 1.2, specifically focusing on consumer procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding and formula feeding), to provide a comprehensive comparison to the practices advocated in the PFBDGs.

High subjective knowledge (one's perceived knowledge) compared to objective knowledge (one's factual knowledge) can lead to overestimating abilities, resulting in an overconfident attitude, known as the Dunning-Kruger Effect (DKE) (Duignan, 2024). This theory explains how people with limited knowledge in a particular area can overestimate their competence. The DKE poses a particularly significant threat when it comes to feeding young children. Given that these children rely entirely on their caregivers for proper nourishment, they find themselves vulnerable. The significant consequences of possible DKEs present in consumers' knowledge of the PFBDGs inspired the investigation of consumers' subjective and objective knowledge (Objective 2.1 - 2.2) of this construct

irrespectively. Areas of concern were first identified within the individual knowledge fields. Attention was then turned to the identification of domains requiring intervention stemming from misaligned knowledge (Objective 2.3), particularly favouring the subjective field – these are the areas where DKEs are of the essence.

This study revealed that consumers, even among the more educated and affluent demographic, require more consistently conveyed subjective and objective knowledge regarding the PFBDGs. The concern areas are discussed in this chapter, providing insights into areas to be focused on for intervention.

This chapter presents the study's limitations and offers recommendations to address the identified public health concerns related to young child feeding. Additionally, it provides suggestions for future research to enhance our understanding of these critical issues further.

5.1.1 A Demographic Overview

A notable representation of female participants and the Millennial age cohort can be attributed to the study's prerequisite mandating participants to be caregivers of children aged 0-5 years. This age group is most relevant to childbearing and often assumes primary caregiving responsibilities of young children (Kim, 2023).

The sample predominantly falls under the well-educated category (Bureau of Market Research, 2012). While literature commonly addresses knowledge gaps in individuals with lower educational attainment, research on well-educated individuals is limited (Victora, et al., 2021). Consequently, this sample provides valuable insights into a demographic group that has been less frequently studied, contributing to new perspectives in the field.

Findings related to the age of the caregiver's oldest child suggest that a significant portion of the sample possesses prior experience in young child feeding, given that the majority's oldest child age surpassed 36 months. Literature supports the concept that consumers with previous experience tend to demonstrate greater competence in young child feeding (Herman, et al., 2023), implying that this sample may benefit from their accumulated experience. The fact that almost half of the sample had two dependent children, also suggested additional prior experience, and aligned with findings presented by Statistics South Africa (2021), which indicated that most South African households had two dependent children.

Cardel, et al., (2012) underscores the pivotal role of ethnicity as a predictor of young child feeding abilities. Another influential factor in caregivers' ability to feed their young ones was identified as their age. A study investigating the impact of caregiver age on the feeding of young children in their first year of life found that older caregivers generally adhered more closely to feeding guidelines compared to their younger counterparts (Moiseeva, et al., 2020). The findings of this study confirmed the abovementioned literature as ANOVAs unveiled differences among various ethnic and age groups' knowledge, and Multiple Comparison Tests extended beyond these findings to identify differences among specific groups.

Supported by the literature, such insights are valuable for tailoring targeted educational initiatives. This analysis delved into subjective and objective knowledge results and explicitly identified differences within specific dimensions of the PFBDGs, which is discussed in section 5.3.

The primary aim of the study was to test consumers' knowledge of the PFBDGs. The recruitment procedure prioritised convenience and practicality, with a keen focus on aligning participants with the study's central aim. Consequently, the sample was not intended to be representative of South Africa or Gauteng, as the emphasis was placed on selecting participants in accordance with the primary research aim.

It is critical to consider the profile of the sample throughout the study's findings, as it underscores the importance of this specific group in terms of potential interventions arising from the study's outcomes.

5.2 Current Consumer Practices

Abundant evidence highlights the health risks associated with substituting exclusive breastfeeding for formula feeding in infants aged 0-6 months (Rothstein, et al., 2021). Risks include the possible procurement of infant formula from informal retailers deeming it inappropriate for consumption, together with the sacrifice of health benefits associated with exclusive breastfeeding for both the mother and infant (CDC, 2024). Recognising the significance of appropriate formula procurement and feeding practices this section delves into Objective 1.1: To explore and describe consumer procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding).

5.2.1 Procurement

Decisions for procurement of food groceries were mostly done by primary caregivers themselves, with a mere 20% of cases involving someone else. This underscores the significance of concentrating mostly on caregivers when addressing grocery purchasing decisions, given their substantial involvement in the process. Shopping frequency for food was also investigated and results revealed that the majority of the sample procured food weekly. These results are similar to the observations made by Nielsen (2021). This report highlighted a shift in consumer shopping behaviour, noting a substantial reduction in shopping frequency post-COVID-19, reaching an average of once a week.

Interestingly, despite all caregivers in this study choosing formal retailers for food groceries, this preference did not extend to the procurement of infant formula, with 7.2% of caregivers opting for the informal sector. This is concerning, given the FDA's (2023) warnings regarding potential health risks associated with using informal retailers for infant formula, including the possibility of tampering leading to potential bacterial infections in the infant or the inadequate nutritional content thereof. Despite these warnings, some caregivers in the study still risked the health of their infants and inappropriately procured this vital source of nourishment. The underlying reason for some consumers selecting the informal sector for infant formula, despite purchasing other food groceries from formal retailers remains unclear, indicating an opportunity for further investigation in future research.

5.2.2 Breastfeeding

The PFBDGs provides crucial guidelines for breastfeeding, advocating exclusive breastfeeding for the first six months of the infant's life, followed by the gradual introduction of complementary foods (UNICEF, 2013). Additionally, mothers are encouraged to continue breastfeeding for two years and beyond. The benefits of breastfeeding are endless, with Dieterich, et al., (2013) highlighting its role in saving infant lives and mitigating health risks for both the mother and child. Despite the overwhelming evidence and recommendations from both the literature and PFBDGs, only 37.8% of the sample followed the 6-month exclusive breastfeeding guideline, prompting an inquiry into the underlying causes. Notably, unsupportive work policies and inadequate parental leave emerged as significant contributors (CDC, 2020). This literature supports the need for employers to establish supportive measures such as providing sufficient parental/maternal leave to improve the current rate of exclusive breastfeeding.

5.3 "Once we know something, we find it hard to imagine what it was like not to know it" - (Chip & Dan, 2024)

This section initiates by exploring consumers' awareness of the PFBDGs to establish a foundation for understanding their knowledge of it. Barker (2020) states the importance of awareness when it comes to fully optimising proactive measures, supporting the investigation of consumers' awareness of the PFBDGs. The results indicated that a mere 21.2% of the sampled population was aware of these guidelines. Within this group, 34.3% gained their awareness from non-industry professionals. Awareness of PFBDGs could be even more concerning among less educated consumers, as highlighted by Kajjura, et al., (2019).

