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**HEALTH
ECONOMICS
UNIT**

An assessment of the utilisation of stokvels or rotating savings and credit associations to influence healthy eating in South Africa

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1. **Lukwa, A.T.**, Odunitan-Wayas, F., Lambert, E.V., Alaba, O.A. and “Savings for Health” IDRC Collaborators, 2022. Can Informal Savings Groups promote food security and social, economic and health transformations, especially among women in Urban Sub-Saharan Africa: a narrative systematic review. *Sustainability*, 14(6), p.3153.
2. **Lukwa, A.T.**, Wayas, F.A., Lambert, E.V., “Savings for Health” IDRC collaborators and Alaba, O., 2024. Stakeholder mapping to explore social and economic capital of Rotating Savings and Credit Associations (ROSCAs) to increase demand for and access to healthy food. *Frontiers in Sustainable Food Systems*, 8, p.1301578.
3. **Lukwa, A.T.**, Wayas, F.A., Lambert, E.V., Alaba, O.A., and “Savings for Health” IDRC Collaborators (2024). Conditions that influence decision making of ROSCAs\Stokvels as social entities relative to food purchasing and foodways, amongst ROSCAs\Stokvels members: A realist evaluation. *Plos One*
4. **Lukwa, A.T.**, Wayas, F.A., Lambert, E.V., Alaba, O.A., and “Savings for Health” IDRC Collaborators (2024). Factors influencing informal savings groups decision-making related to food preferences and procurement strategies: a discrete choice experiment. *PlosOne*

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List of Acronyms and Abbreviations

Abbreviation	Full Meaning
ASCA's	Accumulating Savings and Credit Associations
CMO	Context Mechanisms Outcomes
COVID-19	Coronavirus Disease 2019
DCE	Discrete Choice Experiment
DCM	Discrete Choice Modelling
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GHI	Global Hunger Index
HIC's	High Income Countries
HREC	Human Research Ethics Committee of the Faculty of Health Sciences
IDI	In-depth Interview
IDRC	International Research Development Centre
IPT	Initial Programme Theory
ISPOR	International Society for Pharmacoeconomics and Outcomes Research
LMIC's	Low- and Middle-Income Countries
NCDs	Non-communicable diseases
NDoH	National Department of Health
NGOs	Non-governmental Organisations
NIHR	National Institute for Health Research
NPO	Non-profit organization
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
ROCSA's	Rotating Savings and Credit Associations
RP	Revealed Preferences
SAMRC	South African Medical Research Council
SDGs	Sustainable Development Goals
SES	Socio-economic status
SP	Stated Preferences
SSA	sub-Saharan Africa
U.S	United States
UN	United Nations
VQPP	value-quality-price-preference
WHO	World Health Organisation
WTP	Willingness to Pay

Thesis Abstract

Background

In South Africa, the prevalence of non-communicable diseases (NCDs) is rising alarmingly, closely linked to dietary habits shaped by socio-economic conditions. Stokvels, traditional community-based savings groups, emerge as potential catalysts for nutritional intervention, particularly among urban populations facing the dual challenges of undernutrition and obesity. This extensive study delves into the roles of stokvels in improving food security, promoting health, and empowering women within the urban landscapes of sub-Saharan Africa.

Methods

The research utilized a mixed-method approach to investigate the role of stokvels in urban sub-Saharan Africa comprehensively. Firstly, a systematic literature review was conducted, meticulously analyzing 28 studies that delved into the socio-economic impacts of ROSCAs and ASCAs, providing a foundational understanding of the role of stokvels in the region. This was complemented by stakeholder mapping, where in-depth interviews with 21 key stakeholders were conducted to identify the macro-level influencers on stokvel operations. These influencers included government policies, economic conditions, cultural norms, and technological advancements, offering a nuanced view of the external factors impacting stokvel functionality.

Further, the research employed a realist evaluation, involving 60 participants, including 20 stokvel leaders and 40 general members. This qualitative approach facilitated an understanding of the contextual factors influencing decision-making within stokvels, particularly concerning food purchasing and consumption patterns. Lastly, the study incorporated a discrete choice experiment (DCE), engaging 200 stokvel members. This quantitative method assessed the factors impacting members' preferences for healthy foods, analyzing their choices against various attributes related to food procurement and consumption.

Results

The study's results presented a multi-dimensional understanding of stokvels' influence. The systematic literature review highlighted stokvels as catalysts for disciplined savings and financial literacy, indirectly contributing to improved nutritional choices and food security. The stakeholder mapping revealed that stokvel operations are significantly influenced by external factors such as government policies, economic conditions, cultural norms, and technological advancements, which shape their efficacy in achieving financial and health-related goals.

The realist evaluation provided deep insights into how grocery stokvels shape food purchasing decisions. It was found that these stokvels often employ bulk buying strategies, which ensure food security and affordability for their members. This approach reflects the stokvels' emphasis on strategic, collective decision-making that prioritizes the welfare of all members.

Lastly, the discrete choice experiment highlighted members' preferences regarding healthy food options. The study revealed a preference for cost-effective shopping options like "two-for-one" offers. It also underscored the significant role of household decision-makers in influencing food choices, showing a complex interplay between socio-economic status, cultural norms, and individual preferences in dietary habits. This aspect of the study offered valuable insights into the behavioural economics of food choice within the context of stokvels.

Conclusion

The comprehensive analysis concludes that stokvels are vital components of the urban food systems in sub-Saharan Africa. They significantly impact women's health and economic empowerment by influencing healthier eating habits and facilitating community engagement in health promotion. However, the effectiveness of stokvels is subject to various challenges, including economic constraints and the need for supportive infrastructural and policy frameworks.

Recommendations

To enhance the positive impact of stokvels, it is recommended that government policies should provide more robust support and integration of these groups into the formal economic framework. Health promotion strategies need to incorporate stokvels as platforms for disseminating nutritional education and influencing food choices. Future research should extend to other African nations, exploring the varied impacts of stokvels in different cultural and economic contexts to develop comprehensive, culturally sensitive, and region-specific health and nutritional interventions.

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Chapter I

1.1 Background

Malnutrition is a critical global health issue affecting millions worldwide (Branca, 2019). It occurs when an individual's diet does not provide adequate nutrients or the right balance for optimal health. This condition can manifest in two primary forms: undernutrition and overnutrition. Unhealthy diets lead to overnutrition (excessive nutrient and energy intake) or undernutrition (a lack of nutrients and insufficient energy supply). Both types of malnutrition can co-exist (World Health Organisation, 2021). Undernutrition and overnutrition (which leads to obesity) might seem like contrasting public health issues. Still, they are closely interlinked in many ways, and together, they form two ends of the malnutrition spectrum (Wells *et al.*, 2020, 2021). Both forms of malnutrition can coexist within the same community and even within the same household. This phenomenon, known as the double burden of malnutrition, highlights the complex nature of nutritional challenges.

For instance, historically, undernutrition was perceived as the result of inadequate food intake (Dipasquale, Cucinotta and Romano, 2020; Govender *et al.*, 2021), and this is indeed true. However, in many contemporary societies, there is evidence of the rise of highly processed and calorie-dense foods, which are often cheaper and more readily available than nutrient-rich alternatives (Food and Agriculture Organization (FAO), 2023). This means that individuals can simultaneously consume too many empty calories and too few essential nutrients, leading to the double burden of overnutrition and undernutrition. The exploration above into the nexus between undernutrition and obesity reflects the overarching concerns addressed by the Sustainable Development Goals (SDGs) on hunger and malnutrition. SDG 2, specifically, aims to “end hunger, achieve food security and improved nutrition, and promote sustainable agriculture” (United Nations (UN), 2023).

The concept of "hidden hunger", where individuals are calorie-sufficient but nutrient-deficient, further underscores the importance of SDG's holistic approach towards hunger beyond mere caloric intake. Furthermore, the public health strategies employed in LMICs to combat obesity, as highlighted in the literature (Dudley, Cotton and Peralta, 2015; Jaacks *et al.*, 2017; Pingali *et al.*, 2019; Arabbadvi *et al.*, 2023), align with the SDG's emphasis on fostering healthier lifestyles and creating sustainable food systems. Yet, the concerns raised about the efficacy of these strategies in addressing the endemic hunger in low-income urban areas are reminders that there is still a considerable journey ahead to fully realize the ambitions of the SDGs related to hunger and malnutrition.

The discussion above shows that undernutrition and obesity are seemingly antithetical and connected through transitions in dietary patterns and lifestyles on a global scale (Popkin, 2006; Rousham *et al.*, 2020). The recent surge in obesity, as documented since the 1980s, showcases that high-income countries are leading this

epidemic, with low- and middle-income countries (LMICs) catching up (Miranda *et al.*, 2008). A significant driver of these transitions is the economic growth and globalization experienced by LMICs (Fox, Feng and Asal, 2019; Swinburn *et al.*, 2019). As they integrated into the world economy, there was a surge in obesogenic environments that favoured unhealthy dietary habits and sedentary lifestyles. This environment was marked by an increased intake of low-cost, calorically dense, and nutritionally void foods, like sugar-sweetened beverages (SSBs), and a decline in physical activity (Hedrick *et al.*, 2017).

The urgency of addressing obesity has become even more pronounced in the light of the COVID-19 pandemic, where obesity emerged as a strong predictor for the disease's severity (Mohammad *et al.*, 2021; Ye *et al.*, 2021; Aziz *et al.*, 2023). All these transitions and trends emphasize the need for a multifaceted, global approach in the forthcoming years to navigate the intertwined challenges of undernutrition and obesity. In tandem with the global nutrition transition, South Africa has witnessed a notable increase in obesity rates (Hunter-Adams, Battersby and Oni, 2019). A South African National Health and Nutrition Examination Survey indicated that 13.5% of children between 6 and 14 are overweight or obese (Shisana *et al.*, 2013). This rate surpasses the global prevalence of 10% in school-aged children. This increase in obesity rates also coincides with an increase in poverty, health disparities, inequity, hunger, and food insecurity (Mchiza *et al.*, 2019; Otitoola, Oldewage-Theron and Egal, 2021). As obesity rates in South Africa rise in tandem with the global nutrition transition, the economic burden at both the household and provider levels becomes increasingly palpable, coupled with documented evidence that healthy foods are costlier when compared to highly processed unhealthy foods (Boachie, 2022).

Healthy eating is essential for overall well-being. An unhealthy diet increases the risk of various communicable diseases such as cancer, diabetes, and cardiovascular diseases (UNICEF South Africa, 2023). Of note, it is one of the leading risks for the global burden of non-communicable diseases such as cardiovascular diseases, diabetes, and cancer (World Health Organisation (WHO), 2023). It also impacts negatively on the physical and mental health conditions. Variations in dietary habits across socio-economic strata are often influenced by affordability, accessibility, and cultural factors (Turrell and Kavanagh, 2006; Thakur *et al.*, 2011; Kadam, 2023), thus in a nutshell, some segments of society are more predisposed to the risks of NCDs than others. Furthermore, for households, the increased prevalence of obesity-associated noncommunicable diseases (NCDs) like hypertension, diabetes, cardiovascular diseases, and cancer has direct and indirect costs (Tiwari and Balasundaram, 2021; Nilson *et al.*, 2022). Direct costs entail medical expenses related to regular check-ups, hospitalizations, medications, and other healthcare needs. Indirect costs emerge from reduced labour productivity, absenteeism, and the potential loss of income due to disability or early mortality. Particularly in South Africa, these costs can take up a significant portion of the family's income, plunging them further into economic hardships or even poverty (Hunter-Adams, Battersby and Oni, 2019; Hunter-Adams, J and Hunter-Adams, 2019; Hunter-Adams and Battersby, 2020).

Globally, there has been conflicting evidence of the impact of socioeconomic status on unhealthy food choices (Bajema *et al.*, 2019). These variations in dietary patterns across different socioeconomic strata underscore the complexity of addressing diet-related health disparities in diverse global contexts. Evidence shows that food purchasing characteristics are influenced by socioeconomic status, with a lack of mobility, affordability, and food choice key issues in urban South Africa, like other Low- and Middle-Income Countries (LMICs) (Odunitan-Wayas *et al.*, 2018). Furthermore, socioeconomic status is an indicator of food insecurity. Food security analysis has recently shifted from the international to the local level, focusing on households and individuals (Akbari *et al.*, 2022). In South Africa, while there is food security at the national level, an estimated 2,6 million (15%) and 1,1 million (6%) households stated that they had inadequate and severe inadequate access to food as of 2021, respectively (Department: Statistics South Africa, 2023). 3,7 million (21%) South African households were food insecure as of 2021, and 49,2% of the adult population were living below the upper-bound poverty line (UBPL) live below the poverty level (Department: Statistics South Africa, 2019). Various strategies have been adopted as coping mechanisms to combat this issue.

One of these coping mechanisms is an emerging interest in leveraging informal financial systems, notably Accumulating Savings and Credit Associations (ASCAs) and Rotating Savings and Credit Associations (ROSCAs), to alleviate food insecurity and financial constraints. Known locally as Stokvels in South Africa, these groups function as informal financial reservoirs, primarily serving those without access to formal banking services, predominantly in low and middle-income countries (LMICs). These community-based financial initiatives offer promising tools for health interventions (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). Of the numerous Stokvels in South Africa, approximately 30% operate as "grocery stokvels". They utilize collective bargaining to secure discounts on bulk purchases, particularly during festive seasons (Buijs, 2002; Haddad and Maluccio, 2003; Lakhani, 2014; Gichuki and Kinuthia, 2015; Kemboi, 2016). However, the emphasis often leans towards procuring energy-dense, highly processed foods, which are nutritionally subpar (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022).

Despite this, the inherent community-driven nature of grocery stokvels offers a unique opportunity to pivot towards healthier, nutrition-focused purchasing behaviors. These groups already bolster community development, social interactions, and, crucially, the economic empowerment of women, who often helm households. With women being key decision-makers in household nutrition (Buijs, 2002; Haddad and Maluccio, 2003; Lakhani, 2014; Gichuki and Kinuthia, 2015; Kemboi, 2016), empowering them financially and educationally can have profound effects on dietary choices and overall health. While grocery stokvels have traditionally been inclined towards purchasing less nutritious, calorie-rich foods due to their affordability and longer shelf life (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022), there lies a substantial yet untapped potential to reorient these collective purchasing patterns towards more nutritious options. However, the process by which households acquire food is a critical determinant of dietary choices and nutritional status (Caswell, Yaktine and Council, 2013). This acquisition process, which includes the mode of transportation used, the distances travelled to procure food, the cost and quality of available food, and the selection of retail

outlets, has significant implications for the accessibility of nutritious food options. Particularly for households with limited financial resources and food insecurity, these logistical factors are not merely a matter of convenience but pivotal indicators of the ease with which they can access and afford healthy food (Fanzo, 2023). Research highlights that the availability of nutritious food within proximate and accessible locations is correlated with healthier dietary patterns (Caspi *et al.*, 2012; Atanasova *et al.*, 2022; Aretz *et al.*, 2023; U.S Department of Health and Human Services, 2023) underscoring the need for public health strategies that address these fundamental aspects of food procurement to improve food security and dietary outcomes.

This shift could significantly improve dietary quality among the members, particularly in low-income urban settings where access to affordable, healthy food is often limited (Matuku and Kaseke, 2014; Mabika, 2018; Mabika and Tengeh, 2021). By fostering partnerships with local farmers and suppliers of fresh produce, stokvels could facilitate the bulk purchase of fruits, vegetables, and whole grains at competitive prices, thereby enhancing the nutritional value of food baskets. Moreover, integrating nutrition education into the stokvel framework could further empower members to make informed food choices, creating a ripple effect that extends beyond individual households to the broader community. This way, stokvels could catalyse a grassroots movement towards improved nutrition, aligning with national health objectives and attenuating malnutrition-related diseases. The gap is clear: there is a need for innovative, community-centric strategies to promote healthy eating, and stokvels are well-positioned to bridge this divide, underscoring their potential as a cornerstone in the fight against the double burden of malnutrition. Therefore, using grocery stokvels as multifaceted public health tools could address the issue of unhealthy eating, especially for women, by promoting agency, encouraging healthy lifestyles, and bolstering social and economic resilience. The key is to recognize and harness the strengths within these informal saving groups, transforming them into public health intervention platforms.

1.2 Scope of the thesis

How households obtain their food, which involves factors like the mode of transportation, distance travelled, cost, quality, and choice of stores, plays a crucial role in shaping their food choices (Caswell, Yaktine and Council, 2013). This attention stems from the understanding that these factors can serve as indicators of access to nutritious food, particularly among households grappling with low incomes and food insecurity (Hillier *et al.*, 2017). Good nutrition, defined as an adequate and well-balanced diet to meet the body's dietary and energy requirements, has long been recognized as a fundamental pillar of lifelong good health (World Health Organization, 2018). The quality of one's dietary intake largely influences health outcomes (Malek *et al.*, 2017).

The process of making food choices involves the selection of foods for consumption and is influenced by a complex interplay of various factors (Monterrosa *et al.*, 2020). These factors encompass a wide spectrum, ranging from individual responses to physiological and sensory cues to broader societal, environmental, and economic influences (Sobal, Bisogni and Jastran, 2014a). In recent decades, there has been a notable surge in

the consumption of ultra-processed foods (UPF), particularly in low-income countries (de Morais Sato *et al.*, 2020). This trend has been closely linked to the escalating prevalence of diet-related obesity and non-communicable diseases (Sato *et al.*, 2020). The global prevalence of overweight and obesity has reached alarming proportions, constituting a significant public health challenge (World Health Organisation (WHO), 2021). These conditions collectively contribute to more than 2.8 million deaths annually, and unfortunately, the numbers continue to rise in contemporary times (World Health Organisation (WHO), 2021).

When examining the global burden of disease through the lens of dietary components, it becomes evident that suboptimal dietary patterns play a central role in the health crisis of noncommunicable disease (Perez-Escamilla *et al.*, 2018). Poor dietary choices have emerged as the primary culprit responsible for a greater number of deaths than any other modifiable risk factor associated with non-communicable diseases, excluding smoking (Gakidou *et al.*, 2017). This highlights the critical need to address and improve dietary habits as a cornerstone of public health efforts to reduce the burden of diet-related diseases worldwide.

The well-established connection between adopting a healthy diet and achieving positive health outcomes is widely recognized (Rippe, 2018; Cena and Calder, 2020; Green, Murphy and Gryboski, 2020). Moreover, extensive research has underscored the pivotal role of cultivating healthy food preferences and dietary behaviours in children, as these habits often persist into adolescence and adulthood (Kelder *et al.*, 1994; Birch, Savage and Ventura, 2007; Cooke, 2007; Wadhera, Capaldi Phillips and Wilkie, 2015). Therefore, it becomes imperative to actively promote healthier eating patterns within populations, given that such efforts are associated with enduring and, in some cases, lifelong enhancements in nutrition and overall health (Schreinemachers *et al.*, 2020).

South Africa presents a unique challenge in the realm of nutrition. While many countries grapple with obesity or undernutrition, South Africa faces a dual burden (Modjadji and Madiba, 2019a). The nation is simultaneously combating obesity-related health complications and undernutrition, especially in children. A concerning percentage of South Africans suffer from stunted growth, an indicator of chronic undernutrition (Mandela, 2020). At the other end of the spectrum, urbanization and changes in food systems in South Africa have led to a higher intake of calorie-dense and nutrient-poor foods, contributing to the rise in obesity and related non-communicable diseases among adults and children (Okop *et al.*, 2019).

Stokvels present a unique opportunity to address these nutritional challenges. Historically, stokvels have been a platform for communities to pool financial resources, which are then rotationally distributed to members (Gwamanda, 2019). Stokvels have evolved for various purposes, from savings and credit platforms to buying clubs where groups bulk-purchase household items. By leveraging the structure and community trust of stokvels, these entities can be reimagined as a food security and nutrition education tool. Imagine stokvels prioritising the bulk purchase of nutritious foods at discounted rates, leveraging their collective buying power.

Such stokvels could partner with local farmers or suppliers, ensuring a consistent fresh produce supply and supporting local economies.

Moreover, by integrating nutrition education and cooking demonstrations into regular meetings, members can be empowered to make healthier food choices. Stokvels can also be a platform to dispel myths about certain foods and educate members about the benefits of traditional and indigenous foods, which are often nutrient-rich and affordable. Furthermore, stokvels can be used to address undernutrition, especially among children. They can help bridge the nutrition gap in vulnerable populations by procuring and distributing fortified foods or supplements.

In conclusion, while South Africa faces significant nutritional challenges, its rich tapestry of community structures like stokvels provides innovative avenues to tackle them. By re-envisioning the role of stokvels in nutrition and food security, South Africa can pioneer community-driven solutions that ensure food security and promote healthy eating habits across the socio-economic spectrum. To address this imperative, this study proposed engaging community members by utilising stokvels to facilitate healthier food choices. The approach involved inviting community members to identify and prioritize specific barriers encountered when striving to make healthier food choices. These barriers included economic constraints, cultural considerations, behavioural factors, structural limitations, logistical challenges, or individual preferences. The underlying rationale behind this approach was grounded in the understanding that the choice of food retailers frequented by households significantly influences the nutritional quality of the food they acquire. Consequently, it played a pivotal role in shaping their dietary habits, which is expected to impact their risk of obesity and chronic diseases.

1.3 The rationale of the thesis

The thesis seeks to evaluate how stokvels, intrinsic to South African culture as communal savings and credit groups, can be strategically harnessed to promote and facilitate healthy eating habits among their members. This research is grounded in the recognition that unhealthy diets are significant drivers of malnutrition in South Africa, which manifests not only as undernutrition but also as an increasing trend of overnutrition, leading to a dual burden of disease that includes a rise in obesity and non-communicable diseases. Stokvels, traditionally used for financial pooling for various purposes (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022), have the potential to be reoriented towards collective action in nutrition. By examining the potential of stokvels to influence food choices, this thesis addresses the critical gap between economic accessibility and nutritional adequacy. It explores whether these grassroots financial associations can leverage their collective bargaining power to procure nutritious food at lower costs, alleviating the financial barrier to a healthy diet.

Moreover, the study investigates the possibility of integrating nutrition education within the structural framework to empower members with knowledge to make informed dietary decisions. Given the central role of socioeconomic factors in dietary habits and the proven effectiveness of community-driven solutions, this research posits that stokvels could be a sustainable model for improving public health nutrition. The aim is to provide evidence-based recommendations on how stokvels can be utilized as a public health tool to combat the double burden of malnutrition in South Africa, fostering a culture of healthy eating that could ripple through communities and potentially inform national nutrition policies.

The attributes and functions of South Africa's informal saving groups, stokvels, have been widely described in the literature. They have been identified as informal group savings schemes (ASCAs/ROSCAs) in which members voluntarily agree to contribute a fixed amount at regular intervals to a common pool (Ngcobo *et al.*, 2018; Biyela, Tsibolane and Van Belle, 2019; Nkambule and Mohammed, 2019). Furthermore, stokvels have been highlighted as a key poverty-alleviation strategy practised for many years by most black South Africans (Matuku and Kaseke, 2014). Several studies have concluded that ROSCAs/ASCAs provide an important livelihood and sustenance for the resource-poor and poor women, especially heads of households (Buijs, 2002; Haddad and Maluccio, 2003; Lakhani, 2014; Gichuki and Kinuthia, 2015; Kemboi, 2016). However, there is still insufficient evidence concerning how informal savings groups may be viable in mitigating food insecurity, focusing on healthy food options, promoting health, and increasing agency in women and their economic leverage in urban sub-Saharan African settings. Therefore, it is important to add to the body of knowledge and cover the existing gap.

1.4 The research aims and objectives.

The overall aim of the doctoral research is to assess how stokvels or rotating savings and credit associations can be used to influence healthy eating in South Africa.

1.5 Research objectives

The specific objectives for the doctoral research were as follows:

1. To investigate the role of Rotating Savings and Credit Associations (ROSCAs), locally known as stokvels, in addressing food insecurity, health promotion and agency in women: A Systematic Review.
2. To investigate which macro-level influencer may impact how stokvels function and interact using stakeholder mapping and key informant interviews.
3. To investigate how grocery stokvels, as social entities, create conditions that influence decision-making concerning food purchasing and foodways amongst their members using a Realist Evaluation.

4. To assess factors that may impact or influence stokvel members' choice for "healthy food", food preferences, foodways, and food procurement decisions when purchasing bulk groceries for stokvels using a Discrete Choice Experiment (DCE).

1.6 Research questions

The specific research questions for the doctoral research are as follows;

- a. What is currently available in literature as roles of stokvels/ROSCAs in mitigating food insecurity, promoting health, and increasing women's agency?
- b. How does the macro-level influence how stokvels/ROSCAs function and interact?
- c. How do grocery stokvels/ROSCAs, as social entities, create conditions that influence decision-making concerning food purchasing and foodways amongst their members?
- d. Which factors may influence the demand for "healthy food", food preferences, foodways, and food procurement decisions when purchasing bulk groceries for stokvels of stokvels and their members?

1.7 Overall thesis description

The doctoral thesis explores research questions, comprising four interconnected sub-studies that integrate mixed methods (qualitative and quantitative research) methodologies. These studies collectively contributed to a holistic understanding of how stokvels can be leveraged to encourage healthy eating. An essential aspect of this research design is the interdependence of the studies. The initial study served as foundational work for the second, while the third was designed based on findings from the first and second studies. Finally, the fourth study built upon the insights from the first, second, and third studies. This interconnected approach ensured a seamless progression of knowledge and underscored the coherence and depth of the thesis's contribution to the field.

1.7.1 Narrative Systematic Review

Objective 1: To investigate the role of Rotating Savings and Credit Associations (ROSCAs), locally known as stokvels in South Africa) in addressing food security, health promotion, and agency in women in urban sub-Saharan Africa: A Systematic Review

The doctoral study conducted a systematic narrative review of published literature. The aim was to explore the role of Rotating Savings and Credit Associations (ROSCAs) in addressing various aspects such as food

security, health promotion, and agency in women. Data for the systematic review was sourced from various search engines, including Google Scholar, Pubmed, EBSCOhost, Scopus, Sabinet, and the Cochrane Library.

To compile the relevant information, titles were gathered from the selected databases and screened. The screening process was vital in determining the study's final set of full articles. The research primarily concentrated on urban Sub-Saharan Africa, specifically ROSCAs, Stokvels, and ACSAs. Several key themes, including agency in women, food security, well-being, and nutrition, aspects related to behavioural economics, such as peer pressure and social marketing, and the concept of economic leverage guided the analysis.

1.7.2 Stakeholder Mapping

Objective 2: To investigate which macro-level influencer may impact how stokvels function and interact using a Stakeholder mapping

The study undertook a stakeholder mapping analysis to explore the macro-level influencers that affected the functioning of grocery stokvels and their collective decision-making processes within the broader societal context. The data utilized for this study consisted of interviews conducted with various stakeholders, including representatives from public sector policymakers, government regulators, public sector service providers, academic institutions, national non-profit organizations, private sector institutions (banks or financial services, formal and informal food retailers), wholesalers, and producers.

Key informant interviews were conducted using snowball sampling to collect the necessary data. The framework employed for the key informant interviews drew inspiration from a report on NCD prevention in Kenya (Juma, Mohamed and Kyobutungi, 2017). These interviews were structured around two key themes: i) understanding the nature of the interactions between these organizations and stokvel members or officers, and ii) assessing the potential impact of these organizations on the food environment, particularly regarding access to and affordability of "healthy food." After data collection, transcripts were uploaded into *Nvivo 12.0* for analysis. The analysis was conducted thematically, employing a grounded theory approach.

The study undertaken was a four-part process, beginning with a systematic literature review in Chapter 3: The importance of informal saving groups as a public health multi-faceted intervention tool to promote agency in women, healthy lifestyle, social and economic stability: A systematic review of the literature. This review laid the groundwork by synthesizing existing knowledge on the role of stokvels in economic empowerment, food security, and community support. Insights gained from the literature review were instrumental in shaping the subsequent chapters. Chapter 4: Identifying meso- and macro-level actors that may interact and engage with local grocery stokvels built on this foundation with stakeholder mapping, identifying key players within the stokvel ecosystem and their interdependencies. This mapping exercise provided a nuanced understanding

of the social and economic networks surrounding stokvels, highlighting potential areas for intervention and collaboration.

Chapter 5: The potential of stokvels in facilitating access to affordable and healthy food options employed a realist evaluation to delve deeper into the mechanisms through which stokvels influence food purchasing decisions and economic behaviors. By engaging directly with stokvel leaders and members, this chapter uncovered the gender dynamics, socio-economic factors, and community impacts that underpin stokvel operations. The realist evaluation offered rich, contextual insights that were crucial for designing the discrete choice experiment (DCE) in Chapter 6: Evaluating the factors influencing Stokvel members' decision-making related to healthy food preferences, food traditions, and procurement strategies. Informed by the findings of the previous chapters, the DCE aimed to quantitatively assess the preferences and decision-making processes of stokvel members regarding food procurement and consumption.

The meso and macro-level influencer concept posits that stakeholders might have the potential to influence Stokvel's operation concerning their savings and food purchasing practices. In this study, we further conceptualized a power/influence and interest matrix against which to plot these stakeholders. Bally and Cesuroglu (2020) defined the three levels of power/influence as (i) Control, where the stakeholder has the power to control how stokvels operate; (ii) Influence, where the stakeholder may influence decisions taken by stokvels concerning their purchasing and procurement practices and food choice decisions; and (iii) Interest/concern: where the stakeholder is interested in these practices and decisions by stokvels, but has no significant ability or mechanism to impact them. This power and influence matrix was developed by considering the stakeholders. We also considered the level of interest that each stakeholder may have in developing relationships with stokvels toward mutual benefit and demarcated micro and meso-level influencers. Refer to Section 4.3.3. for the process.

1.7.3 Realist Evaluation

Objective 3: To investigate how grocery stokvels, as social entities, create conditions that influence decision-making concerning food purchasing and foodways amongst their members using a Realist Evaluation

The third objective of this doctoral research involved conducting a realist evaluation, which was guided by the Initial Programme Theory based on three key themes: context, mechanism, and outcome (CMO), with a focus on existing grocery stokvels in the Western Cape Province of South Africa. A realist evaluation is inherently theory-driven, aiming to shed light on how context influences both the mechanisms and outcomes of an intervention, program, or strategy. The preliminary work, which included the systematic literature review and the stakeholder mapping, was utilized to construct an initial program theory and conceptual model illustrating how stokvels influenced food security and agency among South African women. Drawing

inspiration from the methodological framework presented by Calo et al. (Caló *et al.*, 2019), the doctoral research aimed to extend this theory to elucidate the potential impact of stokvels on choices related to "healthy food" and health promotion among their members and communities. The realist evaluation employed in-depth interviews with Stokvel leaders and group discussions with general Stokvel members.

1.7.4 Discrete Choice Experiment (DCE)

Objective 4: To assess factors that may impact or influence stokvel members' choice for "healthy food", food preferences, foodways, and food procurement decisions using a Discrete Choice Experiment (DCE).

In this research's fourth and final objective, we built upon the formative work conducted in the preceding objectives, which included the systematic literature review, stakeholder mapping, and the realist evaluation. The aim was to evaluate the factors that could impact or influence stokvel members' decisions regarding "healthy food," their food preferences, foodways, and how they made food procurement decisions. In summary, Objective 4, the final phase of this doctoral research, harnessed the cumulative knowledge and insights gained from the preceding objectives to explore the intricacies of stokvel members' choices and preferences related to "healthy food" and food procurement decisions, employing a Discrete Choice Experiment (DCE).

Below (Figure 1) is a pictorial of how the doctoral study was structured:

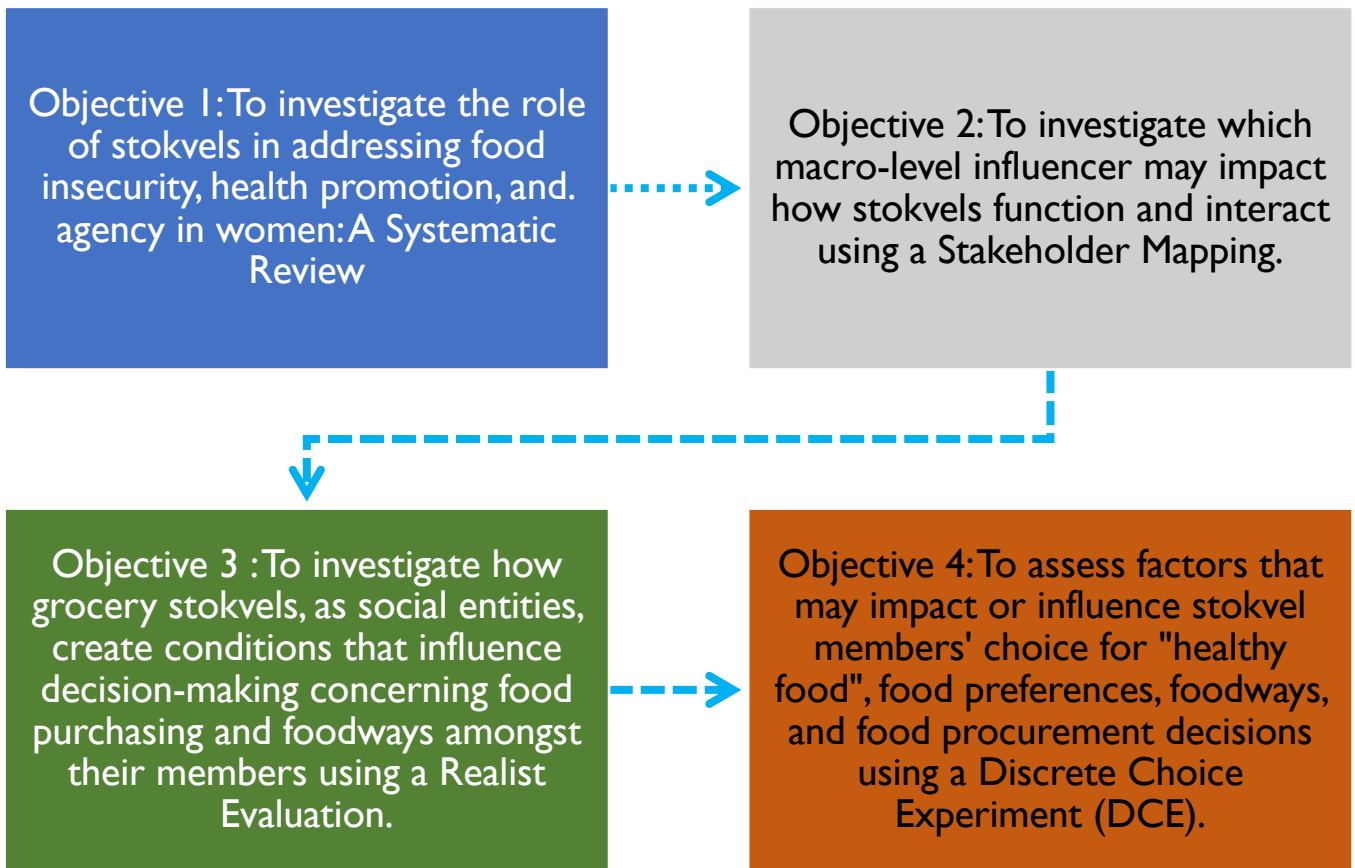


Figure 1: Study Structure

Figure 1 is a picture showing how the doctoral study was set up. It gives a clear view of the main parts and steps in the research. It shows the order of the study, how different parts connect, and the methods used.

Chapter 2

2.1 Literature Review

Introduction

Healthy eating, defined as the intake of diverse foods that provide necessary nutrients in adequate amounts to maintain good health, is a cornerstone for preventing malnutrition and many chronic diseases (World Health Organisation (WHO), 2023). However, achieving this is not without its challenges. Food security, fundamental to healthy eating, is compromised when individuals face uncertainty about their ability to obtain food or have limited access to nutritious options due to high costs, inadequate supply, or both (The World Bank, 2023). This is particularly pronounced in low-income areas where high-quality, nutrient-rich foods are often more expensive and less accessible than calorie-dense, nutrient-poor alternatives (Erokhin *et al.*, 2021). The economic constraints lead to a paradox where the more affordable food is often the least healthy, contributing to diet-related health disparities (Darmon and Drewnowski, 2015).

Moreover, geographical and logistical constraints significantly impact food security. People living in remote or rural areas may have limited access to supermarkets or fresh food markets, often called "food deserts" (Brace, Moore and Matthews, 2020; Chenarides *et al.*, 2021). Urban areas are not exempt from these challenges; despite having more grocery stores, the density and distribution of these stores may not align with the areas of greatest need, leaving many urban poor in "food swamps" where unhealthy food options far outnumber healthy ones (Dubowitz *et al.*, 2015). Additionally, transportation barriers can further restrict access to healthy food choices for those without reliable transportation to nutritious stores (Caswell, Yaktine and Council, 2013; U.S Department of Health and Human Services, 2023). Cultural factors also play a role in food security and healthy eating. Dietary choices are deeply rooted in cultural traditions and practices, which can sometimes prioritize less healthy food options due to their cultural significance or because they are more readily available within a community (Samaddar *et al.*, 2020). Shifting dietary patterns towards healthier choices requires access to healthy foods and culturally sensitive education about nutrition to encourage acceptance and integration of new foods into traditional diets.

Lastly, the constraints of knowledge and education cannot be understated. Even with financial and physical access to healthy food, individuals may not have the necessary knowledge to make nutritious choices (Van Der Velde *et al.*, 2019). Misinformation about diet and health is widespread (Diekman, Ryan and Oliver, 2023), and without proper education, people may lack the awareness needed to utilize available resources effectively. Nutritional literacy is critical, as it empowers individuals to discern between healthy and unhealthy foods and understand the long-term impact of their dietary choices (Silva *et al.*, 2023). The intersection of economic, logistical, cultural, and educational constraints presents a complex challenge to achieving food security and healthy eating. Addressing these constraints requires multifaceted strategies considering the local context and involving community engagement to ensure sustainable and culturally appropriate solutions.

Informal savings groups are known by many names globally. They are known as *Ajollusu* in Nigeria, *Tontines* in Francophone West African countries, such as Senegal and Cameroon, *Hui* in China, *Muzikis* or *Likelambas* in the Democratic Republic of Congo, *Ekub* in Ethiopia, *Stokvel* in South Africa, *Mukando* in Zimbabwe, *Susu* in Ghana, *Chama* in Kenya, *Tandas* in Mexico, *Chits* or *Kuries* in India and *Stokvels* in South Africa. Regardless of which name they are known for, the principles and roles of informal saving groups are consistent. They have been highlighted as a tool for poverty alleviation and financing alternatives built on communal fund pooling and trust, especially for resource-poor communities.

In South Africa, stokvels are a unique and integral part of South African culture, tracing their origins back to the 19th century (Verhoef, 2000, 2001, 2008, 2020; Matuku and Kaseke, 2014; Gwamanda, 2019a). The name "stokvel" is believed to have been derived from the term "stock fair," as they were influenced by rotating cattle auctions introduced by English settlers (Verhoef, 2008). Stokvels have emerged as a cultural cornerstone, offering a pragmatic approach to managing economic challenges, particularly in communities where formal financial services are either lacking or inadequate (Response and African Response Research, 2012; TSHANDU, 2016; Bäckman Kartal, 2019; Fairbridges Wertheim Becker, 2019; Nkambule N, Nkambule and Mohammed, 2019). They were inspired by practices that migrant workers from rural areas brought with them to the cities during the gold rush (Verhoef, 2008, 2020). As many found themselves in unfamiliar territories, they formed groups based on trust and common backgrounds, pooling resources to support one another in need. Initially, these informal groups served as a means for workers to collectively save for their journeys back home (Verhoef, 2008).

Over time, the concept evolved and adapted to be a coping mechanism for the unique socio-economic challenges faced by black South Africans, especially during the apartheid era when access to formal banking systems was limited for the majority (Verhoef, 2000, 2008). Stokvels traditionally had a strong social component, and they served as spaces for socialization, information sharing, and mutual support and strengthening communal bonds (Response and African Response Research, 2012; Barry, 2015; Holmes, 2017; Bäckman Kartal, 2019; Nkambule and Mohammed, 2019; Hutchison, 2020; Mabika and Tengeh, 2021). Their significance in the South African economic landscape cannot be understated. With millions of members participating nationwide, stokvels collectively manage billions of Rand, showcasing their enduring relevance and resilience in modern banking systems (Old Mutual, 2023). These informal savings groups facilitate financial resource pooling among members and serve as significant coping mechanisms to counteract food insecurity and economic instability (Lukwa, Odunitan-Wayas, Lambert, Alaba, et al., 2022).

Today, stokvels remain a testament to the power of collective action and community trust. They stand as a beacon of community-driven financial solutions tailored to meet the specific needs of their members and the broader South African context (Ramagoshi, 2016). Their evolution and endurance through the country's tumultuous history underscore their significance and pivotal role in South African society's social and

economic spheres. In South Africa, Stokvels manifest in a variety of objectives and structures, with some of the primary types being savings stokvels, burial stokvels, investment stokvels, high budget stokvels, and grocery stokvels (Verhoef, 2001; Bophela and Khumalo, 2019). Savings stokvels primarily aim to foster savings habits among members. Participants each contribute a predetermined amount into a shared pot and decide on the sequence in which they'll receive the pooled funds. Notably, this form of stokvel boasts the largest membership compared to others (Smallhorne, 2013). Burial stokvels are designed to provide both tangible and intangible assistance to members and their families upon the occurrence of a death. Members make consistent contributions, which are used to cover funeral expenses per Stokvel's constitution (Matuku and Kaseke, 2014).

On the other hand, investment stokvels prioritize building capital by investing in various business opportunities. Alongside this primary objective, they also emphasize savings by buying goods in bulk (Matuku and Kaseke, 2014). When focusing on savings via bulk purchasing, such stokvels are often termed cooperative buying societies (Irving, 2005). Contributions are typically made monthly, accumulating funds before business investment (Irving, 2005). Women dominate the membership in savings, burial, and investment stokvels (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). High-budget stokvels serve as financial entities to bolster savings and investment activities (Matuku and Kaseke, 2014). Exclusively catering to the wealthier segments of society, members make significant contributions to align with their societal status. These hefty contributions grant members access to large, one-time payments, often utilized for substantial expenses. Interestingly, these high-budget stokvels are predominantly male-led with minimal female participation (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022).

Grocery stokvels exist with the primary objective of pooling funds for purchasing everyday food items and groceries to support members' households (Mabika, 2018; Mabika and Tengeh, 2021). Depending on the stipulated agreements of individual stokvels, groceries are procured either monthly or annually and are equitably distributed among participants (Mabika, 2018). Thus, members can make manageable contributions over set durations, ensuring they collectively benefit from shared grocery acquisitions. As a coping mechanism, stokvels provide a reliable financial buffer for members, allowing them to save for and obtain essential goods, including food, which might otherwise be unaffordable (Matuku and Kaseke, 2014; Mabika, 2018; Mabika and Tengeh, 2021). The collective purchasing power of stokvels often translates into better prices and access to bulk buying options, which is particularly advantageous when procuring groceries (Mabika and Tengeh, 2021). This approach directly impacts food security, enabling households to maintain a steady food supply and mitigating the risk of food shortages that often arise from individual financial constraints.

Economic instability, characterized by fluctuating incomes and uncertain financial futures, is a stark reality for many South Africans (Redl, 2018). Here, stokvels serve a dual purpose: they are economic instruments that help members save money, and credit associations provide loans during financial hardships (Kibuuka, 2007; Bäckman Kartal, 2019; Old Mutual, 2023). By doing so, stokvels offer their members a layer of economic

resilience, allowing them to weather periods of financial uncertainty without compromising their immediate and essential needs, such as food and healthcare. Moreover, the role of stokvels in alleviating food insecurity extends into the domain of social welfare (Matuku and Kaseke, 2014). This community-based approach to savings and credit significantly reduces the severity of food insecurity that members might otherwise face due to individual economic hardships (Food and Agriculture Organization of the United Nations, 2014; Duraó *et al.*, 2020; Baptista *et al.*, 2022).

The social fabric of stokvels also fosters a sense of community and mutual support, which is invaluable during economic downturns. The trust-based system upon which schools operate encourages shared responsibility and collective action (Lukwa *et al.*, 2022), which is essential for sustaining communities through economic stress. This collective ethos not only strengthens community bonds but also reinforces the social safety net that stokvels provide, making them a critical element in the fight against food insecurity and economic instability. In essence, stokvels exemplify a successful indigenous financial model that has the potential to be leveraged for greater social and economic stability within South African communities. Their impact on food security showcases the power of community-driven solutions to address systemic challenges, making stokvels an invaluable asset in the broader context of socio-economic resilience. This study only focused on grocery stores and their possibility of being used as vehicles to encourage healthy eating and improve food insecurity in South African households.