Nankumbi & Muliira (2015) stated that a lack of awareness among consumers regarding proactive measures, such as the PFBDGs, presents a substantial obstacle to addressing the ongoing issue of child malnutrition. Additionally, overlooking educational resources deprives communities of valuable opportunities to enhance the nutritional outcomes of young children. This lack of awareness not only hinders progress in improving overall young child health but also results in significant missed potential.

Another area of concern is the spread of misinformation often of the essence when non-industry professionals are the communicators of measures intended to help the public (American Psychological Association, 2024). The spread of misinformation has a significant effect on improving public health. The importance of improving the accessibility of the PFBDGs and ensuring their widespread distribution through reliable channels (industry professionals) has been underscored.

5.3.1 Consumers' Subjective Knowledge of the PFBDGs

Testing consumers' subjective knowledge of the PFBDGs assisted in determining their confidence levels for each dimension identified in this primary construct (Health, Food Safety, Nutrition, Hygiene and Feeding Practices). This discussion specifically focuses on Objective 2.1: To explore and describe consumers' subjective knowledge of the PFBDGs. Consumers' subjective knowledge is the level of knowledge that individuals believe they have about a particular topic (Kim & Ammeter, 2011).

The participants in the study demonstrated notable levels of confidence across several dimensions from certain areas listed above: Hygiene (M = 3.6), Feeding Practices (M = 3.26), Food Safety (M = 3.21) and Nutrition (M = 3.2).

Their mean scores substantiated this, all of which were average to above average (Mean > 3). Entwistle, et al., (2010) emphasised the significance of caregiver confidence in all aspects of feeding young children, citing its positive impact on the overall parent-infant relationship. While average to above-average confidence levels in most domains are encouraging, Hadar & Sood (2014) warn against the possibility of high confidence leading to overconfidence.

Dahlen (2024) observed that older caregivers generally exhibit higher confidence levels in feeding their young ones. This could be attributed to their possible greater financial stability and accumulated experience. The ANOVA analysis conducted in this study confirmed age as a significant predictor of subjective knowledge, particularly in the Nutrition dimension. The subsequent post-hoc test further supported this literature, revealing that the older caregivers from the Generation X cohort (42 - 57-year-olds) demonstrated higher confidence levels in the Nutrition dimension compared to younger caregivers from the group labelled as Millennials (25 - 41 year-olds). Generation X obtained a mean score of 3.78, surpassing the mean score of the younger Millennial cohort (M = 3.13).

Notably, the singular dimension with a below-average (Mean < 3) score for subjective knowledge was Health (M = 2.71), indicating a unique instance of low consumer confidence, suggesting that caregivers might feel the need to improve their competencies in this domain.

5.3.2 Consumers' Objective Knowledge of the PFBDGs

The participants' objective knowledge scores were tested to determine their factual knowledge regarding the guidelines, in response to Objective 2.1 (To explore and describe consumers' objective knowledge of the PFBDGs). Objective knowledge is based on logic and is linked to reality. It is not influenced by subjectivity or personal opinions and must be verified independently, as Rihn (2021) states. The PFBDGs serve as a crucial proactive measure by delivering objective and information about young child feeding to caregivers (Bourne, 2007).

Inadequate objective knowledge about feeding could disproportionally impact the most vulnerable group: dependent, young children (Motebejana, et al., 2022). It is thus of paramount importance to shed light on the dimensions of the PFBDGs in need of intervention when it comes to objective knowledge. Among the dimensions assessed, the Feeding Practices dimension exhibited the most notable deficiency in objective knowledge, scoring merely 46.23% and consequently being classified as poor.

The Feeding Practices dimension of the PFBDGs encompasses crucial elements of young child feeding, including breastfeeding, complementary feeding, and formula feeding. A closer examination of this dimension reveals concerning findings. Only 5.3% of caregivers correctly answered the question regarding the recommended duration of exclusive breastfeeding, with the majority suggesting that three months is sufficient. This is alarming considering the established importance of exclusive breastfeeding for the first six months, as advocated by the PFBDGs (Dieterich, et al., 2013).

Furthermore, the guideline advocating the gradual introduction of solid foods starting at six months of age (Bourne, 2007), raised concerns, as only 7.2% of consumers correctly acknowledged this recommendation in the true-or-false test. Moreover, despite the guideline advising against forcing children to eat and the documented adverse effects of such practices, including the development of negative associations with food (Leung, et al., 2012), only 15.9% of the participants correctly indicated that young children should not be forced to eat. These findings underscore Feeding Practices as an area of considerable concern regarding consumers' objective knowledge, with specific aspects of this dimension warranting urgent attention.

Both the Hygiene (52.08%) and Nutrition (57.42%) dimensions achieved an average percentage score for objective knowledge. Although participants better comprehended these fields, a lack of knowledge was still present. The World Health Organisation (2023) has revealed that 45% of all child deaths are linked to inappropriate nutrition or unhygienic feeding. Given the gravity of this issue, achieving an average score in the Nutrition and Hygiene dimensions of the PFBDGs is insufficient. The significance of these practices underscores the need for a concentrated effort in consumer education within these dimensions.

The literature underscores the significance of caregivers' age on their objective knowledge across all dimensions of feeding young children. Bayero (2020) specifically highlights that younger caregivers, especially those below 18 years of age, exhibit lower competence in this domain. Consistent with these findings, the ANOVA results from this study identified age as a significant predictor of consumers' objective knowledge in the Hygiene, Nutrition and Food Safety dimensions.

While this study's sample excluded caregivers younger than 18 years due to ethical considerations, post-hoc tests affirmed the literature's observations.

Consistent with the literature highlighting the enhanced competence of older age cohorts when it came to objective knowledge of feeding young children, Generation X demonstrated superior performance in Feeding Practices, with a mean score of 9.313 compared to younger Generation Z's mean score of 6.957. Furthermore, within this dimension, Millennials (M = 8.510) also outperformed Generation Z.

This trend persisted across the Nutrition dimension, where Generation X (M = 9.294) outscored Generation Z (M = 6.783). Similarly, in the Hygiene dimension, Generation X (M = 6.722) exhibited significantly higher competence than Generation Z (M = 5.130), reinforcing the literature's findings.

Furthermore, ethnicity emerged as another influential factor affecting consumers' objective knowledge, particularly in Food Safety where the White ethnic group (M = 8.908) scored higher than the Black African (M = 7.434) group. This pattern extended to the Health dimension as the White ethnic group (M = 11.679) outscored the Black African group (M = 9.416). While cultural diversities associated with different ethnic groups may influence feeding, no significant disparities were identified within the literature in the objective knowledge levels (Risica, 2022).

Although the Food Safety (67.34%) and Health (71.52%) dimensions yielded objective knowledge of above average and good results, optimising all fields is imperative, given their equal importance in young child feeding (Dieterich, et al., 2013). It is however recommended to first focus education towards Feeding Practices, due to the caregivers' distressing objective outcomes of this topic revealed in this study. Education can furthermore be zoomed into specific demographic groups more in need of intervention within certain domains, particularly the younger age cohorts, specifically Generation Z when it comes to Feeding Practices, Nutrition, and Hygiene, and the Black African group when it comes to Food Safety and Health.

5.2.3 "The only true wisdom is knowing you know nothing" - (Socrates, 1966)

The DKE refers to a cognitive bias, where consumers overestimate their abilities and assume that they have accurate and appropriate knowledge, even if this is not the case (Duignan, 2024). This section will discuss the construct of possible Dunning-Kruger Effects (DKEs) in consumer knowledge of the PFBDGs [Objective 2.3: To identify a possible misalignment between consumers' subjective and objective knowledge of the PFBDGs (i.e., DKEs), which could be considered a risk factor when feeding young children].

A DKE in consumers' knowledge of the PFBDGs is harmful and can result in an attitude among consumers believing that they do not need additional education, placing young children at high risk. This study used the DKE phenomenon by weighing up the caregivers' subjective and objective knowledge. Compared to the objective knowledge score, higher subjective knowledge indicates a DKE based on the participants' overestimated knowledge.

Overall, a DKE was not identified, as consumers' subjective knowledge (M = 3.2) and objective knowledge (58.92%) across all dimensions were both of average nature, suggesting relatively aligned knowledge. Examining the alignment of individual consumers' subjective and objective knowledge, the scatter plot depicted in Figure 4.6 revealed that only a small portion of the sample's results fell within the quadrant of the graph where a DKE was of the essence. Most of the sample demonstrated relatively aligned knowledge, which was encouraging, however, a closer examination into individual dimensions of the PFBDGs revealed a different trend.

Consumer confidence within the Feeding Practices dimension demonstrated average levels (M = 3.26) despite their poor performance in objective testing, achieving a mere 46.23%. This significant misaligned knowledge underscores a DKE where consumers believe they are more competent than they are. The overconfidence of consumers within this dimension signals the initial phase of the DKE, emphasising the necessity to first uncover and address their limitations, before achieving a favourable increase in competence and confidence. This study, by revealing the limitations of knowledge i.e. Feeding Practices, marks the initial advance towards reaching The Plateau of Sustainability (Swart, 2022).

While not as prominent as the DKE observed within the Feeding Practices dimension, Hygiene similarly exhibited an elevated subjective knowledge score (M = 3.6) in contrast to the objective knowledge results (52.08%). Consumers displayed an above-average confidence level that exceeded the average outcome of objective testing, leaning towards the unfavourable side of the average range. Similar to the alignment observed in the Feeding Practices dimension, addressing the limitations within this field requires targeted intervention and consumer education to gradually enhance its standing on the DKE graph.

The Imposter Syndrome is the opposite of the Dunning-Kruger Effect and is defined as a cognitive bias where consumers cannot recognise or admit to their actual competence (Eldridge, 2023). This phenomenon was identified within the Health dimension of the PFBDGs caused by lower subjective knowledge of below-average classification (M = 2.71) in comparison to objective criteria (71.52%) which obtained a good rating.

Food Safety was also subject to The Imposter Syndrome due to a similar discrepancy in subjective and objective knowledge ascribed to a slight above-average subjective mean score of 3.21 compared to a definite above-average (67.34%) objective rating. Although objective knowledge was still not of excellent quality within these fields and consumer competencies could further be enhanced to ensure optimal feeding outcomes, consumer education is recommended to commence in areas where DKEs feature prominently.

The Nutrition dimension was rated as having average knowledge in both subjective (M = 3.2) and objective (57.42%) fields. Although there were no remarkable objective knowledge gaps in this field, the average knowledge scores indicate a need for improvement to excellent levels for optimal nutritional outcomes in young children. The significance of this dimension gives rise to the importance of excellent nutritional knowledge among South African caregivers.

Pearson's Correlation Table depicted in Table 4.15 indicated low positive correlations of subjective and objective knowledge in Food Safety, Hygiene, Nutrition, and Health. These findings suggest the possible presence of DKEs, a hypothesis which was further supported by the examination of the alignment of subjective and objective knowledge results in each dimension individually compared. Particularly, these areas were pinpointed as Feeding Practices and Hygiene.

5.4 Limitations of the Study

Throughout the study, the primary researcher made sure to prioritise the production of quality data with statistically correct conclusions. However, despite all efforts, the following limitations of the study were identified:

- The aftermath of the COVID-19 pandemic is still affecting many people. The study was conducted after all COVID-19-related regulations were lifted, but some consumers still experienced psychological effects. The pandemic not only made consumers more conscious of the virus but also generally conscious of other viruses and infections. For example, some people still avoid public places such as clinics, creches, kindergartens/nursery schools, and taxi ranks, which they consider high-risk areas for contracting infections. Unfortunately, these same areas were selected for data collection regions, resulting in the loss of many potential participants. Nonetheless, the final sample size was suitable for the nature of this study.

- The data was collected using convenience sampling, which can result in a skewed sample that does not accurately reflect the larger population's demographic characteristics (Tyrer & Heyman, 2016). This was evident in the ethnic group ratios of the sample, which did not align with the ethnic distribution presented for Gauteng by Statistics South Africa. However, the study still provided a thorough analysis of the utilised sectors and focused on the main aims accurately.

5.5 Recommendations for Future Studies

The primary aim of the study was to determine the areas of risk related to young child feeding caused by possible knowledge deficiencies and gaps. Food-based Dietary Guidelines are not limited to the paediatric field. This study can be expanded by investigating possible opportunities for knowledge enhancement among additional age groups, such as adolescents, adults and the elderly.

This study attempted to include participants from all income groups in the sample, targeting areas which potentially held a concentrated number of participants. Although this was convenient and time-efficient, additional areas within lower-income communities could have been excluded. The sampling technique did not allow for investigation among the poorest group of caregivers – those who would likely have been situated in townships and rural areas when data collection commenced. It is recommended to focus explicitly on this demographical group, reaching them by travelling to such areas. The outcomes for this study and risk areas were obtained from a relatively educated and higher-income class sample. The results could potentially be even more concerning among the poorest income group of South Africa. A study following a similar structure as this study within rural areas would be of significance as it could potentially expose problem areas within the most vulnerable group of South African consumers.

This research highlighted the significance of buying infant formula from authorised retailers. To ensure the safety of young children, it is crucial to assess consumers' understanding of food labels, especially infant formula, and determine if there is a need for educating them on food labels, especially milk formula products. This will help address the problem of unsafe formula milk consumption and the severe aftermath thereof.

5.6 Concluding Remarks

This research had the core purpose of exposing the danger in young child feeding arising from caregivers' overestimation of competencies and their lack of appropriate knowledge. The study has unmasked a root cause of such – The Dunning-Kruger Effect – a misalignment between caregivers' subjective and objective knowledge within specific dimensions of the PFBDGs.