2.2 Evolution of global food systems

The global food system has dramatically transformed over the past few decades. Historically, most societies primarily consumed locally sourced, seasonal, and minimally processed foods (Gordon-Larsen and Popkin, 2011). However, technological advancements, transportation, and globalization have reshaped how food is produced, processed, distributed, and consumed worldwide (Fardet and Rock, 2020; Huebbe and Rimbach, 2020; Reardon *et al.*, 2021). With the dawn of the industrial age, food production shifted from small-scale, localized farms to large-scale industrial agriculture (Grantham, 1989; Hueston *et al.*, 2012). This shift brought about the mass production of crops, enabled by the widespread use of synthetic fertilizers, pesticides, and advanced farming techniques. The ability to produce food on such a grand scale gave rise to centralized processing facilities, where raw agricultural commodities could be transformed into a wide variety of products with extended shelf lives (Mbow *et al.*, 2020).

As globalization took hold, intricate supply chains developed, enabling foods to be transported across vast distances. This connectivity ensured that products previously limited to certain regions or seasons became available year-round in supermarkets worldwide. As a result, consumers expect a diverse array of food products irrespective of seasonality or geographic origin. Parallel to these changes was the rise of the food processing industry. The advent of technologies that could extend shelf life, enhance flavour, and improve the visual appeal of foods led to the proliferation of highly processed products (Wyrwa and Barska, 2017; Yan,

Hsieh and Ricacho, 2022). These products often contain added sugars, unhealthy fats, and high sodium levels, making them calorie-dense yet nutritionally sparse (Weaver *et al.*, 2014; Valicente *et al.*, 2023). It has been argued that a combination of factors ranging from their long shelf life, palatability, aggressive marketing, and economies of scale in production meant that such foods are often cheaper to produce, distribute, and sell than their whole or minimally processed counterparts (Monteiro *et al.*, 2019; Fardet and Rock, 2020).

Economically, producing highly processed foods is often more lucrative for the food industry (Wallinga, 2009). These products frequently have a higher profit margin, partly due to their low production costs and addictive nature, which encourages repeat purchases (Lustig, 2020; Leite *et al.*, 2022). Consequently, in many regions, especially urbanized areas, these foods have become more readily available and often cheaper than nutrient-rich, whole-food alternatives (Food and Agriculture Organization (FAO), 2023). The relative affordability of calorie-dense, nutrient-poor foods, especially in socio-economically disadvantaged areas, has made them a staple in many households (Daniel, 2020; Erokhin *et al.*, 2021; Headey *et al.*, 2023). The evolution of the global food system has brought undeniable benefits, such as increased availability and diversity. However, it has also ushered in a new set of challenges. The dominance of highly processed, calorie-dense foods has contributed to the dual burden of malnutrition: rising rates of obesity and diet-related non-communicable diseases, juxtaposed with persistent undernutrition in many parts of the world. Addressing these challenges requires a multi-faceted approach that considers the food system and the broader economic, socio-cultural, and policy environments in which it operates.

2.3 Conceptual Frameworks

2.3.1 Socioecological model for healthy eating

The socio-ecological model for healthy eating (Figure 2) is a framework that emphasizes the interconnectedness of individual, interpersonal, organizational, community, and societal influences on dietary behaviours. At the individual level, personal beliefs, knowledge, skills, and motivations are pivotal in shaping dietary choices. The interpersonal level focuses on the influence of relationships and social networks, considering how family, friends, and peers can encourage or deter healthy eating habits. Organizational factors relate to the institutions and structures people are a part of, such as schools and workplaces, and how they can promote or hinder access to nutritious foods. The community level delves into the broader environmental context, addressing issues like the availability and affordability of fresh produce in local stores or the prevalence of fast-food outlets. Lastly, societal factors consider the larger structural aspects, including food policies, cultural norms, and mass media, which can profoundly shape the dietary landscape. By understanding and addressing influences at all these levels, interventions can be more effectively tailored to promote healthier eating patterns in various populations.

Food insecurity and poverty are deeply entwined challenges that impact communities across the globe (Siddiqui *et al.*, 2020). When individuals or families lack reliable access to sufficient and affordable nutritious food, they experience food insecurity. This lack of food security can reduce the quality and variety of diets, pervasive uncertainty about the next meal, and disruptive eating patterns caused by financial constraints (Morales and Berkowitz, 2016). Poverty exacerbates this situation, as it hampers people's ability to purchase enough food, especially the nutritious products crucial for maintaining good health. The irony lies in the higher cost of healthy foods compared to less nutritious, calorie-dense options, which puts a balanced diet out of reach for impoverished people (Anekwe and Rahkovsky, 2013).

The socio-ecological model for healthy eating provides a comprehensive perspective on how various factors influence food security and poverty (Olson, Miller and Troy, 2011). At the individual level, a person's knowledge and skills in nutrition, cooking, and budgeting are crucial. Those in poverty often lack the education to maximize limited resources for a healthy diet (Wallinga, 2009). Interpersonal networks, such as family and community connections, also significantly impact food security. Strong social ties can provide a buffer against food scarcity, while their absence can compound the difficulties of poverty (Connolly-Boutin and Smit, 2016). The community environment also plays a role, with the local availability of food in stores or markets or the lack thereof in food deserts directly affecting food security (Story, Karen M Kaphingst *et al.*, 2008; Story, Karen M. Kaphingst, *et al.*, 2008; Farley *et al.*, 2009; Lucan *et al.*, 2013; Ni Mhurchu *et al.*, 2013; Dubowitz *et al.*, 2015). In impoverished areas, the scarcity of stores selling healthy, affordable options is a significant barrier. A holistic strategy is needed to tackle the dual challenges of food insecurity and poverty. This would include policies aimed at fostering economic stability, nutrition education, investments in community food systems, and social programs offering direct aid. Community-driven endeavours like food banks, community gardens, and group buying clubs, such as stokvels, are critical in providing immediate and long-term solutions for enhancing food security in impoverished regions. To note, the macro-economic framework aspect of the Economic systems includes the prices influence on health eating habits, i.e. link to affordability (Marcone, Madan and Grodzinski, 2020).

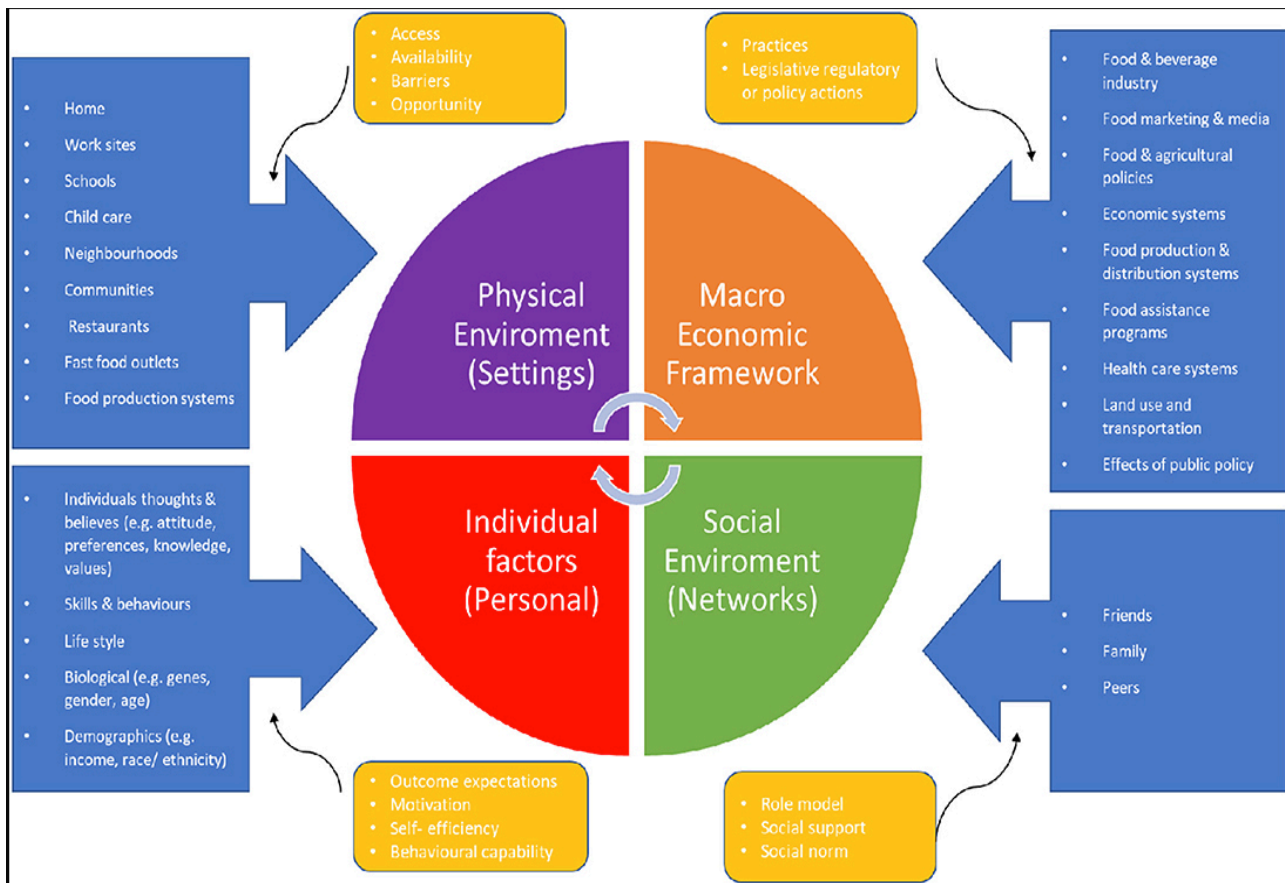


Figure 2: Socioecological model for healthy eating

Source:(Marcone, Madan and Grodzinski, 2020)

2.3.2 World Health Organisation (WHO) framework for healthy eating

The World Health Organization (WHO) has, over time, laid down an extensive set of guidelines and recommendations to form a comprehensive framework dedicated to healthy eating and nutrition (World Health Organisation (WHO), 2023). Central to this framework is its emphasis on preventing non-communicable diseases (NCDs) and championing optimal health throughout every phase of life. Among the cornerstone principles of this structure are the concepts of energy balance and physical activity. An individual's food-derived energy intake needs to harmonize with their energy output via physical activities to maintain a healthy weight (Beaulieu, Oustric and Finlayson, 2020) in macronutrient distribution, WHO underscores the significance of choosing unsaturated fats over their saturated and trans counterparts. Furthermore, it promotes deriving the bulk of dietary energy from complex carbohydrates, particularly whole grains.

The framework also addresses the potential hazards of excessive salt or sodium consumption, linking it to conditions like hypertension and heart diseases and thus advising an intake of under 5 grams daily (World Health Organisation (WHO), 2021). Sugar consumption, too, is spotlighted, with guidelines suggesting its limitation to under 10% of one's total energy intake, with an added emphasis on the benefits of further

reducing it to below 5% (World Health Organisation (WHO), 2023). The undeniable health benefits of a diet abundant in fruits and vegetables are also championed, particularly their role in fending off NCDs, setting a recommended intake of over 400 grams daily (World Health Organisation (WHO), 2023).

Moreover, the framework extends beyond healthy eating to confront the overarching challenges of undernutrition and malnutrition, especially in vulnerable demographics and developing nations. This framework serves as a beacon for national policymakers, public health enthusiasts, and the general populace in navigating the intricate realm of dietary choices to enhance overall health. It's noteworthy that while WHO lays down these general guidelines, individual nations often tailor or augment them to better resonate with their unique nutritional obstacles and ingrained dietary customs.

2.3.3 Consumer Theorem

Kenneth Arrow's The Impossibility Theorem underscores the formidable challenge of attempting to please everyone, revealing the inherent impossibility of such an endeavour (Maskin and Sen, 2014). Arrow's work identifies collective decision-making procedures capable of accurately reflecting social preferences. Within economics, values are often quantified in monetary terms, largely owing to the dominance of the neoclassical discourse in economic research, as asserted by (Kaplan, 1960).

Preferences, a fundamental concept in decision-making, entail selecting one option from among several alternatives. Scholars such as Barnett and Serletis (2008) and Barten and Böhm (1982) have delved into the intricacies of preference theory. These choices are significantly influenced by the constraints of discretionary income and limited resources, which invariably impact the decision-making process. In essence, the presence of choices is essential, as their absence would result in an ideal scenario where every individual receives their complete needs, thereby achieving a perfect equilibrium of demand equalling supply (Besanko and Thakor, 1987). The Neo-classical economic discourse posits that people have rational choices and can assign values to various goods (List, 2004). The consumer theorem deeply embeds the choice of food to consume (Chen and Antonelli, 2020). As resources, more specifically monetary resources, affect the choice of nutrition over non-nutritional foods, behavioural economics will affect the outcomes related to consumption. Understanding the value of choices and the consumer theorem may be measured through revealed or stated preferences. Figure 3 shows how revealed preferences (RP) and stated preferences (SP) assessments can be evaluated. Choice modelling is the basis of the Discrete Choice Experiment, one of the topics focused on in this study.

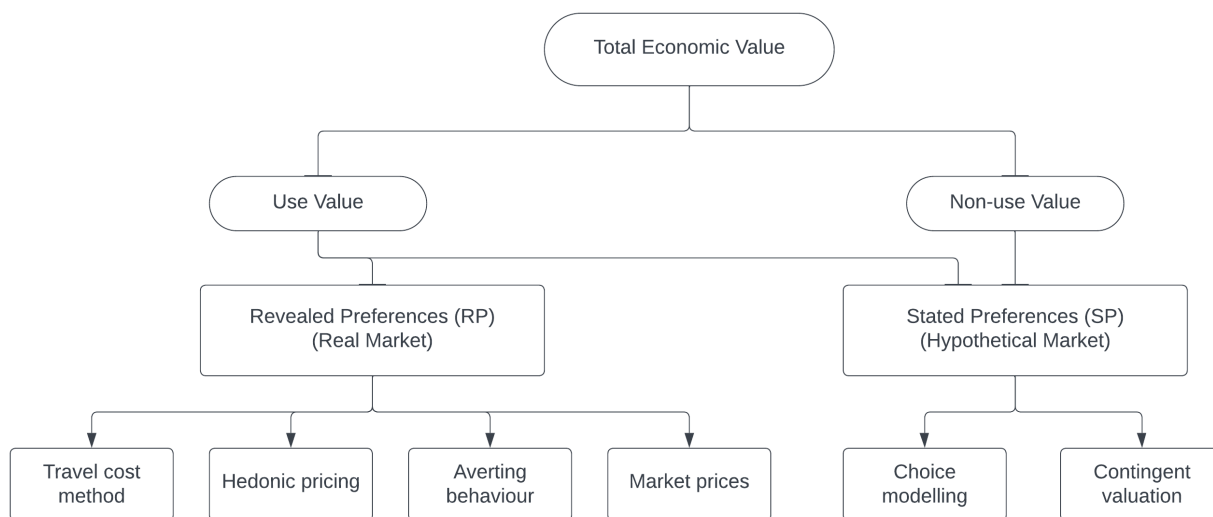


Figure 3: Revealed vs State Preferences

Source: (Ritchie, Amaya Molinar and Frechtling, 2010)

2.3.4 Revealed Preferences (RP) and Stated Preferences (SP)

Revealed Preferences: Paul Samuelson's theory of consumer behaviour notes that if a person is provided with products A and B, his revealed preference is A if product A is chosen (Wade Hands, 2014). Specifically, if a person is presented with products A and B and chooses A, this indicates a revealed preference for A over B. Importantly, the validity of these preferences is contingent upon the availability of a second option at the time of selection. For preferences to be considered valid, they must satisfy the weak and strong axioms of revealed preference theory. The weak axiom states that if a consumer chooses option A over option B when both are available, they should not choose B over A in any subsequent choices where both options are again available. The strong axiom extends this consistency across multiple alternatives, ensuring that the consumer's choices are rational and transitive over a set of options. This assertion is similar to ordinal utility theory, where preferences are ranked rather than quantified. The subject of RP theory has progressed over time, resulting in more intricate modeling, such as Walrasian General Equilibrium models and Stochastic Revealed Preference models (Wade Hands, 2014). However, in cases where revealed preference information is not easily obtainable, economists employ hypothetical scenarios known as Stated Preferences to elicit consumer preferences.

Stated preferences: Observing information about the market or non-market items is not always possible, as in the revealed preferences situation (Champ, Boyle and Brown, 2003). To overcome such barriers, economists developed a mechanism for eliciting customer preferences and measuring their worth in monetary or rating styles (Champ, Boyle and Brown, 2003). According to De Bekker-Groba et al. (2010), stated preferences are a quantitative tool used to evaluate relative choices or underlying usefulness given

distinct features (Krabbe, 2013). Hence, it is sometimes called the multi-attribute utility theory (Krabbe, 2013). Methods used in this regard include discrete choice experiments (DCE) and willingness to pay (WTP). WTP is a contingent valuation method, whereas DCE is known as a conjoint analysis or choice experiment. The primary application of conjoint analysis is to aid decision-making in policy processes and management when a question cannot be addressed due to the complicated nature of having several attributes with different levels.

2.4 Methodology literature review

2.4.1 Choice Modelling (Discrete Choice Experiments)

The Impossibility theorem by Kenneth Arrow notes the daunting task of trying to please everyone and how impossible it is (Savedoff, 2004). He noted the difficulty in finding a collective decision-making process where social preferences could be easily ranked. It is, however, possible to use econometric models such as DCEs to predict the choices of individuals given hypothetical alternatives. The use of hypothetical scenarios has been under the spotlight due to validity and reliability, prompting calls to do thorough tests (Rakotonarivo, Schaafsma and Hockley, 2016). Using attributes and attribute levels and understanding the importance of the numbers that can be used is important in interpreting the generalisability of the results (Mandeville, Lagarde and Hanson, 2014). Table 1 states the different models one can use for a DCE.

Table 1: Models that can be used for DCE analysis

Binary choice	Multinomial choice without correlation among alternatives	Multinomial choice with correlation among alternatives
Logit with attributes of the person but no attributes of the alternatives	Logit with attributes of the person but no attributes of the alternatives	Nested Logit and Generalized Extreme Value (GEV) models
Probit with attributes of the person but no attributes of the alternatives	Logit with variables that vary over alternatives (also called conditional logit)	Multinomial probit
Probit with variables that vary over alternatives		Mixed logit
Logit with variables that vary over alternatives		

Source: Adapted by the author from (Ben-Akiva, Bolduc and Walker, 2001; Haaijer, Kamakura and Wedel, 2001; Hensher and Greene, 2003)

2.5 Empirical literature review

2.5.1 South African policies and its role in promoting a healthy food environment

In response to the escalating rates of non-communicable diseases (NCDs) and the health implications of a double burden of malnutrition, South Africa has been proactive in implementing policies geared towards fostering a healthier food environment. Central to these policies is an intention to affect the food industry's supply and demand dynamics. One notable step was the 2010 mandate by the South African Department of Health, which necessitated nutrition labelling on all packaged foods, aiming to bolster consumers' awareness of their food choices (Bopape *et al.*, 2021; Dlamini, Mukoma and Norris, 2022). In 2013, given the identified correlation between high salt intake and cardiovascular diseases, mandatory caps were placed on the salt content in various processed foods (Hofman and Lee, 2013). Four years later, in 2018, the government introduced the Health Promotion Levy, essentially a tax on sugar-sweetened beverages, in a move to curb the consumption of sugary drinks linked with obesity and diabetes, among other NCDs (Essman *et al.*, 2021; Koen *et al.*, 2022).

The adverse effects of advertising on children's dietary choices haven't gone unnoticed either, with active discussions about regulating unhealthy food and beverage promotions targeting the youth (Yamoah *et al.*, 2021). Additionally, the National School Nutrition Programme, orchestrated by the Department of Basic Education, has been pivotal in ensuring learners in economically disadvantaged schools receive at least one nutritious meal daily (Kwatubana and Makhalemele, 2015). Beyond direct food policies, urban planning, including establishing green spaces walking trails, and encouraging community gardens, indirectly champions a healthier lifestyle. Breastfeeding, vital for its nutrition and long-term health benefits, has also been supported through proposed policies emphasizing extended maternity leave and fostering environments conducive to breastfeeding.

In tandem with associated organizations, the government has launched public awareness campaigns emphasizing healthy eating, the hazards of NCDs, and the significance of an active lifestyle to amplify the importance of these health-centred changes. While introducing these policies is praiseworthy, their tangible impact hinges on effective execution and widespread public compliance. The true success of these initiatives rests on a collaborated effort spanning education, healthcare, industry sectors, and civil society, coupled with diligent monitoring, periodic evaluations, and the flexibility to adapt based on evolving feedback. Such a comprehensive approach is instrumental in steering South Africa towards a healthier diet.

2.5.2 Global context

The lack of access to healthful foods and disproportionate exposure to unhealthy foods in low-income and minority communities has been widely documented in the literature (Hilmers, Hilmers and Dave, 2012; Evans *et al.*, 2015; Ohri-Vachaspati *et al.*, 2019; Khanna, 2020; Vilar-Compte *et al.*, 2021); as are the impact these 'food deserts' have on obesity and chronic disease (Morland, Wing and Roux, 2002; Baker *et al.*, 2006; Kipke *et al.*, 2007; Lopez, 2007; Bodor *et al.*, 2010; Caspi *et al.*, 2012). Earlier global statistics reported that 77.6% and 78.4% of men and women in 52 low and middle-income countries consumed less than the 400g or five portions recommended daily serving of fruits and vegetables (World Health Organization, 2003; Hall *et al.*, 2009).

As a result, the global prevalence of NCDs has rapidly increased, especially in LMICs, where almost 75% of NCD-related deaths occurred in 2012 (Sommer *et al.*, 2015). In 2011, the General Assembly of the United Nations adopted a political declaration agreeing on approaches for the prevention and control of NCDs (World Health Organization and others, 2013), considering the social determinants of health (SDH) (International Diabetes Federation (IDF), 2013). In 2013, the World Health Organization launched the Global Action Plan for Preventing and Controlling NCDs for 2013–2020, prioritising the SDH (Sommer *et al.*, 2015).

Different approaches have been suggested to focus on disadvantaged populations, the entire population, or a combination of both (Solar and Irwin, 2007; Frohlich and Potvin, 2008, 2010; Rasanathan and Krech, 2011). In many high-income countries (HICs), preventive efforts to reduce social inequalities in diet take structural or agentic interventions (Mayén *et al.*, 2016). Structural interventions work by altering the context in which health is produced or reproduced (McLaren, McIntyre and Kirkpatrick, 2010), such as taxes on unhealthy foods or subsidies on fruits and vegetables (Blankenship, Bray and Merson, 2000) and reformulation of food products (i.e. lowering the salt content) (Darmon *et al.*, 2014).

Agentic interventions are the ones in which an individual must act on the information provided, such as health education programs (Mozaffarian *et al.*, 2012; Ji and Cappuccio, 2014; McGill *et al.*, 2015). Such interventions have successfully reduced social inequalities in the diet in several HICs (Mozaffarian *et al.*, 2012; Ji and Cappuccio, 2014; Friel *et al.*, 2015; McGill *et al.*, 2015). It was evident in the literature reviewed that causal processes exist that link food store choices to health behaviours and health outcomes. Although several studies have reported a correlation between the local food environment and health outcomes (Morland, Wing and Roux, 2002; Inagami *et al.*, 2006; Larson, Story and Nelson, 2009; Zenk *et al.*, 2009; Caspi *et al.*, 2012) far fewer, have used individual-level food purchasing data to assess the relationship between store type and the nutritional quality of food purchases.

2.5.3 Sub-Saharan Africa context

A report by the Global Hunger Index (2016) indicated that the Global Hunger Index (GHI) dropped by 29%, although this progress has been uneven. The highest GHI scores remain in sub-Saharan Africa (SSA) and South Asia. According to the same report, hunger levels were serious or alarming in 50 countries, and most of the seven countries with bad GHI scores were in Sub-Saharan Africa (SSA). Nevertheless, although the region remains the most food and nutrition insecure in the world, some progress has been made over the years. The proportion of the undernourished dropped by about half and these changes were reported in East, Southern, and West Africa (FAO/Accra, 2015).

On the other hand, sub-Saharan Africa reported a growing burden of obesity and NCDs (Cannuscio, Weiss and Asch, 2010; Abrahams, McHiza and Steyn, 2011; Chukwuonye *et al.*, 2013; Agyemang C, Boatemaa S, Agyemang FG, 2015). Low-and-middle income countries (LMIC) have been reported to continue to focus on behaviour, choice, and the proliferation of obesogenic food environments relative to obesity health interventions, all of which obscure the persistence of hunger in low-income urban (Steyn and Temple, 2012; Schönfeldt, Hall and Bester, 2013). Trends from low and middle-income countries (LMICs) constantly show the distribution of overweight and obesity shifting to more socio-economically deprived groups (Swinburn *et al.*, 2011). However, obesogenic food and built environments adversely affect the food insecure and vulnerable urban poor populations. This partially explains why many households in LMICs are dominated by under-nutrition and overweight populations (Steyn *et al.*, 2011).

Fruits and vegetables are important components of a balanced and healthy diet. However, it is quite concerning that their consumption is lower globally than the recommended guidelines, with the lowest figures reported in sub-Saharan Africa (Bvenura and Sivakumar, 2017). Africa's food and vegetables per capita per year as of 2022 was 66,16 kgs. South Africa reported 22,39 kgs, three times lower than Africa's fruit and vegetable per capita consumption (Our World in Data, 2023). Low consumption of fruits and vegetables increases the risks of diseases and conditions associated with increased mortality rates, such as heart disease, stroke, certain types of cancer, and obesity-related complications. Furthermore, the food environment of poor urban communities in LMICS is characterised by low-cost, high-energy-dense street foods, processed foods, and fast foods (Ziraba, Fotso and Ochako, 2009; Agyei-Mensah and De-Graft Aikins, 2010; Cannuscio, Weiss and Asch, 2010; Dake *et al.*, 2016). Furthermore, several studies reviewed showed that poor households and educated groups were less likely to consume fruit and vegetables (Mayosi *et al.*, 2009; Fontbonne *et al.*, 2011; Kimani-Murage *et al.*, 2015). Obesity is a complex problem that needs an interdisciplinary framework and systems-based approach to address it (Roberto *et al.*, 2015; Swinburn *et al.*, 2015). However, interventions such as short-term educational programs and one-off community health fairs have not met the expected criteria of being appropriate, sustainable, and scalable to prevent or manage obesity in low-resourced settings that lack equity, underlining the necessity for a social justice-oriented approach (Smith, Fu and Kobayashi, 2020; Drimie *et al.*, 2023a; Zurynski *et al.*, 2023).

2.5.4 South African context

In South Africa, diet-related noncommunicable diseases (dr-NCDs) significantly burden individuals, households, and the health system (Hunter-Adams and Battersby, 2020). Alongside the nutrition transition, obesity rates were reported to rise in South Africa (Hunter-Adams, Battersby and Oni, 2019). Dr-NCDs affect the quality of life, entailing a significant cost to health systems, the economy and households (Hunter-Adams and Battersby, 2020). Abegunde et al. (2007) conservatively estimated the accumulated losses to South African gross domestic product (GDP) due to diabetes, stroke, and coronary heart disease at US\$1.88 billion for the period between 2006 and 2015 (Hofman, 2014). Dr-NCDs have been evidenced to be linked with a lack of dietary diversity and food insecurity (Hunter-Adams, 2019; Hunter-Adams, Battersby and Oni, 2019).

In South Africa's urban informal areas, a dual aspect of food insecurity prevails, manifesting as obesity and hunger (Hunter-Adams, Battersby and Oni, 2019). The increasing obesity rates contribute to a heightened risk of noncommunicable diseases (NCDs), presenting significant health challenges and adding strain to healthcare systems (Case and Menendez, 2009). Contributory factors to obesity include diets with high energy density, excessive consumption of sugar-sweetened beverages, large portion sizes, irregular eating patterns such as meal-skipping, high sedentary behaviour and low physical activity levels (Eisenberg et al., 2005). Despite the availability of healthier food choices in places like Cape Town, the cost remains a barrier; nutrient-rich foods like lean meats, fish, fruits, and vegetables are significantly more expensive, sometimes by 10–60%, than their processed counterparts (Jacobs, 2009; Igumbor et al., 2012; Schönfeldt, Hall and Bester, 2013). This price gap exacerbates the issue, as many individuals with lower socioeconomic status (SES) and limited resources frequently experience both childhood and ongoing hunger due to these chronic and acute food shortages.

South Africa is characterised by the co-existence of undernutrition, hunger, and obesity within households and individuals, which might be mainly driven by inconsistent access to food (Hunter-Adams, Battersby and Oni, 2019). The South African Demographic and Health survey of 2016 reported that 41% of black women, 31% of white women, 46% of coloured women, and 49% of Indian/Asian women are obese (National Department of Health (NDoH) South African Medical Research Council (SAMRC), and ICF et al., 2019). Over 32% of informal urban residents in South Africa experience hunger (Shisana et al., 2013). In addition, South Africans have a relatively low intake of fruits and vegetables. Several studies have demonstrated that South Africans, even those from financially deprived communities, are aware of healthy food options, highlighting that the major barriers may be affordability and access challenges and not nutritional knowledge (Dolman et al., 2008; Muzigaba and Puoane, 2011; Everett-Murphy et al., 2015; Draper, Davidowitz and Goedecke, 2016; Masupe et al., 2018).

Social connectedness and engagement are critical in creating healthy food environments and promoting healthy choices (Conklin *et al.*, 2014). When communities engage collectively, particularly in environments challenged by food insecurity and inequity, they can develop robust support networks that could facilitate access to nutritious food. These networks might include community gardens, cooperative buying groups like stokvels, or shared meal programs, collectively enhancing food security. Gender equity is also integral in this context, as women often play key roles in household food choices and meal preparation (Das and Anindya J Mishra, 2021; Njuki *et al.*, 2021; Visser and Wangu, 2021). Therefore, empowering women with equal access to resources and decision-making can lead to more informed food choices and the establishment of healthier eating patterns for families. In essence, fostering an environment where social connectedness, engagement, food security, and gender equity are prioritized can significantly influence individuals' abilities to make healthier food choices. It enables the sharing of nutrition knowledge, increases the affordability and accessibility of healthy foods, and supports cultural shifts towards more nutritious diets.

While the literature reviewed showed the existence of several initiatives which were promising in terms of social connectedness and engagement, food security, gender equity and livelihood, and access to more affordable, healthy food (Dolman *et al.*, 2008; Jacobs, 2009; Mayosi *et al.*, 2009; Abrahams, McHiza and Steyn, 2011; Muzigaba and Puoane, 2011; Steyn *et al.*, 2011; Temple and Steyn, 2011; Igumbor *et al.*, 2012; Steyn and Temple, 2012; Schönfeldt, Hall and Bester, 2013; Shisana *et al.*, 2013; Everett-Murphy *et al.*, 2015; Draper, Davidowitz and Goedecke, 2016; Gakidou *et al.*, 2017; Masupe *et al.*, 2018; MP *et al.*, 2018; Hunter-Adams, Battersby and Oni, 2019; National Department of Health (NDoH) South African Medical Research Council (SAMRC), and ICF *et al.*, 2019), there is still lack of evidence concerning scalability and sustainability of such public health interventions.

A balanced diet should contribute significantly to a healthy and normal life while lowering nutrition-related mortality incidences (Bvenura and Sivakumar, 2017). However, there is little evidence of successful behavioural interventions to change lifestyles (Hunter-Adams and Battersby, 2020). Worldwide, the most common informal savings groups are often called Accumulating Savings and Credit Associations (ASCAs) or Rotating Savings and Credit Associations (ROSCAs). ROSCAs represent community-based financial initiatives that comprise self-selected members of a group who regularly meet and contribute an equal amount of savings towards a common fund, with one member rotationally taking the whole sum (Kabuya, 2015). ASCAs, on the other hand, are savings groups where funds contributed regularly are not immediately withdrawn like the ROSCAs but are left to grow as loan opportunities for members, bulk purchases, or collective investments (Bouman, 1995). Both ASCAs and ROSCAs have been attributed to be significant in poverty alleviation (Mukorombindo and Coetzee, 2013; Stavropoulou, Holmes and Jones, 2017; Mantsios *et al.*, 2018; Nkambule N, Nkambule and Mohammed, 2019).

2.6 Summary of literature review and identified gaps

This literature review underscores the significant role of stokvels in South African society. Over time, the role of stokvels expanded to become socio-economic support systems, particularly during the apartheid era when formal banking access was restricted. Today, stokvels are integral to South Africa's economy. However, this thesis focuses on grocery stores, which were examined for their potential to enhance healthy eating and reduce food insecurity. Globally, the food systems landscape has been marked by significant changes. Technological advancements and globalization have shifted diets from local, minimally processed foods to a variety of often nutritionally deficient, processed foods. While these changes ensure food availability, they pose health challenges, including rising obesity and persistent undernutrition.

The evolution of stokvels in the context of contemporary financial landscapes presents a significant gap in the literature. There is a need for a thorough analysis of how these informal community savings groups have adapted and interrelated with the modern banking systems in South Africa. Concurrently, the impact of globalization and industrial advancements on South African dietary habits remains underexplored. This is further compounded by a limited understanding of marketing dynamics, specifically in shaping preferences for highly processed foods over more nutritious alternatives. Investigating strategies that prioritize or reintegrate locally sourced and minimally processed foods in urban diets worldwide would be valuable.

Moreover, there is a discernible gap in assessing the efficacy of policy interventions designed to address the challenges posed by the evolving food system, both within South Africa and globally. What traditional community savings mechanisms, particularly stokvels, align with broader health and food access initiatives also requires deeper exploration. Understanding the behavioural shifts toward healthier eating in the South African context, including potential barriers and facilitators, is crucial. Lastly, a comprehensive evaluation is necessary to discern the role of community-based financial initiatives in global settings, especially concerning their indirect implications for food access and overall health.

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Chapter 3: The importance of informal saving groups as a public health multi-faceted intervention tool to promote agency in women, healthy lifestyle, social and economic stability: A systematic review of the literature

This systematic literature review provided formative work for the thesis by examining the role of informal savings groups like ASCAs and ROSCAs in enhancing food security and socio-economic and health benefits for urban women in sub-Saharan Africa. Drawing on a comprehensive search of six databases covering 2000-2021, the study analyzed twenty-eight records using the CASP checklist. It found that these groups, while instrumental in socio-economic empowerment, particularly for women, have a secondary impact on food security and lack focus on the nutritional quality of food. This highlights the potential of ASCAs and ROSCAs in women's empowerment and points to opportunities for initiatives promoting healthier diets and well-being in these communities. The findings are crucial for policy-making in the socio-economic and public health sectors.

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The relevance of the manuscript to the thesis: This study presents an examination of informal savings groups known as ASCAs and ROSCAs and their potential impact on improving access to food, social and economic status, and health outcomes, especially among women in urban areas of sub-Saharan Africa. The research involved a search of academic databases from 2000 to 2021, leading to the selection of 28 studies evaluated using established qualitative assessment methods. The findings show that while these savings groups contribute to food security, it is often not the main reason individuals join. The study suggested that there is an opportunity to work with these groups to shift focus towards supporting healthy eating habits. This could be done by establishing partnerships with stakeholders that could influence the food purchasing decisions of these groups to include more healthy options.

Article

Can informal savings groups promote food security and social, economic and health transformations, especially among women in urban sub-Saharan Africa: A Narrative Systematic Review**Akim Tafadzwa Lukwa^{1,2*}, Feyisayo Odunitan-Wayas^{3,4}, Estelle Victoria Lambert^{3,4}, “Savings for Health” IDRC collaborators[†] and Olufunke Alaba¹**

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3.1 Abstract

This narrative review aimed to identify if roles of common informal savings groups known as Accumulating Savings and Credit Associations (ASCAs) or Rotating Savings and Credit Associations (ROSCAs) can play a significant role in mitigating food insecurity, socioeconomic inequality, promoting health, and increasing agency in women in urban sub-Saharan Africa (SSA). These organizations exist under various names in most low- and middle-income countries (LMICs) worldwide. A comprehensive search of scholarly outputs across six electronic databases (Pub-Med, Google Scholar, EBSCOhost, Scopus, Sabinet, and Cochrane) from 2000 to 2021 was completed. Twenty-eight (28) records met our inclusion criteria, and their quality was appraised using the Critical Appraisal Skills Programme (CASP) qualitative checklist. We identified through thematic analysis that ROSCAs/ASCAs play a crucial role in advancing social, economic, and health transformations, especially among women in urban SSA. However, while ROSCAs/ASCAs played important roles in food security, it was often not the primary motivation for participation. None of the selected studies identified the importance of dietary quality or access to healthy food in relation to food security. This review suggests a window of opportunity to promote partnerships and collaborations of ROSCAs/ASCAs with relevant stakeholders to leverage the functionalities of ROSCAs/ASCAs as vehicles for re-alignment of priorities, increased knowledge, and opportunities to encourage affordable healthy diets in urban SSA.

Keywords: informal savings groups; ROSCA's; ASCA's; food (in)security

3.2 Introduction

The “wicked” problem of food insecurity juxtaposed with overweight/obesity disproportionately affects women and the vulnerable urban poor globally, particularly in the Global South, including sub-Saharan Africa (SSA) (Conklin, 2005; Kelly *et al.*, 2008; Swinburn *et al.*, 2011; Temple and Steyn, 2011; McHiza *et al.*, 2019). Women in sub-Saharan Africa (SSA) are more likely to be food insecure than men, even though women play a more significant role in ensuring household food security (Sraboni *et al.*, 2014). However, food insecurity has been linked to factors such as poverty, gender, unemployment, low educational attainment, and low socioeconomic status (Lakhani, 2014). Furthermore, the continuous rise of the wicked problem has also been attributed to nutrition transition, lack of dietary diversity and quality, cost of healthy food, poor ability to store food, expansion of the food retail environment “big box” stores, issues of last mile distribution and greater body size tolerance (Kanter and Caballero, 2012; Atek *et al.*, 2013; NCD Risk Factor Collaboration, 2016; McHiza *et al.*, 2019). Consequently, households adopt several strategies to mitigate food insecurity and socioeconomic inequality.

One such strategy for mitigating food insecurity socioeconomic inequality involves participation in informal savings groups (Travkina, Froy and Pyne, 2013). Worldwide, the most common types of informal savings groups are often referred to as either Accumulating Savings and Credit Associations (ASCAs) or Rotating Savings and Credit Associations (ROSCAs). ROSCAs represent community-based financial initiatives that comprise self-selected members of a group who regularly meet and contribute an equal amount of savings towards a common fund, with one member rotationally taking the whole sum (Kabuya, 2015). ASCAs, on the other hand, are savings groups where funds contributed regularly are not immediately withdrawn like the ROSCAs but are left to grow as loan opportunities for members, bulk purchases, or collective investments (Bouman, 1995). They are found in almost every LMIC and fulfil the role of informal financial institutions, typically providing credit to low-income consumers that often do not have access to more formal financial services.

ROSCAs/ASCAs are known by many names globally, for example, Ajo/Isusu in Nigeria, Tontines in Francophone West African countries, such as Senegal and Cameroon, Hui in China, Muzikis or Likelambas in the Democratic Republic of Congo, Ekub in Ethiopia, Stokvel in South Africa, Mukando in Zimbabwe, Susu in Ghana, Chama in Kenya, Tandas in Mexico, and Chits/Kuries in India. Notably, the attributes and functions of South Africa’s informal saving groups, stokvels, have been widely described in the literature. Stokvels have been practised for many years by most South Africans and are highlighted as a key poverty-alleviation strategy (Matuku and Kaseke, 2014). Of these groups, nearly 30% (of over 800,000) have been described as “grocery stokvels” and typically leverage collective buying power to garner discounts on long-shelf-life items from major retailers and wholesalers, particularly leading up to the festive season. Most of these items are highly processed or energy-dense foods, often of lower nutritional quality.

There appears to be substantial evidence that ROSCAs/ASCAs promote community development, social interaction and social capital (Pronyk *et al.*, 2008). They also provide an important means of livelihood sustenance for poor women, especially those who are heads of households (Buijs, 2002; Haddad and Maluccio, 2003; Lakhani, 2014; Gichuki and Kinuthia, 2015; Kemboi, 2016). However, there is no evidence on the role of ROSCAs/ASCAs as a potential public health multi-faceted intervention tool to promote agency in women, healthy lifestyle, social and economic stability. Of note, the COVID-19 pandemic has been cited to have aggravated the situation of food insecurity, poverty, and unemployment, disproportionately in women, resulting in adverse public health consequences globally (Udmale *et al.*, 2020; Singh *et al.*, 2021). The novelty of the paper is that it will provide insights into the strengths and importance of informal saving groups and opportunities as a public health multi-faceted intervention tool to promote agency in women, healthy lifestyle, social and economic stability that exists within ROSCAs/ASCAs that can be leverage on especially for women. This review will address the gaps in literature focusing on the following research questions: to what extent have ROSCAs/ASCAs been used to address food insecurity, but i) to increase agency in women and their economic leverage in urban areas in sub-Saharan African settings. ii) to promote healthy lifestyles and well-being amongst their members, and iii) to increase demand for and access to healthier food options.

As a narrative review that was conducted systematically, the structure of the review is as follows: Section 1 comprises the introduction highlighting the gap the review aims to fill Section 2 includes detailed information on methods used to conduct the review and assess the quality of the selected documents, identification and definition of themes for the review, a summary of included studies and study quality and description of the types of stokvels, as the most common type of ROSCA/ASCA in literature. Section 3 comprises the findings under each theme consisting of a thematic description with relevant quotes from literature. Section 4 is the discussion section to draw more insights into the findings and its policy and health implications and importance of ROSCAs/ASCAs, in the SSA, especially women and to foster further research and development activities. Section 5 highlights the strengths and limitations of the study and Section 6 provides the conclusion of the review with a short summary.

3.3 Methods

This narrative systematic review was registered in the International Prospective Register of Systematic Reviews (Booth *et al.*, 2012), and evidence was extracted and synthesized using the SPICE mnemonic (Pollock and Berge, 2018). The SPICE mnemonic is guided by five distinctive sub-groups: setting (*where*), perspective (*for whom*), intervention (*what*), comparison (*what else*), and evaluation (*what result*) (Booth, 2006). This narrative systematic review used the five sub-groups to extract the required information. We conducted a comprehensive search of scholarly outputs from six electronic databases (Pubmed, Google Scholar, EBSCOhost, Scopus, Sabinet, and Cochrane) to identify studies that focused on the role of

ROSCAs/ASCAs in addressing issues of food security, health promotion, socioeconomic challenges and agency in women from urban SSA.

3.3.1 Search strategy

The following search strategy was developed with the guidance of a librarian and adapted for the various databases using appropriate controlled vocabulary and syntax: (“Rotating Savings and Credit Associations” OR “Stokvel” OR “Community Savings Groups” OR “Saving Promotion Interventions”) AND (“Food Security” OR “Food systems” OR “Health promotion” OR “Health” OR “Well-being” OR “Obesity” OR “Women” OR “Gender equity” OR “Agency” OR “Leadership” OR “Community Development” OR “Collective efficacy” OR “Non-communicable diseases”) AND (“Global South” OR “Southern Africa” OR “South Africa” OR “Lower- and Middle-Income Countries” OR “AFRICA”) NOT (“Banking” OR “Microfinance” OR “Financial institutions”). Additionally, a hand search of reference lists of relevant studies and grey literature was done, including conference abstracts and proceedings.

The research focused on identifying relevant literature from academic databases published between 2000 and 2021. This 21-year period was selected to ensure a comprehensive review of significant contributions to the field, addressing the scarcity of literature prior to 2000. From this search, 28 studies were selected and evaluated using established qualitative assessment methods. Studies were selected guided by the following keywords: “Rotating Savings and Credit Associations”, “Stokvel”, “Community Savings Groups”, “Saving Promotion Interventions”, “Food Security”, “Food Systems”, “Health Promotion”, “Health”, and “Well-being”. All identified abstracts were assessed for relevance to the focus of the narrative systematic review and a full report was retrieved for studies with the relevant keywords. Studies identified as part of reference list searches were also assessed for relevance to the review based on the information provided in the study title.

3.3.2 Inclusion criteria

Only studies that were conducted in urban SSA with a focus on ROSAs/ASCAs were considered, with the inclusion criteria guided by the following themes: agency in women, food security, well-being or nutrition, behavioural economics (peer pressure, social marketing), and economic leverage (Table 1). Community development, social interactions, and social capital were excluded in this study as themes as there have been substantial studies conducted in SSA that have shown that ROSAs/ASCAs promote these themes as highlighted in the introduction.

3.3.3 Data extraction & abstraction

This narrative review used thematic analysis to systematically review the roles that ROSCAs/ASCAs play in mitigating food insecurity, promoting health, and/or increasing agency in women in urban sub-Saharan African settings. As such, a deductive thematic approach based on the existing knowledge and objective of the current study was used to analyze the relevant literature. The themes against which we examined the role of ROSCAs/ASCAs were 1) mitigating food insecurity, 2) promoting health and well-being, 3) increasing agency in women, and 4) encouraging economic leverage and behavioural economics in urban sub-Saharan African settings. Once data extraction tables were completed, two reviewers used qualitative software (Nvivo) to thematically organize the data from all included studies into these deductive themes (Appendix 2) which were agreed upon *a priori* with the review team and based on the objective of the current study. Although the final selected articles were guided by the deductive themes, inductive coding was used to derive relevant sub-themes within the larger themes. All major themes and sub-themes were verified by at least two review team members, and discrepancies were discussed until a consensus was reached. Quotes and statistics from included studies are presented in the results for the purposes of elucidation and illustration.