These findings have the potential to contribute towards corrective action that can combat the severe effect of child malnutrition that haunts South Africa and become a compass to steer policymakers towards more informed communication with caregivers. The study's findings determined the dimensions most at risk as Feeding practices and Hygiene. In these dimensions, caregivers' perception of their knowledge starkly differed from their actual (objective) knowledge, leaving vulnerable young children exposed to risk. Navigating this divide emerges as the key pillar to securing the well-being and nutritional status of South Africa's youngest generation. If current trends endure, the state of child malnutrition will remain unchanged, limiting progress towards the nation's second SDG, causing the Zero Hunger objective for 2030 to slip beyond reach.

Building educational campaigns that are driven by the relevant professionals in the field emerges as a potential beacon of change, arming caregivers with preventative strategies found in the PFBDGs (Fink, 2010). This research has enabled educational campaigns to spotlight dimensions that were highlighted as risk zones. To foster superior nourishment for young children, the retail sector holds the corporate responsibility to make young child feeding guidelines more accessible through packaging and food labels. A QR code, visible on infant food products, such as infant formulas, could act as a portal to the PFBDGs, supplying a cost-effective manner of providing caregivers with informative information. This approach offers a practical manner of sharing the guidelines, given the need for a greater awareness of the PFBDGs, as revealed in the study.

This study has armed policymakers and those with a responsibility towards consumers with the research needed to carve out more focused routes to take care of our nation's precious children.

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7. Annexure

Annexure A Conference Proof

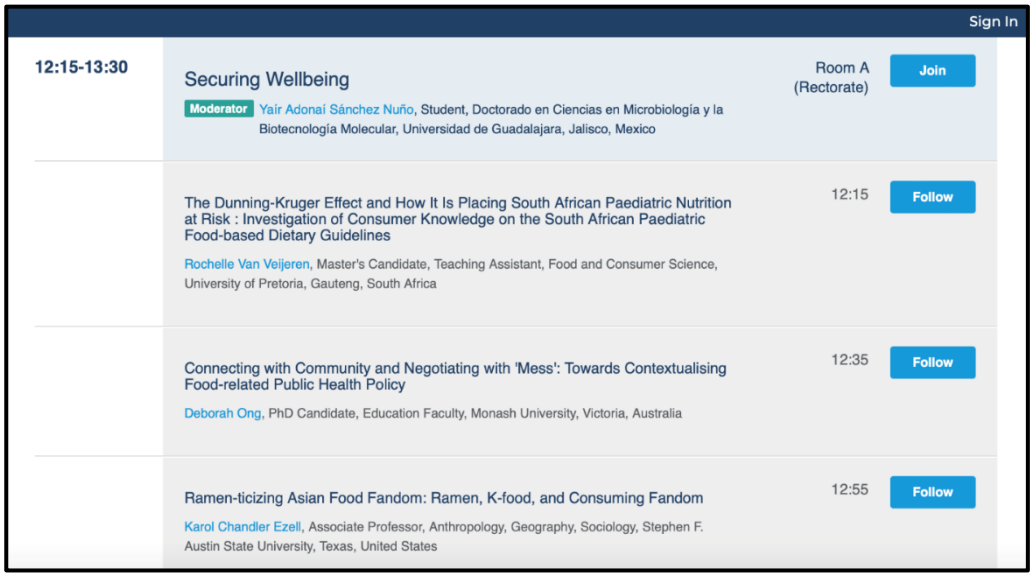

Figure 7.1 Annexure A Conference proof.

13th International Food Studies Conference 2023:

Full program available on:

https://cgscholar.com/cg_event/events/O23en/schedule#2023-10-18

Figure 7.2 Presentation of this study's findings at the 13th International Food Studies Conference in Mexico

Annexure B: Ethical Clearance Letter

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Natural and Agricultural Sciences
Ethics Committee
E-mail: ethics.nas@up.ac.za

29 August 2022

ETHICS SUBMISSION: LETTER OF APPROVAL

Dr AMP Hoffman
Department of Consumer and Food Sciences
Faculty of Natural and Agricultural Science
University of Pretoria

Reference number: NAS208/2022
Project title: SOUTH AFRICAN CONSUMER KNOWLEDGE OF THE CURRENT PAEDIATRIC FOOD-BASED DIETARY GUIDELINES

Dear Dr AMP Hoffman,

We are pleased to inform you that your submission conforms to the requirements of the Faculty of Natural and Agricultural Sciences Research Ethics Committee.

Please note the following about your ethics approval:

- Please use your reference number (NAS208/2022) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.
- Please note that ethical approval is granted for the duration of the research (e.g. Honours studies: 1 year, Masters studies: two years, and PhD studies: three years) and should be extended when the approval period lapses.
- The digital archiving of data is a requirement of the University of Pretoria. The data should be accessible in the event of an enquiry or further analysis of the data.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.
- **If Applications using GM permits:** If the GM permit expires before the end of the study, please make an amendment to the application with the new GM permit before the old one expires
- **If Applications using Animals:** NAS ethics recommendation does not imply that Animal Ethics Committee (AEC) approval is granted. The application has been pre-screened and recommended for review by the AEC. Research may not proceed until AEC approval is granted.

Please see comments made by the reviewer:
Some of the comments is more technical. In overall the proposal and study design are very sound. We just observe the title is in Capital letters where is is explicitly asked to be in Sentence format. We also see that in some of the sections the abbreviation PFBDGs was used before the full description was given.

We do just would urge that anonymity should be obtained as it is important as some of the information might be personal.

Post approval submissions including application for ethics extension and amendments to the approved application should be submitted online via the Ethics work centre.

We wish you the best with your research.

Yours sincerely,

Prof VJ Maharaj
Chairperson: NAS Ethics Committee

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Figure 7.3 Annexure B Ethical Clearance Letter

Annexure C: Manner of Fieldworker Training: Online training session

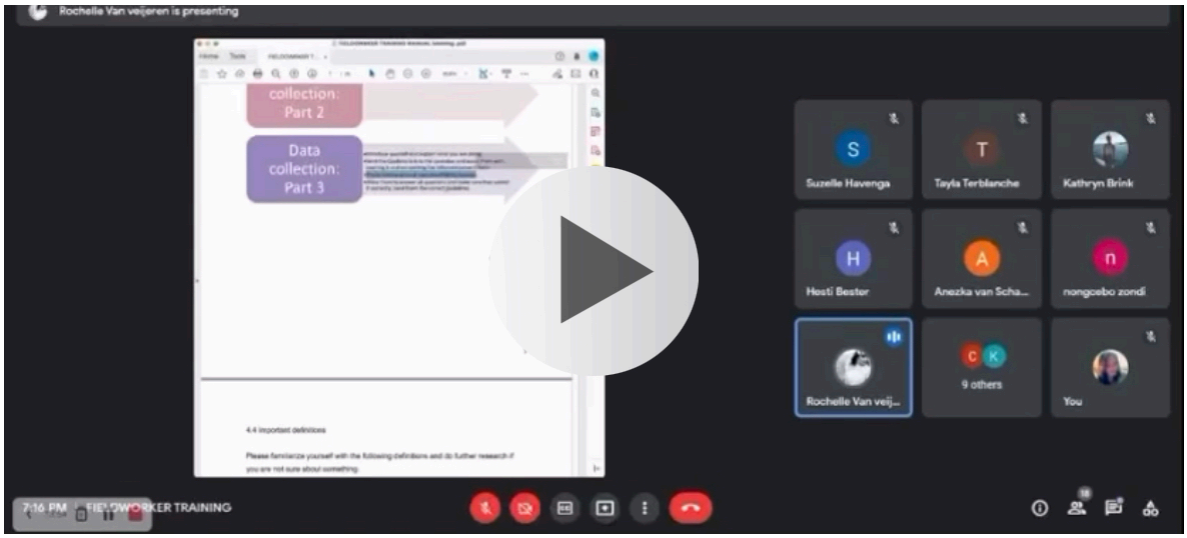


Figure 7.4 Annexure C Manner of Fieldworker Training: Online Training Session

Figure 7.5 Annexure C Fieldworkers on a trip to Kalafong Clinic for Data Collection

Annexure D: Fieldworker training manual (containing the consent form and final questionnaire)

UNIVERSITY OF PRETORIA | UNIVERSITEIT VAN PRETORIA

Fieldworker training manual

Date: 6 September 2022

Time: 19:00 – 21:00

Principle investigator: Rochelle Van Veijeren

Under supervision of: Dr. Hoffman, Dr. Marx-Pienaar and Dr. Pretorius

For queries contact me at: rochellevanvei@gmail.com / 0795422070

Master's Title:

SOUTH AFRICAN CONSUMER KNOWLEDGE OF THE PAEDIATRIC FOOD-BASED DIETARY GUIDELINES

Topics Discussed

a) Why this research?
b) Objectives of this research.
c) What is an online questionnaire?
d) What is a fieldworker?
e) Your responsibility as a fieldworker.
f) Ethical requirements as a fieldworker.
g) Process of data collection.
h) Important definitions.
i) The questionnaire.

Why this research?

Consumers, with specific reference to primary caretakers, often overestimate their abilities involving the feeding of young children. This is problematic as a lack of knowledge leads to public health concerns, in this case, child malnutrition.

The following concerning facts give further reason to delph deeper into child malnutrition (as retrieved from the study's problem statement):

- Over 149 million children under the age of five are estimated to have been stunted in 2020, with 45 million children being underweight and nearly 38 million overweight on a global level (UNICEF, 2021).
- The World Health Organization reported that about 45% of all under-five deaths were related to malnutrition in some way (WHO, 2020).
- The Triple Burden of Global Malnutrition can be defined as the coexistence of undernutrition, micronutrient deficiency and overweight or obesity on a global and national level (Sanders, 2022).
- Gilbert Tshitaudzi, nutrition specialist, describes malnutrition as “the slow violence in South Africa” and indicates that the COVID-19 pandemic made access to adequate and nutritious food in low-income communities even more challenging (Tshitaudzi, 2021).
- Despite numerous attempts to conquer the matter, high stunting rates, overnutrition and micronutrient deficiencies are still prevalent on a national level (Tshitaudzi, 2021).
- Recent literature indicates that consumers’ knowledge relevant to nutrition is of concern and that they furthermore often overestimate their ability or knowledge when it comes to feeding which consequently place themselves and those dependent on them at risk (Kumoji, 2019). This is often seen within consumers from all economic settings.
- Unfortunately, many caretakers are not sufficiently educated about appropriate feeding, and this therefore exacerbates the public health issue of malnutrition. Consumer knowledge can thus be seen as fundamental in terms of paediatric malnutrition.

Specific objectives of this research:

Objective 1: To explore and describe consumer practices
Objective 1.1: To explore and describe consumers' current procurement (i.e. food groceries and infant formula) and feeding practices (i.e. breastfeeding).
Objective 2: To explore consumers' knowledge of PFBDGs to identify possible elements of risk when feeding young children
Objective 2.1: To explore consumers' subjective knowledge of the PFBDGs
Objective 2.2: To explore consumers' objective knowledge of the PFBDGs
Objective 2.3: To identify a possible misalignment between consumers' subjective and objective knowledge of the PFBDGs (i.e., DKEs), which could be considered a risk factor when feeding young children.

The objectives will be tested in the following sections of the online questionnaire:

SECTION A:	Demographical characteristics
SECTION B:	Consumer behaviour test – procurement and feeding practices
SECTION C:	Subjective knowledge test (5-point Likert scale), Objective knowledge test (5-point true or false test)

What is an online questionnaire?

Consumers who meet the criteria to fall in the specific investigated sample will be approached to complete a questionnaire, using an electronic device, such as a mobile phone. An online questionnaire can more specifically be defined as a computer-assisted manner of web interviewing, achievable through specific software (SmartSurvey, 2022). The abovementioned software will in this case be Qualtrics. This software is a user-friendly tool which researchers can use to gather data. This software allows the researcher to design questions which can be asked in numerous manners, such as true/false, multichoice-based or qualitative manners (Qualtrics, 2022).

What is a fieldworker?

An individual is purposefully selected to assist with data collection: in this case, quantitative data (Green, 2012), and is known as a fieldworker.

4.1 Your responsibilities as a fieldworker for this research:

- To be well aware of each aspect mentioned in this manual.
- To contact the principal investigator if any uncertainties occur.
- To adhere to all ethical requirements (stated in this document).
- To gather AT LEAST 10 responses from the relevant sample group.

It is important to take note of the sample criteria. Each participant needs to adhere to the criteria to be allowed to complete the questionnaire. There will be no limitations in terms of race, gender or income level. Take note of the following:

NB

✓ The participant needs to be over the age of 18.

✓ The participant needs to have given consent to partake in the study.