We used an adapted Critical Appraisals Skills Programme (CASP) qualitative checklist to assess the quality of the selected studies. The CASP qualitative checklist is a common tool for quality appraisal in health-related qualitative evidence syntheses. It is also used for assessing mixed-method and qualitative research (Dalton *et al.*, 2017). Details on the study quality based on the seven adapted questions can be found in Appendix 1. These questions include whether there were clear aims and objectives for the research, if the method and data collection used were appropriate to address the aims of the research, if there was a clear statement of findings, if the data analysis was sufficient and rigorous, and if the extent to which the research related to the current study was sufficient.

Table 2: Narrative review deductive themes.

Theme	Definition	Keywords
Agency in women	This is the ability of women to identify goals or make choices and then act upon them as individuals and collectively within the family. It includes their participation in markets, politics, and other formal and informal networks. It also refers to women's ability to make and act on their own life choices, even in the face of others' opposition (Kabeer, 1999, 2005).	"Choices for myself and my household", "individual decision making", "collective decision making" and "empowerment autonomy"
Food security and well-being	Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and promotes an active and healthy life" (FAO, 1996). Food security encompasses the following: Food availability: The availability of sufficient quantities of food of appropriate quality. Food access: Access by individuals to adequate amounts of appropriate foods for a nutritious and healthy diet. Utilization: Utilization of food through adequate diet, clean water, sanitation, and health care to reach a state of nutritional well-being where all physiological needs are met. Stability: To be food secure, a population, household. an individual must always have access to adequate food.	"Buy more food", "enough to eat", "eat better, healthy food", "food that I like", "eat more", "well-being", and "not worrying about food or going hungry"
Behavioural economics	In this study context Behavioural Economics was defined as emotional, cultural and social factors affecting the economic decisions of individuals (Garai, 2017).	"Peer pressure", "social marketing", "habits" "social norms", "culture", "why you buy," "value proposition", "value for money".
Economic leverage	Economic Leverage in this context will refer to the use of the Accumulating Savings and Credit Associations (ASCAs) or Rotating Savings and Credit Associations (ROSCAs) as sources of incentive for borrowing or saving funds to meet needs and wants of the members individually or as a group and members of their households.	"Bulk buying", "access to capital", "profit, increased income".

The literature search generated a total of 20,757 records. In the initial phase, screening was performed by titles, and we excluded 20,351 irrelevant records. The remaining 406 records were screened by abstracts, and 258 were excluded after abstract screening. The retained 148 records were screened by full text, guided by the themes (agency in women, food security, behavioural economics, and economic leverage) in urban SSA and 120 records were excluded. Only 28 records met our inclusion criteria and were considered relevant for this narrative systematic review. Figure 4 shows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram of the study selection process.

3.4 Summary of included studies and study quality

All studies included in this review had a primary focus on ROSCAs/ASCAs in one or more of our deductive themes. Of the 28 selected studies, 19 were conducted in South Africa, three in Kenya, two in Tanzania, and one each in Ethiopia, Zimbabwe, Senegal, and Nigeria. The selected studies consisted of qualitative (10), quantitative (9) and mixed-methods (9) re-search methodologies. Further details on sample size and participant characteristics are represented in the supplementary material.

Most (n = 24) of the included studies met all the CASP qualitative checklist criteria; however, one lacked sufficient rigorous data analysis (Matuku and Kaseke, 2014), and one comprised data that was not collected in a way that addressed the research issue (Skenjana, 2012). Two other studies did not have an adequate methodology to address the aims of the study and appropriate data analysis (Irving, 2005; Krige, 2014) (Appendix 1). As such, these may be impacted by selection and information bias. As most of the studies were conducted in South Africa, this review will provide some specific insights into the types and structure of ROSCAs/ASCAs commonly known as stokvels in South Africa.

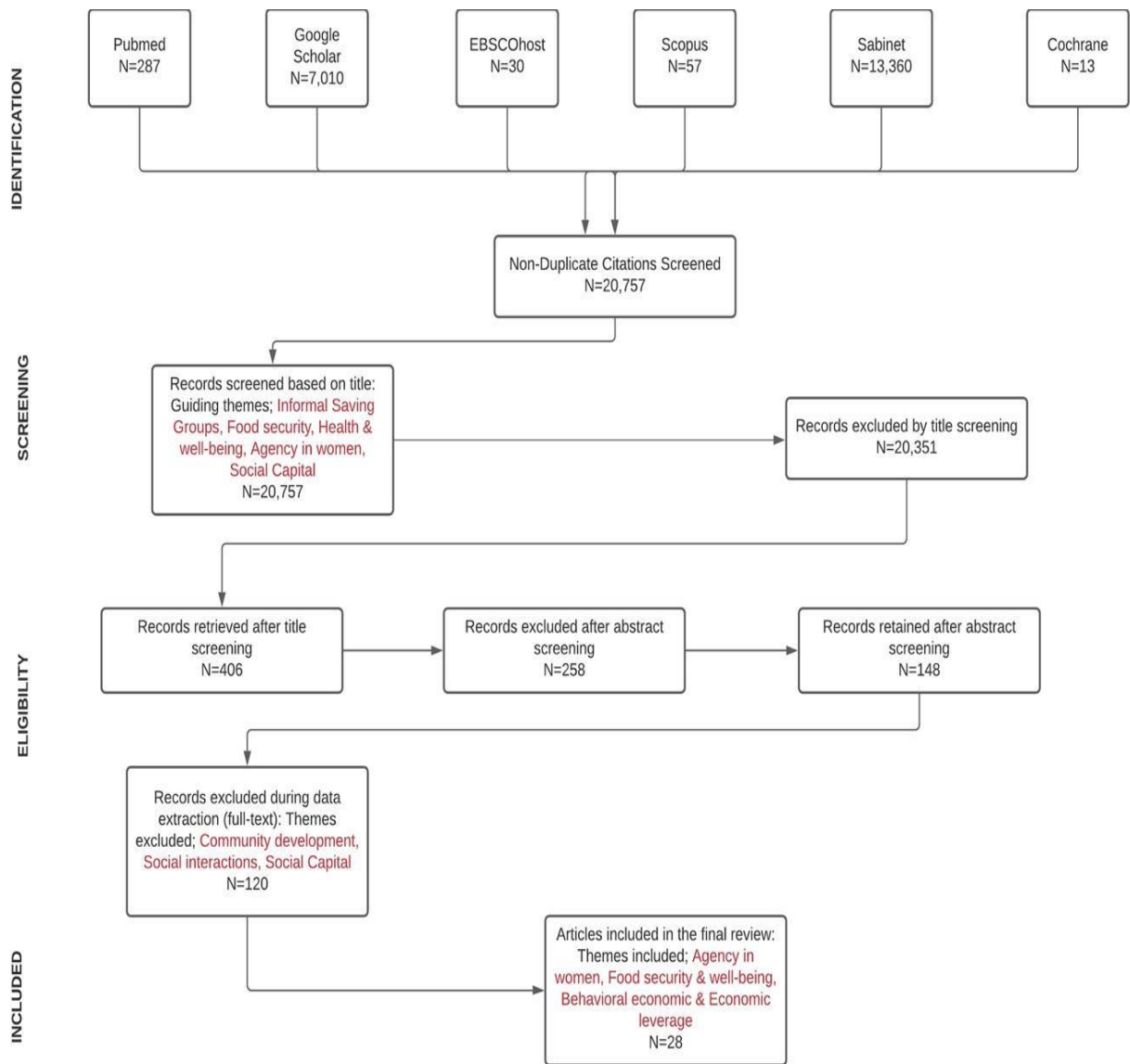


Figure 4: Prisma diagram on the role of “informal saving groups” in mitigating food insecurity, promoting health, and increasing agency in women in urban sub-Saharan Africa settings.

3.5 Types of stokvels

Stokvels in South Africa exist in different structures and types, the major types of which are as follows: savings stokvels, burial stokvels, investment stokvels, high-budget stokvels, and grocery stokvels (described in Table 2) (Verhoef, 2001; Bophela and Khumalo, 2019).

Table 3: Typologies of South African ROSCAs (stokvels).

Type of Stokvel	Definition and structure
Savings stokvels	The sole mandate of this type of stokvel is to promote savings; therefore, members contribute a fixed amount of money into a common pool and mutually agree upon the order or cycle of receiving the pooled funds (Matuku and Kaseke, 2014). Saving stokvels have been argued to have the largest membership in comparison to all other types of stokvels (Smallhorne, 2013).
Burial stokvels	This type of stokvel avails material and non-material support to members and their families in the event of death. In this stokvel structure, members make fixed contributions to cover funeral expenses and the specific benefits are defined in the constitution of the relevant stokvel (Matuku and Kaseke, 2014).
Investment stokvels	The standard objective of investment stokvels is the accumulation of capital by investing in business ventures. However, investment stokvels also promote savings through the bulk purchases of goods (Matuku and Kaseke, 2014). Stokvels that promote savings through bulk purchasing are commonly referred to as cooperative buying societies (Irving, 2005). With this type of stokvel, members contribute a fixed amount of money—usually monthly—and funds are allowed to accumulate before investment in business ventures (Matuku and Kaseke, 2014). Savings, burial, and investment stokvels are mainly women-dominated.
High-budget stokvels	These forms of stokvels function as financial institutions and are established to promote savings and investments (Matuku and Kaseke, 2014). High-budget stokvels do not serve the poor or persons of limited means; members contribute substantial amounts in keeping up with their high standing in society. These substantial contributions enable members to receive large lump-sum payments, which are mostly used to meet needs that require an outlay of considerable resources. The literature shows that high-budget stokvels are dominated by men and that very few women are members of these schemes (Kent, 2005).
Grocery stokvels	Grocery stokvels are formed to accumulate funds for the purchasing of basic foods and groceries for the households of members (Mabika, 2018). Groceries are purchased on a monthly or annual basis, depending upon the agreements on which individual stokvels are based and purchases are shared equally among members (Mabika, 2018). Owing to the latter, grocery stokvels therefore enable

members to contribute affordable amounts of money over specified periods of time to buy groceries to share among themselves.

3.6 Results

3.7 Thematic analysis

3.7.1 Food security and well-being

Eleven (Aliber, 2001; Guérin, 2006; NETNOU, 2012; Matuku and Kaseke, 2014; Katende, 2016; Nyoni, 2016; Mabika, 2018; Ngcobo *et al.*, 2018; Nyandoro, 2018; Bophela and Khumalo, 2019; Koenane, 2019a) of the included studies directly discussed the impact that ROSCAs/ASCAs have on individual or household food security status and/or well-being. Studies also showed that women contributed more to the well-being of their households rather than spend the money for personal use when compared to men (Kabeer, 2005; Guérin, 2006; Katende, 2016). However, it is acknowledged that even though financial empowerment might often be the primary aim when joining ROSCAs/ASCAs, the result often offers benefits beyond this goal. For example, in this quote from a South African study of stokvels, financial well-being was integrally linked to health and physical well-being.

“Wealth is actual possession that comes as a result of your working effort. The reality of wealth is not cash, it is what is visible. Most importantly for me is your health, you cannot be wealthy when you are not healthy.” (Katende, 2016).

Many of the studies identified that funds from ROSCAs/ASCAs were used primarily for non-consumption purposes and that the acquisition of food was rarely a priority, except for the grocery stokvel members (which are primarily dominated by women). Even though it is undeniable that ROSCAs/ASCAs contribute to food security, it is not often the major focus of ROSCAs/ASCA’s members when joining. However, a study conducted in South Africa indicated that 67.5% of 36,333 stokvels surveyed in the eThekweni Municipality—which constitutes 14% of the total stokvels—were grocery stokvels (Bophela and Khumalo, 2019), thus highlighting the relevance of grocery stokvels. A participant in one of the studies in South Africa stated the following:

“It has benefited me a lot, I do not have that headache when it comes to food, I don’t want to lie, and even now I am still eating food that I bought in December.”...“Participants explained that they have not experienced hunger or food insecurity ever since they joined stokvels...” (Matuku and Kaseke, 2014).

Grocery stokvels and food security

Only two of the included studies (Mabika, 2018; Bophela and Khumalo, 2019) focused specifically on grocery stokvels. The two studies were conducted in South Africa, although one of the studies focused on Zimbabwean grocery stokvels in South Africa (Mabika, 2018; Bophela and Khumalo, 2019). Grocery stokvels, which mostly comprise women, harness the advantage of collective and bulk purchases. This allows them to buy more for less and to provide access to food for not only themselves and their immediate households, but also their relatives within and outside the country of residence of the stokvel members (Mabika, 2018; Bophela and Khumalo, 2019).

“Grocery savings are often perceived by members as being supplementary to the money which they allocate to purchasing groceries during the year, and to make it possible to purchase extra groceries in their Christmas shopping.” (Mabika, 2018).

“In our stokvel, we have two males, one of which one is divorced and the other has a wife but the wife is back in Zimbabwe taking care of the kids. If you look, most stokvels are female-dominated; the few with males, those males are either divorced or widowed.” (Mabika, 2018).

The need for food storage is, however, a challenge, as indicated by one member of a grocery stokvel in one study in South Africa,

“Most of us rent one room or two rooms it’s difficult to store bulk groceries for a long time to share. So, we go to wholesale X and they keep our money and also we have an agreement that we buy from them” (Nyandoro, 2018).

Some retailers have made an initiative to support stokvels by providing opportunities to spread their purchases over a period of time in a bid to dissuade bulk buying, which has been argued to pose storage challenges, spoilage, and nutritional value loss (Mabika, 2018; Nyandoro, 2018; Bophela and Khumalo, 2019).

3.7.2 Agency in women

The importance of ROSCAs/ASCAs to women is apparent in the review; more than half (16) of the studies (Anderson Jean-Marie, 2000; Aliber, 2001; Buijs, 2002; Guérin, 2006; NETNOU, 2012; Matuku and Kaseke, 2014; Gichuki and Kinuthia, 2015; Nyoni, 2016; Mabika, 2018; Mantsios *et al.*, 2018; M D M Cullen, 2018; Ngcobo *et al.*, 2018; Nkosiyazi Kaseke *et al.*, 2018; Nyandoro, 2018; Oraro and Wvys, 2018; Mulimila, 2019) highlighted the role of ROSCAs/ASCAs in women’s empowerment and most showed an overall dominance of women’s participation in ROSCAs/ASCAs. Notably, 10 of the studies (Verhoef, 2001; Buijs, 2002; Guérin, 2006; Matuku and Kaseke, 2014; Gichuki M. M.; Kinuthia, L. N., 2015; Nyoni, 2016; Mantsios *et al.*, 2018;

Nkosiyazi Kaseke *et al.*, 2018; Nyandoro, 2018; Mulimila, 2019) focused specifically on women and informal savings/ROSCAs/ASCAs, while only one study focused specifically on an all-male stokvel (Krige, 2014).

Most studies showed gender-specific differences in participation in ROSCAs/ASCAs and the use of the funds. As there are various types of ROSCAs/ASCAs, studies indicate that women are more involved in the saving, burial, and grocery stokvels, while men are more involved in the high-budget, investment, and saving stokvels (Buijs, 2002; Guérin, 2006; Matuku and Kaseke, 2014; Gichuki M. M.; Kinuthia, L. N., 2015; Nyoni, 2016; Mantsios *et al.*, 2018; Nkosiyazi Kaseke *et al.*, 2018; Nyandoro, 2018; Oraro and Wyss, 2018; Mulimila, 2019). The participation of women in ROSCAs/ASCAs is often linked to the needs of children and the household (Anderson Jean-Marie, 2000; Aliber, 2001; Buijs, 2002; Kabeer, 2005; Gichuki M. M.; Kinuthia, L. N., 2015; Mulimila, 2019). Some of our studies characterized ROSCA/ASCA members as poor women who are often unemployed (Buijs, 2002; Matuku and Kaseke, 2014). However, other studies showed that stokvels in urban areas involved women of varying socioeconomic statuses, who were mostly employed and either married or female heads of households, albeit with limited funds (Kibuuka, 2007; Mabika, 2018; Lappeman *et al.*, 2020). Only one study indicated that more single people than married were involved in stokvels, but it was not clearly stated whether they were female heads of households with children (Ngcobo *et al.*, 2018). Five sub-themes associated with agency in women emerged in our review and were discussed.

3.7.3 Collective efficacy

While many of the studies have shown that ROSCAs/ASCAs may comprise mixed-gender groups, some studies implied that a women-only group was often favoured as it creates a space where women can let their guard down and have a sense of belonging and support (Mabika, 2018; Mantsios *et al.*, 2018). ROSCAs/ASCAs are seen as financial, emotional, and social safety mechanisms in times of need for vulnerable women, where these women can collectively address challenging issues (Mantsios *et al.*, 2018). Some of the studies highlighted as evidenced in these quotes:

“Women needed themselves and not external saviours to defy poverty.” (Nyandoro, 2018).

“That’s how we help each other, not because it’s your turn and you want to take the money without caring about your friends and their problems. We listen to each other, and we listen to our friends’ problems, how big their problems are and how we can help them.” (Mantsios *et al.*, 2018).

“We wanted only women in the group, we are freer, and we can talk and laugh. Men always want to take the lead. They are like children. They are not interested in improving the situation of the family.” (NETNOU, 2012).

3.7.4 Assertion in decision making

ROSCAs/ASCAs have increased the level of control or assertion in individual or household decision-making (Anderson Jean-Marie, 2000; Mulimila, 2019). The collegial support within groups appears to be instrumental in empowering women in their interactions with their husbands or in being able to influence their livelihoods. This is seen in a quote from a member of a sex workers' ROSCA in Tanzania:

“The Mchezo (ROSCAs are also called Mchezo in Tanzania) has helped me a lot. For example, you might get a client, and he will refuse to use a condom. But I can decide to refuse because I know even though he doesn't pay me, I have money at home from the mchezo. It's different from when you're not in a mchezo, you might just go without a condom because you want money. But now I make my own decisions” (Mantsios et al., 2018).

Consequently, solidarity is reinforced by various mechanisms (Anderson Jean-Marie, 2000). Overall, studies have shown that ROSCAs/ASCAs encourage a certain level of self-sufficiency in women by promoting gender equality; they are empowered to have access to a significant amount of funds, thereby reducing or eliminating their dependence on men (Anderson Jean-Marie, 2000; Matuku and Kaseke, 2014). This sense of empowerment is manifested through their confidence and capabilities as women who significantly contribute to the well-being of their families, both immediate and extended, without having to depend heavily on their husbands, relatives, or clients (Matuku and Kaseke, 2014).

3.7.5 Savings protection mechanism

Several studies highlighted that participation in ROSCAs/ASCAs acted as a protective tool for women for themselves and from their spouses and demanding relatives, as it prevented immediate and purposeless consumption (Anderson Jean-Marie, 2000; Guérin, 2006; NETNOU, 2012). Studies documented that ROSCAs/ASCAs “can serve as a socially acceptable excuse to refuse the financial requests of a demanding relative” (Guérin, 2006), and women use ROSCAs to prevent men from “misusing” household resources (Anderson Jean-Marie, 2000). Quotes from some of the studies portray this mechanism:

“Joining a merry-go-round (i.e., a local ROSCA) is the only way to save some money. If I leave it at home, it will disappear.” (NETNOU, 2012).

“...encourage women to use their savings for their purposes, and to stand up against the demands of others...” (Anderson Jean-Marie, 2000).

“...to save up money for my children as I am the breadwinner and it's difficult for me to manage the family.” (Aliber, 2001).

3.7.6 Promotes entrepreneurship, acquisition of assets and social networking

Several of the studies emphasized that ROSCAs/ASCAs provide the opportunity for women to access credit or lump sums to start-up businesses or to expand current businesses, acquire assets, and social network for business or job opportunities (Buijs, 2002; Guérin, 2006; Matuku and Kaseke, 2014; Gichuki M. M.; Kinuthia, L. N., 2015; Katende, 2016; Mantsios *et al.*, 2018; Mulimila, 2019). Other studies showcased ROSCAs/ASCAs as a platform for the availability, affordability, and accessibility of credit, which has led to the positive growth of women-owned enterprises (Buijs, 2002; Matuku and Kaseke, 2014). This is especially important as most of these women do not have access to formal credit, due to lack of collateral or individual economic rights. Additionally, the ROSCAs/ASCAs serve as an avenue for business and social networking, helping to bring together women of different social statuses (Kabuya, 2015).

3.7.7 Increased knowledge and skills

Although ROSCAs/ASCAs seem to attract mostly resource-poor women, some consist of women from different backgrounds with diverse educations, occupations, incomes, and social connections (Mantsios *et al.*, 2018; Bophela and Khumalo, 2019; Koenane, 2019a). As such, they can benefit from shared knowledge and acquire skills. A participant in one study stated the following:

“I see more benefits because you will gain knowledge and you will know how to save money.” (Matuku and Kaseke, 2014)

Studies indicated that ROSCAs/ASCAs;

*“help poor women to make the most of what little resources they have” and that “women whose savings groups had regular meetings described the meetings as opportunities for information sharing, exchanging advice, and addressing group dynamics and community issues” (Mantsios *et al.*, 2018).*

3.7.8 Behavioral Economics

In this section, we will consider the impact of social, cultural, emotional, cognitive, and other influences on stokvel decision-making processes as they relate to food security, food choice decisions, and the decision of individuals to join or participate in stokvels. Eighteen studies (Aliber, 2001; Buijs, 2002; Irving, 2005; Kibuuka, 2007; Raccanello *et al.*, 2009; Krige, 2012, 2014; NETNOU, 2012; Skenjana, 2012; Matuku and Kaseke, 2014; Nyoni, 2016; Mabika, 2018; M D M Cullen, 2018; Ngcobo *et al.*, 2018; Nkosiyazi Kaseke *et al.*, 2018; Mulimila, 2019; Ademola Abimbola *et al.*, 2020) included in the review were classified under the economic leverage theme.

The participation of women in ROSCAs/ASCAs has helped them to identify with a specific group (Anderson Jean-Marie, 2000; Aliber, 2001; Buijs, 2002; Matuku and Kaseke, 2014; Gichuki M. M.; Kinuthia, L. N., 2015; Nyoni, 2016; Mantsios *et al.*, 2018; Ngcobo *et al.*, 2018; Bophela and Khumalo, 2019; Mulimila, 2019); they have created opportunities of belonging and a means of sharing and socializing among members. However, several studies have indicated that sometimes circumstances beyond these reasons seemed to have driven women to become members and to participate in a stokvel as a desperate attempt for survival (Guérin, 2006; NETNOU, 2012; Matuku and Kaseke, 2014; Nyoni, 2016; Ngcobo *et al.*, 2018). For instance, women are often the immediate food suppliers at the household level (Chigara *et al.*, 2001). Their inability to access microfinance institutions to meet this need has forced them to participate in ROSCAs/ASCAs to meet their household's needs.

Our review showed that ROSCAs/ASCAs were growing in popularity as savings vehicles. In most of the studies, they were identified as a forced savings mechanism. This is one of the major reasons for joining ROSCAs/ASCAs, as indicated by quotes in two of the studies:

“My saving is much better now since I joined this group. Every single cent is allocated ahead of time; I don't just spend my money any how because I cannot fail to make my contribution. I am no longer reckless with my finances” (Katende, 2016).

“Because I could not save when I was alone, the stokvel helps me to save”... “I feel obliged to pay and therefore benefit in that it is a savings scheme of some sort” (Aliber, 2001).

The quotes above also showed that the contribution is a commitment that the members place as a high priority to prevent default. Notably, ROSCAs/ASCAs are characterized by highly organized structures with rules related to accountability. They are also reliant on the behaviours of the members of the group, who are mostly either friends from the same community, workplace, religious body, or cultural background. As such, the group functionality is based on the trust and commitment of the members of the group and members of ROSCAs/ASCAs try to meet their contributions.

“The thing that has kept us to survive is honesty and understanding each other. If you are honest and sit down and talk, everything will be alright” (Matuku and Kaseke, 2014).

In a study conducted in Zimbabwe, a study participant highlighted the following:

“Other members who wish to join must be from the same community because they can be trustworthy, are easy to locate, and it reduces the distance to be travelled for meetings, which causes lateness and absenteeism” (Nyoni, 2016).

The review also highlighted that participation in ROSCAs/ASCAs is driven by immediate environments, such as family, neighbourhoods, and friends [37,41,42]. In one of the studies, almost all (98%) of all the parents of the ROSCAs/ASCAs members had been members of a ROSCA/ASCA [42]. Additionally, participants of ROSCAs/ASCAs in South Africa highlighted the following:

“When I was growing up, my mother taught me that money is not kept behind doors like brooms; that is why I joined this group, because I did not want to keep my money under a pillow. The little money that I have, I contribute to the group, and we buy relish because I cannot afford it on my own...” (Nyoni, 2016).

“I am just doing [it] because my friends are doing it” (Mabika, 2018).

Another study in South Africa also indicated that more than three-quarters (77%) of stokvel members taught their children about the importance of ROSCAs/ASCAs (Cullen, 2018). In addition, the fact that no bank fees are charged in ROSCAs/ASCAs, which function in a similar capacity to formal financial institutions, is another of the major reasons for participating in these groups, as seen in the quotes below about banks, indicating preference and trust in ROSCAs/ASCAs when compared to banks (formal financial institutions):

“This is called a savings account, but at the end of the day, there is no money... you put in R5000 and when you come back you find there is R500” (Irving, 2005).

“There is no difference between banks and criminals. When you put your money into your bank account they charge you. When you take it out, they charge you. Now you tell me why should I keep my money in a bank account?” (Irving, 2005; Katende, 2016).

Evidence from this narrative systematic review shows that ROSCAs are an important component of the behavioural economic component of finance, as financialization may require the principles of self-organization and solidarity, which are distinctive attributes of ROSCAs (NETNOU, 2012; Matuku and Kaseke, 2014; Nyoni, 2016; Ngcobo *et al.*, 2018; Bophela and Khumalo, 2019). It can be deduced that societal and cultural differences in gender roles and the economic behaviour of stokvel participants (mostly

women) has adapted and driven women to use stokvels as their economic 'voice' for financial independence and power (NETNOU, 2012; Matuku and Kaseke, 2014; Nyoni, 2016; Ngcobo *et al.*, 2018; Bophela and Khumalo, 2019).

3.7.9 Economic leverage

Eighteen studies (Anderson Jean-Marie, 2000; Aliber, 2001; Buijs, 2002; Irving, 2005; Kedir, 2005; Kibuuka, 2007; NETNOU, 2012; Skenjana, 2012; Katende, 2016; Ngcobo and Chisasa, 2018, 2018; Ngcobo *et al.*, 2018; Nkosiyazi Kaseke *et al.*, 2018; Oraro and Wyss, 2018; Bophela and Khumalo, 2019; Mulimila, 2019; Ngcobo, 2019; Ademola Abimbola *et al.*, 2020) included in this review were classified under the economic leverage theme. Social relations strongly influence financial strategies (Guérin, 2006), which might explain why most ROSCA/ASCA members are women. Our review showed that poor households are often forced to rely on community-based self-help initiatives for survival due to a lack of resources and access to formal financial institutions. In South Africa, stokvels have been cited among the key poverty-alleviation strategies practised for many years by most black South Africans (Matuku and Kaseke, 2014).

ROSCAs/ASCAs have also been regarded as a form of social security. Evidence from the review reflects stokvels as mutual aid arrangements whose mandate is to provide mutual assistance to members. However, establishing mutual aid arrangements aims to address gaps in social protection (Nkosiyazi Kaseke *et al.*, 2018). ROSCAs/ASCAs provide a platform for periodic collective savings for members, whereby the total amount collected during a year is either reserved on behalf of the members or disbursed as an equally shared lump sum (Ngcobo, 2019). Female-headed households were highlighted supporting themselves through small business enterprises formed through participation in ROSCAs/ASCAs (Buijs, 2002).

Our review also showed that ROSCAs were important in improving household livelihoods. For instance, in a ROSCAs/ASCAs in Zimbabwe (Nyoni, 2016), one of the members, when asked about the benefits of the group, indicated that:

"I joined this group because sitting at home and depending on salary was not helping in any way. The salary that my husband and I are getting was not enough for us to do anything. But ever since I started being a member of this group, we managed to extend our house from a two- to a four-roomed house in 2013, and we are managing to pay our children's school fees; one is at Empandeni High School, and another is at MSU in her second year."

Our review also highlighted that stokvels played a critical role in financial support during tough times (Guérin, 2006; Krige, 2014; Matuku and Kaseke, 2014; Nyoni, 2016; Ngcobo *et al.*, 2018; Bophela and Khumalo, 2019); thus stokvels are a means of eradicating poverty. Several studies (Guérin, 2006; Krige,

2014; Matuku and Kaseke, 2014; Nyoni, 2016; Ngcobo *et al.*, 2018; Bophela and Khumalo, 2019) alluded that poor women find refuge in income, asset accumulation, and livelihoods made available by their access to ROSCAs/ASCAs.

3.8 Discussion

Our findings highlight that ROSCAs/ASCAs are crucial in advancing social, economic, and health transformations, especially for women in sub-Saharan Africa. Aside from the broad definition of ROSCAs/ASCAs, which are primarily for savings and credit for various purposes, they are used as a multifaceted tool that can be used for financial, social, and emotional safety, as well as support, protection, insurance, improved well-being, and opportunity, by women (Figure 5). ROSCAs/ASCAs are tools that seemingly make women more economically and socially visible. Our review has demonstrated that women’s participation in ROSCAs/ASCAs is directly or indirectly linked to their well-being and that of their households. Although ROSCAs/ASCAs do play a role in food security, it was not often the primary focus, and none of the studies reviewed identified the nutritious and healthy part of food security. However, the accessibility, availability, and stability of food and the purchase of non-perishable products were highlighted.

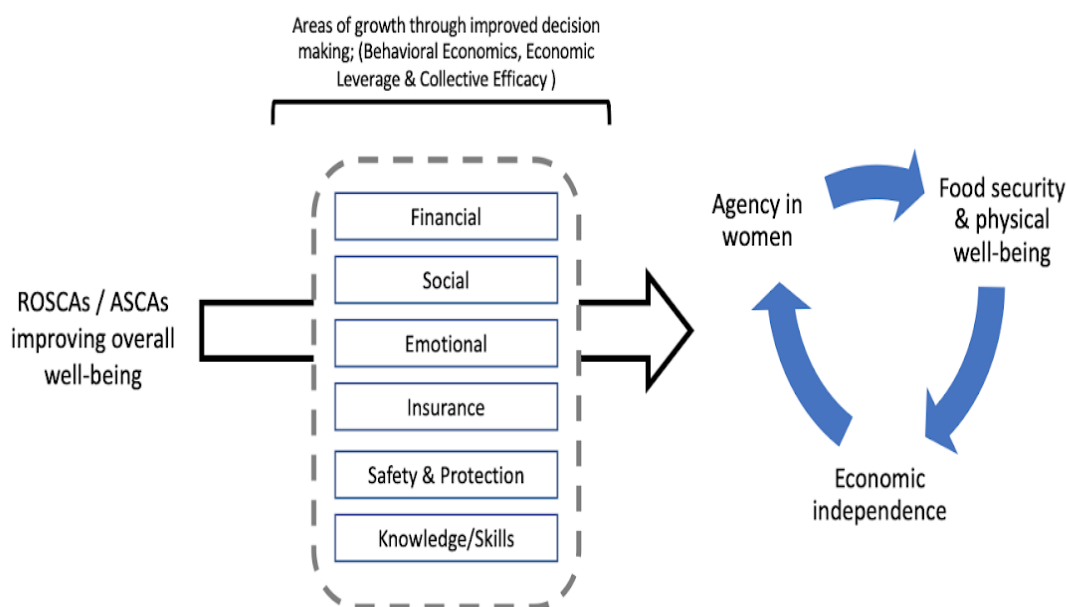


Figure 5: Illustration of the Role of ROSCAs/ASCAs for women in urban sub-Saharan Africa settings

Notably, ROSCAs/ASCAs are used by women to prevent funds from being misused or demanded by their husbands or relatives (Anderson Jean-Marie, 2000). They also prevent women from being solely financially dependent on their spouses, enabling them to start businesses and have a voice in household decisions (Anderson Jean-Marie, 2000). In addition, ROSCAs/ASCAs allow women to address issues of self-realization and make informed decisions through knowledge and skill sharing and personal development

(Verhoef, 2020). They provide support socially and emotionally as members bear each other's burdens, and there is a sense of belonging and kinship with the group (Ngcobo *et al.*, 2018; Verhoef, 2020). ROSCAs/ASCAs also allow women to connect or meet with people they might not otherwise have had the opportunity to relate with, which might be beneficial to them individually or as a group (Buijs, 2002). Perhaps the most important role of stokvels for women is providing either short- or long-term insurance; they can access credit or bulk money for important and emergency purchases (Verhoef, 2020). Studies (Guérin, 2006; Krige, 2014; Matuku and Kaseke, 2014; Nyoni, 2016; Ngcobo *et al.*, 2018; Bophela and Khumalo, 2019) have shown that ROSCAs/ASCAs have both economic and social functions; the economic function related to the use of ROSCAs/ASCAs is to promote income security, whereas the social function speaks to social capital, which manifests itself through friendships and social networks.

Grocery stokvels are one of the major types of stokvels dominated by women. Importantly, although it is evidenced in some of our studies that these stokvels help the women and their families (immediate and sometimes extended) to put food on the table and improve their food security status, none of the studies emphasized the purchase of healthy and nutritious food options. Instead, one study showed that the top food types purchased by these grocery stokvels (in descending order) are staple foods, cooking products, and tinned goods. Perishable foods, such as fruits and vegetables, were not on the list of food purchased by grocery stokvels, except for when the purchases were made on a monthly or frequent basis, which is not common. According to one study in South Africa, almost 80% of grocery stokvels purchase once a year, often during the festive season (Response and African Response Research, 2012), resulting in bulk purchases and a significant flow of funds into the economy. However, these purchases largely comprise less nutritious and highly processed foods with a long shelf-life.

Retailers and suppliers have recognized the relevance of grocery stokvels from a profit-making perspective. Hence, they employ various strategies to retain stokvels as customers while dissuading bulk buying because of challenges, such as storage, spoilage, and the loss of nutritional value (Mabika, 2018). For instance, stokvels that bulk buy over the festive season typically take some time to evaluate and decide on their purchases. The decision making is about which products to purchase and in what quantities, and retailers and suppliers can advertise their products to the stokvels and offer incentives and discounts. During this period, the suppliers and retailers have an open window to influence stokvels' decision-making (Lappeman *et al.*, 2020). To maximize profits, retailers try to align their promotions and discounts to accommodate the usual shopping list of grocery stokvels, which are often not the healthiest options (TSHANDU, 2016). As such, providing healthier food options to ROSCAs/ASCAs is not prioritized, even though the consumption of processed food is associated with an increased risk of obesity and NCDs (Ng *et al.*, 2014; Adams *et al.*, 2020). As it is evident that the decision-making of ROSCAs/ASCAs can be influenced, there exists a window of opportunity in these relationships that can be harnessed to promote demand for and access to healthy and affordable food options by offering various incentives and discounts, such as storage, transport, and

frequent delivery opportunities, to dissuade bulk buying (Delhi, 2012; Caswell and Yaktine, 2013; Garcia, 2013).

This review also shows that while stokvels are used advantageously by both urban men and women, the greater relevance of ROSCAs/ASCAs in urban women's lives compared to that of men is undisputed. This is supported by evidence that women firmly established stokvels urban environments (Verhoef, 2020). Moreover, only a few studies have published reports on men-only stokvels, whereas most highlighted that men were mostly associated with investment and high-budget stokvels (Buijs, 2002; Irving, 2005; Response and African Response Research, 2012). In conducting this review, we observed similar findings to those of the African Response study (Response and African Response Research, 2012). The African Response research highlighted that in South Africa, stokvels used by men were skewed towards investment (53%). In comparison, women comprised most grocery stokvel members (86%) (Response and African Response Research, 2012).

Here, we were able to showcase the potential of ROSCAs/ASCAs to be harnessed to address the issues of health promotion and health equity, especially for resource-poor women in SSA. For instance, food vendors in informal dwellings in Nairobi, Kenya, who are mostly women, launched a savings group within their slum federation, '*Muungano wa Wanavijiji*', for capacity building and health promotion. They regularly engage in savings to help purchase stock or cover other expenses, clean-up activities, and collaborate with non-governmental organizations (NGOs) that train them in food safety and advocate for changes, such as better storage facilities and infrastructure (Zoo *et al.*, 2017).

3.9 Health and policy implications

The findings from this study are imperative for health and policy implications for achieving overall well-being in urban SSA, especially among women who are vulnerable, socioeconomically, with high risk of non-communicable diseases. As such, these findings could be a viable and sustainable tool to leverage on promoting partnerships and collaborations of ROSCAs /ASCAs with relevant stakeholders such as health, empowerment and community-based oriented NGOs, government agencies, retailers, wholesalers, food producers and financial institutions in the realignment of priorities, increased knowledge, and opportunities to promote overall well-being of ROSCAs/ASCA/ members, especially women and their households in urban SSA. Inroads can be reached by the evident sustainability characteristics and impactful role of /ROSCAs/ASCAs as a collective group to be harnessed in addressing health promotion and health equity issues, especially for resource-poor women in SSA. Also, this information might help policymakers formulate appropriate policy intervention channels through ROSCAs/ASCAs to establish relationships with the

different layers in the food systems to improve access to quality, healthy and affordable foods throughout the year.

There is overwhelming evidence in the literature suggesting that women's socio-economic empowerment opens up opportunities for them to participate in public decision-making processes (CARE, 2021). Our study findings show that women's participation in informal savings groups improves their confidence, skills, and ability to influence household decision-making. Armed with the latter it can be deduced that social norms can be reshaped by leveraging the informal savings groups in promoting healthy lifestyles to encourage healthy eating.

3.10 Strengths and limitations of the study

Strength: This narrative review on informal groups in urban SSA that focuses on our identified themes is novel and provides insights into the strengths and importance of informal saving groups and those opportunities that exist to leverage ROSCAs/ASCAs, especially for women. **Limitation:** The study only focused on urban sub-Saharan Africa and excluded studies which focused on village savings groups; hence, the generalizability of our findings may only be applicable in urban settings with similar economic structures to the studies included. There is also the possibility of not having covered all search options using keywords and, as such, might have excluded some relevant documents that do not contain the keywords in either their title or abstract. Also, our review was limited to the deductive themes identified based on the study's objectives. Furthermore, our CASP-Qualitative-Checklist for rigorous appraisal indicated that a few of the selected studies did not meet all the CASP criteria, which may impact the reliability of their conclusions.

3.11 Conclusion and Recommendations

This narrative systematic review shows opportunities exist to leverage ROSCAs/ASCAs to advocate for healthy eating. Retailers, food suppliers, NGOs, public health practitioners, and other relevant stakeholders should maximize the open window of opportunity during the decision-making phases of ROSCAs/ASCAs to advocate healthier, more affordable food choices. Discounts on the purchase of fruits and vegetables and other healthier options should be promoted instead of the promotion of highly processed food products. Alternatively, food suppliers and retailers could offer a means to have access to food products on a weekly or monthly basis rather than wait for end-of-the-year purchases while offering the same or better discounts. NGOs could also work within the structure and objectives of the ROSCAs/ASCAs to provide food-related health training or empower them to advocate for health-related changes.

ROSCAs/ASCAs play a significant role in developing skills, social and financial empowerment, and knowledge dissemination, especially in SSA women. Moreover, it is evidenced that they lead to improved household well-being and access to food. The study findings suggest a window of opportunity to leverage the functionalities of ROSCAs/ASCAs based on the four major themes discussed in this review as vehicles to encourage their members' demand for and access to healthy, affordable food.

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Chapter 4: Identifying meso- and macro-level actors that may interact and engage with local grocery stokvels

This study examines the influence of Rotating Savings and Credit Associations (ROSCAs) on food security in South Africa, uncovering their potential to enhance access to nutritious food. Through stakeholder interviews, it identifies the dual role of stokvels as women-led economic drivers and as potential key players in negotiating healthier food choices. The findings indicate that while stokvels significantly empower economically, they could further leverage their collective power for improved nutrition. This insight calls for policies that bolster economic and dietary well-being, suggesting future research to solidify stokvels' partnerships for greater impact on food systems and health outcomes.

Lukwa, A.T., Wayas, F.A., Lambert, E.V., "Savings for Health" IDRC collaborators and Alaba, O., 2024. Stakeholder mapping to explore social and economic capital of Rotating Savings and Credit Associations (ROSCAs) to increase demand for and access to healthy food. Frontiers in Sustainable Food Systems, 8, p.1301578.

The manuscript's relevance to the thesis: This manuscript offers an insightful exploration of urban food systems players and their interactions with stakeholders. The study was conducted through a qualitative stakeholder mapping approach by engaging various actors within the urban food system. The mapping identified key themes from the discussions with 21 stakeholders, reflecting on the interactions and influences stokvels have within the food system and the economy in general. The study's revelations assert that while stokvels promote food security, this is not typically their primary purpose. Instead, they function primarily as a means of social and economic empowerment.

Nonetheless, the research identifies a latent potential in these groups for influencing dietary habits and food choices. It posits that by forging strategic partnerships with relevant stakeholders such as local farmers, food retailers, and financial institutions stokvels could be steered to advocate for and facilitate healthier food options for their members. In alignment with the thesis, the findings from this stakeholder mapping study offer a compelling argument for integrating stokvels into broader initiatives aimed at improving public health nutrition. By capitalizing on the existing structures and social capital of stokvels, there is an opportunity to design interventions that support healthier eating habits and address the dual burden of malnutrition in urban South Africa.

A Qualitative Assessment of the Social and Economic Capital of Rotating Savings and Credit Associations (ROSCAs) to Increase Demand for and Access to Healthy Food

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4.1 Abstract

South Africa faces a dual challenge of under and overnutrition, with a significant number of children under 5 years experiencing stunting, while most adult women struggle with overweight or obesity. Additionally, about 24% of households in the country suffer from moderate-to-severe food insecurity. An existing avenue for addressing these concerns involves harnessing the power of ROSCAs, often referred to as stokvels. Instead of considering ROSCAs as a novel external intervention, it's important to recognize them as an inherent and established intervention that can be utilized to enhance dietary conditions. Stokvels are informal savings and borrowing groups, often led by women, which could help households improve their access to and consumption of healthy and affordable foods. Understanding the role of stokvels within this context highlights the importance of addressing gender disparities in financial inclusion and creating more equitable avenues for women's economic empowerment. To explore this possibility further, we conducted a stakeholder mapping of stokvels in South Africa to identify key actors and their potential influence on the food system. This study delves into a unique perspective on stokvels, focusing not on their internal dynamics among members but on how they are perceived and operate from an external standpoint.

The initial phase of the study focused on categorizing stakeholders based on their level of interest in engaging stokvels and their potential to influence them. Four main themes emerged from this analysis: 1) unincorporated savings and borrowing associations, 2) social conventions, 3) maximizing value, and 4) partnerships and mutual benefit. Participants described stokvels as diverse social associations that operated on a non-formal model. Regular meetings were held where members made financial contributions, fostering partnerships and social networks. Stokvels were seen as a means of saving money and accessing credit and capital. While the social conventions and governance structures within stokvels contributed to social cohesion and accountability, the absence of formal legal agreements posed challenges in forming partnerships with institutions such as banks.

Regarding the role of stokvels in improving access to healthy foods, stakeholders' perceptions of stokvel organizational structures and practices influenced their demand for and access to affordable, healthy food options. Although participants had different definitions of healthy food, they unanimously emphasized the importance of fresh produce. Proximity to farms and partnerships with farmers were crucial for accessing fresh, healthy produce at lower prices. Retailers also played a role in influencing food purchases through discounts and promotions.

In conclusion, the study highlights the potential of stokvels in promoting healthy eating practices relating to fresh produce in particular(?). It underscores the importance of understanding stakeholders' perceptions and leveraging partnerships to enhance access to and consumption of healthy foods. Future research could explore strategies for formalizing Stokvel partnerships with institutions and developing interventions that align with the preferences and needs of Stokvel members.

4.2 Background

African nations are undergoing a rapid and complex shift in nutrition and epidemiology, characterized by a dual challenge of malnutrition encompassing both underweight and overweight/obesity (Mbogori *et al.*, 2020). This is further compounded by chronic infectious and non-communicable diseases (NCDs) coexistence. South Africa is no exception, with chronic NCDs accounting for 52% of all causes of adult mortality (Biney, Amoateng and Ewemooje, 2020) and 1 in 5 adults living with HIV/AIDS. In a country with the highest prevalence of adult overweight and obesity in the region, and where nearly 24% of households experience some form of food insecurity (Goetjes *et al.*, 2021), this so-called “wicked problem” of obesity juxtaposed with food insecurity and NCDs, may, in part, be explained by an unhealthy diet and a clear lack of dietary diversity (Harper *et al.*, 2022). To this end, the World Health Organization (WHO) defines a healthy diet as one which “ achieves energy balance and a healthy weight; limiting the intake of total fats and giving preference to unsaturated fats versus saturated fats; increasing the contribution of fruit, vegetables, legumes, whole grains, and nuts; and limiting the intake of free sugars and salt, and ensuring that salt is iodised” (Willett *et al.*, 2019; World Health Organisation (WHO), 2022). In a study of 187 countries comparing dietary intake worldwide, diets from many African countries were more diverse. They included fewer processed, energy-dense foods or foods with minimal nutritional value than many developed countries (Imamura *et al.*, 2015).