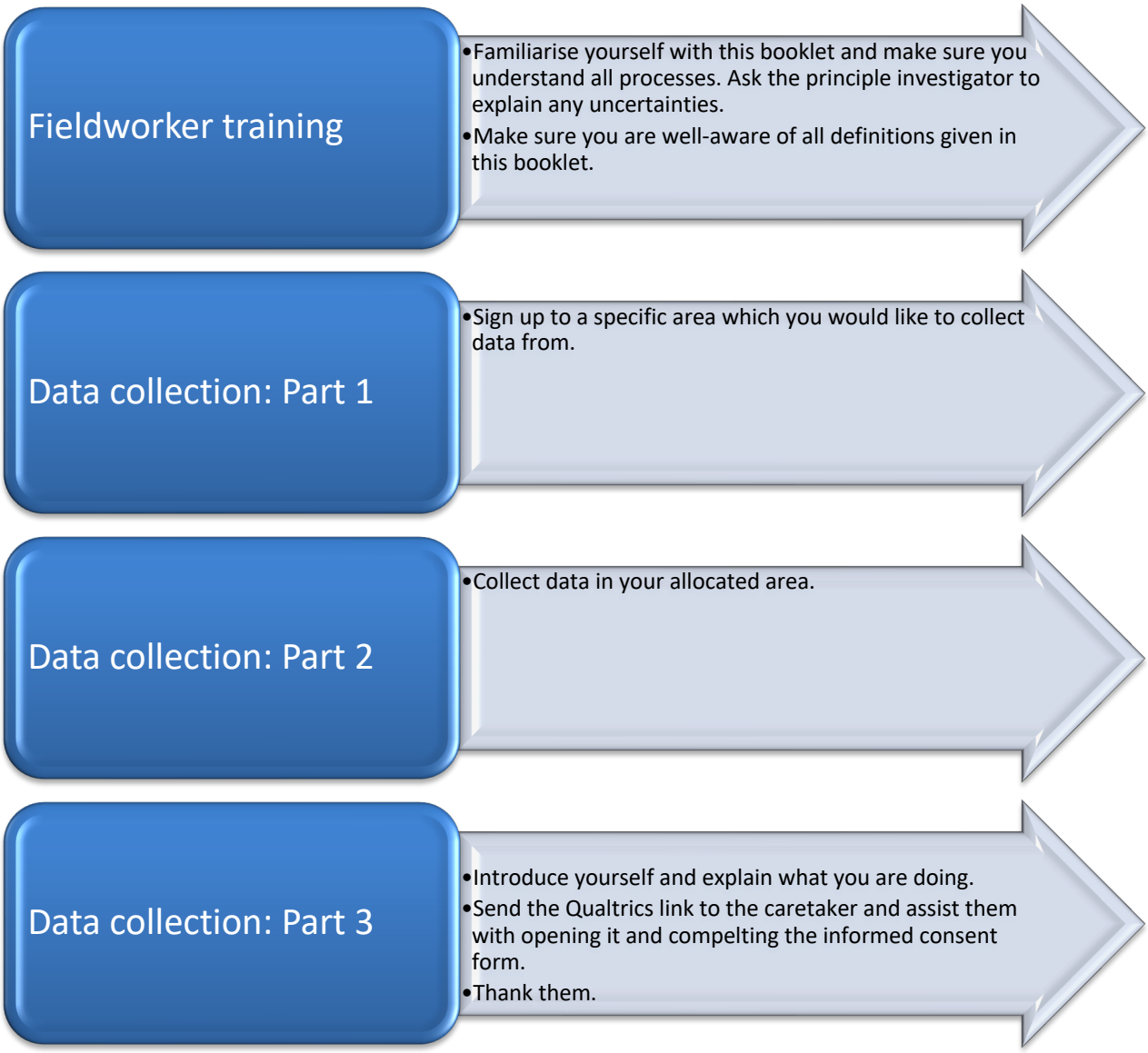
✓ The participant needs to be the primary caretaker of a child who falls within the definition of Paediatric (be 0-5 years old)

✓ The participant needs to reside in the Gauteng region of South Africa.

4.2 Ethical requirements as a fieldworker:

- To handle all participants with respect.
- To handle all information collected as highly confidential and only share it with the principal investigator.
- To allow participants to ask questions relevant to the questionnaire.
- To allow participants to refuse to answer specific questions, if they do not want to.
- To allow participants to discontinue from answering the questionnaire.
- To not lead participants towards certain outcomes of answers.
- To translate certain words, if needed.

4.3 Process of data collection



4.4 Important definitions

Please familiarize yourself with the following definitions and do further research if you are not sure about something.

Term/Concept	Definition	Reference
Consumer survey	A series of questions specifically structured to gain information about certain topics of interest/ groups of consumers.	(Techopedia, 2013)
Dunning-Kruger effect	A theory explaining a cognitive bias which indicates that incompetent consumers often overestimate their ability towards certain tasks, or knowledge around certain topics, even though they are not skilled in the field of interest. Confidence will decrease as their knowledge around the topic of interest increases until a certain threshold is reached where their confidence and competence will increase in the same direction.	(Vandergriendt, 2022)
Health system	The way all health services of a country are provided and the overall quality thereof.	(WHO, 2021)
Objective knowledge	The amount of factual knowledge that a consumer possesses.	(Han, 2019)
Pilot study	An essential stage in research which aims to describe the importance of the steps involved with the execution of the study. The feasibility of the study is tested to ensure that the proposal is accurate. Additional aspects tested are recruitment of subjects and research tools and data analysis which will take place in the final study. A pilot study is	(Hassan, 2006)

	practical in terms of providing groundwork for a research study.	
Public health	"The art and science of preventing disease, prolonging life and promoting health through the organized efforts of society".	(Acheson, 1988; WHO)
Public Health service(s) (PHS)	A collection of agencies of the Department of Health and Human Services concerned with public health.	(WHO, 2021)
Qualtrics	A simple web-based software where users can build surveys and use numerous other tools for research goals. Responses can be analysed on this software.	(Qualtrics, 2022)
Subjective knowledge	The amount of knowledge which a consumer thinks they have about a topic, or product. A form of self-assessed knowledge.	(Han, 2019)
United Nations (UN)	An intergovernmental organisation with the core objective of maintaining global peace and security. Additional aims include the development of healthy relationships among different nations, international cooperation, and harmonising outcomes of different nations. This organisation was found in 1945 and furthermore define themselves as "a place where the world's nations can gather together, discuss common problems and find shared solutions".	(UN, 2022)
Child wasting	One of the main indicators used to evaluate the prevalence of childhood malnutrition in a country. A child can be classified as "wasted" if their weight is too low for their height.	(Ritchie, 2022)

Exclusive breastfeeding	A feeding practice recommended by the PFBDGs for month 0-6 of the infant's life where they receive breastmilk as their only form of nourishment, whereafter complimentary feeding can be introduced with additional breastfeeding. The WHO furthermore describes this feeding practice as the "most effective way to ensure child health and survival".	(WHO, 2022)
Human immunodeficiency virus (HIV)	A virus that attacks one's bodily immune system which can lead to AIDS) (acquired immunodeficiency syndrome).	(CDC, 2022)
Integrated Nutrition Programme (INP)	The INP aims to improve the nutritional status of all people situated in the western Cape province of South Africa.	(WCG, 2022)
Non-communicable diseases (NCDs)	A medical condition or disease which cannot be passed from one person to another. This type of disease is not caused by an acute infection, but rather a result of a health consequence. This type of disease is also known as chronic.	(WHO, 2021)
Paediatric Food-based Dietary Guidelines (PFBDGs)	In attempt to address effects of the Triple Burden of Malnutrition in South Africa, food-based guidelines are put in place, with specific focus to children from birth up to the age of 7. These guidelines were designed to be compatible with scientific and local public health concerns to nutrition which should be practical in terms of numerous constrains for South African caretakers.	(Bourne, 2007)
RDI (Recommended Dietary Intakes)	A system of nutrition recommendations formed by the National Academy of Medicine, introduced in 1997 to enhance the previously published Recommended	(Healtheries, 2020)

	Dietary Allowances. There are different guidelines for various age groups and genders, which are put in place for healthy individuals.	
Stunting	Impaired growth and development in children due to the result of poor nutrition inadequate psychosocial stimulation and repeated infection. Children can be defined as stunted if their height-for-age is more than two standard deviations below the WHO Child Growth Standards Median.	(WHO, 2015)
Triple burden of malnutrition	The co-existence of overnutrition, undernutrition and micronutrient deficiencies which equally increase the risk of numerous health problems in humans.	(Dev Ram Sunuwar, 2020)
United Nations International Children's Emergency Fund (UNICEF)	An Agency of the United Nations which are responsible for developmental aid and humanitarian with regards to children, on a global level.	(Mingst, 2022)
World Health Organization (WHO)	A section of the United Nations that handles health issues on a global level – from global disasters to public nutrition and numerous additional health issues.	(WHO, 2022)

Annexure E: Questionnaire and Informed Consent Form (in fieldworker training manual)

The Questionnaire

Please read through each question in this questionnaire. Make sure you understand everything and ask the principle investigator to elaborate further if needed.

Understanding consumers' knowledge of the paediatric food-based dietary guidelines

Informed Consent Form

Dear respondent

The purpose of this study is to gain insight into consumers' knowledge of the Paediatric Food-based Dietary Guidelines (in particularly primary caregivers of young children). It is envisaged that results from this research project will present a scenario not only about the caregivers' knowledge but also lack thereof and how this might put young South African children at risk of malnutrition.

Thank you for taking the time to share your perspectives and views in this regard.
Participants in this study will be asked to answer a number of questions regarding their household's food consumption, preparation and feeding practices. Respondents will also be asked to answer some questions pertaining to their knowledge about the Paediatric Food-based Dietary Guidelines.

All answers will be recorded for further use by the investigators only. Respondents are welcome to refrain from answering any questions that they view to be the cause of any discomfort or infringement of their privacy. Refusal to participate or withdrawal of consent, or discontinued participation in the study will not result in any penalty. Please note that your participation is voluntary and does in no way release the researchers or involved institutions from their legal and professional responsibilities. All information will be treated as highly confidential, and the identity of respondents need not to be disclosed and will remain anonymous. The results of this study will be presented in aggregated format.

Your decision to respond to the questions posed will be interpreted as confirmation that you have agreed to participate.

Please take note of the following definition of Paediatric Food-based Dietary Guidelines (PFBDGs):

"In attempt to address effects of the Triple Burden of Malnutrition in South Africa, food-based guidelines are put in place, with specific focus to children from birth up to the age of 7. These guidelines were designed to be compatible with scientific and local public health concerns to nutrition which should be practical in terms of numerous constrains for South African caretakers."

Should you have any other questions regarding this study please feel free to contact the principle investigator

Rochelle van Veijeren
rochellevanvei@gmail.com
University of Pretoria
Faculty of Natural and Agricultural Sciences
Department of Consumer and Food Sciences

Please confirm that you are over the age of 18

- Yes
- No

Please tick one of the following boxes as an agreement of your participation

- Yes, I agree to partake
- No, I do not agree to partake

Do you currently stay in **Gauteng**?

- Yes
- No

Please indicate whether you are the caregiver of a young child

- yes
- no

→

SECTION A

PLEASE TELL US MORE ABOUT YOURSELF

Answer every question and mark only the most relevant answer by ticking the box

What is your gender?

- Male
- Female
- Other
- I prefer not to say

What is your highest level of education?

- Grade 7
- Lower than grade 7
- Grade 12
- Lower than grade 12
- Degree/ Diploma
- Post graduate

How many **members** are there in your current household? (Total number of people living together)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Household size

In terms of the employment Equity Act of SA, to which **population group** do **you** (as person) belong to?

What is your preferred home **language**?

- Afrikaans
- English
- Ndebele
- Northern Sotho
- Sotho
- Swazi
- Tsonga
- Tswana
- Venda
- Xhosa

Please indicate **the number of dependent children** who are part of your household

0 1 2 3 4 5 6 7 8 9 10

Children in household ☐ Not Applicable

What was your **age** at your most recent birthday?

- 18 - 24
- 25 - 41
- 42 - 57
- 58 - 76
- older than 76

What is your approximate total **monthly household income** rounded up to the nearest R1000?

- Less than R5000
- R5001 - R15 000
- R15 001 - R 30 000
- R30 001 - R50 000
- R50 001 - R75 000
- R75 001 - R110 000
- More than R110 000

How old is your eldest child?

- 0-6 months
- 6-12 months
- 12-36 months
- older than 36 months

→

Who primarily buys the food in your household?

- Myself
- Partner
- Parent / Guardian
- Friend or family member
- Other

Who is the primary decision maker of the food bought for your household?

- Myself
- Partner
- Parent / Guardian
- Friend or family member
- Other

Who is the primary decision maker of the food bought for your household?

- Myself
- Partner
- Parent / Guardian
- Friend or family member
- Other

Please indicate at which of the following retail outlets you mostly purchase food products from

- Pick n Pay
- Woolworths
- Checkers
- Spar
- Shoprite
- Street vendor
- Other

Please indicate how often you shop for food

- Daily
- 2-3 times a week
- Once a week
- Monthly
- Other

Please estimate the amount (percentage) that each of the following commodities **represent in your monthly household food basket**. i.e. bread equals 20% of the monthly food basket purchased in our household. **(If you never buy a specific commodity, please select the not applicable tick box)**

0 10 20 30 40 50 60 70 80 90 100

Bread ☐ Not Applicable

Fruit ☐ Not Applicable

Cakes pastries and sweet treats ☐ Not Applicable

Beverages ☐ Not Applicable

Meat, poultry and fish ☐ Not Applicable

Dairy products ☐ Not Applicable

Cereals and grains ☐ Not Applicable

Vegetables ☐ Not Applicable

Olis & Condiments ☐ Not Applicable

Beans, pulses and lentils ☐ Not Applicable

Please indicate the initial feeding practice that you followed

- Combination of breast and formula feeding
- Exclusive breast feeding
- Exclusive formula feeding

→

If you answered yes to combination or formula feeding in the previous question, please indicate where you bought your formula from

- Not applicable
- Formal retail
- Informal retail

→

Compared to your friends and family members, how knowledgable are you about the following dimensions of the Paediatric Food-based Dietary guidelines?