Nevertheless, South Africa was part of a limited group of Sub-Saharan African nations displaying a less traditional and more Westernized diet (Willett *et al.*, 2019; Food and Agriculture Organization of the United Nations (FAO) United Nations Economic Commission for Africa (ECA), 2021). This profile was characterized by a relatively higher median intake of sugar/sweeteners, alcohol, meat, animal fats, eggs, and dairy products (Willett *et al.*, 2019). The question remains as to the drivers of this pattern of obesity, malnutrition, and the high burden of diet-related chronic diseases in South Africa. Although South Africa has one of the highest Gross Domestic Product (GDP) in Africa, it also has a highly inequitable economy, with one of the highest GINI coefficients globally. South Africa has experienced rapid urbanisation, often

in poverty, with more than one-third of adults unemployed and a further 5% underemployed (Dodman *et al.*, 2017).

Food systems make up a large part of the country's economy. They can play a vital role in the mitigation of issues such as food insecurity and malnutrition (Food and Agriculture Organization of the United Nations (FAO) United Nations Economic Commission for Africa (ECA), 2021). Several studies have shown that as incomes rise, healthier diets become more accessible, but high-energy, highly processed foods with minimal nutritional value are often more affordable (Zenk *et al.*, 2005; ver Ploeg *et al.*, 2009; Imamura *et al.*, 2015; Willett *et al.*, 2019; World Health Organisation, 2020; Food and Agriculture Organization of the United Nations (FAO) United Nations Economic Commission for Africa (ECA), 2021). Contextual factors in the surrounding environments create bottlenecks affecting physical food access (Committee on National Statistics; Division of Behavioral and Social Sciences and Education; Food and Nutrition Board; National Research Council; Institute of Medicine., 2013).

For instance, people in some urban, rural, and low-income areas may have limited access to full-service supermarkets or grocery stores (Zenk *et al.*, 2005; ver Ploeg *et al.*, 2009). In South Africa, where these large food retail outlets exist, the quality and selection of items are generally less healthy in low-income communities when compared to those in high-income areas (Peyton, Moseley and Battersby, 2015; Odunitan-Wayas *et al.*, 2020). Transport has been argued to be one of the major factors hindering access to food, risking food insecurity in residential areas with limited transport, long distances to shops, and few supermarkets (ver Ploeg *et al.*, 2009). This issue of “last mile distribution” and a supply chain management system that is framed in a context more compatible with the Global North means that access to affordable healthy food, particularly in low-income, urban communities, contributes to this double burden of malnutrition (Tuomala and Grant, 2022).

Exacerbating inequalities are further intensified by increased unemployment and sluggish economic development (Leibbrandt *et al.*, 2010). Several underlying causes of malnutrition in South Africa have been largely interlinked with poverty (Bourne, Lambert and Steyn, 2002). One way to approach these concerns is by leveraging the potency of ROSCAs, commonly known as stokvels, which already exist. Rather than perceiving ROSCAs as a new external measure, it's crucial to acknowledge their intrinsic and well-established role. They can be effectively employed to improve dietary conditions. Furthermore, it's worth considering the informality within South Africa's food retail system as another distinctive aspect that sets it apart from higher-income countries (Peyton, Moseley and Battersby, 2015). Rotating Savings and Credit Associations (ROSCAs) are a global phenomenon, existing in various forms across different cultures and

economies (Milles, 2011; Benda, 2013; Stoffle Richard W.; Minnis, Jessica; Van Vlack, Kathleen, 2014; Kabuya, 2015; Lasagni and Lollo, 2015; Nyoni, 2016; Koike *et al.*, 2018; L, 2018; Nyandoro, 2018; Sato N.; Kondo, K., 2019; Ademola Abimbola *et al.*, 2020; Lappeman *et al.*, 2020). They operate on a simple yet effective mechanism: a group of individuals contribute to a common fund, and each member, in turn, receives the lump sum on a rotational basis. This system fosters a sense of community and mutual trust and serves as an informal financial institution with limited access to formal banking (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). In South Africa, these associations are known as 'stokvels,' and they also play a pivotal role in mitigating household food insecurity (Aitchison, 2003; MASSMART, 2011; Response and African Response Research, 2012; Bäckman Kartal, 2019; Fairbridges Wertheim Becker, 2019; Ngcobo, 2019; Hutchison, 2020; Mabika and Tengeh, 2021; Old Mutual, 2023). By providing members with access to lump sums of money, stokvels enable households to make significant food purchases and cushion against times of scarcity. This communal financial model not only alleviates immediate food insecurity but also empowers communities by fostering a culture of savings and financial planning, ultimately contributing to long-term food security (Mabika, 2018; Mabika and Tengeh, 2021). Women's predominant participation in stokvels reflects broader societal patterns where limited access to formal financial institutions and economic opportunities often relegate them to informal, community-based systems (Pillay and Nhleko, 2023). The increasing number of women in leadership roles within South African households may suggest a notable shift towards a significant female-headed household demographic (STATISTA, 2021). These gender inequalities are rooted in historical biases, unequal distribution of resources, and societal expectations that can constrain women's financial autonomy and hinder their ability to thrive in traditional financial systems (Wardle *et al.*, 2004).

While South Africa is a net food-exporting country, the major food imports for South Africa include rice, maize and wheat, palm oil, sugar, and candy, the “perfect storm” of ingredients for the manufacture of ultra-processed foods (Fundira, 2017; Posted by Palm Oil Detectives, 2023). Food security and healthy eating are complex public health issues, further exacerbated by the current state of load shedding in South Africa, affecting food systems from irrigation in the agricultural sector to food processing and maintaining a cold chain for fresh foods (Maré, 2023). Load shedding in South Africa refers to the intentional and controlled reduction of electricity supply to different areas or regions to balance the demand and supply of electricity on the national grid. This is typically done during high electricity demand or supply constraints, such as insufficient generation capacity or maintenance issues. Load shedding helps prevent a complete collapse of the power system by avoiding overloading and damage to the infrastructure. It can result in scheduled power outages in different areas for a certain period, impacting businesses, households,

and overall daily activities. Therefore, cross-cutting frameworks and system-based approaches are needed to address these challenges (Roberto *et al.*, 2015; Swinburn *et al.*, 2015).

Findings from our recent publication demonstrated the critical role of Rotating Savings and Credit Associations (ROSCAs), known as stokvels in South Africa, in accelerating social and economic reforms and in addressing certain health concerns, particularly for women in sub-Saharan Africa (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). As an informal institution, Stokvels's success hinges largely on collective goals, trust, cultivating a sense of community and leveraging their social and economic capital. There are reportedly over 800,000 stokvels in South Africa (more than 11 million persons, worth more than ZAR50 billion annually), with 20% of these recognized as grocery stokvels (Bophela and Khumalo, 2019). Grocery stokvels, mostly women-led, primarily aim to mitigate household food insecurity and procure long shelf-life items and staples, often in bulk and destined for their annual circular migration to rural homelands or distributed to extended families (Bophela and Khumalo, 2019). These grocery stokvels engage with various actors and stakeholders in the food system.

However, what is unclear is these stakeholders' potential power and influence to increase demand for and access to affordable, healthy food. Central to this question is a better understanding of the organisations and meso- and macro-level actors and institutions that may interact with stakeholders to which this social and economic leverage may be applied. For example, until recently, stokvels largely operated outside the banking sector. Moreover, collective bargaining of stokvels with the food retail sector has largely been unexplored. In a recent study, Lappeman *et al.* (Lappeman *et al.*, 2020) examined relationships between these savings groups and retail and wholesale suppliers. In this case, the power dynamics to influence food purchasing behaviour was heavily in favour of the sellers, whose primary aim was to attract and secure the loyalty of stokvels to purchase from and through this supply chain.

Using stakeholder mapping, we identified various actors within the food system framework (Figure 1) that may currently engage with or have the potential to engage with stakeholders. We also identified how this engagement might increase regular access to healthy, affordable food for stokvel members. Stakeholders included the formal and informal retail and wholesale sectors, formal and informal financial institutions, social and economic development organizations, urban planning and agriculture, groups based on cultural or social salience (faith-based organizations, community networks, NGOs), the health sector within local and provincial governments, food producers, and providers of “last mile distribution” or transport. This study used a qualitative approach to address the following objectives: i) identify stakeholders and meso- and macro-level actors that may interact and engage with local grocery stokvels or similar community

informal savings groups to mitigate food insecurity and improve access to healthy foods, ii) explore stakeholders' perceptions of how stokvels' function and how this might be applied to improve the demand for and access to affordable, healthy foods and iii) gather information about their interaction and engagement with stokvels and the power they may have to influence access to healthy food.

4.3 Methods

4.3.1 Identification of stakeholders and meso- and macro-level actors that interact and engage with stokvels

The research adopted the stakeholder mapping and analysis method adapted from the Community Toolbox developed by the University of Kansas Centre for Community Health and Development (Rabinowitz, 2015), the Australian Department of Health Stakeholder Mapping and Analysis tool (Australian Department of Health, 2023) and the World Bank Public-Private Dialogue Stakeholder Mapping Toolkit (World Bank Group, 2016). In identifying stakeholders and meso- and macro-level actors that interact and engage with stakeholders, we tried to consider all potential interactions and factors that may influence household food security, food consumption, and procurement against the various actors in the food system (Figure 6). A stakeholder list was then used to map the categories according to the potential for power, influence on stokvels, and interest in engaging with stokvels. Potential stakeholders were largely based in the City of Cape Town or the Western Cape Province, although some, for example, had a national presence in the financial sector.

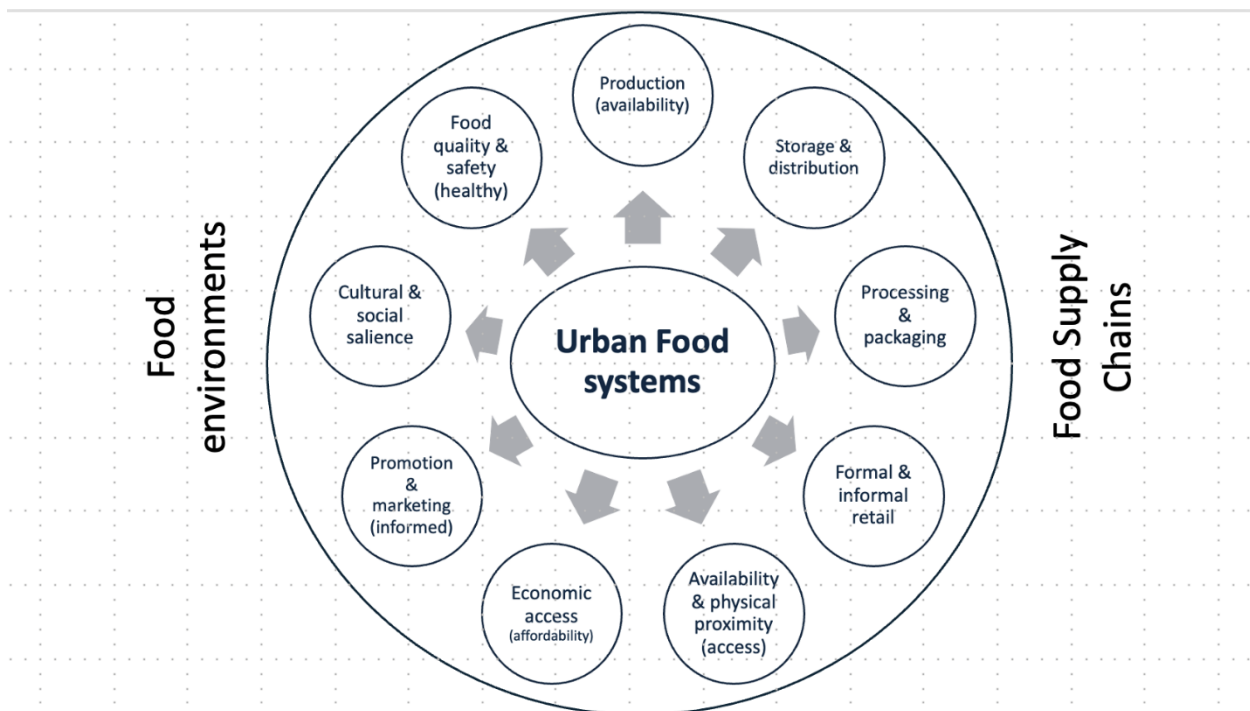


Figure 6: Urban food systems adapted from Tumwesigye et al. (Tumwesigye et al., 2019).

4.3.2 Study population

The study adopted the snowball sampling technique of meso- and macro-level influencers in the areas of interest and the chain referral technique by identifying industry or sector focal contacts who could then refer the research team to additional stakeholders to interview. In this study, a stakeholder is defined as any person or group who influences or is influenced by stokvels with specific reference to the food system (Rabinowitz, 2015; Australian Department of Health, 2023). This broad definition was further adapted as it covers any persons or groups that may provide insights into and address the study's objectives, directly or indirectly. Potential participants were recruited through publicly available contact details. All efforts were made to arrange interviews. However, some invitees did not respond to emails or telephonic messages (non-responsive after up to 5 attempts at contact). In some cases, identified stakeholders did respond but ultimately defaulted on the day of the scheduled interviews, as they had to attend to other competing priorities. As a result, 21 participants were recruited and interviewed across various sectors at the meso- and macro-levels (Table 4). Table 5 shows the stakeholders who did not respond to requests for interviews or who chose not to participate. The decision to exclude stokvel members and leaders from this study was strategic, aimed at obtaining unbiased and independent views from external parties. We concentrated on gathering insights from food system actors, potential stakeholders, and key informants who are not directly involved in stokvel operations. This study ethics was sort and approved by University of Cape Town Human Research Ethics Committee (HREC: 456/2021). The participants provided their written informed consent to participate in this study.

4.3.3 Stakeholder Power Analysis

Based on our formative systematic review (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022) and key informant discussions, we posited that stakeholders might have the potential to influence Stokvel's operation concerning their savings and food purchasing practices. In this study, we further conceptualised a power/influence and interest matrix against which to plot these stakeholders. Bally and Cesuroglu (Bally and Cesuroglu, 2020) defined the three levels of power/influence as (i) Control, where the stakeholder has the power to control how stokvels operate; (ii) Influence, where the stakeholder may influence decisions taken by stokvels concerning their purchasing and procurement practices and food choice decisions, and (iii) Interest/concern: where the stakeholder is interested in these practices and decisions by stokvels, but has no significant ability or mechanism to impact on them. This power and influence matrix was developed by considering the stakeholders. We also considered the level of interest that each stakeholder may have in developing relationships with stakeholders toward a mutual benefit.

We hypothesised an expected level of power/influence and interest for each stakeholder or meso- and macro-level actor at the study's outset. We used this framework to summarise the study findings in key themes and sub-themes, exploring perceptions of how stakeholders might leverage their social and economic capital to improve the demand for and access to affordable, healthy food. We also interrogated the potential interest for and means by which stakeholders might engage with stakeholders and their perceptions of their power to influence these decisions, maximising value and partnerships and moving towards mutual benefit.

4.3.4 Interviews

Interviews were undertaken by a proficient team of two interviewers, both extensively trained and possessing prior knowledge about stokvels, thus bringing a nuanced understanding to their roles in the study and interactions with stakeholders. Stakeholders, particularly those in proximal distance, were provided with the option of face-to-face meetings to facilitate a more personalized engagement. The interviews were primarily conducted through online platforms, utilizing Microsoft Teams or Zoom, based on stakeholders' preferences. This approach accommodated the geographical dispersion of stakeholders and aimed to ensure broader participation, considering the constraints posed by ongoing travel restrictions during the COVID-19 pandemic. Commencing in September 2021 and concluding in May 2022, the data collection timeline spanned a period of 9 months. Utilizing a semi-structured interview format, we employed a strategic blend of standardized and adaptive questioning tailored to the unique context of each stakeholder. The interview questions, outlined in the appendices, were meticulously crafted to elicit both quantitative and qualitative information. Topics ranged from stakeholders' comprehension of stokvels to their perceptions of stokvels' socio-economic influence and potential roles in enhancing access to healthy foods. Each interview typically lasted 30 min or less and was conducted in English. The flexibility embedded in our approach, adjusting questions based on the stakeholder's background and relationship to stokvels, ensured the collection of comprehensive and context-specific data.

Table 4: Stakeholders interviewed for the study ¹

Urban Food System/s	Stakeholder	Sector category	Reasons to involve them	No of interviewees (N=21)	Influence	Interest
Formal and informal food retail	Retail Food Stores (local Supermarkets/ Food Store Managers)	Formal and informal food retail	To better understand current & potential interactions of stokvels & the formal food retail industry.	Interviewed (N= 1)	++	+++
Formal and informal food retail	Wholesale Food Dealer	Food wholesale	To understand wholesale buying, supply-demand, bulk purchasing, and food purchase drivers	Interviewed (N=1)	+++	++
Economic Access/ Proximity/ Storage & Distribution	Food redistribution (e.g., Food Forward SA)	Food Charity (NPO)	To understand food choice decisions & food insecurity, community organizations that address food insecurity	Interviewed (N=1)	+	+
Production/Proximity/ Economic Access	Social Enterprise vegetable gardening (e.g., Fresh Life Produce)	Social enterprise agriculture	To explore current & potential interactions of stokvels with local and urban food vegetable gardening	Interviewed (N=5)	+	+
Cultural & Social Salience/Economic Access	Community Action Networks (Cape Town)	Community group (food charity)	To understand food choice decisions & food insecurity, community organizations that address food insecurity	Interviewed (N=2)	+	++

¹ In the context of this study, the terms "influence" and "interest" are evaluated on a scale ranging from one to three crosses (+), where a higher number of crosses indicate a greater degree of influence or interest. This scale allows for a nuanced assessment of the varying levels of impact and engagement attributed to these factors.

Urban Food System/s	Stakeholder	Sector category	Reasons to involve them	No of interviewees (N=21)	Influence	Interest
Economic Access	Retail banking (e.g., Retail banks with stokvel account offerings)	Retail finance	To better understand the relationship between the retail banking sector and stokvels.	Interviewed (N=3)	++	++
Proximity/ Storage & Distribution	Social enterprise and "last mile distribution."	Social enterprise consultancy	To explore current & potential interactions with "last mile distribution" partners and stokvels	Interviewed (N=3)	++	++
Cultural & Social Salience/ Economic Access	Social enterprise and micro-finance (e.g., Spoon Money)	Micro-finance	To better understand the relationship between the micro-finance sector and stokvels.	Interviewed (N=2)	+++	+++
Cultural & Social Salience/ Economic Access	Informal Savings Associations (e.g., SaveAct/NASSA)	Social enterprise informal savings groups	To explore the governance, context, decision-making processes, collective efficacy, agency, health, and food choice decisions	Interviewed (N=1)	+++	++
Cultural & social salience	Food Security & Agriculture (Food Security Initiative)	Academia/Research	To understand food choice decisions & food insecurity, community strategies that address food-insecurity	Interviewed (N=2)	+	+++

Table 5: Stakeholders who did not respond to requests for interviews or who chose not to participate²

Urban Food System/s	Stakeholder	Sector category	Reasons to involve them	No of persons contacted (N=6)	Influence	Interest
Formal and informal retail	Spaza Association (e.g., Somalia Association)	Informal food retail	To better understand current & potential interactions of stokvels & the informal food retail industry	Not Interviewed (N=1)	++	++
Cultural & Social Salience/ Production/ Processing & Packaging	Local food service (café) and production (e.g., Spinach King)	Food outlet, takeaways, food production, and distribution	To understand the agricultural supply chain of fruit & veg from "farm to table," social marketing, demand side	Not Interviewed (N=1)	++	+
Formal and informal retail	Formal local restaurant (e.g. 4Roomed Ekasi)	Food outlet, seated dining	To understand the demand side, foodways, and food choice decisions	Not Interviewed (N=1)	+	+
Food quality & safety/ Cultural & social salience	Local government (e.g., transport, social development, housing, health, and agriculture, sports and culture, parks and recreation, sanitation)	Local government	To identify possible and mutually beneficial interactions between stokvels and local government	Not Interviewed (N=1)	+++	++
Economic access	Retail insurance sector (e.g., funeral policies)	Retail Insurance	To better understand the relationship between the retail insurance sector and stokvels	Not Interviewed (N=1)	++	++
Cultural & Social Salience/ Economic Access	Retail home improvement (e.g., home appliances & furnishings)	Retail household & building supply	To better understand the relationship between household and building supply sector and stokvels	Not Interviewed (N=1)	+	+
Food quality & safety/Cultural & social salience	Western Cape Department of Health	Government department	To get the political buy-in of the government in the fight against unhealthy eating	Not Interviewed (N=1)	++	+
Economic access	Economic Development (Western Cape Economic Development Partnership)	NPO partnering with local government	To better understand the role of stokvels in the township economy, social entrepreneurship	Not Interviewed (N=1)	++	++
Cultural & social salience	Food Security & Agriculture (Food Security Initiative)	Academia/Research	To understand food choice decisions & food insecurity, community strategies that address food-insecurity	Not Interviewed (N=1)	+	+++
All	Food security and food systems (e.g., COE for Food Security UNESCO Chair in African Food Systems)	Academia/Research	To understand food choice decisions & food insecurity, community strategies that address food-insecurity	Not Interviewed (N=1)	+	+++ ³

² In the context of this study, the terms "influence" and "interest" are evaluated on a scale ranging from one to three crosses (+), where a higher number of crosses indicate a greater degree of influence or interest. This scale allows for a nuanced assessment of the varying levels of impact and engagement attributed to these factors.

³ Although there were only 6 stakeholders not interviewed in total, the sum of stakeholders not interviewed per category surpasses this number because certain stakeholders represent multiple categories.

4.3.5 Data analysis

Data preparation for analyses followed standard guidelines for qualitative research. Stakeholder interviews were coded using NVivo 12 ([QSR International](#) Pty Ltd). This process involved identifying and highlighting key phrases and concepts that aligned with the study's objectives. ATL, as the primary researcher, undertook the initial coding phase, systematically organizing the data into mutually exclusive yet exhaustive thematic categories. This coding was grounded in the content analysis methodology. To ensure rigor and consistency in the analysis, OA and EVL, both serving in supervisory capacities, reviewed and validated the coded data and themes. Their role was primarily oversight, providing expert guidance and ensuring the integrity of the analysis.

4.4 Results

In our study, we successfully engaged with 78% of the identified stakeholders, resulting in interviews with 21 out of the 27 initially targeted. These interviewees spanned various sectors within the food system: 1 from Formal and Informal Food Retail, 1 from Food Wholesale, 1 representing Food Charity (Non-profit organization), 5 from Social Enterprise Agriculture, 2 from Community Groups (Food Charity), 3 in Retail Finance, 3 in Social Enterprise Consultancy, 2 in Micro-Finance, 1 in Social Enterprise Informal Savings Groups, and 2 from Academia/Research (Figure 7). Unfortunately, a non-response rate of 22% led to the absence of some perspectives, particularly from sectors such as Informal Food Retail, Local and Provincial Government, Retail Insurance, and Retail Household & Building Supply. Despite these gaps, our study provides a detailed exploration of stakeholder perceptions on stokvels' role in the urban food system and their potential to utilize social and economic capital to improve access to healthy foods.

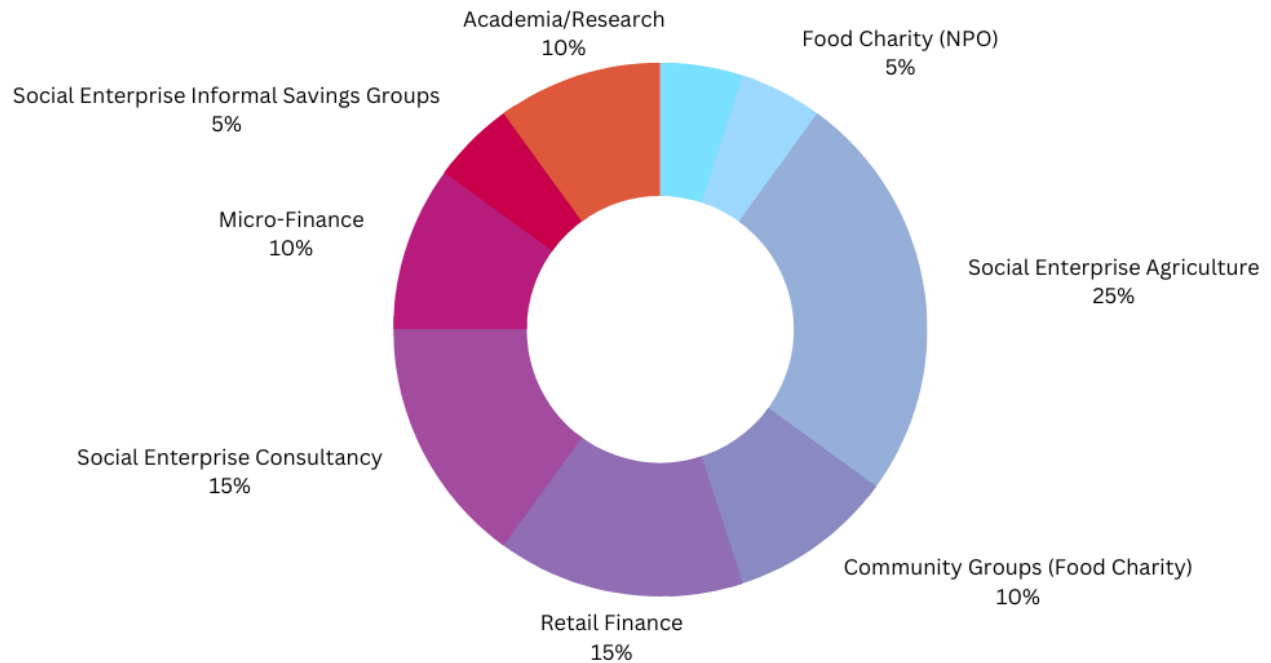


Figure 7: Stakeholder representation by sector proportion

4.4.1 Exploring stakeholder perceptions of how stokvels function

Stakeholders in our study commonly viewed stokvels as diverse and autonomous entities, operating under social norms and often beyond formal state regulatory frameworks. Their governance structures were perceived as intricate, posing challenges for comprehension by those not directly involved with them. An academic legal stakeholder insightfully summarized stokvels, capturing their essence and the complexity of their operational framework:

"A stokvel is an association, an unincorporated association normally run on, according to indigenous law or vernacular norms." (Academic stakeholder: Law)

Stokvels are largely recognized as social entities that self-regulate based on their members agreed-upon rules, functioning similarly to a bank. They convene regular meetings, at which members contribute money into the pool, thus fostering social networks and partnerships. As one academic stakeholder in law emphasized,

"Stokvels in South Africa exist in places that are in many ways only lightly touched by state regulations." (Academic stakeholder: Law)

"It's essentially a self-governed institution set up according to a system of norms developed by the participants themselves in a contract." (Academic stakeholder: Law)

"I think that you could say that social norms govern it, and some of those social norms might be entrenched in terms of long-established rules within that particular association of ways to do things." (Academic stakeholder: Law)

Stakeholders in our study often viewed stokvels as a mechanism predominantly utilized by women for saving money and accessing credit and capital. This perception aligns with the role of stokvels as informal financial institutions, as one stakeholder aptly compared them to an informal credit union.

"Stokvels essentially provide a mechanism to save money and to access credit without the red tape of statutory lenders." (Academic stakeholder: Law)

"A lot of stokvels lend money as well. So they set on the capital value balance and then to generate more money for the stokvels, they lend it, count to the members as well."
(Social enterprise stakeholder)

"[There are] different reasons that people have stokvels, but effectively, I guess it's, it's sort of [an] access to capital issue and seeing how combined efforts in group collection of finances can enable one to save and to... look at... how we benefit from acting in a group, whether it's such things as ensuring that I save every month or whether it's group discounts or whatever the case might be." (Academic stakeholder: Law)

Other stakeholders suggested that the structure and function of stokvels vary based on their purpose. For instance, a representative from a national non-profit social enterprise focused on community empowerment and breaking the cycle of poverty offered a unique perspective. While recognizing the financial aspects of stokvels in terms of collective saving and lending, they also emphasized their role in fostering social cohesion. They observed that stokvels operate informally and socially, pooling and distributing resources among members, thereby enhancing their economic leverage and purchasing power.

"They use it by making weekly or monthly or fortnightly or whatever it is contributions they provide capital in the group." (Academic stakeholder: Law)

4.4.2 Social convention and governance structure

Stakeholder experiences with stokvels were described as constructing a sense of community among members, trust, and social cohesion. However, beyond this, most of the stakeholders interviewed had little to no direct experience with or perception of the specific governance of stokvels. One stakeholder, an academic involved in commercial law, who has had direct interactions with stokvels, reported that a stokvel's governance structure may not be recognised within a formal legal framework. However, to stokvel members, it is inclusive and supportive of transparency for group decisions and fostering social inclusion. In their experience, members experience of stokvels, is that they have a highly formal and respected governance structure, and that they use their collective efficacy and social cohesion to agree upon and bring about positive changes. As such, the governance structure of stokvels is established according to local conventions where traditional authorities of communities, may even be consulted in some instances, and social norms are used to govern. These include elements such as positive obligation, where members must contribute or invest to benefit from all participants' collective efforts, in effect, a social contract.

"... a contract is a law that parties agree will govern a relationship, or maybe a stokvel constitution can be seen in those terms. Not necessarily in those terms like, you know, what in the law of general application would meet the contract definition. But, maybe, an indigenous sort of contract."
(Academic stakeholder: Law)

Stakeholders observed that in stokvels, older members often set the rules. While some stokvels involve signed contracts, others rely solely on verbal agreements for member contributions. This variability can lead to legal ambiguities in resolving disputes. Consequently, the absence of formal legal agreements among members can not only heighten internal conflicts but also poses challenges in establishing formalized partnerships with external institutions, such as banks.

"I did argue that this constituted a kind of indigenous law in that African customary law is a discourse known in South Africa... limited to well-defined areas. And stokvels at present is not one of those areas." (Academic stakeholder: Law)

They further stated,

"It is mostly very traditional. It is locked in a kind of context, particularly like, you know, a rural, pre-colonial, almost context. And, of course, indigenous law evolves over time as circumstances change. So the constitutional court often said that it is a living law." (Academic stakeholder: Law)

Overall, stakeholders demonstrated a certain level of understanding regarding stokvels, highlighting their informal, community-centric nature. They recognized stokvels as pivotal in encouraging household savings and potentially in securing credit. Additionally, the significance of social norms, conventions, and autonomy in the operation of stokvels was a key aspect of their understanding. This reflects a general awareness of the multifaceted role that stokvels play within communities.

4.4.3 Conflict resolution concerning decision-making and the social contract

A stakeholder involved in the "last mile distribution" of food, aimed at connecting formal retail environments with low-income communities, noted that internal conflicts among stokvel members could significantly influence their food purchasing choices.

“Those who make the loudest noise may have their way, and it may be choosing unhealthy food packages.”

(Storage & distribution stakeholder)

Contrary to the general observation about transparency in stokvels, a representative from a local grocery distribution service connected to a mobile app suggested that a lack of transparency can actually pose a challenge to the cohesive functioning of stokvels. This indicates that transparency is a critical factor in maintaining the structural integrity and effectiveness of these groups.

The social contract and norms within stokvels play a crucial role in ensuring economic collaboration among members. In cases of non-compliance, such as defaulting on stokvel payments, peer enforcement mechanisms are often employed. These can include harsh measures like property damage, public shaming, or coercion, as explained by a stakeholder with expertise in commercial law. This strict enforcement underscores the importance of adherence to the group's agreements and the upholding of its social norms. This approach is seen as vital for maintaining the integrity and functionality of the stokvel.

"...when it came to enforcing the rule of the stokvel, particularly when it came to debt collection, um hmm, this was not done through the courts, which means another kind of system of norms was at play." (Academic stakeholder: Law)

4.4.4 Maximising value

Stakeholders provided limited insights on how stokvels could use their collective purchasing power to enhance their value proposition. A representative from a food charity focusing on surplus food recovery and redistribution highlighted their cost savings and waste reduction strategies, alongside offering tax certificates to incentivize donations. These incentives foster ongoing collaborations with farmers and food

retailers, creating a significant value proposition. However, the stakeholder was uncertain about the specific value proposition stokvels might offer to the retail and wholesale food sectors.

A representative from a Pan-African insurance company expressed the view that stokvels effectively maximize value by leveraging their collective economic power to pool resources. From this perspective, the enhancement of food security is seen as a secondary outcome of these collective activities, rather than their primary objective.

"I don't know; maybe this is debatable. I'm not convinced that grocery stokvels are aimed at food security. I think it's a, and it's a good by-product. But I think it's really about buying power. It's about maximizing... value to me with, uh, with a limited or discrete amount of resources."
(Banking sector stakeholder)

While many stokvel members find satisfaction and utility in their arrangements, not all experiences are positive. A stakeholder from the retail finance sector mentioned that some members view stokvels as a business opportunity, focusing on financial returns. In contrast, others prefer straightforward transactions to receive their paid-for products without complex business dealings. The utility for these members lies in the receipt of goods, and business arrangements can diminish their satisfaction. Additionally, there is a perception that peer pressure within stokvels can lead to borrowing and subsequent debt accumulation. This complexity in member experiences and expectations highlights the varied nature of stokvel participation.

"We do find, even in our savings group, that there can be elements driving and pressuring people to borrow as much as possible because they understand that maximizing lending maximizes returns. And they begin to try to tilt the balance toward it being more like a business than savings, a safe savings space." (Social enterprise informal savings group)

4.4.5 Partnerships and driving mutual benefit

A stakeholder from a community organization focused on urban food gardens discussed the complexity of navigating social networks within stokvels. Despite these challenges, they noted that stokvels have gradually gained cooperation from various stakeholders, evolving from being seen merely as consumers to partners in networks. For instance, some stokvels have formalized relationships with retail banks, benefiting from the security offered for their funds. Initially, banks viewed stokvels just as product consumers, but this perception has shifted, recognizing them as a distinct market segment and even potential competition. This evolution reflects the growing significance of stokvels in the financial landscape.

“The success is very limited, and that is predominantly because stokvels, for the longest time within the bank, were seen as product consumers and not as a segment. So, they then hold their architecture and growth.” (A stakeholder from the banking sector)

While stakeholders generally agree that financial institutions benefit from relationships with stokvels, the process of formalizing these partnerships has been challenging, particularly due to the extensive documentation required to establish legal partnerships. A stakeholder from a financial institution highlighted this complexity. This situation underscores the intricate balance between the informal nature of stokvels and the formal requirements of financial institutions.

“And when we were doing some of the work around investments, that was typically our challenge in that a lot of them, of course, don’t have formal documents, and we would require a constitution or something to onboard them as clients.” (Banking sector stakeholder)

The mutual benefits arising from the interaction between stakeholders and stokvels were a key area of exploration in our study. One stakeholder highlighted the concrete advantages for stokvels collaborating with banks, such as earning interest on deposited funds, enhanced savings capacity, the convenience of electronic fund transfers, and the potential use of bank premises for meetings. In reciprocation, certain stakeholder initiatives focus on safeguarding the financial interests of stokvel members. For instance, a representative from a non-profit initiative working with stokvels discussed their engagement in saving through shares:

"So, what helps a lot is the saving in shares, which means saving in lump sums. So that's simplified as the math: getting a stamp for every share you buy in the record book. Puts the information in

the hands of the member. So, it's very reassuring for members, making it hard for anybody in the group to crook the system. So, that's some of what is powerful about it."

Fostering a transparent and trusting relationship between potential stokvel members and the initiative has been crucial. The approach encourages mutual understanding and cooperation. Additionally, it was emphasized that stokvels should aim for a symbiotic relationship with retailers, enhancing benefits for both parties. This approach underlines the importance of building strong, trust-based connections within the stokvel ecosystem.

4.4.6 Leveraging the power of stokvels to improve demand for and access to affordable, healthy food

Our findings revealed a significant connection between stokvels and other stakeholders in shaping the consumption of healthy foods. The perceived organizational structures and practices of local stokvels were identified as factors that could either enhance or hinder their ability to demand and access affordable, nutritious food. Key themes identified in leveraging stokvels to improve access to and consumption of healthy foods included defining what constitutes healthy food, the availability of fresh produce, the influence of retailers on food choices, and the frequency of purchasing healthy products.

"There needs to be a way of linking stokvels together to strengthen their buying power regardless of what they buy." (Social enterprise-Community Action Network stakeholder)

"The stokvel, really, could be very powerful in changing that. If the stokvels could pull their buying power... they could go and push back and say okay, we don't want this type of product, we'd rather have this type of product." (Social enterprise-Community Action Network stakeholder)

"There's a big education part of this about teaching women what is healthy and what isn't. How one could change their diets from too much carb, too much fat, to greater portion of fresh nutrient-rich vitamin-rich vegetables." (Food charity NPO)

4.4.7 Defining healthy food and promoting healthy food intake

The concept of healthy food varied among stakeholders interviewed in our study. One notable observation came from a professor experienced in food systems, who emphasized the distinction between healthy and unhealthy foods. This stakeholder's perspective, illustrated through a rhetorical question, sheds light on the subjective nature of defining 'healthy food' in the context of stokvels and food consumption patterns.

"...What is healthy? ... Umhmm, there's some subjectivity, but there are also some things that are not subjective. So, we do know what is generally healthy and what we do know, very well, what is unhealthy." (Academic in food systems research)

Other stakeholders also responded:

"Whilst it's a lovely idea that one wants to encourage and try and promote healthy eating, are you sure that the communities that you want to impact, are you sure that they are interested in your ideal of eating healthy food?" (Food charity NPO)

"On our on-demand side of things, we're ordering from the App, more than 90% is not healthy food." (Social enterprise-last mile distribution)

The distinction between healthy and unhealthy foods, such as the contrast between highly processed "junk foods" and fresh fruits and vegetables, was acknowledged by stakeholders. However, there was a subjective interpretation of healthy eating, particularly among basic food items. A general agreement emerged that long shelf-life foods are typically less healthy, while vegetables are considered healthy choices. One stakeholder involved in storage and "last mile distribution" highlighted the demand for healthy food among low-income households but identified two major barriers: a lack of awareness about healthy food options and issues with affordability and accessibility.

"If they know what healthy food is... I think that one of the big issues we might have today is that people don't realize... what some of the food might have... and they do not care about drinking a lot of cool drinks." (Storage & distribution stakeholder)

"There are a lot of fundamental changes that need to be made to make healthy eating more convenient and more affordable." (Food Charity (NPO))

A stakeholder from an informal trader's initiative, focused on impacting the food value chain, observed a strong demand for fresh food, noting that fresh produce is often a staple in most households. They discussed the interconnected relationships between spaza shops (informal retail), formal retail, and farms. A key point raised was that some traders might compromise on quality, and the cost of fresh foods can pose a limitation. This perspective sheds light on the challenges within the food distribution network, especially in terms of quality and affordability.

"So, ... I will do it in two ways. I would do activations at these shops. You know, promoting a healthy lifestyle and so on. But I would also work, most importantly, in the same communities in South Africa, and they are not driven by health choices.

"Nice pricing point of view, whatever healthy alternatives, it has to be. There has to be an incentive from a price point of view.

So, you, you'd, you'd have to put something together. That's about price point of view to competitive.

And then just market it through those partnerships in my model particularly you know, if I'm using those, those community leaders who are really influencers in the way they stay, it'd be even becomes easier." (Informal Traders Initiative)

A stakeholder from a non-profit food charity highlighted that while there is a demand for healthy diets among low socio-economic households, the greatest challenges remain accessibility and cost. This underscores the complex interplay between socio-economic status and the ability to maintain a healthy diet.

"So, the issue is, they love to eat healthy; they just simply can't afford to." (Food Charity NPO)

"What women tell us is when they go to the store, there is a limited amount of money. So, what do they spend money on first? They try and mentally construct what is needed to put a plate of food on the table." (Social enterprise-Food systems)

"There is a direct connection between what people buy and the cooking process to put that on the table." (Social enterprise-Food Systems)

A common practice among stokvel members, especially during the festive period, involves bulk collective purchasing of long shelf-life dietary staples. This approach serves a dual purpose: sharing with extended families and mitigating high expenses in December. It ensures food availability in the new year, a time when funds are typically lower. This strategy reflects the foresight and communal approach of stokvel members in managing resources.

"...the only time these things happen is in December. Whereby, you, you go to your bargain wholesalers... These ladies come together [with] a huge amount of money that they give to these wholesalers for groceries, but mainly it's the staple food, it will be your rice, your maize meal, your flour sugar. And yeah, those are commodities that most families join the stokvels for..."

4.4.8 Proximity to fresh produce stakeholders

The proximity of fresh produce was emphasized by several stakeholders, including those from social enterprise-last mile distribution, academic & research, retail finance, food charity, community groups, and social enterprise agriculture. They suggested that stokvels could form beneficial partnerships with nearby farms to source fresh produce. Such partnerships could help farmers and wholesalers reduce waste from perishable goods and offer advantages like minimized transport or delivery costs, which would be particularly beneficial for stokvels.

"I mean, off the cuff, I think if stokvels could say they are quite organized actually. If stokvels could have agreements with farmers that are in close proximity with them." (Food Charity (NPO))

"And so they get more healthy food out of the equation. But it could only work if they are in close proximity because the challenge is that last mile delivery." (Food Charity (NPO))

"Last mile distribution is one of the biggest challenges to ensure food access."
(Storage & distribution stakeholder)

A recurring sub-theme in the discussions was the ability of stokvels to negotiate lower prices, thus enhancing their purchasing power, a point echoed by most participants. A participant from the Philippi market initiative highlighted that aggregating resources as a group leads to greater benefits than individual efforts. This approach, aimed at securing lower prices and stronger buying power, coupled with

partnerships with farmers, was seen as a potential catalyst for increasing healthy food consumption. This concept was further supported by insights from two stakeholders:

"If stokvels could have agreements with farmers that are in close proximity... to them, um hmm, it could work that the farmer could give them preferential rates for the food. And so the stokvel will make a bit of saving." (Stakeholder 1: food gardening initiative)

"... you could work at the sliding scale with the farmer. The farmer says okay, I will supply you with one ton, and you get it at an X-rate, which is a good rate. But if you buy five tons, I give you an even better rate. (Stakeholder 2: food gardening initiative)

"And in that way, the stokvel would get more "bang for their buck" kind of thing. And so they get more healthy food out of the equation. But it could only work if they are in close proximity because the challenge is that last mile delivery." (Stakeholder 2: food gardening initiative)

"And you know, through...partnerships in collaborations with stokvels, we can have... much healthier fresh produce being made available to marginalised groups within the society." (Stakeholder 1: food gardening initiative)

4.4.9 Retailers' influence on food purchases

Retailer discounts significantly influence the purchasing decisions of stokvel members. Stakeholders noted a preference for basic, long shelf-life foods, which are often packaged by retailers specifically for stokvel sales. However, the availability of inexpensive, long-life, less healthy "combos" at discounted prices presents a challenge to healthy eating. The affordability of healthier options within the food environment was also identified as a key factor affecting purchasing choices.

"If, say, Unilever, wanna push a new size of a can of Koo beans that are discounted massively. Pushing it at a trade phase and the stokvels will not really be having an option." (Food charity NPO)

Though most of the stakeholders mentioned that many long-shelf items do not fit in the healthy lifestyle category, some foods, such as plant-based proteins like lentils and dried beans, were regarded as healthy and available in the category of long-shelf-life foods.

"As much as you want to change the behaviour, it's actually the people who hold the money who have the purchasing decision." (Social enterprise-Community Action Network stakeholder)

One stakeholder from a social enterprise-community action network focusing on food gardens pointed out that despite various efforts, there remains an unmet need for the recommended intake of fruits and vegetables for optimal health. Additionally, there was a lack of stakeholder input on whether the quantity consumed, or the methods of food preparation contributed to the nutritional value in a healthy lifestyle. This gap in the conversation was notable, especially given the context of a retail industry stakeholder who had conducted extensive studies on stokvels,

"...there will be certain kinds of product[s] that people want, which is common in the marketplace. Then, the retailers might influence that decision by offering special or bulk discounts, which could influence the decision." (Retail industry stakeholder)

"We would be very happy to partner... in any way, if we can... try and help spaza shops distribute these types of products." (Storage & distribution stakeholder)

4.4.10 Frequency of purchasing products

Stakeholders proposed that stokvel members could benefit from more frequent food purchases, such as weekly or monthly, instead of the current practice of biannual or bulk festive buying. This change could enable the incorporation of fresher, healthier foods into their diets. However, the shift from purchasing longer shelf-life items, which are more economically advantageous, may not align with stokvels' primary objective of saving. The quality of products was emphasized as a greater concern than availability. Additionally, addressing broader ecosystem issues was seen as a key to improving access to healthy foods.

4.5 Discussion

This study explored stakeholder perceptions and potential leveraging of saving groups in South Africa's urban, low-income settings, particularly concerning food systems. Stakeholder mapping was employed to understand how meso- and macro-level actors interacted with various stokvels and to gain insights into improving access to healthy food through these associations. The study successfully engaged with 78% of selected stakeholders, representing ten food system actors across different sectors, including formal and informal food retail, food wholesale, food charity (NPO), social enterprise agriculture, community groups, retail finance, social enterprise consultancy, micro-finance, social enterprise informal savings groups, and academia/research. While some sectors were well-represented, there were unrepresented actors, such as informal food retail, food production and distribution, local government, retail insurance, retail household and building supply, government departments, and NPOs partnering with local government.

Stakeholders view stokvels as tools for savings, credit accessibility, and capital growth. Stakeholders agreed on the broad definition of stokvels and that their goal was to maximise value through partnerships and social networks whose mandate was driven by mutual benefit. Therefore, stokvels serve an economic and social function (Hevener, 2006). This was also evident in the study as several stakeholders maintained that social capital was arguably the strongest driver of stokvels' success. Previous research has suggested that stokvels act as social and economic instruments that provide members with funding for planned and unplanned events (Mashigo and Schoeman, 2012). The latter concurs with sentiments shared by some stakeholders as they argued that access to capital had been an issue among low-socioeconomic households. Hence, stokvels were formed based on how they leverage combined efforts in group collection of finances to enable individuals to save. They are seen as a catalyst for low-income people, mobilising financial services without formal financial institutions (Irving, 2005; Kaseke, 2013).

Stokvels function through regular meetings that cultivate social networks and partnerships (Lappeman *et al.*, 2020) the stakeholder perceptions in our study on how stokvels function collaborated with this finding. The results further aligned with the study in Malawi, which noted the diverse nature of stokvels, together with their classification as unincorporated associations regulated by social norms outside formal state controls, constitutes a substantial challenge when trying to interface with them and impose accountability via formal legal routes (Gondwe, 2022). The perception of women dominating Stokvel (Matuku and Kaseke, 2014; Mulaudzi, 2017; Gwamanda, 2019a; Ngcobo, 2019; Mabika and Tengeh, 2021) was further emphasised in our study. Women wield considerable influence in Stokvels.

One of the key insights which has been drawn so far from the formative work we did is that stokvels often comprise members from the same community, family, or social network, resulting in a tight-knit structure that promotes trust and a shared identity (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). This study described stakeholder experiences with stokvels as constructing a sense of community among members, trust, and social cohesion. The literature demonstrates the significant role of stokvels in South African culture, acting as crucial instruments for financial inclusion and empowerment in disadvantaged communities (Moliea, 2007; Response and African Response Research, 2012; Barry, 2015; TSHANDU, 2016; Holmes, 2017; Ngcobo and Chisasa, 2018; Ngcobo *et al.*, 2018; Bäckman Kartal, 2019; Fairbridges Wertheim Becker, 2019; Lavagna-Slater and Powell, 2019; Nkambule N, Nkambule and Mohammed, 2019; Mabika and Tengeh, 2021). The financial inclusion of those who may not necessarily have been able to afford it promotes social conventions and cohesion, thereby allowing financial inclusion.

Informal stokvels, are predominantly reported to be community-based and operated without official oversight, thus often lacking clear rules and documentation. While this informality was reported to allow for flexibility and informal social networks, it was also perceived to increase the risk of financial disputes, mismanagement, and fraud (Fairbridges Wertheim Becker, 2019). It, therefore, feeds into the study finding of the lack of formal agreements, governance structures and no direct experience with specific governance of stokvels resulting in fuelling conflicts and difficulties in conflict management in cases arising. It is, therefore, important to institute governance processes that allow for transparency and compliance with rules and regulations.

Our stakeholders noted possible benefits for Stokvels in partnering with financial institutions, such as earning interest on deposited funds, enhanced savings capacity, the convenience of electronic fund transfers, and the potential use of bank premises for meetings. Another benefit is averting possible fraud amongst members (News24, 2019). Evidence shows that banks have already capitalised on the Stokvel savings structure, recognising them as a distinct market segment and even potential competition, a sentiment our stakeholder's echo. The banks in South Africa have been proactive in adopting stokvel savings and investment for over 100 years (News24, 2019; Business Day, 2021; IOL, 2021). The bank accounts earn monetary interest on capital (ISSUU, 2023). This vehicle has been beneficial to both stokvels and financial institutions. The big banks are said only to capture ZAR 12 billion of a ZAR 50 billion stokvel industry (Business Day, 2021). More benefits can be derived if stokvel governance structures are more formalised and financial instructions play a role in sensitisation on required paperwork such as a Stokvel constitution. Mabika and Tengeh, (2021) note the need to encourage stakeholders to acknowledge the inherent potential of stokvels and direct resources and expertise to bolster and empower this essential

sector, thereby unlocking its full potential for the benefit of the communities involved and the wider economy. Stokvel will also benefit by having documents that reduce conflict and outline the entity's purpose. However, it was evident from our stakeholder's perceptions that such close relational proximity could be a safeguard, as members may be cautious or sceptical towards unfamiliar ideas or propositions from external entities. Similarly, the heightened social cohesion within stokvels, stemming from members' unified pursuit of a common financial objective, may fortify their resistance to external influences (Ojo, 2020).

With the stokvel features mentioned above and possible mutual benefits, it is important to explore how leveraging stokvels' power improves demand for and access to affordable, healthy food. There was a common understanding amongst the stakeholders that organisational structures and practices of local stokvels could either enhance or hinder their ability to demand and access affordable, nutritious food. Stakeholders reported differing perceptions of what constitutes 'healthy food', especially on long-life shelf foods, a common factor in grocery stokvels, and whether the communities targeted would be interested in adopting healthier eating habits. Moreso, linking affordability to healthy foods. Clarifying what constitutes "healthy food" is key if stokvels are sensitised to healthy eating. Our study noted that long-shelf-life foods can include plant-based protein sources such as lentils and dried beans, which are healthy options. Possible stakeholders to take up the challenge would be the grocery retailers and financial partners. However, when examining the micro-level, these concerns primarily revolve around food access and utilisation by individual households. This perception is aligned with literature on food security (FAO, 2015; Burchi and De Muro, 2016; Raj *et al.*, 2022; Sumsion, June and Cope, 2023)

To influence healthy food purchasing, our study perceives that if farmers and stokvels collaborated, this could easily shift eating habits. Moreso, it could make the prices more affordable by reducing transportation costs, quick delivery of perishable healthy foods, and allowing for negotiated discounts. Volpe, Roeger and Leibtag, (2013), however, note the opposite, arguing high transportation expenses during the delivery process can directly impact the price of fruits and vegetables, leading to increased costs for consumers and potentially discouraging those with limited budgets from purchasing fresh produce while also affecting the availability and variety of such products in regions distant from agricultural centres. Research has shown that the further away the food, the less likely one is to purchase or consume it, i.e., the "Proximity Effect" (Hunter *et al.*, 2019). This perspective sheds light on the challenges within the food distribution network, especially in terms of quality and affordability but does not dissuade from trying to collaborate for the greater good. Despite the availability of inexpensive, long-life, less healthy "combos" at discounted prices presents a challenge to healthy eating. Retailer discounts may be tailormade towards

healthy foods to make healthy eating more affordable. We cannot ignore the retailer discounts' significant influence on the purchasing decisions of Stokvel members and the power to shift Stokvels' primary objective of saving and purchasing.

It is essential to recognise the study's limitations regarding stakeholder representation. Key sectors such as informal food retail, food production and distribution, local government, retail insurance, retail household and building supply, government departments, and non-profit organisations partnering with local government were not represented. The absence of these sectors has significant implications for our conclusions. For instance, lacking insights from informal food retail limits our understanding of how informal markets, crucial for certain demographics, adapt and respond to changes. Similarly, the exclusion of food production and distribution stakeholders hinders a complete appreciation of the complexities in supply chain management, potentially skewing our perception of market dynamics and consumer behaviour. The non-inclusion of local government voices curtails our grasp of the regulatory and policy environment, which is crucial for understanding policy implementation and compliance challenges.

Furthermore, by not engaging with sectors like retail insurance, household, and building supply, our study may overlook vital financial and logistical aspects of market operation, including risk management and resilience strategies. The absence of government departments and non-profit organisations partnering with local government also means missing out on insights regarding public-private collaboration and its impact on community well-being and market stability. This gap in representation necessitates a cautious approach in generalising our findings and highlights the need for further research incorporating these unrepresented stakeholders. Future studies should aim to engage with these groups to ensure a more comprehensive understanding of the issues at hand and to provide a more holistic view. Regarding the generalizability of the findings, while the study provides valuable insights into the functioning of stokvels in these specific low-income urban areas, caution should be exercised when extrapolating these results to other regions or the country as a whole. The unique socio-economic conditions of Dunoon and Khayelitsha, with their high proportions of low-income earners and informal dwellings, may not fully represent other low-income communities across South Africa. Nationally, approximately 20% of households live in informal settlements, but the extent of economic hardship varies widely (Habitat International, 2023). The economic context in Dunoon and Khayelitsha is more severe compared to many other low-income areas, which may affect the generalizability of the findings. Further research in diverse settings would be beneficial to validate and extend the findings of this study to a broader national context.

4.6 Conclusion

In conclusion, the study captured perceptions by stakeholders on stokvel structures, governance, purchasing power, partnerships and leveraging the power to influence health eating. Through collaboration and partnership, stakeholders may be able to tap into the existing networks and trust built within stokvels to disseminate important health information. Future research should include the unrepresented food system and other actors to explore strategies to enhance the role of ROSCAs in promoting healthier food choices and addressing affordability and accessibility barriers in low-income communities. In summation, stokvels provide an effective platform for collective action that can precipitate positive transformations in food systems, especially within low-income communities. They serve as both an economic mechanism, through pooling and distributing resources, and a social mechanism, through fortifying social capital, ultimately enhancing food security and sustainability.

4.7 References

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4.8 Declarations

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author Contributions

A.T.L. and E.V.L led the conceptualization and the overall drafting process of the manuscript. Section-specific drafting leads are as follows: A.T.L.: Background. E.V.L. and A.T.L.: Review methods. Thematic

analysis. F.O.-W., A.T.L., O.A.A. and E.V.L.: Discussion. E.V.L. and A.T.L.: Conclusion. All “Savings for Health” IDRC collaborators contributed to the overall structure and jointly led editing of the draft version, final version, reviewed and approved the final version of the manuscript. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The ethical implications and considerations of the study were thoroughly examined to ensure the protection, rights, and well-being of all participants involved. The Ethics Committee at UCT, through its diligent evaluation process, has granted this study ethical clearance with the reference number HREC: 456/2021.

Data Availability Statement

The de-identified dataset supporting the findings of this study is available upon reasonable request. Due to privacy and ethical considerations, the dataset has been de-identified to protect the confidentiality of participants' information.

Chapter 5: The potential of stokvels in facilitating access to affordable and healthy food options

This research examines the impact of women-led stokvels, on food purchasing and security in urban South Africa. Through interviews and discussions with stokvel members in Cape Town, it was found that stokvels provide economic benefits and enhance community ties and collective buying. While they bolster financial stability and food access, the potential of stokvels to promote healthier eating remains underutilized. The study suggests that stokvels could serve as influential platforms for public health initiatives, advocating for improved nutrition and addressing diet-related health issues. It highlights the need for policies that harness stokvels' social and economic influence to foster better food choices.

Lukwa, A.T., Wayas, F.A., Lambert, E.V., Alaba, O.A., and "Savings for Health" IDRC Collaborators (2024). Conditions that influence decision making of ROSCAs\Stokvels as social entities relative to food purchasing and foodways, amongst ROSCAs\Stokvels members: A realist evaluation. (PlosOne-In review)

The relevance of the manuscript to the thesis: The relevance of the manuscript to the thesis lies in its exploration of the inner workings of stokvels and their influence on food systems. The study offers a rich analysis of the complex interplay between social structures and economic empowerment by conducting semi-structured interviews and focus group discussions with stokvel members. It revealed that stokvels are pivotal in shaping food purchasing patterns and can direct food choices towards more nutritious options, although this potential is underutilized. Furthermore, the research provides a compelling argument for integrating stokvels into larger public health and economic initiatives. By acknowledging stokvels' existing social capital and organizational structures, the study suggests a valuable opportunity to leverage these platforms for enhancing public health nutrition. It proposes strategic partnerships with local stakeholders such as farmers, retailers, and financial institutions to harness the latent potential within stokvels for promoting healthier diets and combating diet-related chronic conditions. Aligning with the thesis, the findings underscore the importance of considering stokvels as integral components in initiatives to improve nutrition and address malnutrition in urban South African settings. The manuscript argues that through strategic engagement and empowerment of stokvels, they can be transformed into proactive agents of change in the urban food system, contributing to sustainable development and improved public health outcomes.

Context and mechanisms that influence decision making of ROSCAs\Stokvels as social entities relative to food purchasing and foodways: A realist evaluation

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5.1 Abstract

Background

The impact of food choices on public health cannot be overstated, given their link to the increasing prevalence of obesity and chronic diseases globally. Addressing the issue of food security is particularly critical for low-income populations. This study delves into the role of stokvels, termed informal savings groups in South Africa, examining how they contribute to enhancing food security and promoting healthier eating habits.

Methods

Employing a realist evaluation approach, we applied qualitative methods to scrutinize the role of stokvels within the unique settings of the Dunoon and Khayelitsha districts in Cape Town. Twenty grocery stokvels participated, involving 60 individuals, through in-depth interviews with leaders and focus groups with members. NVivo 12 facilitated the data analysis process. The research was informed by an Initial Programme Theory that focused on understanding how the contextual factors of membership criteria and governance structures (C), alongside the mechanisms of regular financial contributions and collaborative decision-making processes (M), impact the outcomes (O) such as food security and last-mile food delivery.

Results

The study's findings reveal that stokvels, which vary in demographic makeup and size (with a demographic range of 24 to 60 years and sizes of 10 to 30 members), notably influence collective purchasing decisions and financial management, leading to improved household food security and economic resilience. However, while these groups foster social ties and support communal decision-making, there is an evident gap in their direct efforts towards facilitating access to healthy food.

Conclusion

In conclusion, stokvels are instrumental in economic empowerment and strengthening social cohesion, with significant benefits for women and community building. The research highlights the potential for stokvels to play a more intentional role in promoting healthy food choices, a potential that remains largely unexplored. To fully harness the benefits of stokvels, future studies should focus on utilizing their inherent attributes of agency, economic independence, and social support to develop targeted strategies that promote the demand for and accessibility of nutritious, affordable food options.

5.2 Background

Global food systems face many complex challenges concerning the well-being of humans and the environment, from agricultural production and manufacturing to distribution and consumption (Brouwer, McDermott and Ruben, 2020). From a societal perspective, the problem of global hunger persists, with approximately 690 million individuals worldwide experiencing food insecurity. At the same time, there are nearly 680 million adults worldwide living with obesity, creating a dual burden of malnutrition (Fongar, Gödecke and Qaim, 2019). The high rates of overweight and obesity, particularly in urban areas, have been attributed to lifestyle changes, decreased physical activity levels, and unhealthy dietary patterns (Nurwanti *et al.*, 2019; Popkin and Ng, 2022).

Dietary intake determines health outcomes (Malek *et al.*, 2017). Numerous global studies have consistently demonstrated that the consumption of unhealthy diets, characterized by excessive intake of saturated fats, trans-fatty acids, sugar, and salt, significantly raises the likelihood of developing obesity and other non-communicable diseases (NCDs) such as hypertension, cardiovascular disease, diabetes, certain cancers, as well as various atopic disorders (Agostoni and Przyrembel, 2013; Brazionis *et al.*, 2013; Pearce and Langley-Evans, 2013; Stanhope, 2016; WHO and Organization, 2018). There are nearly 680 million adults worldwide living with obesity. At the same time, approximately 690 million individuals experience food insecurity, creating a dual burden of malnutrition (Fongar, Gödecke and Qaim, 2019).

Furthermore, a complex interplay of factors influences the process of making food choices. These factors include individual responses to psychological, physiological, and sensory cues and broader interactions between social, environmental, and economic influences (Chen and Antonelli, 2020). The rising consumption of ultra-processed foods (UPF) is a significant issue in middle-income countries and is closely associated with increasing obesity and diet-related chronic diseases (Baker *et al.*, 2020; de Morais Sato *et al.*, 2020). However, it's worth noting that this trend is not exclusive to middle-income nations. The increase in UPF consumption is a global phenomenon affecting diverse economies, including high-income and low-income countries. This widespread dietary shift, influenced by various factors such as globalization, urbanization, and changes in food production and marketing, poses a public health challenge across different socio-economic contexts (Nurwanti *et al.*, 2019; Popkin and Ng, 2022). An assessment of the global burden of these diseases has revealed that poor dietary patterns are responsible for more deaths than any other modifiable risk factor of non-communicable diseases, excluding smoking (Baker *et al.*, 2020; Dolui *et al.*, 2023).

To mitigate the burden of diet-related, chronic conditions, there is a need for equitable and safe access to affordable, healthy food, for poor and nutritionally vulnerable persons (Fongar, Gödecke and Qaim, 2019). Various strategies initiated by diverse stakeholders have been employed to address this. Some strategies, such as conditional cash transfers, supplemental nutrition and feeding programmes, and fiscal interventions, such as tax-exempt status for healthy and essential foods (Friel et al., 2015), have been initiated and supported by government and non-government institutions through policies and programmes. Examples of strategies initiated by civil society and communities are community and home food gardening, food redistribution initiatives and food banks, shared farm-to-table transport, farmers market cooperatives or food sharing, fresh produce purchases through local restaurants and healthy food prescription in the primary health care sector,(Miller et al., 2016; Palar et al., 2019; Esquivel et al., 2020; John et al., 2022).

It's essential to clarify that while ROSCAs are widespread in lower- and middle-income countries, serving as a crucial tool for financial security and resource pooling among members, their direct impact on ensuring access to healthy food can vary and has not been the primary focus of these groups. These clubs primarily function as a financial mechanism to provide members with an opportunity to save and access credit, which can be used for various needs, including purchasing food (Bophela and Khumalo, 2019; Mabika and Tengeh, 2021; Lukwa, Odunitan-Wayas, Lambert, Alaba, et al., 2022). As identified in a recent paper, stokvels in South Africa primarily contribute to enhancing food security (Lukwa, Odunitan-Wayas, Lambert, Alaba, et al., 2022). However, it's important to note that food quality and promoting healthy foods are not predominantly addressed within these groups (Brunie et al., 2014; Muzulu et al., 2018; Lukwa, Odunitan-Wayas, Lambert, Alaba, et al., 2022). Understanding these dynamics is crucial to determining whether stokvels can effectively be utilized as a tool to promote healthy eating. Less clear are the food choice decision-making strategies and practices of these informal savings groups, which have been shown, in some cases, to impact the food quality and variety of their food purchases (TOMAK, no date; Zolkoski and Bullock, 2012; Brunie et al., 2014; Muzulu et al., 2019).

In our research, we employed a realist evaluation to understand the role of stokvels in enhancing household food security. This method, anchored in scientific realism, allows for an in-depth look at what strategies are effective, whom they benefit, and the circumstances that permit success (Mukumbang, De Souza and Eastwood, 2023). Specifically, we focused on grocery stokvels, investigating their strategies and effects on consumer choices. Traditional evaluations often concentrate on results, but our application of realist evaluation facilitated an examination of the causes and interactions leading to these results, offering a view of the mechanisms at play in grocery stokvels and their contribution to food security.

This evaluation approach goes beyond simple cause-and-effect by analyzing the interplay between context (C), mechanisms (M), and outcomes (O), providing clarity on the 'how' and 'why' behind stokvels' impact (Better Valuation, 2022). By focusing on these elements, our study aimed to understand the factors and processes that govern member decision-making in food purchasing, casting light on the efficacy of stokvels within their socio-economic landscape. Our study commenced with an in-depth evaluation guided by our Initial Programme Theory (IPT), as detailed in Table 1. This IPT served as the foundational framework for our investigation. As we progressed with our research and gathered findings, it became evident that these results might necessitate a revision of the IPT, which was done based on our findings see Table 8.

5.3 Methods

5.3.1 Study design & study population

The realist evaluation was informed by the methodological framework outlined by Caló et al. (Caló et al., 2019). This framework guided our approach to exploring the dynamics of grocery stokvels in low-income urban areas. The study was conducted in Cape Town, focusing on two low-income urban areas in the Western Cape: Dunoon and Khayelitsha. These areas were selected based on their socio-economic profiles and relevance to the research objectives. According to Statistics South Africa (2024), approximately 73.7% of Khayelitsha's population earns less than USD 2,100⁴ annually, with 32.1% earning below USD 1,000 annually. In Dunoon, a township that is more economically disadvantaged and characterized by nearly 90% shack dwellings, 98% of the residents earn less than USD 1,000 annually. (). These statistics highlight the extreme economic hardship faced by residents in both areas, making them pertinent to the study's objectives of understanding stokvel operations in low-income settings. The selection criteria were intended to ensure that the study captures the dynamics of stokvels in contexts of severe economic constraints, which are likely to influence savings and food purchasing behaviors.

We employed qualitative research methods, including semi-structured interviews and focus group discussions. The study population comprised members of 20 different stokvels operating within these areas. To recruit participants, we engaged two key informants from the community who utilized chain-referral or snowball sampling techniques. These informants were instrumental in connecting us with leaders and members of the stokvels. Each stokvel in our study had between 25 and 150 members. Regarding inclusion criteria, our study specifically focused on individuals 18 or older who were active members of a grocery stokvel operating in Dunoon or Khayelitsha. All study participants, including the leaders interviewed, were women.

5.3.2 Sample size

The study sample consisted of 60 individuals, with 30 participants from each of our study areas. The participants comprised two categories: leaders of stokvels (20 individuals) and general stokvel members (40 individuals). One stokvel leader from each stokvel agreed to participate in the in-depth interviews. Additionally, two general members from each stokvel were recruited as volunteers for the focus group

⁴ The rate of USD 1 = ZAR 18.15 was used on 27 June 2024 from (<https://www.google.com/search?q=oanda+exchange+rate&og>)

discussions. Therefore, the sample included 20 stokvel leaders from 20 different stokvels for in-depth interviews, and the focus group discussions involved 40 participants, with at least two general stokvel members per stokvel. Four (4) focus group discussions comprising ten participants were conducted (2 each in both settings). The study protocol was approved by the Human Research Ethics Committee of the Faculty of Health Sciences, University of Cape Town (HREC REF: 200/2022). Informed, written consent was obtained from all interviewees and focus group participants prior to commencing these sessions. Additionally, all participants received remuneration (between ZAR200 and ZAR250) for their time.

5.3.3 Data collection methods

In-depth interview

A trained field research team conducted in-depth interviews (≤ 25 mins) with leaders of stokvel groups in their preferred language (English or IsiXhosa) to gather detailed information about how the decision-making process of stokvels influenced food purchasing and food-related practices among the members. The objective of these interviews was to understand the factors that influenced the decisions of stokvels concerning food purchasing and the decision pathways they followed (M). The interview questions covered various aspects related to the functionality of the stokvels such as the size of the stokvel group, the purpose behind which the stokvel was formed, factors that encouraged members to participate in the stokvel, and issues of governance, decision-making and compliance. All interviews were conducted face-to-face, ensuring direct and engaging interactions. These sessions were also recorded for accuracy and thoroughness. Following the interviews, the recordings were translated and transcribed into English to facilitate comprehensive analysis and interpretation. For further insight into our methodology, the detailed interview guide and guiding questions used in these face-to-face interviews are available in the supplementary materials.

Focus group discussions

The trained research team conducted focus group discussions with stokvel members to gather detailed information about the factors influencing decision-making regarding food purchasing and food-related practices. These discussions aimed to obtain insights from stokvel members, regarding the conditions that influence these decision-making processes and the various decision pathways followed within these groups. All focus groups were conducted face-to-face, in venues in the communities where the stokvels operated, ensuring direct and engaging interactions. These sessions were also recorded for accuracy and

thoroughness. Following the interviews, the recordings were translated and transcribed into English to facilitate comprehensive analysis and interpretation. For further insight into our methodology, the detailed interview guide and guiding questions used in these face-to-face interviews are available in the supplementary materials.

5.3.4 Initial Programme Theory

Realist evaluation is based on scientific realism (Mukumbang, De Souza and Eastwood, 2023) and, in the present study, was used to understand better the contextual factors (C) and mechanisms (M) that contributed to the effectiveness or ineffectiveness of decision-making within stokvels, regarding food purchasing and foodways among their members (O). Realist evaluation considers the apparent relationships between context and outcomes to uncover specific mechanisms that may help explain how and why a programme or intervention works or doesn't work for specific individuals or groups under circumstances (Better Valuation, 2022). The Initial Programme Theory was developed (Table 6) based on formative work conducted by the present authors, including a narrative, systematic review of Rotating Savings and Credit Associations (ROSCAs) and in-depth interviews with stakeholders representing different actors or organisations within the food system framework that may currently engage with or have the potential to engage with stokvels.

Table 6: Context, Mechanisms and Outcomes (CMOs) based on the Initial Programme Theory (IPT)

Context	Mechanisms	Outcomes
<ul style="list-style-type: none"> ○ Membership size, demographics and criteria ○ Location & socioeconomic status ○ Rules, organisation, and governance ○ The original purpose of forming ○ Monthly contributions, frequency and method of pay-outs 	<ul style="list-style-type: none"> ○ They operate as heterogeneous, autonomous associations governed by social norms. ○ Governance structure varies, with older members often dictating rules. ○ Shared transport secures more proximal distribution points. ○ Liaise with local producers and wholesalers. ○ Using economic leverage to bargain for lower prices increased buying power ○ Members exchange skills and knowledge (food choice and food preparation), as well as for food storage, transport or in-kind. ○ Participation is driven by family, friends, and immediate environments. 	<ul style="list-style-type: none"> ○ Improved household food security ○ Intention and development of strategies to purchase, prepare and/or consume food ○ Greater role in household resource allocation decision-making but not including prioritisation of “healthy food” choices ○ Better prices, bargains and deals on bulk purchases, brand loyalty ○ Increased knowledge and skills ○ Leveraging price points and loyalty vouchers for the more frequent purchases of fresh foods (collective efficacy).

5.3.5 Data analysis

Interviews and focus group discussions were recorded, and trained fieldworkers who were first-language speakers of isiXhosa took field notes to corroborate and provide additional information and insights to the recorded transcripts. Two field workers conducted all the interviews (TC) and (PN). Recordings were later translated verbatim and transcribed, capturing the exact words and expressions used by the participants by (CN). Nvivo coding and thematic content analysis of the transcribed interviews were done by (ATL) and reviewed by (FOA), (EVL) and (OA). The analysis began with familiarization with the data by reading and organizing the transcriptions based on the interview questions. This step allowed for a comprehensive understanding of the content and the identification of recurring patterns and key ideas.

To analyze the data, a thematic data analysis method was subsequently employed deductively based on the attributes of the realist evaluation (CMO) under consideration (Gilmore et al., 2019). This involved systematically examining the content of the data and identifying meaningful themes and patterns that emerged from the participants' responses inductively. The NVivo software was utilized to code the transcriptions, highlighting words or sentences that captured the crucial issues and thoughts expressed by the participants. These codes were then organized into distinct and comprehensive themes to provide a structured framework for analysis. Identifying information was removed or anonymized to protect the privacy and anonymity of the participants during analysis, and the findings were presented in a way that aggregated the data while providing some information and insight into context.

5.3.6 Positionality and Mitigation of Bias

Concerning positionality, the field research team members were drawn from the same communities as the stokvels. This can “shape the dynamics” of the interviews if the interviewers' experiences influence their interpretation or emphasis. Furthermore, although research staff underwent extensive training in qualitative research methods for interviewing and conducting focus groups, we cannot exclude the potential for bias in interpretation, selective perception of responses, or selective use of prompts or cues. Additionally, interviews and discussions were translated and transcribed into English by a trained research associate who was not involved in the original data collection. This also has the potential to introduce bias.

Field notes were taken during focus group discussions to mitigate some of these biases. Peer debriefing was conducted, where the research team regularly discussed the findings and challenged each other's biases and assumptions. This was done to foster a reflexive research environment and critically examine the influence of the researchers' perspectives on the study. Finally, using two coders (ATL-main coding) and (FOA-reviewed the code) for data analysis helped to provide inter-coder reliability, further reducing the risk of individual bias affecting the research outcomes.

5.4 Results

5.4.1 Characteristics of the participating stokvels

In our investigation into the functionality of grocery stokvels in South Africa, our primary objective was to delve into the decision-making processes within these stokvels, particularly concerning food purchasing. We aimed to understand the various pathways and conditions influencing these decisions and how stokvel members collaborate to manage their collective financial resources effectively for food-related purposes. Our study began by examining the 'characteristics of the participating stokvels' section, where we provided detailed context on the demographics of stokvel members, including membership size, contribution amounts, frequency, and meeting structures.

The characteristics of the stokvels and stokvel leaders who participated in the in-depth interviews are presented in Table 7. The ages of office bearers ranged from 24 to 60 years and stokvels varied in size from 10 members to 30 members. Monthly contributions ranged from ZAR200- ZAR1500 and all stokvels met monthly. The findings presented in this study are derived from data collected from both focus groups and in-depth interviews. In total, we engaged with 60 participants, which included 20 stokvel leaders and 40 stokvel members. The focus groups were designed to facilitate dynamic discussions among stokvel members, providing valuable insights into their collective experiences and decision-making processes. These focus groups, complemented by the in-depth interviews with stokvel leaders, offered a varied perspective on the functioning and impact of stokvels. The combined results from these two methods formed the basis of the findings we present in this study, offering a holistic understanding of the role of stokvels in their communities.

Table 7: Characteristics of participating stokvel leaders

Participant	Age (years)	Position	Stokvel size	Stokvel contribution (ZAR/month)	Stokvel contribution (USD/month)
Participant 1 [IDI]	46	Treasurer	20	500	27.51
Participant 2 [IDI]	40	Secretary	15	350	19.26
Participant 3 [IDI]	30	Vice-chair	10	500	27.51
Participant 4 [IDI]	45	Chairperson	15	400	22.01
Participant 5 [IDI]	48	Secretary	20	350	19.26
Participant 6 [IDI]	47	Treasurer	20	500	27.51
Participant 7 [IDI]	35	Treasurer	15	400	22.01
Participant 8 [IDI]	35	Secretary	10	500	27.51
Participant 9 [IDI]	36	Secretary	12	500	27.51
Participant 10 [IDI]	24	Chairperson	10	200	11.00
Participant 11 [IDI]	35	Treasurer	15	500	27.51
Participant 12 [IDI]	42	Vice-chair	25	350	19.26
Participant 13 [IDI]	59	Vice-chair	30	400	22.01
Participant 14 [IDI]	58	Vice-chair	23	800	44.02
Participant 15 [IDI]	60	Chairperson	20	200	11.00
Participant 16 [IDI]	35	Vice-chair	25	1500	82.53
Participant 17 [IDI]	22	Secretary	10	400	22.01
Participant 18 [IDI]	30	Secretary	15	450	24.76
Participant 19 [IDI]	48	Chairperson	20	300	16.51
Participant 20 [IDI]	28	Secretary	18	450	24.76

5.5 CMO configurations for Food Security (Sustenance)

5.5.1 Membership criteria (C) and regular contributions (M)

The first CMO we explored in our results relates to mechanisms (M) and the contexts (C) in stokvels that helped ensure adequate food or household food security, based on sustenance. Our study results showed that the selection criteria for Stokvel membership (C) focused on sustainability and self-reliance and aimed to ensure a committed and stable membership base. Therefore, regular contributions were made. Participants highlighted the importance of specific factors in choosing members. Firstly, individuals who maintained their own households were sometimes preferred over those living with their parents. This preference was due to the concern that individuals living with parents might withdraw from the stokvel unexpectedly, causing a decrease in membership or failure to make contributions. By prioritizing those with their own family (i.e. spouse and children), stokvels aimed to foster long-term stability.

"We want people who have households. We do not want people who stay in their parent's homes to decide to quit suddenly. We do not want someone who will just quit out of the blue when they have fought with their family, and they decide they will not continue with the stokvel, and then our numbers go down."

- Participant 8, [IDI], Secretary, aged 35 years (10 members, ZAR500/month)

Secondly, marital status and parenthood were considered important criteria for membership. Some stokvels favoured married individuals, had children, and actively fulfilled traditional gender roles as caregivers for their households. These criteria contributed to the overall goal of establishing a sustainable and dedicated membership base.

"We only take married people, with children and household."

"We want someone who knows they are women responsible for the house and children, and they are forced to have food."

- Participant 18 [IDI], Secretary, aged 30 years (15 members, ZAR450/month)

Some stokvels did not accept youth and exclusively accepted older adults, such as grandmothers. This targeted selection criterion assumed that younger individuals were prone to more financial and relationship problems, while older women were considered more responsible. Moreover, older women were typically recipients of social grants.

"We do not want youth in our group because they are the ones who always have problems."

"We only take grandmothers in our stokvel."

- Participant 13 [IDI], Vice-chair, aged 59 years (30 members, ZAR400/month)

Other stokvel members highlighted that employment status and receiving a social grant were used as membership criteria. These stokvels were typically comprised of a mix of both working and unemployed individuals. Working members were expected to contribute their dues at the end of each month, while those who received government grants contributed on the grant payment dates.

"I would say that it is fifty per cent, fifty of those working and fifty not working. So, those who are working pay their contributions at the end of the month, and those of us who get grants at home pay on the dates of the grant."

- Participant 11 [FGD 2], aged 27 years, stokvel member (20 members)

"Most of us are working. We have people who get government grants, so we decided to wait on the date of the grant."

- Participant 6 [FG2], stokvel member (20 members, ZAR500/month)

"We do not exclude people who get the grant or a working person."

- Participant 9 [FG3], aged 49 years (15 members ZAR350/month)

These results suggest that household food security can be achieved through stokvels by selecting members with a steady income source (C), thereby ensuring regular and uninterrupted contributions (M). One stokvel member highlighted that many of their members, residing in rural areas, depended largely on government grants for financial support, with varying employment statuses. It was emphasized that for their stokvel, neither employment nor the sole reliance on government grants was a barrier to membership. The key criterion for joining was understanding and accepting the stokvel's constitution and its individual responsibilities. This approach allows for inclusivity, accommodating members with diverse financial backgrounds, whether employed, unemployed, or grant recipients.

"In our stokvel, most of the people in rural areas are not working, and most of them are dependent on the grant."

"And also, the fact that one is not working does not count with us. There is a constitution in the stokvel; people who join stokvels must know what they put themselves into, and they must know what to do."

- Participant 1 [FG2], stokvel member, aged 35, ZAR350/month

Regarding gender, only one participant mentioned that their stokvel included men, which suggested that some stokvels are not exclusively restricted to women.

"In ours, there are men."

- Participant 1 [FG2], stokvel member, aged 35, ZAR350/month

5.5.2 Governance (C) and compliance to stokvel constitutions, self-regulation and social norms (M)

Participants relayed that the constitution (written or verbal) of each stokvel outlined the expectations for the behaviour and activities of its members. These provided a clear framework, including the rules covering contribution amounts, types, and monthly deadlines. In some situations, penalties were in place for lateness, absence, or delayed contributions. Additionally, the constitutions specified distribution cycles (either annually or semi-annually), food purchasing procedures, and transportation arrangements. Participants understood the importance of their constitution in maintaining order and ensuring timely and effective food purchases, thereby contributing to household food security (O). Most groups held monthly in-person meetings, where contributions were made.

"Yes, there is [a constitution]. We sit at the end of the month. When we gather, we pay our contributions."

- Participant 1 [IDI], Treasurer, aged 46 years (20 members, ZAR500/month)

"We have found that if we want everything to go so that, people may not do as they please. We will have people who pay the money and those who do not, or one will pay the amount they want to pay. So, we saw that it is important that, before we start, we must have a constitution where we will all agree about how to do things."

- Participant 3 [IDI], Vice-chair, aged 30 years (10 members, ZAR500/month)

"According to the constitution, we do not give the person their gift cards before the year ends."

"Everyone gets their gift card on the first week of December."

- Participant 4 [IDI], Chairperson, aged 45 years (15 members, ZAR400/month)

One stokvel elected four members, two of whom were secretaries responsible for documenting and organizing the club's activities. The other two members were chosen separately to ensure a fair distribution of roles and responsibilities.

"We elect four members... Two members write they are the secretaries... And then another two, again, we do not take the same members that are secretaries."

- Participant 2 [IDI], Secretary, aged 40 years (15 members, ZAR350/month)

In general, the constitution emphasizes the principle of equality among all stokvel members. Each participant is considered equal, regardless of financial contributions or personal circumstances. Trustworthiness is another crucial trait emphasized in this constitution. Participants were expected to be trustworthy and adhere to the guidelines outlined in the document.

"We all contribute to drafting our constitution. In it, we state all the challenges we come across and deal with them before they are there."

- Participant 3 [FG2], stokvel member, aged 40 years (20 members, ZAR350/month)

"When one enters the stokvel, they are binding themselves. Everything in that stokvel must be followed."

- Participant 5 [FG2], stokvel member, aged 25 years (10 members, ZAR400/month)

"All the members are equal."

- Participant 7 [FG3], stokvel member, aged 49 years, ZAR400/month

"In our constitution, one must be trustworthy."

- Participant 4 [FGD 3], stokvel member, aged 51 years, ZAR350/month

In summary, the constitution is central in regulating the stokvel's operations. Usually, they function as a verbal agreement among and between stokvel members. Although in certain situations, it may also exist as a written document. It ensures that contributions are made consistently, roles are assigned fairly, gift cards are distributed at the designated time, and all members are treated equally. By establishing a constitution and following its provisions, the stokvel maintains order, trust, and accountability within the group.

Handling non-compliant members was also a crucial element in managing stokvel contributions. When members fail to make consistent monthly contributions, there are various ways by which this matter would be dealt with. Some participants shared how their constitution dictated that a member who did not pay would forfeit everything. This included their place in the stokvel, the money they contributed thus far, and their share of any groceries purchased from the pooled funds.

"If there is a member who fails [to contribute], they lose the money. They get nothing. Their money is lost dismally."

"We seldomly get such cases [of a member quitting]. But if such could happen, someone will fill in the space, or we will look for another person in their place."

- Participant 1 [IDI], Treasurer, aged 46 years (20 members, ZAR500/month)

"Our constitution says if one fails to make payments throughout the year, we cannot return... They lose their money."

"We ask the member, even on the first month... what their reasons are... what they have already contributed will be lost, as the constitution said at the beginning."

- Participant 7 [IDI], Treasurer, aged 35 years (15 members, ZAR400/month)

Others spoke of how, in their stokvel, the member was given an additional opportunity to catch up on payments. However, if the member failed to pay, they would be refunded but removed from the stokvel group within the month of grocery purchase. Another participant reported that if a member could not cope with their financial commitments, the group did not chase after them but instead refunded them and asked them to leave the group. Some stokvel deducted a ten per cent administration fee and then refunded the balance.

"And we would say, fellow, you are not coping. What do you suggest that we do? We do not want to be running after the person. We give the person their R350."

- Participant 10 [FGD2], stokvel member, aged 35 years (ZAR350/month)

"In our constitution, if a member wants to quit, they may give up their money or find a replacement."

- Participant 5 [IDI], Secretary, aged 48 years (20 members, ZAR350/month)

"If a member wants to quit and cannot continue, we let them leave, but they do not get the money until we share it."

- Participant 8 [IDI], Secretary, aged 35 years (10 members, ZAR500/month)

"If one has decided that they want to quit, we remove their names from the book and return their money for all the months they have contributed."

"We take a ten per cent fee because we have already budgeted with the money. Plus, the bank has its charges when we keep the money with them, so we take that ten per cent to cover the charges."

- Participant 17 [IDI], Secretary, aged 22 years (10 members, ZAR400/month)

"If a member quits amid the stokvel cycle, they lose their money. But we do give them a month, but if they do not manage, they can ask someone else to replace them."

- Participant 6 [FGD2], stokvel member, aged 35, ZAR400/month

"Because you are failing, we will remove them."

- Participant 8 [FGD2], stokvel member, aged 40, ZAR350/month

"They lose their groceries, and they get nothing."

- Participant 9 [FGD2], stokvel members, aged 35 (20 members, ZAR400/month)

"When one did not bring their R450, as it is March now if one has not brought their R450 and March ends when they bring it in April, it will have an R150 penalty fee for not contributing in the previous month."

"The money must be all in, at the same date, on the date of grants payments."

- Participant 18 [IDI], Secretary, aged 30 years (450/month)

Some stokvels call a meeting when a member's behaviour has been deemed inappropriate, for example, when they default, providing them with an opportunity to explain their actions. Consequences varied depending on the constitution and the nature of the infringement. If members consistently fail to meet

their obligations, they are removed from the group, and their money is returned. However, they were not readmitted due to a lack of trust.

"They hold discussions and explain to the person what they have done is not right."

"If someone has not done well, they are scratched out of the book."

"We return their money, but they are not taken back in because they are untrustworthy."

- Participant 6 [IDI], Treasurer, aged 47 years (20 members, ZAR500/month)

In some stokvels they impose penalty fees for late payments and absenteeism, indicating the group's commitment to punctuality and attendance. The amounts of these penalties differed according to the stokvels rules of engagement.

"If one arrives late, one pays R20. If one does not attend at all, the fee is R50."

- Participant 8 [IDI], Secretary, aged 35 years (10 members, ZAR500/month)

"We do not allow late payments. If the money does not come at the expected time, we charge a penalty fee of R150."

- Participant 10 [IDI], Chairperson, aged 24 years (10 members, ZAR200/month)

"We charge them ten rands if they are late. If we said the meeting is at three, and they reach this place at four, no, we charge them."

- Participant 15 [IDI], Chairperson, aged 60 years (20 members, ZAR200/month)

"When one arrives late on the meeting day, they are charged thirty rands. If one misses the meeting, they are charged fifty rands to top it all."

"If one is not going to make it to the meeting, they must send the contributions with one of us, not someone from outside. This is for the reasons of safety because we are dealing with money."

- Participant 17 [IDI], Secretary, aged 22 years (10 members, ZAR400/month)

In summary, different approaches were used in handling non-compliance. These strategies included implementing penalties, removing non-compliant members from the group, or withholding their contributions. In some cases, before resorting to these measures, some stokvels allowed members to explain any late payments. While they may have received understanding and support from other members

while they navigate through their financial difficulties, trust was emphasized as a crucial element of this process.

5.5.3 Governance (C) and social cohesion, commitment (M)

The concept of *ubuntu*, which emphasizes communal values and mutual support, emerged as a significant factor in the governance of stokvels (C), particularly concerning ensuring household food security. This notion underscores the importance of maintaining commitments within the group. Adherence to the principles of *ubuntu* fosters a strong sense of responsibility and solidarity among members. It is understood that the success and effectiveness of the stokvel, especially in securing food for households, largely depend on each member's commitment to the group's collective goals and obligations (M). In essence, the spirit of *ubuntu* within the stokvel reinforced the idea that the group's success in achieving household food security is contingent on the dedication and cooperation of all its members. Another participant emphasized the importance of commitment when joining a stokvel, suggesting that members should be sure about their willingness to participate to avoid inconsistency or discontinuity.

"If one is joining the group, they must be sure that they want to commit because we do not want on and off."

- Participant 3 [IDI], Vice-chair, aged 30 years (10 members, 500/month)

The study findings also showed that grocery stokvels are more than just financial entities but rather are lifelines that ensure families do not face hunger. As one of the participants highlighted, their pooled resources allowed families to have sufficient food for months. This communal pot acts as a buffer against times of scarcity, turning the fear of empty plates into an assurance of nourishment.

"Stokvels help us a lot because the little we pool together brings us something. We can eat as a family for months."

- Participant 5 [IDI], Secretary, aged 48 years (20 members, ZAR350/month)

Another participant also highlighted that it's not just about the quantity of food; it's the quality of life and the peace of mind that comes from knowing that the struggle to provide daily meals was shared and mitigated by the group's collective effort.

"Food stokvels help a lot. One does not feel hardship."

- Participant 8 [IDI], Secretary, aged 35 years (10 members, ZAR500/month)

Stokvels also appeared crucial in providing their members with financial support and a sense of community (a sense of belonging). The sense of belonging and camaraderie within stokvels was highly valued as participants cherished the opportunity to engage with others and perform activities collectively. They believed that success felt more rewarding when shared, and their support from fellow members lightened their burdens and enhanced their overall well-being. Participants emphasized the importance of mutual support, highlighting that, as individuals, it was vital to stand by one another and offer assistance when needed.