	Far too little	Slightly too little	Neither too little or a lot	Quite a lot	A vast amount
Health	○	○	○	○	○
Food safety	○	○	○	○	○
Hygiene	○	○	○	○	○
Nutrition	○	○	○	○	○
Feeding practices	○	○	○	○	○

Please indicate whether you think the following statements are true or false

	False	Somewhat false	I don't know	Somewhat true	True
It is healthy to feed your baby at a slow pace	○	○	○	○	○
Clean, safe water is essential when feeding young children	○	○	○	○	○
When feeding a baby, his/her mouth should be cleaned regularly	○	○	○	○	○
Exclusive breastfeeding for the first three months is best for your baby's healthy nutritional development	○	○	○	○	○
It is good practice to gradually increase the number of meals per day after the age of 12 months	○	○	○	○	○
It is healthy for children to play outside in a safe environment			○	○	○
It is important to wash your hands before preparing your child's meals	○	○	○	○	○
It is important to take care of your baby's gums	○	○	○	○	○
Breastfeeding should be discontinued after the age of 12 months	○	○	○	○	○
You should only teach your baby to drink from a cup after 12 months	○	○	○	○	○

Your child should not be allowed to touch or play with raw chicken, meat or eggs as it can cause foodborne illnesses	○	○	○	○	○
It is acceptable to reuse your child's utensils for follow up feeding if they did not eat everything the first time	○	○	○	○	○
All main meals after the age of 12 months should consist mainly of starch, such as pap	○	○	○	○	○
Complementary foods should be introduced from the age of 4 months	○	○	○	○	○
It is not necessary to include fruit and veg in young children's diet every day	○	○	○	○	○
From 6 month of age all babies should be given protein foods every day such as chicken, fish or eggs	○	○	○	○	○
Giving young children sugary, caffeinated, fatty snacks is allowed	○	○	○	○	○
When preparing your child's meals, it could be made tastier by adding extra sugar	○	○	○	○	○
It is healthier to use butter instead of olive oil when preparing your child's meals	○	○	○	○	○
Excessive salty foods are not good for your child's health	○	○	○	○	○
	○	○	○	○	○

Additional Information:

Student/fieldworker benefits (hours):

You will receive half an hour per response gathered. If you receive your target of 10 responses, you will receive 5 hours which will contribute towards your OPI file.

Sample method:

Nonprobability sampling method – identification of potential subjects in a convenient manner (i.e. costs and time).

Where can I do my sampling?

- Try to target any area with a high amount of traffic relevant to the selected inclusion criteria.
- Target areas where you assume many caregivers (of < 5 years) will be located – taxi ranks, kindergartens, pre-schools etc.

Thank you for taking the time to read through this booklet.

😊

Annexure F: Full ANOVA tables

Annexure F.1: Subjective Knowledge

Table 3: Annexure F.1: Subjective Knowledge: Health

ANOVA: Health						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between Groups	11.894	5	2.379	1.768	.120
	Within Groups	345.718	257	1.345		
Ethnic Group	Between Groups	4.175	4	1.044	.760	.552
	Within Groups	352.924	257	1.373		
Age	Between Groups	5.616	3	1.872	1.377	.250
	Within Groups	351.996	259	1.359		

Table 4: Annexure F.1: Subjective Knowledge: Food Safety

ANOVA: Food Safety						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between Groups	19.022	5	3.804	3.033	.011
	Within Groups	313.587	250	1.254		
Ethnic Group	Between Groups	6.626	4	1.657	1.276	.280
	Within Groups	324.511	250	1.298		
Age	Between Groups	7.401	3	2.467	1.912	.128
	Within Groups	325.208	252	1.291		

Table 5: Annexure F.1: Subjective Knowledge: Hygiene

ANOVA: Hygiene						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between Groups	15.814	5	3.163	2.852	.016
	Within Groups	285.060	257	1.109		
Ethnic Group	Between Groups	3.070	4	.767	.668	.615
	Within Groups	295.220	257	1.149		
Age	Between Groups	4.538	3	1.513	1.322	.268
	Within Groups	296.337	259	1.144		

Table 6: Annexure F.1: Subjective Knowledge: Nutrition

ANOVA: Nutrition						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between Groups	11.890	5	2.378	2.067	.070
	Within Groups	287.548	250	1.150		
Ethnic Group	Between Groups	7.986	4	1.997	1.721	.146
	Within Groups	289.998	250	1.160		
Age	Between Groups	9.234	3	3.078	2.673	.048
	Within Groups	290.203	252	1.152		

Table 7: Annexure F.1: Subjective Knowledge: Feeding Practices

ANOVA: Feeding Practices						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between Groups	2.421	5	.484	.406	.845
	Within Groups	304.338	255	1.193		
Ethnic Group	Between Groups	8.268	4	2.067	1.766	.136
	Within Groups	298.420	255	1.170		
Age	Between Groups	4.413	3	1.471	1.250	.292
	Within Groups	302.345	257	1.176		

Annexure F.2: Objective Knowledge

Table 8: Annexure F.2.1: Objective Knowledge: Health

ANOVA: Health						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between groups	253.237	5	50.647	10.471	.000
	Within groups	1185.090	245	4.837		
Ethnic group	Between groups	274.161	4	68.540	14.477	.000
	Within groups	1159.939	245	4.734		
Age	Between groups	23.667	3	7.889	1.377	.250
	Within groups	1414.660	247	5.727		

Table 9: Annexure F.2.1: Objective Knowledge: Food Safety

ANOVA: Food Safety						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between groups	135.758	5	27.152	4.647	.000
	Within groups	1425.718	244	5.843		
Ethnic group	Between groups	115.894	4	28.974	4.911	.001
	Within groups	1439.624	244	5.900		
Age	Between groups	71.101	3	23.700	3.912	.009
	Within groups	1490.375	246	6.058		

Table 10: Annexure F.2.1: Objective Knowledge: Hygiene

ANOVA: Hygiene						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between groups	9.768	5	1.954	.564	.070
	Within groups	855.545	247	3.464		
Ethnic group	Between groups	16.010	4	4.002	1.171	.324
	Within groups	844.419	247	3.419		
Age	Between groups	31.564	3	10.521	3.142	.026
	Within groups	833.748	249	3.348		

Table 11: Annexure F.2.1: Objective Knowledge: Nutrition

ANOVA: Nutrition						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between groups	186.923	5	37.385	5.404	.000
	Within groups	1701.923	246	6.918		
Ethnic group	Between groups	51.036	4	12.759	1.709	.149
	Within groups	1836.398	246	7.465		
Age	Between groups	73.236	3	24.412	3.334	.020
	Within groups	1815.621	248	7.321		

Table 12: Annexure F.2.1: Objective Knowledge: Feeding Practices

ANOVA: Feeding Practice						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Level of Education	Between groups	31.860	5	6.372	2.071	.000
	Within groups	762.849	248	3.076		
Ethnic group	Between groups	10.324	4	2.581	.816	.516
	Within groups	784.308	248	3.163		
Age	Between groups	7.663	3	2.554	.811	.489
	Within groups	787.045	250	3.148		