"It is very nice to be part of stokvels. There is nothing you can do (on your own). I see that one would be unable to buy what they want when they are alone."

- Participant 1 [IDI], Treasurer, aged 46 years (20 members, ZAR500/month)

This individual emphasized that the store's grocery share lasted for months, enabling them to fulfil essential needs such as purchasing shoes and winter clothes for their children. This testimony underscores the practical assistance provided by stokvels in addressing immediate needs beyond food, thereby contributing to overall household well-being.

"...One time, I got into the car or a taxi, and I found out that there is a stokvel in Site C. I found out that, oh, that is their way of life as they were telling the story in a taxi. It is for that reason I joined. That is when I saw...our stokvel distributes twice – in June and November. I saw that it is of help because when you get the grocery share, it lasts for months... So, as a person with children like me, I manage to buy them shoes and winter clothes. That is how it helps. Because one cannot always have money, the little money that one gets, we run and buy food. So, the stokvel helped me that way, and it has been three years since I have joined."

- Participant 2 [FGD 4], aged 37 years ZAR500/month

As mentioned, many staff members travel to their rural homes during the end-of-year holidays, usually outside of the Western Cape Province. A significant influence on food purchasing, in part, related to the participants' need to provide for their large families. Furthermore, store discounts and affordable items drive the desire to purchase groceries. Participants tend to buy food items from wholesale stores where

stokvel members can buy in bulk and receive discounts, food at marked-down prices or vouchers in exchange for money spent.

“Sometimes, what helps in decisions is those things you can get in bulk. You see when they say there is a special on Makro's bulk buying. There is a special at Pick n Pay. Or there is a bulk special at Checkers. That's how we decide most of the time.”

- Participant 14 [IDI], aged 58 years (23 members, ZAR800)

Grocery stokvels are more than just informal associations; they are vital instruments of social cohesion that play a crucial role in enhancing food accessibility and security. By pooling resources, these stokvels empower participants to meet the food needs of their immediate households and extend support to their wider family networks. This collective approach provides financial support and a sense of belonging while offering a practical solution to food-related challenges. As members collaboratively manage their resources to purchase groceries, they ensure more consistent and reliable access to food. This, in turn, contributes to a shared prosperity that enhances their overall well-being and mitigates hardships related to food insecurity within their broader community.

"We sit down and reason together."

"We support each other, we keep each other."

"As people, we have to support each other."

- Participant 6 [IDI], Treasurer, aged 46 years (20 members, ZAR500/month)

Favourable social conditions influence decision-making relative to food purchasing. Stokvel's benefits include the cultivation of friendships and social relationships. Communal thinking and group support were highlighted as another key benefit that added to the cohesiveness of stokvels as a social and financial entity. Participants reported they were able to learn how to save and attained help in improving budgeted spending. Furthermore, they believed that pooling funds acted as a subsidy, giving them access to food choices they otherwise could not afford. This underscores the foundational purpose of grocery stokvels in communities thus providing food security. Our findings show that through collective savings and purchasing, members of stokvels ensured that their families could weather financial uncertainties and maintain consistent access to food.

5.5.4 Financial governance (C) and securing and pooling funds for future purchase (M)

Another contextual factor important for household food security that emerged from the current study was the financial governance of stokvel contributions (C). Results highlighted the importance of various approaches in managing the contributions of stokvel members, including documentation, fund handling, and for some, integration into formal financial systems. The success of stokvels in achieving outcomes such as improving household food security was shown to rely on consistency, commitment, and regular contributions from group members. These factors allowed for effective planning and utilization of funds. The key differences were found in the amount, frequency, and form of contributions, ranging from online transfers to gift cards or cash. Additionally, participants differed in how they saved or secured the pooled funds.

"No, we cannot keep our money with a person. If we are sitting late on a Saturday, we make sure that we contribute R350, and there is an extra five rands that we add for each member."

- Participant 2 [IDI], Secretary, aged 40 years (15 members, ZAR350/month)

They argued that depositing the money into a bank ensured a secure and centralized location for their funds. These stokvel members took pro-active steps to handle and secure their contributions. They understood the importance of safeguarding their money and saw the bank as a reliable institution to fulfil this purpose. While they acknowledged the additional cost of bank charges, they willingly added ten rands to cover these fees, considering it a reasonable expense for the peace of mind and assurance of their stokvel's financial integrity.

"We contribute each and every month... We opened a bank account where we put the money."

"We also add an extra ten rands for bank charges."

- Participant 3 [IDI], Vice-chair, aged 30 years (10 members, ZAR500/month)

A stokvel leader belonging to a stokvel whose members were mostly older women reported using an alternative method by loading their contributions onto supermarket gift cards entrusted to a designated person. This approach combined the convenience of a widely accessible retail store and the trust placed in the cardholder to manage the funds.

"We contribute money and load it onto the [supermarket] gift cards."

"We go and load onto those cards kept by one person."

- Participant 4 [IDI], Chairperson, aged 45 years (15 members, ZAR400/month)

Other Stokvel leaders indicated a shift in their group's behaviour as they have transitioned from banking their money to depositing it in big boxes and major retail stores. This change was attributed to various factors, such as convenience, accessibility, or perceived benefits these stores offer over traditional banks.

"Previously, we would bank our money, but now we deposit it with big box stores."

- Participant 5 [IDI], Secretary, aged 48 years (20 members, ZAR350/month)

"When we are done, we take it to a retail giant. Where it is kept because that is where we buy our food from."

- Participant 2 [IDI], Secretary, aged 40 years (15 members, ZAR350/month)

Another participant highlighted that the chairperson was entrusted with receiving the deposited money into their Stokvel account and ensured accountability by requiring proof of payment from the members, typically shared in a WhatsApp group. This arrangement promotes transparency and trust among the stokvel participants.

"They deposit the money into my account as the chairperson and provide proof of payment in the WhatsApp group."

- Participant 10 [IDI], Chairperson, aged 24 years (10 members, ZAR200/month)

Some of the stokvel members managed their stokvel bank accounts collectively. For instance, another participant emphasized the collective nature of their stokvel, where three members collectively managed their money at the bank. This approach indicated a joint decision-making process for accessing and withdrawing their contributions, reinforcing the shared responsibility and commitment within their stokvel.

"We take our money to the [bank] as three members. And when we are going to take it out, we go as three members."

- Participant 14 [IDI], Vice-chair, aged 58 years (23 members, ZAR800/month)

Despite the practical benefits of stokvels, logistical challenges arose due to time constraints. However, participants have found innovative solutions by leveraging technology, such as creating WhatsApp groups

for virtual meetings. This approach enabled them to overcome scheduling conflicts and maintain their engagement and communication with other stokvel members.

"We have a WhatsApp group, and that is where we have our meetings because we do not have time to gather in person."

- Participant 10 [IDI], Chairperson, aged 24 years (10 members, ZAR200/month)

Some stokvels' monthly contributions were collected and deposited within a store account at wholesale stores frequented by stokvel members, where they have built a rapport with staff. To avoid fresh produce turning stale due to bulk purchasing, a member of one food stokvel mentioned that they opted to keep their purchased groceries at the store where they can retrieve portions at monthly intervals.

"We contribute money. This money, we bank it."

- Participant 1 [IDI], Treasurer, aged 46 years (20 members, ZAR500/month)

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"But because we have [discount supermarket] nearby ...there is a deal that we struck with the managers that we will buy this grocery. It is ours, but we will not take all of it simultaneously. So that it does not rot when we are in the house."

- Participant 6 [IDI], Treasurer, aged 47 years (20 members, ZAR500/month)

These quotes illustrate the diverse ways stokvels manage their contributions, including utilizing bank accounts, retail gift cards, and big box stores. The underlying theme was the need for trust, accountability, and cooperation among the members, regardless of the specific method chosen to handle their funds.

5.6 CMO configurations for Food Security (Food preference and quality)

5.6.1 Governance (C) and approach to food purchase decision-making (M)

Stokvels members reported a collaborative decision-making approach (M) when purchasing groceries and making group decisions. One participant argued that in their stokvel, no single person held authority or acted as a boss. Instead, decisions were made collectively, thus ensuring that everyone had an equal say. This participatory approach promoted inclusivity and avoided any power imbalances within the group.

“So, there is no one who is a boss who will say we must do this now. This is what is going to be eaten.”

- Participant 6 [FGD 1], stokvel member, aged 51 years ZAR400/month

Members explained that the contribution of money towards the purchase of groceries occurred before the buying process. Typically, before the purchase, all members convened for a meeting. Therefore, individuals unable to attend the meeting were excluded from the decision-making process. This reinforced the importance of attending the meeting when the grocery list was discussed and finalized.

“We contribute the money, and closer to the time of buying, we all gather in a meeting. The person who will be decided for did not attend the meeting we specified to list groceries.”

- Participant 8 [FGD 1], stokvel member, aged 50 years, ZAR400/month

“We sit and discuss our grocery list so there are no arguments.”

“We try to accommodate everyone's preferences, even if they differ on flavours.”

- Participant 5 [IDI], Secretary, aged 48 years (20 members, ZAR350/month)

“We all sit together, and we decide on how we are going to buy food.”

- Participant 9 [IDI], Secretary, aged 36 years (12 members, 500/month)

“We all sit down and discuss about it [type of food to be bought].”

- Participant 13 [IDI], Vice-chair, aged 59 years (30 members, ZAR400/month)

This demonstrates a commitment to valuing each member's input and ensuring their needs are considered. Several participants emphasized the collective nature of decision-making within stokvels. The practice of

sitting down together as a group to discuss and determine the type of food to be purchased was highlighted several times. This process thus fostered transparency, collaboration, and mutual agreement among the members.

Sometimes, the stokvel members select a designated group, tasked with purchasing food according to a predetermined item list. Before doing so, the selected members approached retail store managers, some of whom offered assistance with the purchases. Afterwards, they report back to the group about the purchases and the group's finances. It is understood that in purchasing and sharing groceries equally, efforts were made to cater for all members' dietary preferences, so allowances for food swaps or substitutions were made. If someone doesn't eat pork, for example, beef was purchased for them, with the same amount of money.

"We choose them because they sell food in bulk. So, we manage to distribute equally."

- Participant 4 [FGD3], stokvel member, aged 60 years R400/month

"What happens is that others, perhaps, someone would say, they do not eat, maybe, pork. So, they will say, themselves, that they would rather be bought beef. The money is the same so they will buy beef for that amount. If pork is bought for R250, they, too, will be bought mutton of R250."

- Participant 2 [FGD4], stokvel member, aged 46 years R500/month

"We all sit and decide together [which shop to buy from]."

"Some of the things we buy from a local big box store. And we buy other items from another local big box store."

- Participant 1 [IDI], Treasurer,

"We stress buying in bulk, such as 12s or 24s."

- Participant 8 [IDI], Secretary, aged 35 years (10 members, ZAR500/month)

It was clear that almost all participants spoke to the transformative impact of stokvels on their grocery buying habits. Some stokvels are purchased infrequently and in bulk, typically at the end of the year. These purchases served a dual purpose: to provide for the holiday period. During that time, many stokvel members travelled to their traditional homes away from the city, especially in January, when finances were stretched due to the holiday and the start of school.

"We share only once a year. First week of December."

- Participant 1 [IDI], Treasurer, aged 46 years (20 members, ZAR500/month)

"It does have a lot of change, sister. That thing of buying food every month, I no longer do. I buy food, perhaps from January until May. From June, in buying food or using money, I do not use it as much as I used to."

- Participant 2 [IDI], Secretary, aged 40 years (ZAR350/month)

One participant described a shift in their purchasing patterns, notably reducing food buying frequency from January to May, which reflects a change in their spending habits. This change highlights how participation in stokvels can impact the timing and frequency of grocery purchases, enabling individuals to plan and manage their resources more efficiently.

The shelf-life of items also further influenced purchasing choices as participants expressed satisfaction that foods last for months after purchase. These foods included mealie meals, rice, sugar, and flour, usually purchased in quantities of 10 kilograms or more. These food choices were often tailored to the specific diets of each household, usually focusing on providing enough food so that the family did not experience hunger, with little to no emphasis on food quality.

"We eat to be full—too much starch. Fatty foods, pork and sausage."

- Participants 3 [FGD 4], aged 60 years, R350/month

"The decision on the type of food to be bought is made by each member individually, but the total cost must not exceed R3000."

- Participant 10 [IDI], Chairperson, aged 24 years (10 members, ZAR200/month)

One participant emphasized that their stokvel activities aligned with school holidays when visitors and school-children were home. They expressed a desire for an ample food supply during this period, highlighting the importance of having enough food to cater to increased household demands.

"Our aim was... during the time where we share in our stokvel are during school holidays. So, there are visitors, and the school kids are at home. So, our wish is that there must be enough food."

- Participant 7 [IDI], Treasurer, aged 35 years (15 members, ZAR400/month)

Another participant emphasized that prioritizing satisfying the family's hunger takes precedence over focusing on a balanced diet. This sentiment reflects the immediate need for sustenance and acknowledges that a balanced diet might not always be achievable.

"You will not be looking at the diet and telling your kids that, my children, the diet. You have... A family must be fed to the satisfaction. But the diet is not even on the top of the list."

- Participant 10 [FGD 2], stokvel member, aged 35 years, ZAR550/ month

5.7 CMO configurations for Food Security (Food access)

5.7.1 Governance (C) and transportation and last-mile distribution (M)

We evaluated the CMO encompassing the governance structures of stokvels (C) and their influence on transportation and last-mile distribution mechanisms (M). The study underscored that efficient governance (C) is a crucial element that significantly affects transportation logistics and the distribution of bulk purchases to the final delivery points. Stokvel members reported using different transportation methods, such as collecting separate funds for transportation or utilizing the penalty fees collected from member defaults and other infractions. Others hire their own transportation, including bakkies or personal vehicles, while some rely on public transport. Certain retail stores also offered transportation options at discount rates for bulk purchases or receiving free delivery depending on the store and arrangements. Where payment was required, participants in stokvels stressed that they bore the costs associated with transportation through private hires or as part of the purchasing arrangement with retailers.

"We get the transport from the shop. But we also pay for it. We pay for it ourselves."

- Participant 1 [IDI], Treasurer, aged 46 years (20 members, ZAR500/month)

"We get transport from the shops... or hire our own transport."

- Participant 3 [IDI], Vice-chair, aged 30 years (10 members, ZAR500/month)

"The places we buy from have their own transport, but we can also bring our own or use people with bakkies."

- Participant 5 [IDI], Secretary, aged 48 years (20 members, ZAR350/month)

They also clarified that the funds for transportation were separate from the grocery money, indicating that participants contribute additional funds specifically for transportation expenses.

"We contribute on the side for transport money, and it does not come from the grocery money."

- Participant 5 [IDI], Secretary, aged 48 years (20 members, ZAR350/month)

In one instance, the stokvel contributed R50 per member to cover transportation costs.

"We do not have transport as such people. So, we decide on our own that we will contribute R50 each to accommodate transport."

- Participant 2 [FDG 2], stokvel member, aged 51 years, R350/month

In some cases, stokvels utilized the interest earned from bank savings to hire transportation for delivering their purchased goods. Alternatively, taxis (public-mini-buses) are used for transportation when the shop is nearby or when, in some cases, each member makes their purchases individually.

"We use the interest from the bank to hire transport for delivering our food from the shop."

- Participant 8 [IDI], Secretary, aged 35 years (10 members, ZAR500/month)

"We use taxis for transportation as the shop is nearby, and the groceries are bought individually."

- Participant 10 [IDI], Chairperson, aged 24 years, (10 members, ZAR200/month)

"In mine, we buy our own groceries and organise our own transport."

- Participant 9 [FDG 3], aged 37 years, R400/month

To address the high costs associated with external transport services, another participant shared that their stokvel sought assistance from community members who owned larger vehicles, such as bakkies (pick-up trucks), and paid for their petrol in exchange for their transportation services. The financial contribution for transportation was made when required, indicating a flexible arrangement.

"We tried to look for transport but, no, it costs a lot. So, we decided, okay, let us do it this way, there is transport in our community. So, we looked for those people with big cars to assist us, and we pay their petrol."

"We contribute it at the time it is needed."

- Participant 17 [IDI], Secretary, aged 22 years(10 members, ZAR400/month)

Another participant reported that transport arrived at the gathering point, collected the stokvel members, took them to the designated location (such as a shop), and returned them afterwards.

"The transport comes to the place where we gather, it takes us from there, and then it brings us back."

- Participant 6 [FDG 2], aged 30 years, R450/month

In summary, this strategic orchestration of transportation and last-mile delivery plays an integral role in bolstering the stokvels' effectiveness and ensuring that their economic and social objectives are met. Stokvels employed various methods to acquire transportation, including using personal vehicles, hiring external transport, utilizing community members' vehicles, or relying on taxis. The stokvel members covered transportation costs through separate contributions, and the transportation logistics were organized according to the specific agreements made within each stokvel.

5.8 CMO configurations for Economic leverage (Financial leverage)

5.8.1 Economic leverage (C) and bargaining for lower prices, increased buying power (M)

The other CMO we investigated in our study was economic leverage (C). within stokvels and how this translates into bargaining for lower prices and increased buying power (M), this collective approach allows stokvels to negotiate more effectively with suppliers, leading to reduced costs and greater buying power (M). By pooling their resources, members can leverage their collective economic influence, which ensures better deals and lower prices and significantly contributes to the stokvel's overall financial efficiency and effectiveness. This collective bargaining process demonstrates how stokvels utilize their combined economic weight to achieve more favourable purchasing terms, a key mechanism in sustaining their financial health and improving members' economic standing. Participants expressed the benefits of being part of a stokvel, emphasizing that it provided them with the financial leverage they could not have as individuals. Working together with others allowed them to fulfil their desires and make purchases that would otherwise be unattainable. The collective nature of stokvels alleviated the burden and cost of individual endeavours, enabling members to achieve their aspirations.

"Our stokvel started in 2016, and I joined them in 2019. Our reasons for us to start this stokvel... many people were finding it difficult to save their money on the side. And they would not see where their money goes to."

- Participant 9 [IDI], Secretary, aged 36 years (12 members, ZAR500/month)

The financial aspect of stokvels was particularly significant. Participants acknowledged that pooling resources together yielded substantial benefits, such as shared meals, for extended periods.

"Because with one's money alone, you can't do anything if you are working. For money to do things one can see, it must be combined with other women's money."

- Participant 3 [IDI], Vice-chair, aged 30 years (10 members, ZAR500/month)

Stokvels members indicated they gathered in meetings to discuss purchasing logistics, aiming to reach a consensus through shared decision-making. Depending on the stokvel's arrangements, these meetings were conducted virtually in some cases or in person. The primary focus was determining what food types to purchase, and which stores to buy them from. To find the best prices, members often visited various stores before the purchase day to compare prices and select the most affordable options. Generally, the administrators and fund holders are responsible for managing the pooled funds, while the chairperson and secretaries may be involved in the distribution process in some stokvels. This collective approach enables stokvel members to share information and resources, ultimately securing better prices and deals for their purchases by leveraging their collective bargaining power.

"So, they will share that there is a cheap wholesale in a certain place. And we look around for better prices. Then, when we are going to buy, four or five people get sent to the wholesale that has been identified as cheap."

- Participant 2 [FDG 4], stokvel member, aged 35 years, ZAR450/month

Overall, these quotes highlight the collaborative and consensus-driven nature of stokvels. Through sharing information, conducting thorough discussions, and leveraging technology, stokvel members worked together to achieve their financial objectives and enhance their purchasing power.

5.9 CMO configurations for Economic leverage (Value for money)

5.9.1 Governance and financial governance (C) and liaising with retailers and wholesalers (M)

In our investigation, another CMO focused on the governance of collective decision making and the economics of scale (C) that allow stokvels to negotiate favourably with retail and wholesale suppliers (M). This synergy enables stokvels to interact directly with suppliers, facilitating access to bulk purchasing opportunities and preferential rates (M). This approach broadens their access to various products and allows them to negotiate terms that might not be available to individual buyers.

One advantage emphasised by a participant was the ability to secure lower prices because of bulk purchases from big box stores and major retail supermarkets. Another participant stated that they chose the shops to purchase from based on which one had specials for the most needed grocery items, particularly from discount supermarkets.

"We all agree as the group... on the shop, we are all going to buy from... we buy from a [retail giant]."

- Participant 7 [IDI], Treasurer, aged 35 years, (15 members, ZAR400/month)

"We buy groceries from a big box store and a retail supermarket because they offer lower prices."

- Participant 8 [IDI], Secretary, aged 35 years (10 members, ZAR500/month)

"We buy from [discount supermarkets]. It depends on the shop that has a special of the grocery items that we need the most."

- Participant 9 [IDI], Secretary, aged 36 years (12 members, ZAR500/month)

"We only use a [discount supermarket] for grocery shopping, and we have a deal with them for staggered purchases."

- Participant 10 [IDI], Chairperson, aged 24 years, (10 members, ZAR200/month)

As regular customers, another participant mentioned receiving discounts on food hampers (*typically bundled products consisting of a selection of food items and sometimes other related products, packaged together*) and other items. Comparing prices was essential, and most of the participants highlighted that they bought from more than one shop, using specials and discounts. It was also highlighted that the group members compare prices by collecting papers advertising specials from discount supermarkets and big box stores before making the actual purchase.

"We get discounts on hampers and other items because we are regular customers of a discount supermarket."

- Participant 11 [IDI], Treasurer, aged 35 years (15 members, ZAR500/month)

"We buy from all these places that have specials."

- Participant 14 [IDI], Vice-chair, aged 58 years (23 members, ZAR800/month)

"We first take the paper for specials from a [discount supermarket], and we take the paper from a [big box store]. And we compare prices."

- Participant 18 [IDI], Secretary, aged 30 years (15 members, ZAR450/month)

"The members go there. We select three members in my stokvel... Then, when we are going to buy, four or five people get sent to the wholesale that has been identified as cheap."

- Participant 2 [FG4], aged 40 years, R400/month

This method of direct engagement with suppliers exemplifies a key mechanism by which stokvels improve their purchasing power and economic efficiency.

5.10 Discussion

In our study, we explored the influence of grocery stokvels on food purchasing decisions and practices among their members in South Africa, uncovering several key aspects. Our study findings showed that stokvels function as more than mere financial collectives and are instrumental in fortifying food security and economic leverage for their members. This concurs with what has also been observed in previous studies, where stokvels not only facilitated a dependable means of securing food sustenance (M D M Cullen, 2018), preference (Mabika, 2018), and access (Mabika and Tengeh, 2021) but also empowered members through financial leverage (Buijs, 2002; Van Wyk, 2017) and ensured value for money in food purchasing (Mabika, 2018; Mabika and Tengeh, 2021; Retail Brief Africa, 2023). Our findings emphasized that stokvels serve as vehicles for savings and investments and as social platforms that foster social cohesion and relationships among members. The social convention and governance structure of stokvels was reported to play a significant role in the functioning and success of these associations (Matuku and Kaseke, 2014; Mabika, 2018; Ngcobo *et al.*, 2018; Menze, 2019; Nkambule N, Nkambule and Mohammed, 2019; Mabika and Tengeh, 2021).

A key highlight of our study is the central focus on unity and cooperation within stokvels, which are essential elements for their success. This unity and cooperation are often evident in the collective decision-making process within the governance structure of stokvels (Kibuuka, 2007; Matuku and Kaseke, 2014; Cliffedekkerhofmeyr, 2023). The idea of ubuntu deeply embedded in the stokvels' operations fosters a resilient social fabric that not only shields against food scarcity but also cements financial solidarity among members (Ndhlovu, 2024). Our study findings show that this communal approach amplifies their bargaining power, allowing them to negotiate favourable terms with retailers and wholesalers, thereby enhancing the collective's purchasing efficacy. Stokvels are key community groups that do more than handle money. They are a strong support system for ensuring people have enough food and helping everyone in the group improve their financial strength.

The research findings suggest that participation in food stokvels significantly influences the frequency of grocery purchasing. Stokvel members reported a change in their purchasing patterns, reducing the frequency of buying food between January and May and decreasing the allocation of money for food and the opportunity to use funds at hand for other immediate non-dietary needs. This indicates that stokvel participation enables individuals to plan and allocate their resources more efficiently, leading to a more

structured and less frequent grocery purchasing behaviour (Gwamanda, 2019a; Mabika and Tengeh, 2021). Furthermore, the study found that the long shelf-life of certain food items influenced purchasing choices among stokvel members. The primary motivation behind these food choices was to provide sustenance for their families rather than focusing on nutrition. The availability of food items with extended shelf-life allowed stokvel members to make bulk purchases, reducing the need for frequent grocery trips and providing a sense of security in having an adequate food supply (Lenk *et al.*, 2020; Pieters, Edsall and Geddes, 2023).

The governance within stokvels represents a cornerstone of their functionality and success (Response and African Response Research, 2012; Smallhorne, 2013; Holmes, 2017; Bäckman Kartal, 2019; Fairbridges Wertheim Becker, 2019; Nkambule N, Nkambule and Mohammed, 2019). Operating through self-regulated constitutions, whether written or orally agreed upon, these communal savings groups enforce a structured approach to managing contributions, implementing penalties for non-compliance, and delineating clear roles among members (Hutchison, 2020). This was also evident in our study as such governance ensured the orderly conduct of stokvel activities and fortified trust and accountability within the groups. Decisions regarding financial contributions, food purchasing, and distribution were reported to be made democratically, respecting the voice and vote of every member, thus underscoring the egalitarian nature of stokvels (Ngcobo and Chisasa, 2018). This inclusive and participatory governance model is integral to fostering a cohesive community that is committed to the collective welfare of its members, reinforcing the stokvel's role as an instrument for both social (Mulaudzi, 2017; Dube, 2018; Storchi, 2018; Masoga A. L., 2019; Radebe, 2019) and economic empowerment (Mashigo and Schoeman, 2012; Schoeman and Mashigo, 2012; Van Wyk, 2017; Phatlane, 2021). Through these self-governance practices, stokvels can navigate the complexities of collective saving and spending, ultimately contributing to their members' food security and economic resilience. The revised initial programme theory (Table 8) reflects a more organized and structured approach within stokvels, with clear governance and accountability mechanisms (Phatlane, 2021). This can be seen as a response to the more heterogeneous and autonomous nature.

Table 8: Context, Mechanisms and Outcomes (CMOs) revised based on the study results

Context	Mechanisms	Outcomes
<p><i>Membership demographics</i> - age range of 24 to 60 years,</p> <p><i>Stokvel size</i> -10 to 30 members</p> <p><i>Stokvel structure</i> -diversity in rules and organizational structures -regular monthly meetings</p> <p><i>Contributions</i> -range from ZAR200 to ZAR1500 per month</p> <p><i>Membership criteria</i> -focus on sustainability -self-reliance -household independence -employment status -gender</p> <p><i>Financial ecosystems</i> -employment vs. grants</p>	<p><i>Financial and social support</i> -stokvels as a means for collective purchasing -shared success -community belonging</p> <p><i>Contribution & management</i> -diverse methods, including banking, gift cards, and retail store accounts -emphasis on accountability and trust</p> <p><i>Governance</i> -constitution outlining behaviour, activities, and financial management -equal member treatment and responsibility</p> <p><i>Handling non-compliance</i> -strategies ranging from forfeiture to refunds with penalties -ensuring commitment</p> <p><i>Decision-making</i> -democratic process -decisions made collectively for purchasing groceries -leveraging technology for communication</p>	<p><i>Food security</i> -ensuring food sustenance -mitigating hardship -allowing families to weather financial uncertainties -providing for food preferences & quality -improving access (last mile distribution)</p> <p><i>Economic leverage</i> -collective contributions leading to greater buying power -enhanced financial planning</p> <p><i>Social cohesion</i> -fostering relationships -mutual support -communal decision-making</p>

Within stokvels, members deeply appreciate the importance of collective decision-making concerning their purchases (Dube, 2018). Thus, emphasizing a participatory process that values the contributions of every member. This decision-making approach highlights individuals' agency and the importance of reaching a consensus within the stokvels. Additionally, members acknowledge the role of the group in determining the most essential items to prioritize. This group decision-making process showcases the collective efficacy of stokvels in addressing the needs and preferences of all members, as supported by a recent study conducted in South Africa (Erzse *et al.*, 2023). The conflicts primarily revolved around financial matters, contributions management, and disagreements regarding pooled resource allocation. A study involving stakeholders noted that conflict resolutions within stokvels predominantly occur through informal means rather than formal legal structures (Stakeholder Mapping, Lukwa *et al.*, in review). This observation aligns with the participants' responses, as they emphasized resolving conflicts through open

dialogue, negotiation, and mutual understanding. Our study findings showed that despite the challenges faced by stokvels, their success depended on the ability of members to work together, listen to each other, and respect diverse views. Stokvels strengthen social bonds and foster mutual understanding among members by creating a sense of shared responsibility. This speaks to one of the attributes that also came out from our recent work (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022), that stokvels are informal groups based on social cohesion.

Additionally, we found that some stokvels adopted staggered pickup or delivery strategies for food to prevent spoilage, reflecting a practical approach to managing perishable goods. This practice helps members stretch their budgets, ensures financial and food security for their families, and fosters healthier long-term spending habits (Retail Brief Africa, 2023). Moreover, our study corroborates previous research, confirming that stokvels prioritize obtaining discounts and buying in bulk (Matuku and Kaseke, 2014; Mulaudzi, 2017; Mabika, 2018; Mabika and Tengeh, 2021). This trend suggests that the emphasis within these savings groups is more on the quantity of food procured at lower costs rather than the quality of the food items (Fanzo, 2023; whatsfordinner, 2024). This suggests that while stokvels effectively address certain aspects of food security, little emphasis is placed on nutritional adequacy or health.

Stokvels' governance structure and demographic composition play a significant role in their operational stability and member commitment, as evidenced by our study findings. Literature supports the notion that stokvels prefer members who are independent householders, suggesting that such individuals provide a level of stability and are less likely to make unpredictable withdrawals, a factor critical to the stokvel's financial health (Kibuuka, 2007; Moloj, 2011). This preference is aligned with the presumption that married individuals and parents are more likely to have a long-term commitment to the group, a sentiment echoed within the stokvel community (Ngcobo *et al.*, 2018). Our research further revealed a nuanced approach to membership selection, where employment status and eligibility for government grants were considered. This flexibility indicates Stokvels' responsiveness to the varying economic realities of potential members, allowing for broader inclusion of individuals across different socio-economic backgrounds (Gwamanda, 2019). The adaptability in membership criteria underscores the Stokvels' aim to accommodate a diverse financial landscape while maintaining a reliable collective committed to the group's objectives.

Our study highlighted the diverse approaches to financial management within grocery stokvels in South Africa. Stokvel members used banks and discount supermarkets as secure ways to protect and save their funds, which was different to the traditional way of saving in which stokvel members would keep the

money themselves (Matuku and Kaseke, 2014). While some stokvels choose to deposit their contributions in banks, reaping the benefits of earned interest (ABSA, 2023; FNB, 2023; Nedbank, 2023; Standard Bank, 2023) and utilizing the funds for transportation costs, others opt for alternative avenues such as big box stores, retail stores, or supermarkets. However, it is important to note that the advantages of banking with these establishments may differ. In cases where stokvels establish fixed prices for products with the stores, the primary benefit lies in hedging against inflation, allowing members to secure goods at agreed-upon rates even if prices rise. Conversely, stokvels that utilize value-based gift cards and are subject to inflationary pressures experience challenges as the purchasing power of their contributions could be impacted over time (News24, 2023). Thus, it becomes crucial for stokvel members to carefully consider the implications of their chosen saving methods and evaluate the long-term effects on the value of their contributions.

The variability in selection criteria across stokvels, as noted in existing studies (Aitchison, 2003; Kibuuka, 2007; Moliea, 2007; Response and African Response Research, 2012; Barry, 2015; Evans, Steyn and Senekal, 2015; M D M Cullen, 2018; Ngcobo *et al.*, 2018; Fairbridges Wertheim Becker, 2019; Ngcobo, 2019; Hutchison, 2020; Mabika and Tengeh, 2021) points to a tailored approach where some groups may specifically target certain demographics to fulfil their unique stokvel goals. This strategic selection process indicates the dynamic nature of stokvels, which seek to balance inclusivity with the pragmatic need for consistent contribution and participation. A notable observation from our study was that the members of grocery stokvels were primarily women, who are often the primary decision-makers regarding food in households (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). Our research further affirms the existing body of literature (Matuku and Kaseke, 2014; Mulaudzi, 2017; Gwamanda, 2019a; Ngcobo, 2019; Mabika and Tengeh, 2021), emphasizing that in South Africa, women wield considerable influence in stokvels. This underscores that women's contributions extend beyond financial aspects and contribute significantly to fostering community and solidarity among stokvel members. This involvement can be attributed to women's aspirations for self-sufficiency, financial independence, and economic stability (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022).

Our findings showed that Stokvels' contribution and management methods are essential components that underpin their functionality, with these mechanisms serving as integral aspects of their operation. The latter is attained through the collaborative pooling of resources and collective efforts (Gotyi, 2019). Stokvel members are then empowered through that process to achieve shared goals (Verhoef, 2020) and make significant purchases that would otherwise remain beyond their reach (Jiao, Moudon and Drewnowski, 2011; Mabika, 2018; Odunitan-Wayas *et al.*, 2020; Mabika and Tengeh, 2021; Retail Brief

Africa, 2023; Whatsfordinner, 2024). This practice establishes a financial safety net and cultivates a profound sense of communal achievement (Van Wyk, 2017), thereby enriching the overall well-being and mutual support network among its members. Our study showed that, while some stokvels experienced notable growth, primarily driven by community interest, it is paramount to recognize that their fundamental purpose remained grounded in fostering social cohesion and a shared sense of purpose.

Our results also highlighted the challenges of last-mile distribution and transportation in accessing food like those reported in other studies (Melkonyan *et al.*, 2020; Suguna *et al.*, 2021; Puram *et al.*, 2022; Silva, Amaral and Fontes, 2023). For instance, Melkonyan *et al.* (2020) evaluated the sustainability of last-mile logistics within local food networks, pinpointing the environmental and operational trade-offs in food distribution to final consumers. Puram *et al.* (2022) explored the operational challenges faced by on-demand food delivery riders during the pandemic in this context, which is a critical last-mile link. Silva *et al.* (2023) addressed the broader communication challenges that affect nutritional and food literacy, factors integral to informed food choices and consumption patterns. Lastly, Suguna *et al.* (2021) investigated the influential factors affecting last-mile delivery projects during COVID-19, revealing the complexities of food delivery systems in crisis conditions. Although these studies did not directly focus on stokvels, they provided valuable insights into the broader issues of food distribution that are pertinent to understanding the challenges stokvels may encounter in their role within the last-mile food supply chain.

It also provides insights into the strategies adopted to combat these challenges. For instance, some stokvels located near stores allow individual members to purchase groceries individually and use taxis for transportation. This proximity provides access to various food options and enables more frequent shopping trips (Athens, Duncan and Elbel, 2016; Wool *et al.*, 2021; Michele Ver Ploeg and Ilya Rahkovsky, 2023). Therefore, one could argue that the proximity to fresh food and efficient transportation arrangements contribute to the participants' overall food security and well-being (Lujabe *et al.*, 2022). Informed by our Initial Programme Theory (IPT), our research explores the complex roles played by stokvels. We highlighted how these groups function as effective financial instruments for savings and enhancing bargaining power and as powerful social platforms. Through their activities, stokvels facilitate economic leverage, foster strong social cohesion, and build meaningful relationships among members. This dual role underscores the multifaceted nature of stokvels as both economic enablers and social connectors within communities.

While some stokvels choose to deposit their contributions in banks, reaping the benefits of earned interest (ABSA, 2023; FNB, 2023; Nedbank, 2023; Standard Bank, 2023) and utilizing the funds for transportation costs, others opt for alternative avenues such as big box stores, retail stores, or supermarkets. However, it is important to note that the advantages of banking with these establishments may differ. In cases where stokvels establish fixed prices for products with the stores, the primary benefit lies in hedging against inflation, allowing members to secure goods at agreed-upon rates even if prices rise. Conversely, stokvels that utilize value-based gift cards and are subject to inflationary pressures may experience challenges as the purchasing power of their contributions could be impacted over time. Thus, it becomes crucial for stokvel members to carefully consider the implications of their chosen saving methods and evaluate the long-term effects on the value of their contributions.

5.11 Conclusion

This study provides valuable insights into the impact of grocery stokvels on decision-making processes and foodways among their members in South Africa. The findings highlight the significant role of women in stokvels, both economically and in collective decision-making. Stokvels serve as platforms for women to exercise agency, contribute to community building, and strive for self-sufficiency, economic independence, and financial stability. Understanding stokvel dynamics can inform policies and interventions for enhancing food security, economic empowerment, and community development in South Africa. Moreover, understanding the factors that influence food choice decisions by stokvels and their members, along with knowledge and skills exchange, may offer the opportunity to co-develop strategies to increase demand for and access to not only food to stave off hunger but also improved quality of food, to promote health.

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5.13 Declarations

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author Contributions

A.T.L ,O.A.A and E.V.L led the conceptualization and the overall drafting process of the manuscript. Section-specific drafting leads are as follows: A.T.L: Background. E.V.L, F.A.W and A.T.L: Review methods. DCE design. A.T.L and O.A.A : Discussion. E.V.L, O.A.A, F.A.W and A.T.L: Conclusion. All “Savings for Health” IDRC collaborators contributed to the overall structure and jointly led editing of the draft version, final version, reviewed and approved the final version of the manuscript. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The ethical implications and considerations of the study were thoroughly examined to ensure the protection, rights, and well-being of all participants involved. The Ethics Committee at UCT, through its diligent evaluation process, has granted this study ethical clearance with the reference number HREC: 200/2022.

Data Availability Statement

The de-identified dataset supporting the findings of this study is available upon reasonable request. Due to privacy and ethical considerations, the dataset has been de-identified to protect the confidentiality of participants' information.

Chapter 6: Evaluating the factors influencing Stokvel members' decision-making related to healthy food preferences, food traditions, and procurement strategies

This study investigates how stokvels, savings groups in South Africa, increasingly influence what people eat in cities. The study surveyed 200 members of stokvels, which are mostly led by women, to understand what makes them choose healthier food options. It was found that stokvels do more than help people save money; they also play a big role in changing what people eat. The research used statistical analysis to show that while stokvels are great at making food more accessible and helping people manage their money better, they could do more to help people eat healthier. The study highlights how stokvels could be a powerful way to promote public health by pushing for better nutrition and fighting against diseases caused by poor diets. It points out that we need new policies that use stokvels' social and economic power to ensure healthy food choices are not only possible but also adopted by communities.

Lukwa, A.T., Wayas, F.A., Lambert, E.V., Alaba, O.A., and “Savings for Health” IDRC Collaborators (2024). *Factors influencing informal savings groups decision-making related to food preferences and procurement strategies: a discrete choice experiment. (PlosOne-In Review)*

The relevance of the manuscript to the thesis: This manuscript substantiates the thesis by providing a detailed analysis of how stokvels influence dietary choices within South African food systems, utilizing discrete choice experiments to decode the behaviours of stokvel members, particularly their impact on healthier food selections. With data from 200 members, it uncovers the gender dynamics in stokvel participation and its implications on food buying habits, emphasizing stokvels' critical influence on dietary patterns and their potential to foster nutritional awareness and healthier lifestyles. Amidst South Africa's nutritional transition and rising NCDs, stokvels emerge as key to overcoming barriers to nutritious food access and affordability. The study advocates for integrating stokvels into wider public health strategies and establishing partnerships with local entities to harness stokvels' social capital for nutritional improvements, especially in urban settings plagued by malnutrition and obesity. The research envisions stokvels as proactive players in the urban food system, capable of driving economic empowerment and public health by steering communities towards nutritious diets, thus reinforcing the thesis that stokvels are essential to health and nutrition initiatives in South Africa.

Factors influencing informal savings groups decision-making related to food preferences and procurement strategies: a discrete choice experiment

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6.1 Abstract

Background

The evolving dynamics of global food systems are particularly pronounced in low and middle-income countries (LMICs), where accessibility and affordability of healthier food options remains a significant challenge. This is exemplified in South Africa, which is undergoing a nutritional transition marked by rising obesity rates and an increase in diet-related non-communicable diseases. In socio-economically deprived communities, trends show a concerning rise in overweight and obesity issues, often coexisting with undernutrition. This research focuses on stokvels, a form of community-based informal financial initiative prevalent in South Africa, particularly grocery stokvels which are mostly used for collective buying. This study aims to evaluate the factors influencing stokvel members' decision-making related to food preferences and procurement strategies using a discrete choice experiment (DCE).

Methods

The research was conducted in the Cape Town region of Western Cape Province, South Africa, specifically targeted at stokvel members residing in the economically disadvantaged urban areas of Dunoon and Khayelitsha. The (DCE) was designed to understand the factors influencing the demand for healthy food among stokvel members, incorporating attributes such as travel distance for grocery shopping, criteria for purchasing staple groceries, and shopping frequency. Scenarios were then constructed for the DCE by altering the levels associated with these attributes. *Sawtooth software*, a specialized tool for designing DCEs, was employed for this purpose. According to Sawtooth's DCE calculations, for our sample of 183 respondents, at least 36 scenarios were required to evaluate preferences for two categories of food items: staples and non-staples. This approach allowed for the selection of the most fitting choice sets or scenarios for questionnaire completion. The collected data was subsequently analysed using a mixed effects logit regression model.

Results

Our study findings revealed that shopping frequency, shop-delivery preferences, and proximity to shopping venues significantly dictate the purchasing patterns of stokvel members, overshadowing the perceived value for money. Notably, over half of the participants were single, unemployed females, heading households with an average size of five, suggesting that stokvels play a pivotal role in supporting female-led households and food security. The findings challenge conventional consumer behaviour theories by highlighting the minimal influence of cost on food selection. These insights provide a perspective on stokvels' potential to contribute to economic development and nutritional strategies, informing policymakers on leveraging stokvels for public health advancement and food security enhancement. The

study enriches the literature on collective buying behaviour and underscores the importance of aligning health and nutrition interventions with consumer shopping patterns to optimize their effectiveness.

Conclusion

In summary, our study argues for logistical considerations, notably shopping frequency, delivery options, and store proximity, as they are central to stokvel members' food purchasing decisions, overshadowing price concerns. These findings challenge traditional consumer behaviour models and highlight the role of stokvels in both economic sustenance and public health domains, offering a strategic avenue for policy interventions to bolster food security in South Africa.

6.2 Introduction

6.2.1 Background

The dynamics of food systems globally is evolving. In the context of food systems, accessibility and affordability of healthier food options remain major challenges in low and middle-income countries (LMICs) (Turner *et al.*, 2020; Alarcon *et al.*, 2021; Hendriks *et al.*, 2023; Kumar *et al.*, 2023; Roy *et al.*, 2023). Overtime, overweight and obesity trends have shifted more towards socio-economically deprived communities (Fox, Feng and Asal, 2019; Jiwani *et al.*, 2019; Lee, Cardel and Donahoo, 2019; Griffith, 2022). The irony is stark in many LMIC households, where undernutrition and overweight issues coexist, often because of obesogenic food environments that hit the urban poor hardest (Winichagoon and Margetts, 2017; Modjadji and Madiba, 2019; World Health Organization, 2019).

Aligned to these trends, the dynamics of food systems in South Africa are rapidly evolving. As the nation undergoes a nutritional transition, rising obesity rates have been recorded (Hunter-Adams, Battersby and Oni, 2019). These shifts, deeply rooted in resource constraints and cultural influences on food choices, significantly impact health systems due to increased prevalence of diet-related non-communicable diseases (dr-NCDs), such as hypertension, diabetes, and cardiovascular diseases (Anand *et al.*, 2015; Budreviciute *et al.*, 2020). The choices people make about their food are not uniform. Social stratifications, particularly economic divisions, play a vital role in dietary decisions (Pechey and Monsivais, 2016; French *et al.*, 2019; McNamara and Wood, 2019). Unsurprisingly, unhealthy dietary habits are often more prevalent among disadvantaged socio-economic groups, leading to heightened NCD rates within these groups (Senekal *et al.*, 2023). Addressing these dietary challenges, especially among these vulnerable groups, could unlock potential public health improvements (Haines *et al.*, 2019).

In urban informal areas of South Africa, a duality of food insecurity emerges obesity and hunger (Hunter-Adams and Battersby, 2020). The economic implications are evident in Cape Town, where cheaper energy sources such as cookies, sugar, margarine, and oil often eclipse nutrient-dense foods like lean meats, fish, fruits, and vegetables in terms of affordability (Claasen, Van Der Hoeven and Covic, 2016). The relative affordability of calorie-dense, nutrient-poor foods, especially in socio-economically disadvantaged areas, has made them a staple in many households (Daniel, 2020; Erokhin *et al.*, 2021; Headey *et al.*, 2023). The economic dimension becomes even clearer, considering that healthier foods, even when available, typically cost more than processed unhealthy alternatives (Igumbor *et al.*, 2012). Globally, community-based financial initiatives such as informal saving groups predominantly take the form of Accumulating Savings and Credit Associations (ASCAs) or Rotating Savings and Credit Associations (ROSCAs). ROSCAs are community-driven financial schemes where members contribute equal savings regularly to a pooled fund, which is then received in rotation by each member (Kabuya, 2015). Unlike ROSCAs, ASCAs allow funds to accumulate as they're not immediately withdrawn. These funds are then available for loans, bulk purchases, or collective investments (Kabuya, 2015). These groups play a crucial role as informal financial institutions in LMICs, especially for low-income consumers who often lack access to formal financial services (Lukwa *et al.*, 2022). These informal saving groups have long served as poverty-alleviation tools and are known by various names worldwide (Matuku and Kaseke, 2014).

In Nigeria, they're called Ajo or Isusu; Tontines in Francophone West African nations like Senegal and Cameroon, Hui in China, Muzikis or Likelambas in the Democratic Republic of Congo, Ekub in Ethiopia, stokvel in South Africa, Mukando in Zimbabwe, Susu in Ghana, Chama in Kenya, Tandas in Mexico, and Chits or Kuries in India. Among these, South Africa's stokvels are particularly noted in research. Stokvels in South Africa are recognized for playing a significant role for mitigating the effects of poverty or resource constraint (Matuku and Kaseke, 2014). Approximately 30% of the more than 800,000 stokvels in South Africa are "grocery stokvels," which use collective buying to secure discounts on long-lasting food items from major retailers and wholesalers, particularly before festive seasons. However, it is notable that these bulk-purchased items are often highly processed or energy-dense, and typically of lower nutritional quality (Battersby, 2017; Lappeman *et al.*, 2020; Lukwa *et al.*, 2022).

This study investigates the decision-making processes of stokvel members in South Africa regarding food preferences and procurement strategies. Despite the critical role stokvels play in addressing food insecurity and empowering women, their potential to influence healthier food choices remains underexplored. Our primary aim was to understand how these groups could shift purchasing patterns towards healthier, affordable options, thereby impacting public health and nutrition. To achieve this, we

employed a discrete choice experiment (DCE), a method superior to others in simulating real-world decision scenarios. This approach, as highlighted by De Brún et al., (2018), Soekhai et al., (2019), and Szinay et al., (2021), assesses the relative importance of different factors by presenting participants with hypothetical situations featuring varied attributes. This allows for a nuanced understanding of how individuals prioritize different aspects in their choices, a method more insightful than simple preference surveys or behavior observations. Specifically, our study focused on determining the relative importance of six attributes affecting staple and non-staple food choices: proximity to shopping locations, value-quality-price-preference (VQPP), store qualities, product factors, shop-delivery preferences, and shopping frequency. We hypothesized that perceived value significantly influences the food selection process among stokvel members.

6.3 Methods

6.3.1 Study setting

The research focused on participants who were members of stokvels in the Cape Town area of the Western Cape Province in South Africa. To be included in the study, individuals needed to be over 18 years old and a member of a grocery stokvel. Anyone under 18 or not a member of such a stokvel was not considered for the study. The research took place in Cape Town, specifically in the economically disadvantaged urban areas of Dunoon and Khayelitsha in the Western Cape. These locations were chosen due to their socio-economic characteristics and their relevance to the study's aims. The selection of these areas and of the study participants was also influenced by convenience sampling. The DCE survey was administered by trained data collectors.

6.3.2 Sample size

Sample sizes in DCEs differ in many studies. Bridges et al. (2008) note that DCEs do not address the hypothesis's statistical power coefficients (Bridges et al., 2008). Sweeney recommends increasing the sample size and the hypothetical scenarios to strengthen the internal validity (Sweeney, 2011). According to a systematic analysis by de Bekker-Grob et al. (2015), the majority of the sample sizes (27 researches) did not indicate the technique of computation; 9 studies used a rule of thumb, 8 linked to other studies, 4 used the parametric approach, 3 reviewed studies, and 3 used Lancsar and Louver's method (de Bekker-Grob et al., 2015). We adopted the Lancsar and Louver (2008) method and had at least 5 respondents or observations per choice set as we assumed it would be adequate to provide precise parameter estimates

as evidenced by previous studies applying a final sample of 200-250 participants (Viney, Lancsar and Louviere, 2002; Lancsar and Louviere, 2008a; Johnson et al., 2013). Therefore, the final sample of the study was set at 200 participants. For this DCE, 10 members per stokvel were recruited from 20 stokvels, thus totalling 200 participants. However, the final sample was reduced to 183, as some questionnaires were invalidated due to respondents selecting both choices in binary questions, thereby compromising the integrity of those responses.

6.3.3 Discrete choice experiment

The study employed discrete choice modelling (DCM), through a discrete choice experiment (DCE), an econometric approach that predicts preferences in situations where actual choices are not observable (van den Broek-Altenburg and Atherly, 2020). This method is particularly useful in understanding how people might behave in hypothetical scenarios. DCE is a type of stated preference methodology, adhering to the random utility theorem (Hauber *et al.*, 2016). This theorem posits that an individual's choices are shaped by both observed and unperceived utilities associated with the attributes of the options available to them, as discussed by Azari, Parks and Xia, (2012). To ensure rigorous and standardised application of this methodology, our study design adhered to the guidelines set by the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) for conjoint analysis, as detailed by Bridges *et al.*, (2011). These guidelines are critical in ensuring the validity and reliability of the study's findings. They introduce the ESTIMATE checklist, as outlined by (Hauber *et al.*, 2016), which serves as a comprehensive framework for justifying the chosen analysis method, detailing the analysis process, and interpreting results effectively.

The discrete choice experiment (DCE) was the most appropriate method for our study. Firstly, the nature of our research question revolves around understanding preferences and decision-making processes in hypothetical scenarios, particularly where actual choices are not directly observable. DCE, being an econometric method proficient in predicting preferences in such scenarios (van den Broek-Altenburg and Atherly, 2020), aligns with our research objectives. Furthermore, the DCE's foundation in the random utility theorem (Hauber *et al.*, 2016) provides a theoretical basis for our study. The validity and reliability of our DCE findings hinge on the experiment's ability to replicate key traits of real-world situations, thereby capturing actual behaviour (Caputo and Scarpa, 2022). This sets DCE apart from other non-market valuation methods, like the contingent valuation of public goods (Carlsson, 2011) and experimental

auctions (Gracia, Loureiro and Nayga Jr, 2011). In this context, the DCE offered subjects more familiar choice contexts, which closely mirrored the real-world.

6.3.4 Attribute and levels selection

In our study, the construction of a discrete choice experiment (DCE) for stokvel members focused on the selection of attributes and their respective levels. Attributes, as defined by Lancsar and Louviere, (2008), are various factors positioned at different levels that significantly influence individual preferences. The process of defining these attributes and levels for our DCE was guided by preliminary research. Our initial step involved a systematic literature review to build a foundational understanding of stokvels, as detailed in Lukwa et al., (2022). This was followed by stakeholder mapping exercises, which helped us identify a wide array of stakeholders within the stokvel ecosystem, as reported in Lukwa et al. (in review, Stakeholder Mapping to Explore Social and Economic Capital of Rotating Savings and Credit Associations (ROSCAs) to Increase Demand for and Access to Healthy Food). These exercises shed light on the diverse interactions and dependencies within this ecosystem. Furthermore, a realist evaluation, pivotal to our methodological framework, offered deep insights. It involved engaging with stokvel leaders and members, our primary demographic for the DCE, and is documented in Lukwa et al. (in review, "Conditions that influence decision making of ROSCAs\Stokvels as social entities relative to food purchasing and foodways, amongst ROSCAs\Stokvels members: A realist evaluation").

Additionally, informed by the literature, we identified major drivers of food choices as perceptions of convenience, cost, taste, and nutritional values, as highlighted in studies by Aggarwal et al., (2016), Nielsen, (2016), Drewnowski and Monsivais, (2020), and Rusmevichientong, Jaynes and Chandler, (2021). Convenience encompasses the ease of physical access to food sources and the time involved in purchasing and preparing food. The influence of food costs, including price considerations and the relative affordability of different food patterns, is also significant, as noted by French et al., (2019) and Drewnowski and Monsivais, (2020).

This preparatory work was critical in ensuring that the selected attributes and levels for the DCE accurately reflected the realities and preferences of stokvel participants. The prioritized list of attributes for both staple and non-staple items included 1) proximity to shopping, 2) value-quality-price-preference (VQPP), 3) store qualities, 4) product factors, 5) shop-delivery preferences, and 6) frequency of shopping. The specific levels within these attributes, designed to capture the varied aspects influencing food purchasing decisions, are detailed in Table I. This approach to attribute and level selection aimed to ensure that the DCE would yield insights that are both relevant and actionable for understanding and influencing the food purchasing behaviours of stokvel members.

6.3.5 Questionnaire design

Scenarios were then constructed (choices) by altering the levels associated with these attributes (Table I). *Sawtooth software* was used to design the DCE (Sawtooth Software, 2024). Scenarios were constructed by altering the levels associated with these attributes shown in Table 9. Following the scenario construction, 36 choice sets for staples and 36 choice sets for non-staples were created. According to Sawtooth's DCE calculations, for a sample of 200 participants, a minimum of 36 choice sets was required to evaluate preferences for two categories of food items: those with staples and non-staples, allowing the selection of the most fitting choice sets for the questionnaire completion. Staple food means those foods that occupy most of the cultivated areas and dominate the cropping patterns in a country most times also influenced by the weather patterns and cultural food preferences. Examples for South Africa defined for this study include bread, maize and rice, beans, wheat and animal products such as meat (FAO, 2024 and Grains SA, 2024) and are mostly affordable to low-income households. Non-staples for this study are therefore designed as foods not falling in the staples category and not normally eaten in an average income or low household. The two categories were due to the difference in food items (Staples and non-staples) and would be for two separate DCEs. The number of unique questionnaires created was 36, with 2 choice sets, i.e., one representing staple and other non-staple foods. Table 10 shows two scenarios (1 choice set) for staples. Table 11 shows two scenarios (1 choice set) for non-staples.

Table 9: Discrete choice experiment attributes and levels for staples and non-staples items

Attribute and levels for staples grocery items	Attribute and levels for non-staple grocery items
Proximity to shopping	Proximity to shopping
<i>less than 1 km</i>	<i>less than 1 km</i>
<i>between 1km -3km</i>	<i>between 1km -3km</i>
<i>between 3km- 5km</i>	<i>between 3km- 5km</i>
<i>more than 5 km</i>	<i>more than 5 km</i>
Value, quality, price & preference (VQPP)	Value, quality, price & preference (VQPP)
<i>value for money</i>	<i>value for money</i>
<i>perceived food quality</i>	<i>perceived food quality</i>
<i>price</i>	<i>price</i>
<i>taste preference</i>	<i>taste preference</i>
<i>shelf life</i>	<i>freshness</i>
Store qualities	Store qualities
<i>cleanliness of the shop</i>	<i>cleanliness of the shop</i>
<i>how you are treated at the shop</i>	<i>how you are treated at the shop</i>
<i>access to buy the groceries on credit</i>	<i>access to buy the groceries on credit</i>
<i>deals and offers</i>	<i>deals and offers</i>
Product factors	Product factors
<i>there are nutrition or ingredients label</i>	<i>the product is made locally</i>
<i>the product is made locally</i>	<i>there is a "two for one" option</i>
<i>there is a best-before label</i>	<i>the product has no preservatives</i>
<i>there is a two-for-one option</i>	
<i>the product has no preservatives</i>	
Shop-delivery preferences	Shop-delivery preferences
<i>shop on-site (you choose and transport own goods)</i>	<i>shop on-site (you choose and transport own goods)</i>
<i>shop on-site and delivery to your home for a small fee</i>	<i>shop on-site and delivery to your home for a small fee</i>
<i>shop online & delivered to a central point in community</i>	<i>shop online & delivered to a central point in community</i>
<i>bulk shopping delivered to a central point in the community</i>	<i>bulk shopping delivered to a central point in the community</i>
Frequency of shopping	Frequency of shopping
<i>as needed</i>	<i>as needed</i>
<i>weekly</i>	<i>weekly</i>
<i>monthly</i>	<i>monthly</i>
<i>quarterly</i>	<i>quarterly</i>
<i>every 6 months</i>	
<i>yearly</i>	

6.3.6 Data collection

To ensure the reliability of the questionnaire, we conducted a sample pilot on 5 participants to check if the questionnaire was easy to understand. Further changes were made where the wording needed clarity. The questionnaire was then fielded to 200 participants. The participant was expected to tick one choice answer between the two scenarios provided per choice set. By requiring participants to choose between the two options provided, we sought to maximize the utility of our limited sample by ensuring every participant contributed data to the study. This methodological choice was key to optimizing the efficiency and effectiveness of our research. For analytical purposes, we treated the preferences for staples and non-staples items as two separate DCEs, allowing for a more targeted analysis of each food category.

Table 10: Example of choice sets for staples

Choice Set 1: Staples	A	B
1) Proximity to shopping	between 1km-3km	less than 1 km
2) Value, quality, price & preference (VQPP)	price	taste preference
3) Store qualities	deals and offers	access to buy the groceries on credit
4) Product factors	there are nutrition or ingredients labels	there is a “best before” label
5) Shop-delivery preferences	bulk shopping delivered to a central point in community	bulk shopping delivered to a central point in the community
6) Frequency of shopping	as needed	quarterly
Tick only 1 choice in the box	<input type="checkbox"/>	<input type="checkbox"/>

Table 11: Example of choice sets for non-staples

Choice set 2 : Non-staples	A	B
1) Proximity to shopping	less than 1 km	between 3km- 5km
2) Value, quality, price & preference (VQPP)	perceived food quality	shelf life (how long it can keep before going “off”)
3) Store qualities	deals and offers	cleanliness of the shop
4) Product factors	the product has no preservatives	there are nutrition or ingredients labels
5) Shop-delivery preferences	shop on-site (you choose and transport own goods)	bulk shopping delivered to a central point in community
6) Frequency of shopping	as needed	every 6 months
Tick only 1 choice in the box	<input type="checkbox"/>	<input type="checkbox"/>

6.3.7 Data Analysis

Descriptive data analysis was conducted, followed by a mixed effects logit regression analysis. Mixed effects logit regression modelling was conducted due to its ability to accommodate random effects in a DCE (Hensher and Greene, 2003), thus capturing the unobserved heterogeneity across individual preferences. Data analysis was done using the statistical software *Stata 17*. In *Stata*, when performing mixed-effects logistic regression, such as with the *melogit* command, the software automatically handles categorical variables using reference coding, also known as dummy coding (StataCorp, 2013). This process involves choosing a reference category against which the other categories are compared. The reference category is typically coded as the baseline and is inherently part of the model, even though its effects are not directly estimated. By default, *Stata* chooses the first category of a categorical variable as the reference category. This is generally the category that appears first in alphanumeric order. A beta-coefficient range was used to determine conditional relative importance for each attribute. The beta-coefficient range is a statistical measure that quantifies attribute influence within a conditional context (Nevil, Kindness and Kvilhaug, 2023). This method gave us valuable insights into the varying degrees of impact exhibited by different attributes under specific conditions. We could precisely estimate each attribute's conditional relative importance, thereby enhancing our understanding of the nuanced dynamics. This approach aligns with conditional relative importance (CRI) in Discrete Choice Experiments (DCE.), employed to discern how various attributes affect decision-making processes. Mixed effects logistic regression model for both staples and non-staples followed the following equation.

$$\begin{aligned} Choice_{ij} = & \beta_0 + \beta_1 \left(Proximity_{to_shopping_{ij}} \right) + \beta_2 \left(Store_{qualities_{ij}} \right) + \beta_3 \left(Product_{features_{ij}} \right) \\ & + \beta_4 (VQPP_{ij}) + \beta_5 \left(Frequency_{of_shopping_{ij}} \right) + \beta_6 \left(Shop_{delivery_preferences_{ij}} \right) + \mu_j \\ & + \varepsilon_{ij} \end{aligned}$$

where:

- $Choice_{ij}$ is the dependent variable representing the choice made by individual i within group j .
- β_0 is the intercept.
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are the coefficients for the fixed effects of the respective independent variables.
- $Proximity_{to_shopping_{ij}}$ is the travel distance for individual i within group j .
- $Store_{qualities_{ij}}$ is the store qualities for individual i within group j
- $Product_{features_{ij}}$ is the product features for individual i within group j
- $VQPP_{ij}$ is the value, quality, price, and preference (VQPP) for individual i within group j .
- $Frequency_{of_shopping_{ij}}$ is the shopping frequency for individual i within group j .
- $Shop_{delivery_preferences_{ij}}$ are the shop-delivery preferences for individual i within group j .
- μ_j represents the random effects at the group level (1d).
- ε_{ij} is the residual error term.

6.4 Results

6.4.1 Descriptive statistics

Out of the 200 questionnaires administered, 17 were not fully completed, resulting in 183 participants being considered for analysis. 88% identified as female. The participants ranged from 18 to 69 years, averaging 37 years (± 13). The mean household size was 5, with a standard deviation of 2. In terms of dwelling types, most participants lived in owned apartments/houses (41%), followed by informal settlements/shacks (34%) and rented apartments/houses (25%). Marital status showed a diverse distribution, with the majority being single (66%), followed by those married or in a partnership (27%), while the others (7%) were either widowed, divorced or separated. Over half of the women were single (never married) and unemployed (Table 12).

The highest proportion of participants had completed Grade 8-12 (69%), followed by National Qualification Level (15%). Employment status varied, with 52% of participants being unemployed 29% employed. The duration of Stokvel membership also showed diversity, with 45% of participants being members for more than 1 year. Regarding stokvel contribution frequency, 95% of the participants contributed monthly. Most participants walked for grocery purchasing (49%), followed by public taxis (34%). The most time chosen for travelling taking 0-15 minutes (44%).

Table 12: Survey participants' descriptive statistics

Variable	N	Mean	Standard Deviation (SD)	Min	Max
Participant's age in years	183	37	13	18	69
Stokvel contribution	183	527,24ZAR	463,43ZAR	R100	R3 000,00
Household size	158	5	2	1	15
Variable	N (%)		Standard Error [Confidence Interval]		
Dwelling type					
Informal settlement/ Shack	63 (34)		0.04 [0.28 0.42]		
Owned apartment/ House	75 (41)		0.04 [0.34 0.48]		
Rented apartment/ House	45 (25)		0.03 [0.19 0.31]		
Marital status					
Divorced	4 (2)		0.01 [0.00 0.06]		
Married or partnership	49 (27)		0.03 [0.21 0.34]		
Separated	2 (1)		0.01 [0.00 0.04]		
Single (never married)	121 (66)		0.04 [0.59 0.73]		
Widowed	7 (4)		0.01 [0.02 0.08]		
Education level					
Grade 0-7	26 (14)		0.03 [0.10 0.20]		
Grade 8-12	127 (69)		0.03 [0.62 0.76]		
National Qualification Level (Diploma) ⁵	28 (15)		0.03 [0.11 0.21]		
Bachelor or equivalent	2 (01)		0.01 [0.00 0.04]		
Employment status					
Unemployed	95 (52)		0.04 [0.45 0.59]		
Student	22 (12)		0.02 [0.08 0.18]		
Self-employed	13 (7)		0.02 [0.04 0.12]		
Employed	53 (29)		0.03 [0.22 0.36]		
Period of stokvel membership					
Less than 2 months	37 (20)		0.03 [0.15 0.27]		
Between 2 months and 6 months	26 (14)		0.03 [0.10 0.20]		
Between 6 months and 1 year	38 (21)		0.02 [0.16 0.27]		
More than a year	82 (45)		0.04 [0.38 0.52]		
Frequency of stokvel contribution					
Weekly	1 (1)		0.01 [0.00 0.04]		
Fortnight	9 (4)		0.02 [0.03 0.09]		
Monthly	173 (95)		0.02 [0.90 0.97]		
Mode of transport to shops					
Bus	6 (4)		0.01 [0.02 0.07]		
Private car	20 (11)		0.02 [0.07 0.16]		
Private taxi	4 (2)		0.01 [0.01 0.06]		
Public taxi	63 (34)		0.04 [0.28 0.42]		
Walking	90 (49)		0.04 [0.43 0.56]		
Time taken to get to the shops					
0-15 minutes	81 (44)		0.04 [0.37 0.52]		
15-30 minutes	49 (27)		0.03 [0.21 0.34]		
30 minutes to 1 hour	36 (20)		0.04 [0.15 0.26]		
More than 1 hour	17 (9)		0.02 [0.06 0.15] ⁶		

⁵ In South Africa, the National Qualification Framework (NQF) is a system used to classify, publish, and regulate qualifications, including academic, vocational, and occupational.

⁶ Note: The total number of participants may not always add up to 183. This discrepancy occurs because some participants did not provide responses for certain variables.

6.4.2 Mixed-effects logistic regression and conditional relative importance

In Table 13 and Figure 8, provide a composite analysis of the factors influencing the purchase of staple foods. The table outlines the logistic regression outcomes, while the figure graphically represents the preference coefficients with their respective standard errors for each attribute. At the top of relative importance is the frequency of shopping, with 'as needed' serving as the reference category. It holds the greatest dominance at 59.0%, though none of the coefficients for weekly, monthly, quarterly, every 6 months, and yearly frequencies showed statistical significance, which is depicted in Figure 8 by preference coefficients on the zero line.

Shop-delivery preferences emerged as the second most influential factor, with a relative importance of 19.3%. For this variable 'Shop on-site' was the reference category. As shown in Figure 8, all the other categories under shop-delivery preferences show minimal variation from the reference category in terms of preference strength, as illustrated by the near-zero coefficients in Figure 8. Proximity to shopping was identified as the third most important attribute with a relative importance of 12.8%. The preference coefficient for shopping 'more than 5 km' away was significantly negative, suggesting a strong aversion to distant shopping locations for staples. This finding is visually represented in Figure 8 by a notably longer negative bar extending below the zero mark.

The store qualities attribute ranked fourth in importance at 7.7%. Attributes such as shop cleanliness, treatment at the shop, access to credit, and deals and offers were not significant determinants of staple food choices. This is mirrored in Figure 8 by the short bars near the baseline. Product features, which are represented as the fifth-ranked attribute at 0.9% relative importance, include aspects like local production and the absence of preservatives. The significant negative coefficient for the 'two-for-one option' implies a counterintuitive aversion to such deals for staple items, as evidenced by the length and direction of its bar in Figure 8. Lastly, the Value, Quality, Price, & Preference (VQPP) category, though lowest in relative importance at 0.3%, displayed a slight positive coefficient for price, contradicting common expectations about price sensitivity. The other VQPP factors such as perceived food quality, taste preference, and shelf life showed negligible effects on the purchasing decisions, with their coefficients hovering close to zero in Figure 8.

In summary, the frequency of shopping is the most significant factor in determining the purchase of staples, albeit without strong statistical evidence for specific shopping frequencies. Meanwhile, Figure 8 serves to

graphically underscore the nuances in preference for the shop-delivery options, proximity, store qualities, product factors, and VQPP attributes, with only the 'more than 5 km' proximity and 'two-for-one option' displaying coefficients with noticeable deviations from the reference, indicating a clear influence on stokvel members preferences.

Table 13: Mixed-effects logistic regression and conditional relative importance of individual food choices for staples

Attribute	Log Odds	Standard Error	Confidence Interval	Relative Importance: Rank	Relative importance: Dominance
Frequency of shopping					
as needed	(ref)	(ref)	(ref)	1	59.0%
weekly	0.37	0.42	[-0.46, 1.20]		
monthly	0.14	0.45	[-0.75, 1.02]		
quarterly	0.03	0.47	[-0.90, 0.95]		
every 6 months	0.35	0.50	[-0.64, 1.33]		
yearly	-0.64	0.43	[-1.48, 0.20]		
Shop-delivery preferences					
shop on-site (you choose and transport own goods)	(ref)	(ref)	(ref)	2	19.3%
shop on-site and delivery to your home for a small fee	-0.07	0.38	[-0.81, 0.66]		
shop online & delivered to a central point in the community	0.01	0.40	[-0.77, 0.80]		
bulk shopping delivered to a central point in the community	0.05	0.40	[-0.74, 0.83]		
Proximity to shopping					
less than 1 km	(ref)	(ref)	(ref)	3	12.8%
between 1km -3km	0.11	0.34	[-0.56, 0.77]		
between 3km- 5km	-0.23	0.40	[-1.01, 0.54]		
more than 5 km	-0.62	0.33	[-1.26, 0.01]		
Store qualities					
cleanliness of the shop				4	7.7%
how you are treated at the shop	-0.15	0.38	[-0.89, 0.60]		
access to buy the groceries on credit	-0.16	0.37	[-0.89, 0.57]		
deals and offers	-0.36	0.37	[-1.09, 0.36]		
Product factors					
there are nutrition or ingredients label	(ref)	(ref)	(ref)	5	0.9%
the product is made locally	-0.21	0.39	[-0.97, 0.56]		
there is a best-before label	-0.12	0.45	[-1.01, 0.77]		
there is a two-for-one option	-0.88*	0.43	[-1.72, -0.04]		
the product has no preservatives	-0.12	0.43	[-0.95, 0.71]		
Value, quality, price & preference (VQPP)					
value for money	(ref)	(ref)	(ref)	6	0.3%
perceived food quality	0.02	0.45	[-0.85, 0.90]		
price	0.05	0.40	[-0.72, 0.82]		
taste preference	-0.03	0.42	[-0.86, 0.80]		
shelf life	-0.17	0.42	[-1.00, 0.66]		

*** Significant at 0.01; ** Significant at 0.05 and * Significant at 0.1

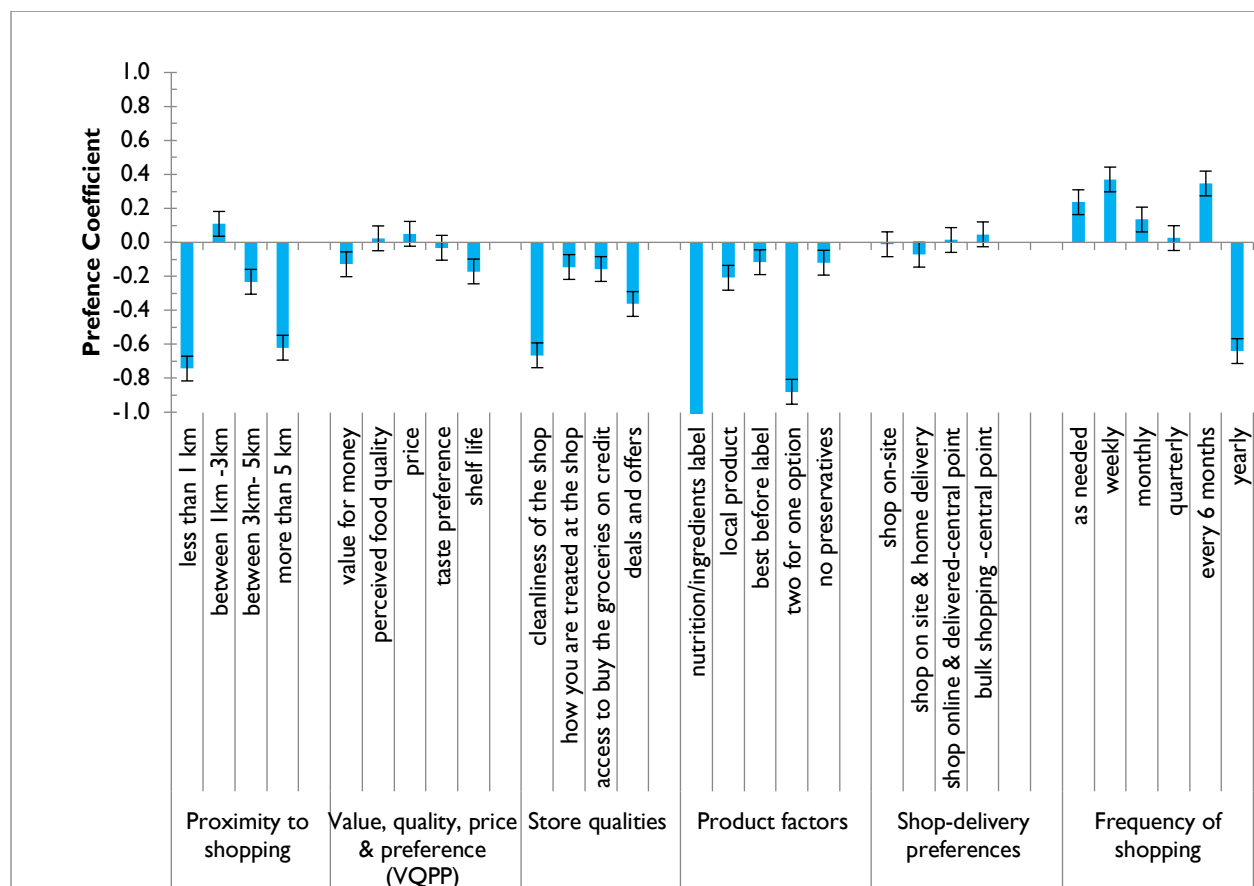


Figure 8: Mixed- effects logistic model with a standard error for staples

Table 14 and Figure 9 provide a detailed portrayal of the mixed-effects logistic regression outcomes, emphasizing the conditional relative importance of various attributes influencing individual food choices for non-staple items. The frequency of shopping for non-staples emerged as the dominant factor, with a relative importance of 79.5% in steering purchasing decisions. This is visually corroborated by Figure 9, which shows positive preference coefficients for monthly and quarterly shopping frequencies compared to the baseline 'as needed' category indicating these frequencies notably enhance the propensity to purchase non-staples.

Shop-delivery preferences are depicted as the second most important attribute, accounting for 9.2% of relative importance. Despite this, Figure 9 revealed that the preference coefficients for all levels of delivery options hover around the zero mark, suggesting these variations do not significantly sway the likelihood of purchasing non-staples when contrasted with the reference of shopping on-site. Proximity to shopping, ranked third with a 4.6% relative importance, is visually represented in Figure 9 with negative coefficients for distances greater than 5 km. Although not statistically significant, this negative inclination aligns with

the concept that consumers tend to favour closer shopping venues, as indicated by the reference category of less than 1 km.

Store qualities, such as the cleanliness of the shop and customer service, are attributed a 4.5% relative importance. Figure 9 illustrates these attributes with slightly negative coefficients, though they do not deviate significantly from zero, suggesting these attributes, while important, may not be critical influencers in the choice process for non-staple items. Product features rank fifth in importance and include attributes like locally made products or those without preservatives. The significance of these factors is not supported by the regression analysis, and this is reflected in Figure 9 by the preference coefficients that remain close to zero, suggesting no substantial effect on purchasing decisions.

Lastly, the VQPP attributes, which are composed of value for money, perceived food quality, price, taste preference, and shelf life, rank lowest in importance, with a relative contribution of only 1.1%. Figure 9 distinctly illustrates the price attribute with a negative coefficient, emphasizing that higher prices substantially deter the purchasing of non-staples, confirming the price sensitivity of consumers as observed in the regression results. In summary, the regression analysis, complemented by the visual evidence from Figure 9, underscores that the frequency of grocery shopping and the preferred features when shopping for non-staples significantly influence purchasing decisions. Monthly or quarterly shopping is positively associated with the likelihood of purchasing non-staples, while higher prices have a converse effect. Notably, Figure 9 serves as a visual reinforcement of these findings, presenting a clear depiction of the impact of each attribute on stokvel members' choices.

Table 14: Mixed-effects logistic regression and conditional relative importance of individual food choices for non-staples

Attribute	Log Odds	Standard Error [Confidence Interval]	Relative Importance: Rank	Relative importance: Dominance
Frequency of shopping				
<i>as needed</i>	ref	ref	1	79.5%
<i>weekly</i>	0.25	0.38 [-0.49 0.10]		
<i>monthly</i>	1.11***	0.38 [0.36 1.85]		
<i>quarterly</i>	1.27***	0.35 [0.57 1.96]		
Shop-delivery preferences				
<i>shop on-site (you choose and transport your own goods)</i>	ref	ref	2	9.2%
<i>shop on-site and delivery to your home for a small fee</i>	0.09	0.33 [-0.56 0.74]		
<i>shop online & delivered to a central point in the community</i>	0.00	0.36 [-0.70 0.70]		
<i>bulk shopping delivered to a central point in the community</i>	-0.45	0.34 [-1.13 0.22]		
Proximity to shopping				
<i>less than 1 km</i>	ref	ref	3	4.6%
<i>between 1 km -3km</i>	-0.59	0.35 [-1.27 0.09]		
<i>between 3km- 5km</i>	0.17	0.33 [-0.48 0.83]		
<i>more than 5 km</i>	0.21	0.33 [-0.44 0.86]		
Store qualities				
<i>cleanliness of the shop</i>	ref	ref	4	4.5%
<i>how you are treated at the shop</i>	0.40	0.34 [-0.26 1.06]		
<i>access to buy the groceries on credit</i>	-0.02	0.36 [-0.72 0.68]		
<i>deals and offers</i>	-0.05	0.32 [-0.68 0.57]		
Product factors				
<i>the product is made locally</i>	ref	ref	5	1.2%
<i>there is a "two for one" option</i>	0.42	0.31 [-0.18 1.02]		
<i>the product has no preservatives</i>	0.18	0.33 [-0.46 0.83]		
Value, quality, price & preference (VQPP)				
<i>value for money</i>	ref	ref	6	1.1%
<i>perceived food quality</i>	-0.44	0.38 [-1.19 0.30]		
<i>price</i>	-0.77*	0.39 [-1.53 -.019]		
<i>taste preference</i>	-0.56	0.38 [-1.31 0.18]		
<i>freshness</i>	-0.05	0.391 [-0.80 0.71]		

*** Significant at 0.01; ** Significant at 0.05 and * Significant at 0.1

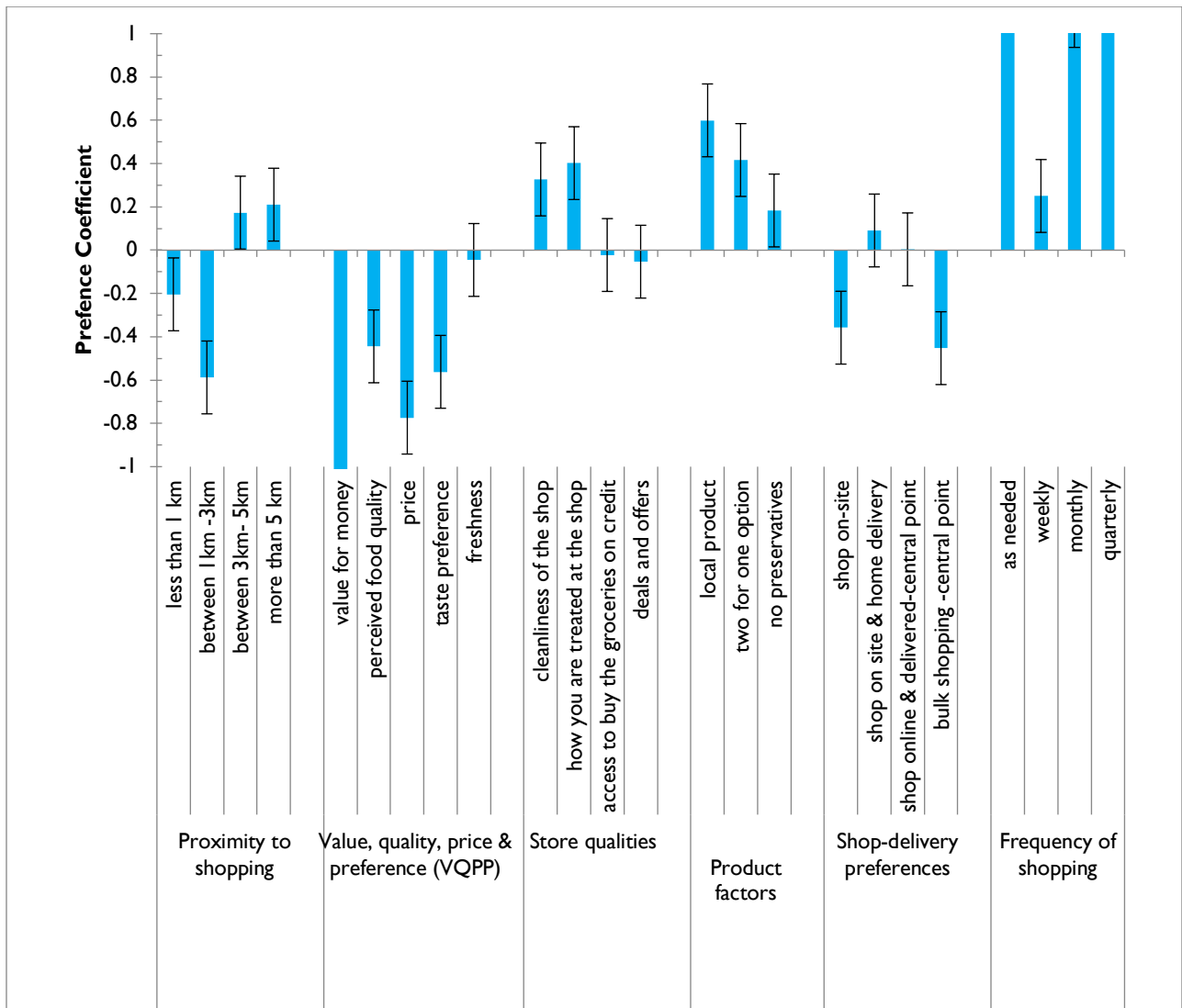


Figure 9: Mixed-effects logistic model with a standard error for non-staples

6.5 Discussion

The objective of this study was to evaluate the factors influencing stokvel members' decision-making related to food preferences and procurement strategies using a discrete choice experiment (DCE). Our study found that more than half of the women were single (never married) and unemployed. Moreover, the mean household size was 5. The substantial female representation in our sample consistent with other studies (Matuku and Kaseke, 2014; Mabika, 2018; Mabika and Tengeh, 2021; Lukwa et al., 2022) underscores the pivotal role women play in dietary decisions and highlights the need for gender-sensitive approaches in food-related interventions (Das and Mishra, 2021; Lufuke et al., 2022; Berretta et al., 2023; Bryan, Ringler and Meinzen-Dick, 2023). The diversity in educational backgrounds and employment statuses among our participants suggests varied levels of knowledge and financial stability, which likely influence food purchasing decisions. With the majority having completed Grade 8-12 and a significant proportion being unemployed, there are implications for both the financial capacity and the nutritional literacy within these stokvel groups. Studies have shown that lower educational levels can be linked to less nutritional knowledge and poorer dietary choices (Egg et al., 2020; Rippin et al., 2020; Fard et al., 2021; Nishinakagawa et al., 2023; Wei and Sun, 2023). Thus, in the context of stokvels, where group dynamics play a crucial role, the varied educational backgrounds could impact collective decisions regarding food procurement, possibly skewing towards more affordable but less nutritious options.

The preferences highlighted for specific characteristics of food items, such as staples, reflect a pragmatic approach to food purchasing that balances quality, cost, and accessibility. It is, therefore, evident that food choice within households and stokvels is a complex interplay of socio-economic, logistical, and personal preference factors (Steenhuis, Waterlander and De Mul, 2011; Dimitri and Rogus, 2014; Pechey and Monsivais, 2016; Wahl et al., 2017; Healthier and Choices, 2018; de Morais Sato et al., 2020; Sato et al., 2020; Enriquez and Archila-Godinez, 2022). Healthiness, price, and convenience are typically indicated as important motives for food choices (Kamphuis, de Bekker-Grob and van Lenthe, 2015). One possible explanation is that low socioeconomic groups may find the possible long-term health effects of food less important and immediate taste and price considerations more important than do high socioeconomic groups (Guthrie, Butler and Ward, 2009). Some studies showed that low-income groups valued price (Adams, 2009; Guthrie, Butler and Ward, 2009) and familiarity more and sensory appeal less than did high-income groups (Adams, 2009).

The motives behind food choices, traditionally centred around healthiness, price, and convenience (Kamphuis, de Bekker-Grob and van Lenthe, 2015), appear to vary significantly across socioeconomic

groups. (Guthrie, Butler and Ward, 2009) suggest that lower socioeconomic groups might prioritize immediate taste and price considerations over potential long-term health effects, a contrast to the preferences of higher socioeconomic groups. This difference in priorities could be attributed to the immediate financial constraints and lifestyle needs faced by lower-income groups (Sheehy-Skeffington and Rea, 2017). Studies, including those by Adams, (2009) and Guthrie, Butler and Ward, (2009), indicate that these groups place a higher value on price and familiarity, whereas higher-income groups tend to emphasize sensory appeal. These findings are particularly relevant in the context of our study, where the decision-making processes of stokvel members, primarily from lower-income backgrounds, were explored. The findings suggest that for both staple and non-staple food items, stokvel members prioritize logistical factors such as shopping frequency, shop-delivery preferences, and proximity to shopping venues. These preferences indicate a focus on the practicalities and convenience of food procurement, rather than on economic factors like cost. This insight is pivotal for understanding the complex interplay of socio-economic, logistical, and personal preference factors that shape food choices within households and stokvels. While immediate logistical concerns are paramount, longer-term considerations such as healthiness and economic value appear to be less influential in the decision-making process.

The diverse duration of stokvel membership and the high frequency of monthly contributions provide insights into the commitment and financial planning within these groups. Longer membership durations could indicate a deeper understanding of and adherence to the stokvel's objectives, potentially influencing more strategic and health-conscious food purchasing decisions. On the other hand, the high rate of monthly contributions underscores a structured financial approach among members (Aliber, 2001). This regularity thus, facilitates bulk purchasing, offering opportunities for better deals and possibly healthier food options, given the right interventions and awareness programs (Gittelsohn *et al.*, 2014; Kim *et al.*, 2017; Martinez *et al.*, 2018). The finding that a significant number of participants walk or use public taxis for grocery shopping, often traveling for 15 minutes or less, suggests that proximity to food sources is a critical factor. This aligns with the literature indicating that limited transportation options can restrict access to diverse and healthy food outlets, often confining shoppers to nearby convenience stores which may lack a variety of nutritious options (Ver Ploeg, 2010; Hilmers, Hilmers and Dave, 2012; Hector, Boylan and Lee, 2016; Haboush-Deloye *et al.*, 2023; Madlala *et al.*, 2023). Our results highlight nuanced aspects of food choice behaviours. The preference against two-for-one options in staple groceries could indicate a focus on quality over quantity, suggesting a potential opening for interventions promoting healthier staples. Additionally, the significant role of price in non-staple food choices contradicts the general assumption of price insignificance, indicating that for certain food categories, cost remains a crucial consideration. This insight is vital for retailers and policymakers aiming to promote healthier diets;

strategies could include price reductions or promotions on healthier non-staple foods to encourage their purchase among stokvel members.

Our study findings also showed that for both staples and non-staples 3 attributes dominated food choice decisions including: frequency of shopping, shop-delivery preferences, and proximity to shopping venues, with their cumulative dominance accounting for over 90% of the decision-making process. Several studies referencing non-staple grocery purchasing noted the frequency of shopping emerged as the key determinant (Wekeza and Si banda, 2019; Czeczotko, Górska-Warsewicz and Zaremba, 2022). Nile et al (2021) notes the propensity for monthly and quarterly shopping frequencies suggests a structured approach to food procurement among the surveyed individuals, which may have implications for food security and budgeting within households as well as a window of opportunity to harness the potential of stokvels (Niles et al., 2021). Monthly and quarterly purchasing are both ingrained in ensuring food security in the home or following the income availability either linked to salary pay period of the end of the month or quarterly savings from stokvels (Crush, Caesar and Haysom, 2018).

The convenience of location not only affects the frequency of shopping trips but also might influence the quality and diversity of food choices available to consumers (Peng and Kaza, 2019; Winkler *et al.*, 2020). Surprisingly 'value for money' played a minimal role in shaping food choices, as it ranked the least to influence food choice decisions for both staples and non-staples. This finding challenges the conventional wisdom that cost is a prime driver of consumer behaviour (Lobaugh, Stephens and Simpson, 2019; Gillian Rightford, 2021), prompting a re-evaluation of the role that perceived value plays in the food selection process. Our research indicates that consumers prioritize logistical aspects such as availability, proximity, and transportation when purchasing staple and non-staple foods. Although they are aware of economic factors like cost and value, these are considered secondary. The initial focus is on overcoming the logistical challenges in accessing food, with economic considerations influencing decisions to a lesser extent afterward. This could suggest that when it comes to staples, the practicalities of access, convenience, and shopping cadence overshadow the quest for economic value.

Policy implications of stokvels in enhancing food security; Policymakers can leverage insights from the present study to develop targeted support for stokvels, recognizing their role as a cornerstone in the socio-economic fabric of communities. For instance, recognizing the influence of shopping frequency on food choices, policies could be designed to support and incentivize stokvels that align grocery purchases with income cycles, such as the end of the month or quarterly savings withdrawals. This support might include partnering with retailers to offer discounts or loyalty points for fresh purchases made by stokvels,

thereby reinforcing the members' purchasing power and ensuring a steadier demand for healthy food (An *et al.*, 2013). Additionally, the minimal role that 'value for money' played in food decision-making suggests that stokvel members prioritize access and convenience. Policymakers could use this information to improve infrastructure and transportation to make shopping venues more accessible, especially for those in informal settlements. Enhanced access to markets can also encourage a greater diversity of healthy food options, thus indirectly promoting better nutrition (Brouwer *et al.*, 2021; Usman and Callo-Concha, 2021; Ziso, Chun and Puglisi, 2022).

Strengths of the study: Our study presents a pioneering approach in exploring the decision-making processes related to food preferences and procurement strategies among members of stokvels, a form of informal savings group in South Africa. This is achieved through a discrete choice experiment (DCE), a method not commonly applied in this context. The considerable sample size and the presence of an interviewer during the survey administration are notable strengths. These elements enhanced the validity of the responses by providing clarification and assistance to participants, ensuring the data accurately reflects their preferences. **Limitations of the study:** However, the study has limitations. The primary limitation is the hypothetical nature of the DCE. While insightful for planning and policy, as noted by Quaife *et al.*, (2018), this approach may introduce hypothetical bias, where responses do not entirely reflect real-life decisions. Our methodology followed a stated preference approach, which could suffer from hypothetical bias a common issue in such studies, where participants might overstate their preference for healthier or costlier options due to social desirability. While revealed preference approaches, as discussed by Meenakshi *et al.*, (2012), could minimize this bias, they also have limitations, including the inability to predefine attributes by researchers and potential misinterpretation by participants. **Contribution to the literature:** Despite these limitations, our study makes a significant contribution to the existing body of knowledge on stokvels in South Africa. It is one of the few, if not the only, DCEs focused on this subject in the literature. The attributes and levels identified provide a rich source of information, which could be the subject of further research, enriching the literature on grocery purchasing behaviours within stokvels. This information is crucial for understanding the purchasing considerations and choice dynamics of stokvels, especially as South Africa advances towards integrated health and nutrition strategies. Gaining insight into these dynamics is essential for designing effective public health interventions that cater to the specific needs and preferences of the population.

6.6 Conclusion

This study provides critical insights into the food choice dynamics among South African stokvel members, predominantly females responsible for their households. The findings reveal a strong preference for logistical factors shopping frequency, delivery options, and store proximity over cost considerations in their decision-making process. This emphasis on practical aspects of food procurement, rather than purely economic value, offers a new perspective on consumer behaviour within group savings schemes. These insights have significant policy implications. They highlight the need for interventions that align with stokvels' unique purchasing patterns, such as synchronizing health-promoting initiatives with their regular shopping schedules and improving infrastructure to enhance access to diverse food outlets. Recognizing these patterns is vital for developing strategies that facilitate better food access and promote nutritional well-being.

Our study positions stokvels as more than financial entities; they are key contributors to household food security and public welfare in South Africa. The prominent role of shopping frequency in decision-making suggests the potential for interventions that encourage healthier and more sustainable buying practices aligned with stokvel members' needs and preferences. In sum, this research underscores the importance of stokvels in the socio-economic landscape of South Africa. It lays the groundwork for future research and policy efforts aimed at leveraging their collective influence for societal benefit.

6.7 References

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6.8 Declarations

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author Contributions

A.T.L, O.A.A and E.V.L led the conceptualization and the overall drafting process of the manuscript. Section-specific drafting leads are as follows: A.T.L: Background. E.V.L, F.A.W and A.T.L: Review methods. DCE design. A.T.L and O.A.A : Discussion. E.V.L, O.A.A, F.A.W and A.T.L: Conclusion. All "Savings for Health" IDRC collaborators contributed to the overall structure and jointly led editing of the draft version, final version, reviewed and approved the final version of the manuscript. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The ethical implications and considerations of the study were thoroughly examined to ensure the protection, rights, and well-being of all participants involved. The Ethics Committee at UCT, through its

diligent evaluation process, has granted this study ethical clearance with the reference number HREC: 303/2023.

Data Availability Statement

The de-identified dataset supporting the findings of this study is available upon reasonable request. Due to privacy and ethical considerations, the dataset has been de-identified to protect the confidentiality of participants' information.

Chapter 7: Discussion, conclusion & recommendations

7.1 Overview

This chapter summarises the assessment of stokvels and credit associations to influence healthy feeding in South Africa. The aims, methodologies utilised and key research findings, as well as strengths and limitations, are discussed in this chapter, demonstrating the coherence of this research project. In addition, contributions to science, recommendations for health systems research, and future research are also described.

7.2 Thesis aim and methods

Certainly, the comprehensive development of a community undeniably relies on proper human nourishment (Ohlhorst *et al.*, 2013). In South Africa, the dual challenges of undernutrition and overnutrition persist (Kimani-Murage, 2013; Modjadji and Madiba, 2019b; Azomahou, Diene and Gosselin-Pali, 2022; Modjadji *et al.*, 2022; Drimie *et al.*, 2023b), and studies indicate that stokvels may play a significant role in addressing the nutritional issues confronting the country (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). The global prevalence of underweight, overweight and obesity has reached alarming proportions, constituting a significant public health challenge (NCD, 2017). These conditions collectively contribute to annual deaths of about 2.8 million, and unfortunately, the numbers continue to rise in contemporary times (World Health Organisation, 2020).

The process of making food choices involves the selection of foods for consumption and is influenced by a complex interplay of various factors (Sobal, Bisogni and Jastran, 2014b). These factors encompass a wide spectrum, ranging from individual responses to physiological and sensory cues to broader societal, environmental, and economic influences (Monterrosa *et al.*, 2020b). Stokvels are a popular form of informal savings and credit unions in South Africa, where people contribute together and save. Members of a stokvel agree to contribute a fixed amount of money to a common pool weekly, fortnightly or monthly (Response and African Response Research, 2012; Smallhorne, 2013; Barry, 2015; Evans, Steyn and Senekal, 2015; TSHANDU, 2016; Bophela, 2018; Fairbridges Wertheim Becker, 2019; Nkambule N, Nkambule and

Mohammed, 2019; Hutchison, 2020; Mabika and Tengeh, 2021). This initiative is not unique to South Africa, however, the structure and how they operate might be different as the practice continues in many other African countries and beyond. For instance, in Nigeria, several versions of these informal credit initiatives exist, with Esusu being the most known (Iwara, Adeola and Netshandama, 2021). The same initiative is Susu in Ghana (Anku-Tsedo, 2013) and Chama in Kenya (Chidziwisano, Wyche and Kisyula, 2020). Even though the names differ, the practices, norms and objectives are similar across African societies (Bouman, 1995; Aredo, 2004; Varadharajan, 2004; Kedir, 2005; Hevener, 2006; Lappeman *et al.*, 2020; Iwara, Adeola and Netshandama, 2021). In this thesis, stokvels were assessed to understand how they can influence the nutritional benefits of the participants. Table 15 shows the objectives of this work and the methodologies used.

Table 15: Highlighting the research objectives and the methodologies used to get the results

Research Objectives	Methodology
<p>Objective 1 - To investigate the role of stokvels in addressing food security, health promotion, and agency in women in urban sub-Saharan Africa.</p>	<p>This involved a literature search that generated 20,757 records, screened by titles, abstracts, and full text, to arrive at 28 relevant records for the systematic review. The selected studies utilized qualitative, quantitative, and mixed-method research methodologies, primarily focusing on ROSCAs/ASCAs in urban sub-Saharan Africa. Thematic organization of data was done using qualitative software, and the study quality was assessed using an adapted Critical Appraisals Skills Programme (CASP) qualitative checklist.</p>
<p>Objective 2- To investigate which macro-level influencer may impact how stokvels function and interact using a Stakeholder mapping.</p>	<p>It was informed by literature review and began with identifying and categorizing stakeholders from various sectors, including formal and informal food retail, food wholesale, social enterprises, community action networks, retail finance, micro-finance, and academia. Semi-structured interviews with 21 participants explored stakeholders' perceptions of stokvels, their organizational structures, and practices, focusing on the potential for partnerships and influence on healthy food access. Thematic analysis identified key themes such as unincorporated savings associations, social conventions, maximizing value, and partnerships for mutual benefit. A power/influence and interest matrix were developed to plot stakeholders based on their ability to influence stokvel operations and their interest in engagement.</p>
<p>Objective 3 - To investigate how grocery stokvels, as social entities, create conditions that influence decision-making concerning food purchasing and foodways amongst their members using a Realist Evaluation</p>	<p>Employing a realist evaluation approach, this objective was to comprehend the contextual factors influencing decision-making within stokvels regarding food purchasing and foodways among members. It utilized qualitative research methods, including semi-structured interviews and focus group discussions, and involved 60 individuals, comprising 20 stokvel leaders and 40 general stokvel members. Data analysis was conducted using NVivo 12 software, following established qualitative research guidelines.</p>
<p>Objective 4 - To assess factors that may impact or influence stokvel members' choice for "healthy food", food preferences, foodways, and food procurement decisions using a discrete choice experiment (DCE)</p>	<p>The methodology involved recruiting 200 participants from local "grocery stokvels" and assigning them two specific choice sets for long-shelf and short-shelf items. The randomization aimed to evenly distribute cognitive demands and ensure data reliability. The study employed a Mixed Effects Logit Regression Model to accommodate random effects and capture unobserved heterogeneity in individual preferences, providing insights into the factors influencing the utilization of stokvels for healthier food choices. The attributes and levels for the discrete choice experiment were identified through a systematic literature review and stakeholder mapping, with 36 distinct scenarios</p>

	developed for evaluation. Data collection involved interviews administered by trained data collectors, with a final sample size of 200 participants.
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7.3 Discussion of Findings

The investigation into the role of stokvels in South Africa revealed a multifaceted on promoting healthy eating. For the literature available, it was evident that stokvels, traditionally grassroots savings and investment clubs, have not been primarily associated with health promotion (Bouman, 1995; Handa and Kirton, 1999; Tsai, 2000; Biggart, 2001; Aredo, 2004; Varadharajan, 2004; Kedir, 2005; Adofu E.; Alabi, O., 2010; Lasagni and Lollo, 2015; Koike *et al.*, 2018). They are better known for their economic benefits, focusing on savings and investments rather than direct health outcomes (Aitchison, 2003; Kibuuka, 2007; Response and African Response Research, 2012; Margaret D M Cullen, 2018; Bäckman Kartal, 2019; Fairbridges Wertheim Becker, 2019; Ngcobo, 2019; Nkambule N, Nkambule and Mohammed, 2019; Sato N.; Kondo, K., 2019; Ademola Abimbola *et al.*, 2020). This presents a missed opportunity, as stokvels are deeply embedded in the community and could serve as a platform for advancing health education and initiatives. Despite their potential, there is an evident gap in the academic literature regarding incorporating stokvels into formal economic policy frameworks. This omission limits understanding of how stokvels could contribute to poverty alleviation and enhancing livelihoods within South Africa (Dube, 2018; Nkosiyazi Kaseke *et al.*, 2018). Bridging this gap could provide insights into how these communal structures might be harnessed to support broader economic and health objectives.

Furthermore, stokvels hold a considerable position within the informal economy (Irving, 2005; Kongolo, 2007; Kaseke and Olivier, 2008; NETNOU, 2012; Neves and Du Toit, 2012; Stavropoulou, Holmes and Jones, 2017; Fairbridges Wertheim Becker, 2019), which suggests they could be pivotal in fostering a more collective economic system. Such a system could lead to benefits beyond individual members to the community, promoting solidarity and shared well-being (Nkambule N, Nkambule and Mohammed, 2019). The findings from this research were synthesized into four manuscripts, each tailored to meet the thesis objectives. Table I, as referred to, presumably offers a comprehensive overview of the methodologies employed in the study, providing a clear understanding of the research approach and the techniques used to gather and analyze data. This structured approach ensures that the research outcomes are robust and that the implications for policy and practice are grounded in solid evidence.

7.3.1 Objective I

To investigate the role of Rotating Savings and Credit Associations (ROSCAs), locally known as stokvels in South Africa) in addressing food security, health promotion, and agency in women in urban sub-Saharan Africa: A Systematic Review.

The socio-economic landscape of sub-Saharan Africa, characterized by persistent unemployment and poverty, has necessitated a shift towards self-reliance as a survival strategy (Lukwa, Odunitan-Wayas, Lambert and Alaba, 2022). Within this context, stokvels emerge as a beacon of financial discipline and communal support, offering their members a means to save regularly (Response and African Response Research, 2012; Van Wyk, 2017). This saving model instils disciplined spending habits and financial responsibility among participants. Stokvels contribute significantly to the internal cash flow of the economy by providing a network of savings and credit facilities (Response and African Response Research, 2012; Townsend *et al.*, 2016; Old Mutual, 2023). These self-help groups are not merely financial entities but are instrumental in combating poverty (Van Wyk, 2017) and income insecurity at the community level (Fairbridges Wertheim Becker, 2019). They act as informal social security nets (Bäckman Kartal, 2019), offering their members a platform for saving (Moliea, 2007; Ngcobo and Chisasa, 2018; Ngcobo *et al.*, 2018), which in turn paves the way for investment opportunities and asset accumulation. Research indicates that membership in stokvels has empowered individuals to fulfil their basic needs, demonstrating the practical impact these groups have on improving the quality of life for their members (Margaret D M Cullen, 2018; Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). Furthermore, stokvels represent a grassroots approach to economic empowerment, where collective financial practices enable individuals to navigate economic challenges and work towards financial stability and growth.

Stokvels and Food Security

Stokvels, as community-based savings groups, have emerged as a pivotal element in the urban food security strategies in sub-Saharan Africa, particularly for the urban poor (Van Wyk, 2017; Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). They provide access to affordable food and significant employment opportunities. By engaging in collective savings and making bulk purchases, stokvels not only facilitate consistent access to nutritious food but also enable members to combat the prevalent issue of food insecurity (Sobal, Bisogni and Jastran, 2014b; Mabika and Tengeh, 2021). For women in urban settings, participation in stokvels is more than a financial venture; it ensures food affordability and security for their families. These mechanisms empower women to navigate food affordability challenges in urban settings. Their participation in stokvels enables them to accumulate funds to purchase the groceries they need to sustain themselves and their families.

Stokvels and Health Promotion

Stokvel Savings has been recognized as a community-based informal financial institution with the potential to advance health promotion objectives (Lukwa, Odunitan-Wayas, Lambert, Alaba, *et al.*, 2022). The World Health Organization underscores the importance of enhancing health promotion interventions to improve physical, social, and emotional well-being (World Health Organisation (WHO), 2023). Stokvels can play a key role by providing their members with the means to afford health-related expenses, encompassing medical care, nutritious food, and activities that foster health (Storchi, 2018). Beyond their financial benefits, stokvels also offer social support networks that can be pivotal in influencing health-seeking behaviours among their members. The shared knowledge and communal interactions within stokvels facilitate health information dissemination, encourage disease prevention, and promote healthy practices. These networks can be especially effective in communities where formal health education and promotion may not have the desired reach or impact.

In the context of non-communicable diseases (NCDs), which present a growing global challenge, stokvels have been identified as a vehicle for health promotion. The Self-Help Obesity Prevention Program in Stokvels (SHOPPS), for instance, targets NCD prevention, focusing on areas such as obesity, a critical health concern (Evans, Steyn and Senekal, 2015). Programs like SHOPPS exemplify how stokvels can be integrated into broader health strategies to combat diseases prevalent in South Africa and beyond. Thus, the role of stokvels in health promotion is multifaceted, encompassing financial support, community education, and the implementation of targeted health interventions. These aspects combine to enhance the capacity of stokvels to contribute significantly to the well-being of their members and the wider community.

Stokvels and Agency in Women

The historical context of traditional kinship in sub-Saharan Africa often restricted women's access to property and financial resources (Gray and Kevane, 1999; Akinola, 2018; Errico, 2021). However, as women migrated to urban centres, they carved out new economic pathways, demonstrating a strong entrepreneurial spirit. The stokvel, a form of rotating credit and savings association (ROSCA), emerged as a strategic tool for women to harness savings and access capital outside formal financial institutions (Bouman, 1995; Kedir, 2005; Hevener, 2006). Participation in stokvels has been a game-changer for women, providing them with financial empowerment and a greater voice in decision-making processes at both the household and community levels (Aredo, 2004; Stoffle Richard W.; Minnis, Jessica; Van Vlack, Kathleen, 2014; Kabuya, 2015; Lappeman *et al.*, 2020). The financial autonomy gained through stokvels translates into an enhanced agency for women, enabling them to become active community leaders (Van Wyk, 2017). These platforms are more than just economic conveniences; they allow women to assert their independence and contribute meaningfully to their communities.

Pathways to Nutrition Impact through Stokvels

Drawing on the conceptual framework proposed by Kumar *et al.* (2018), which outlines pathways from women's group-based programs to nutrition change, we can conceptualize the pathways through which stokvels in South Africa may influence food security and nutrition.

- **Income Generation**

Participation in stokvels often involves pooling financial resources and providing members with access to credit. This can increase household income and purchasing power, enabling members to afford a diverse and nutritious diet. The findings from our study indicate that stokvel members, primarily women, use their collective financial power to negotiate bulk purchasing discounts and access credit (55), thus enhancing their economic stability and capacity to purchase healthier food options. However, despite this financial leverage, stokvels are not explicitly utilized for health promotion, highlighting an untapped potential in leveraging these groups for targeted health interventions.

- **Agricultural Engagement**

Some stokvels might engage in agricultural activities, such as community gardens or collective farming. These initiatives can enhance local food production, improve food availability, and ensure that members have access to fresh, nutritious produce. By empowering women to participate in agricultural decision-making and production, stokvels can contribute to improved household nutrition. Although our study did

not find significant engagement in agricultural activities among the surveyed stokvels, the potential for such initiatives exists and could be developed further to promote local food security and nutrition.

- Behavior Change Communication (BCC)

Stokvels can serve as platforms for disseminating health and nutrition information. Regular meetings provide opportunities for peer education on topics such as dietary diversity, infant and young child feeding practices, and hygiene. Our realist evaluation highlighted that stokvels have the potential to influence members' dietary choices and food purchasing decisions significantly (86). By fostering a supportive environment for behavior change, stokvels can improve members' nutrition knowledge and practices. However, the study found that this potential is not fully realized, as stokvels currently lack structured health promotion programs.

- Social Accountability and Community Demand

Stokvels can also play a role in advocating for better public services and government programs that support nutrition and health. By collectively demanding higher-quality services and accountability from service providers, stokvels can enhance access to nutrition-related services for their members. The stakeholder mapping conducted in our study identified key stakeholders within the stokvel ecosystem who could be mobilized to support these advocacy efforts (86). Despite this, our findings indicate that stokvels are underutilized in this advocacy role, representing another area for potential development.

Understanding and leveraging these pathways can enhance the role of stokvels in promoting food security and nutrition among their members. Stokvels serve as a crucial mechanism in urban sub-Saharan Africa, addressing vital issues such as food security, health promotion, and women's empowerment. They not only facilitate financial independence for women but also contribute significantly to household support and overall well-being improvement. By fostering a culture of savings, investment, and asset accumulation, stokvels empower women to improve their lives and play a more prominent role in the socio-economic development of their communities. In conclusion, while the potential of stokvels to promote food security and nutrition is evident, their role in health promotion remains largely untapped. There is a need for policy advocacy and targeted interventions to harness this potential fully. By integrating health promotion strategies into the existing financial and social frameworks of stokvels, stakeholders can enhance the overall impact of these groups on community well-being.

7.3.2 Objective 2

To investigate which macro-level influencer may impact how stokvels function and interact using stakeholder mapping.

As grassroots financial collectives in South Africa, Stokvels are subject to a range of macro-level influencers that shape their operations and efficacy. Understanding these influencers is crucial for stokvels to adapt and thrive within their socio-economic landscapes.

1. *Government Policies*: The regulatory framework set forth by the government is a significant influencer. Financial oversight, savings, and credit provision policies directly affect the operation of stokvels. Regulatory environments can either foster the growth of stokvels by offering supportive policies or hinder their functioning through restrictive measures (Matuku and Kaseke, 2014).
2. *Economic Conditions*: Economic climates have a profound impact on stokvels. In times of economic prosperity, stokvels may see an increase in contributions and activities, whereas economic recessions can strain members' ability to make regular contributions, thereby affecting the stability and sustainability of these groups (Response and African Response Research, 2012; Bophela, 2018; Bäckman Kartal, 2019; Koenane, 2019b; Radebe, 2019).
3. *Cultural Norms*: The ethos and activities of stokvels are deeply intertwined with cultural norms and values, which can dictate the nature of transactions, member engagements, and the allocation of collective resources.
4. *Technological Advancements*: Digital technologies have opened new avenues for stokvels, enabling them to conduct transactions efficiently and securely. Adopting digital platforms can facilitate broader participation and streamline stokvel operations (Cathrine Larkin, 2023).

The stakeholder mapping served as a strategic tool to inform about the roles, interests, and influences of various parties involved or affected by their activities. In conclusion, the interplay of macro-level influencers and the insights provided by the stakeholder mapping were indispensable in understanding the functioning and interaction of stokvels. Grasping the dynamics of these factors is essential for stokvels to operate effectively, ensuring they can withstand challenges and leverage opportunities within their environment (Bophela, 2018).

7.3.3 Objective 3

To investigate how grocery stokvels, as social entities, create conditions that influence decision-making concerning food purchasing and foodways amongst their members using a Realist Evaluation

Grocery stokvels in South Africa are community-based savings schemes that pool funds specifically for the procurement of essential food items and groceries for their members (Mabika, 2018; Mabika and Tengeh, 2021). The operational dynamics of these stokvels, whether they purchase groceries monthly or annually, are determined by mutual agreements that dictate the equitable distribution of goods among members. In assessing the impact and functioning of grocery stokvels, the realist evaluation offered a comprehensive framework. This approach, which contrasts with more traditional empiricist evaluation methods, is instrumental in examining social programs by understanding the interplay between context, mechanisms, and outcomes (Gilmore *et al.*, 2019b; Mukumbang *et al.*, 2020; Greenhalgh and Manzano, 2022). It facilitated a deeper insight into how grocery stokvels influence their members' decision-making and food-purchasing behaviors. The realist evaluation process in this context began with formulating an initial program theory, followed by identifying specific Context-Mechanism-Outcome (CMO) configurations, which were later revised based on the findings drawn from the in-depth interviews and focus group discussions. This entailed collecting and analyzing data to understand how the unique conditions within grocery stokvels affect members' decision-making processes regarding food purchases and consumption patterns.

One of the highlights from this study was that grocery stokvels make purchasing decisions influenced by factors like price reductions and bulk purchasing opportunities, resulting in organized and infrequent. Such strategic buying enabled households to manage their budgets more effectively and ensured a steady supply of essential food items. The participatory decision-making process within stokvels underscored the importance of inclusivity and transparency in their governance structures. Each member's input is valued, thus fostering a sense of agency and the necessity of consensus. The collective bargaining power of stokvels enabled them to secure favourable deals and prices, a testament to their cooperative nature and the efficacy of their collective action (Smallhorne, 2013; Nkosiyazi Kaseke *et al.*, 2018; Storchi, 2018).

Moreover, resolving conflicts within stokvels typically occurred through open dialogue and negotiation, emphasising unity and the respectful consideration of diverse opinions. Regular meetings about purchasing logistics facilitated consensus-building and exemplified the stokvels' ability to adapt to and overcome logistical challenges, including transportation, which is a critical factor in the success of their activities. In essence, grocery stokvels are more than economic units; they are social entities that cultivate conditions conducive to effective decision-making, thus enhancing food security, fostering economic empowerment, and contributing to community development in South Africa. Understanding these dynamics is crucial for informing policy and designing interventions that support and amplify the positive impact of stokvels on the communities they serve.

7.3.4 Objective 4

To assess factors that may impact or influence stokvel members' choice for "healthy food", food preferences, foodways, and food procurement decisions using a Discrete Choice Experiment (DCE).

The evolving food systems in South Africa are seeing a shift towards rising obesity rates and non-communicable diseases (Claasen, Van Der Hoeven and Covic, 2016), influenced by socio-economic divisions and food choices. The urban poor are particularly hit by an obesogenic environment, where undernutrition coexists with overweight issues. Stokvels, local informal saving groups, are pivotal for black South Africans (Peer *et al.*, 2014; Battersby Maya; Mngqibisa, Ncedo, 2016; Hill *et al.*, 2016), but their role in promoting healthier food options and addressing food insecurity is under-researched. Various factors influence stokvel members' choice for healthy food, food preferences and procurement. The use of discrete choice experiment (DCE) as the research aid in understanding individuals' preferences and choices. The aim of the DCE was not just to predict what people will choose, but to understand why they make the choices they do. Household dynamics, pricing strategies, food security, and individual preferences significantly impact dietary choices, with household decision-makers playing a pivotal role (Constantinides *et al.*, 2021; Eicher-Miller *et al.*, 2023). Stokvels, rooted in cultural traditions, have the potential to steer dietary behaviors towards healthier choices, emphasizing the need to leverage these insights for promoting a healthier dietary future for South Africa.

Attributes and levels for the discrete choice experiment were identified through the formative work, the systematic literature review, stakeholder mapping and realist evaluation, with 36 distinct scenarios

developed for evaluation. The study used a Mixed effects logistic regression Model to analyze the data and gained insights into the factors influencing the utilization of stokvels for healthier food choices. The experimental design carefully crafted levels within attributes to reflect realistic choices, ensuring a robust and grounded DCE design. The impact of stokvel participation on dietary choices within South Africa, emphasizing the influence of women and household dynamics was then explored. The DCE shed light on the potential of stokvels to promote healthier dietary behaviours and the need to leverage these insights for a healthier future in South Africa. The mixed-effects logistic regression analysis indicated that while some shopping preferences, like "two-for-one" offers, significantly influenced food choices, others, such as price and freshness for non-staples, do not. The influential figures within households and stokvels significantly affected food choices. Conditional relative importance assessments highlighted the dominance of certain attributes over others in influencing food decisions, specifically, frequency of purchasing and product features for staple (long-shelf items) and non-staple products (short-shelf items). The participants' household dynamics reveal insights into access to and choices surrounding healthy foods, influenced by diverse living conditions and social support systems.

Additionally, it uncovers nuances in grocery buying habits, emphasizing the significant sway of bundled pricing strategies on consumer choices, especially for long shelf-life items. It is safe to conclude that utilizing stokvels in a community can influence feeding positively and promote health education and awareness. Thus, the research offers insights into the complex interplay of socio-economic factors, household dynamics, and stokvels on dietary choices in South Africa, with a call to harness these insights for promoting healthier eating patterns.

7.4 Conclusions and Recommendations

Stokvels can potentially increase the face of several challenges in sub-Saharan Africa, such as low liquidity and integration and the need for better technical and institutional development. This includes harmonising legislations such as bankruptcy and accounting laws and a liberalized trade regime. The underdevelopment of the middle class and low savings rates can hinder the growth and effectiveness of stokvels. It is worth noting that high levels of criminality and corruption can challenge the operation and trustworthiness of stokvels (Breneol *et al.*, 2022; Lukwa, Odunitan-Wayas, Lambert and Alaba, 2022). When there are high levels of debt in a country that can limit the resources available to stokvels and their members, a lack of capital and skills can hinder the process of industrialization in Africa, which can indirectly impact the operation and effectiveness of stokvels. Underinvestment in infrastructure can impede the continent's productivity, including the operation of stokvels. Nearly 40% of sub-Saharan African countries risk slipping into a major debt crisis. This could impact the financial stability of stokvels and their ability to meet the needs of their members. These challenges highlight the need for supportive policies and interventions to

enhance the effectiveness of stokvels in promoting economic development and financial inclusion in sub-Saharan Africa.

It is crucial to inform policy and design interventions that support and amplify the positive impact of stokvels on the communities they serve. As noted above, the ethos and activities of stokvels are deeply intertwined with cultural norms and values, often placing women at a disadvantage. However, stokvels have provided a platform for women's empowerment through financial control and decision-making in areas such as grocery, food, and, in some instances, medicine choices.

An example at the meso-level is SaveAct, a South African NGO that integrates savings and credit groups with financial literacy training. SaveAct has demonstrated that such initiatives can significantly improve economic empowerment and food security within communities (Kirsten & Ncube, 2020). This model can be replicated within stokvels to enhance their impact. The Ministry of Women, Youth, and Persons with Disabilities can use this opportunity as an advocacy tool for women's economic empowerment. Given the substantial role of stokvels within the informal economy, formalizing certain aspects could further amplify their benefits. Stokvel platforms are more than just economic conveniences; they allow women to assert their independence and gain confidence, aligning closely with the Ministry's mandate to "lead on socio-economic transformation and implementation of the empowerment and participation of women, youth, and persons with disabilities through mainstreaming, advocacy, monitoring, and evaluation." This advocacy could also promote healthy food choices within these communities.

Although there is a gap in academic literature regarding the formal incorporation of stokvels into economic policy frameworks, this study highlights the opportunity to advocate for such policy implementations. The Ministry of Women, Youth, and Persons with Disabilities, or the Ministry of Small Business Development, could promote cooperation between stokvels and small businesses. This collaboration could extend benefits beyond individual members to the broader community, fostering solidarity and shared well-being. Financial autonomy gained through stokvels translates into enhanced agency for women, enabling them to become active community leaders.

Supporting evidence from the existing literature shows that similar microfinance initiatives have been successfully applied in other health contexts, such as HIV prevention and treatment adherence. For example, microfinance programs have improved health outcomes by empowering women economically, thus enabling them to make better health decisions (Pronyk et al., 2008). At a macro-level, policies such as those in Bangladesh, where microfinance has been systematically integrated into economic development strategies, offer a robust model for formalizing and scaling up stokvel initiatives (Khandker & Samad, 2014).

Furthermore, integrating a farm-to-table approach within stokvels can enhance their role in promoting food security and healthy eating habits. By connecting stokvels with local farmers and markets, these groups can access fresh produce at lower costs, thereby improving nutrition and supporting local agriculture. This meso-level recommendation aligns with the broader goals of socio-economic development and public health improvement. In conclusion, leveraging the findings from this study and existing literature, stokvels hold significant potential for driving socio-economic transformation. By implementing targeted financial literacy programs and collective bargaining initiatives, and promoting policy frameworks that formalize their operations, stokvels can become powerful agents of change, enhancing the well-being of their members and communities at large.

7.4.1 Empowerment through Financial Literacy and Collective Bargaining

Financial literacy and awareness of collective bargaining power are essential for empowering stokvel members. The discrete choice experiment (DCE) findings (176), realist evaluation (124), stakeholder mapping (86), and systematic literature review (55) from this thesis highlight the significant role of stokvels in influencing dietary choices, food security, and economic empowerment among their members. Stokvel leaders and members have a keen understanding of household economy, which is evident from their decision-making processes regarding food purchases. The study noted that stokvels' purchasing decisions are significantly influenced by factors such as price reductions and bulk purchasing opportunities. However, the power dynamics between retailers and stokvels are imbalanced, with retailers often dictating terms and pushing products to stokvels, taking advantage of their collective buying power without offering commensurate benefits.

To address this imbalance, it is crucial to roll out financial literacy programs and collective bargaining initiatives. These programs can be spearheaded by stakeholders identified in the study, such as banks, government organizations, and non-governmental organizations. Educating stokvel members about the pooling of resources and the financial power that comes with it will enable them to negotiate better prices and delivery terms for groceries, aligning with stokvel specifications. A practical example would be government-led negotiations with financial institutions to secure favorable interest rates for stokvels, thereby promoting their formation for financial protection and food security, particularly in urban areas. Such initiatives empower stokvel members to become more vigilant and financially responsible, fostering a shift towards self-reliance as a survival strategy.

The study also revealed that stokvels act as informal social security nets, offering members a platform for saving and influencing their decision-making processes regarding food purchases and consumption patterns. This understanding of economic dynamics allows stokvel members to calculate price differences

related to discounts effectively. However, there is a need to balance the power between retailers and stokvels to ensure that the benefits of bulk purchasing and collective bargaining are equitably shared. By implementing targeted financial literacy and collective bargaining programs, stokvel members can be better equipped to leverage their collective power. This approach not only enhances their economic empowerment but also ensures food security and promotes healthier dietary choices. Empowered stokvels can drive socio-economic transformation, benefiting both individual members and their communities.

7.4.2 Recommendations for Policy Implementation:

1. **Policy Advocacy:** State actors, particularly the Ministry of Women, Youth, and Persons with Disabilities, should advocate for the formal recognition of stokvels within economic policy frameworks. This includes creating legal and regulatory support systems that protect and enhance the operations of stokvels, ensuring they are integrated into the broader economic landscape and can operate effectively and sustainably.
2. **Capacity Building:** Non-state actors, including NGOs and community-based organizations, should focus on capacity-building initiatives that provide women in stokvels with financial literacy, business management skills, and health education. These initiatives will not only empower women but also leverage the inherent trust and social cohesion within stokvels, ensuring their sustainability and maximizing their potential as valuable, yet underutilized, assets in the community. By recognizing stokvels as units of trust and capitalizing on their social and economic leverage, these efforts can foster more resilient and empowered communities.
3. **Collaborative Frameworks:** Encourage collaborations between stokvels and small businesses through the Ministry of Small Business Development. Such partnerships can facilitate access to markets, credit facilities, and business development services, fostering economic growth at the community level. This approach ensures that stokvels can operate more effectively and contribute to local economic development.
4. **Health and Nutrition Programs:** Integrate health and nutrition programs within stokvels. By working with the Ministry of Health, stokvels can promote healthy food choices and improve the overall well-being of their members. This aligns with the broader goal of socio-economic transformation and empowerment, ensuring that stokvel members not only achieve financial security but also maintain good health and nutrition.

5. **Research and Data Collection:** Invest in research to fill the existing gap in academic literature concerning stokvels. State and non-state actors should collaborate with academic institutions to collect data and conduct studies that inform policy decisions and interventions.

7.4.3 Evaluating Stokvels as an Intervention Study

Given the non-interventional nature of this thesis, conducting an intervention study would be a compelling next step. The findings from the discrete choice experiment (DCE) (176), realist evaluation (124), stakeholder mapping (86), and systematic literature review (55) underscore the significant role stokvels play in influencing dietary choices, food security, and economic empowerment among their members. The DCE revealed several key insights. Shopping frequency emerged as the most significant factor influencing food choices, with a preference for monthly or quarterly shopping, suggesting structured approaches to food procurement aligned with income cycles. Closer proximity to shopping venues significantly influenced purchasing decisions, emphasizing the need for accessible food sources. Shop-delivery preferences varied, but the availability of bulk shopping delivered to a central point in the community was favored, indicating logistical convenience as a priority. For staple foods, attributes like 'two-for-one' options were less preferred, highlighting a focus on quality over quantity.

While, insights from the realist evaluation further enriched our understanding. Stokvels predominantly comprised women, playing a pivotal role in dietary decisions and highlighting the need for gender-sensitive interventions. The diversity in educational backgrounds and employment statuses among stokvel members influenced food purchasing decisions, with lower educational levels linked to less nutritional knowledge. Stokvels significantly contribute to economic empowerment and food security, suggesting their potential in driving socio-economic transformation. Findings from stakeholder mapping and the systematic literature review also provide critical insights. Stakeholder mapping identified key stakeholders within the stokvel ecosystem, highlighting the interdependencies and potential for collaborative efforts to enhance food security and economic empowerment. The systematic literature review emphasized the critical role of stokvels in mitigating the effects of poverty and resource constraints, particularly through collective buying and financial management practices.

Building on these findings, an intervention study could specifically target financial literacy programs and collective bargaining initiatives within stokvels. Financial literacy programs could enhance members' understanding of budgeting, saving, and investing, thereby improving their economic stability and capacity to make healthier food choices. Evaluating the impact of these programs would provide insights into their effectiveness in promoting economic empowerment and food security. By leveraging the collective purchasing power of stokvels, collective bargaining initiatives could negotiate better prices and access to

healthier food options from suppliers. The study could assess how such initiatives influence food procurement strategies and dietary habits among stokvel members.

Key stakeholders such as banks, government organizations, and NGOs could implement and evaluate these programs. Their involvement would not only ensure the scalability and sustainability of the interventions but also provide valuable data on their effectiveness. This approach could yield actionable insights into how stokvels can be leveraged to drive socio-economic transformation and enhance the well-being of their members. By systematically evaluating these interventions, we can better understand the potential of stokvels as a tool for promoting public health and economic development in South Africa.

7.5 Contribution to Science

While stokvels are primarily economic institutions, they contribute to scientific knowledge in several ways. They provide valuable insights for researchers in various fields and contribute to our understanding of informal economies, women's empowerment, and innovation in financial services. So, Stokvels provide a rich area of study for social scientists, particularly those interested in economics, sociology, and anthropology. They offer insights into how communities self-organize to address economic challenges, the role of trust and social capital in economic transactions, and the impact of informal financial institutions on poverty alleviation and social advancement. Researching Stokvels contributes to understanding informal economies often underrepresented in economic models and statistics. They highlight the importance of these organizations as saving institutions and as mechanisms of poverty alleviation and social advancement. Stokvels have been found to promote women's empowerment, providing them with opportunities to meet their basic needs, save, invest, and accumulate assets. Stokvels represent an innovative approach to financial services, which can inform the development of new financial products and services. They show how rotating savings and credit associations can provide access to credit and savings opportunities for individuals excluded from formal financial institutions.

7.6 Implications and Recommendations for Health Systems

It has been established that stokvels play a vital role in improving the nutritional value and content consumed by the public and, by extension reduce the risk of non-communicable diseases. They can significantly improve people's lives, especially in the context of health systems. One of the major implications of Stokvels is community engagement. The use of stockvels being community-based initiatives, can help in engaging the community in health-related matters. This can lead to a better understanding and acceptance of health policies and guidelines. In addition to fostering community, solidarity, and support

among the stokvel members, it enables the participants to engage in income-generating activities and contribute to local economic development. Stokvels can provide financial support for health-related expenses, thus reducing the financial burden on individuals and families. This can lead to improved access to healthcare services. Evidence shows that stokvels can serve as platforms for health education and awareness campaigns. This can lead to improved health literacy and better health outcomes.

From this study, it is recommended that health systems collaborate with stokvels to reach out to the community, provide health education, and understand the community's health needs better. These health systems can go a long way in supporting stokvels, which could be in the form of resources, training, and guidance. Health systems can incorporate the role of stokvels in health policies and guidelines. This can help in making health policies more inclusive and effective.

7.7 Recommendations for future research

This research provides valuable insights into the impact of stokvels in various aspects of life, such as health promotion, food security, and independence in women. While this research offers a compelling snapshot of the impact of stokvels on women in urban sub-Saharan Africa, it marks just the beginning of a more comprehensive understanding. Future research endeavors should expand the scope to encompass diverse African countries, considering regional variations and cultural contexts. Moreover, in-depth qualitative studies and longitudinal analyses can provide richer insights into the nuanced ways in which stokvels influence lives over time.

This research was non-interventional. It is important to ponder in what situations stokvels can be evaluated as an intervention study. One can take this study forward and create an intervention that links to health outcomes. There is potential for stokvels to promote healthier dietary behaviors and the need to leverage these insights for a healthier future in South Africa. A suggestion would be to study a cohort of stokvels that integrate healthy food purchases and link them to broader health outcomes related to NCDs such as obesity, diabetes, and high blood pressure or any other lifestyle disease of interest to combat diseases prevalent in South Africa and beyond.

Targeting stokvels and their billions of rand makes it possible to mobilize financial enterprises to support health promotion initiatives, including healthy eating campaigns. However, this would require policymakers to formulate an economic transformation policy framework that includes stokvels and their economic contribution factors. In conclusion, this research underscores the pivotal role of stokvels in shaping women's health, food security, and independence in urban sub-Saharan Africa. The call for further research resonates with the need to unlock the full potential of stokvels and craft targeted interventions that amplify their positive impact on women's lives across the continent. Evaluating stokvels as an intervention in health outcomes presents an exciting and valuable next step in this research journey.

7.8 References

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8: Thesis Appendices

8.1 Systematic review appendices

Appendix I: CASP-Qualitative-Checklist

Study title	Year published	Was there a clear statement of the aims of the research?	Is the methodology appropriate?	Was the research appropriate to address the aims of the research?	Was the data collected in a way that addressed the research issue?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	How valuable is the research?	Total out of 7
The role of stokvels in improving people's lives: The case in orange farm, Johannesburg, South Africa.	2014					0			6
The Economics of Roscas and Intrahousehold Resource Allocation.	2002								7
Strengthening informal social security to provide meaningful social protection: The case of stokvels in Soweto	2018								7
How does membership in local savings groups influence the determinants of national health insurance demand? A cross-sectional study in Kisumu, Kenya.	2018								7
5The Role of Stokvels in South Africa: A case of Economic Transformation of a Municipality.	2019								7
Stokvels as vehicles of wealth accumulation amongst migrants in Johannesburg.	2016								7
Informal finance for the middle and high income individuals in South Africa : a case study of high budget "stokvels" in Pretoria.	2007								7
The Politics of Formalization and Financialisation: Informal Savings and Credit Clubs in urban South Africa.	2012								7

Study title	Year published	Was there a clear statement of the aims of the research?	Is the methodology appropriate?	Was the research appropriate to address the aims of the research?	Was the data collected in a way that addressed the research issue?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	How valuable is the research?	Total out of 7
Self-Organization and Financialization from Below in an All-Male Savings Club in Soweto.	2014		0	0	0	0			3
The motivation and success factors of Zimbabwean grocery stokvels in Cape Town, South Africa.	2018								7
Success Factors and Gender Participation of Stokvels in South Africa.	2018								7
The nature and benefits of participating in burial society stokvels in South Africa.	2018								7
Rotating savings and credit associations and the pursuit of self-discipline: A case study in South Africa.	2001								7
Rotating credit associations: their formation and use by poverty-stricken African women in Rhini, Grahamstown, Eastern Cape.	2002								7
Stokvels: An Investment Opportunity in Urban Agriculture.	2018								7
Influence of participation in "table banking" on the size of women-owned micro and small enterprises in Kenya.	2015								7
Women and money: Lessons from Senegal.	2006								7
The Economics of Rotating Savings and Credit Association: Evidence from Ethiopia.	2005								7
That's how we help each other': Community savings groups, economic empowerment and HIV risk among female sex workers in Iringa, Tanzania.	2018								7

Study title	Year published	Was there a clear statement of the aims of the research?	Is the methodology appropriate?	Was the research appropriate to address the aims of the research?	Was the data collected in a way that addressed the research issue?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	How valuable is the research?	Total out of 7
The role of savings and internal lending communities in women's economic empowerment: a case of Morogoro municipality, Tanzania.	2019								7
An Appraisal of the Role of Women's Rotating Savings and Credit Associations on Household Livelihoods: A Case of Mkhosana Township in Victoria Falls.	2016								7
Investigating informal savings as income generating and poverty alleviating tool in Nelson Mandela Bay Municipality.	2012								7
Reaping Profits at the Bottom of the Pyramid: Exploring different industries funded by stokvels in South Africa.	2001				0				6
Defying the Odds, Not the Abuse: South African Women's Agency and Rotating Saving Schemes, 1994-2017.	2018								
The Dynamics of Education and Stokvels in South Africa	2019								7
Stokvels—A hidden economy: unpacking the potential of South African traditional saving schemes.	2012								7
Informal savings groups in South Africa: investing in social capital. University of Cape Town. Irving, Margaret	2005		0	0	0		0		3
Rotating And Savings Credit Association (Roscas): A Veritable Tool For Enhancing The Performance Of Micro And Small Enterprises In Nigeria	2020								7

|= Yes

0=No

Appendix 2: Summary characteristics of selected studies

S/N	Title	Country of study	Authors'	Year	Type of document	Research method	Sample	Agency in women	Food security and well-being	Behavioral economics	Economic leverage
1	The Economics of Rotating Savings and Credit Association: Evidence from Ethiopia.	Ethiopia	Kedir, A. M.	2005	Article	Quantitative	The data used in this study were collected from seven urban centers in Ethiopia. A total of 1500 households were interviewed	No	No	Yes	Yes
2	The economics of ROSCAs and intrahousehold resource allocation.	Kenya	Anderson, S., & Baland, J. M.	2002	Article	Mixed methods	Forty-four informal groups	Yes	No	Yes	Yes
3	How does membership in local savings groups influence the determinants of national health insurance demand? A cross-sectional study in Kisumu, Kenya.	Kenya	Tessa O.; Kaspar W.	2018	Article	Quantitative	A cross-sectional survey of 444 households	Yes	Yes	No	Yes
4	Influence of participation in "table banking" on the size of women-owned micro and small enterprises in Kenya.	Kenya	Gichuki, C. N.; Mutuku, M. M.; Kinuthia, L. N.	2015	Article	Quantitative	A cross-sectional survey involving 225 randomly selected women entrepreneurs	Yes	No	No	No
5	Rotating and savings credit associations (ROSCAs): A veritable tool for enhancing the performance of micro and small enterprises in Nigeria	Nigeria	Ademola Abimbola, O.; Ben-Caleb Egbide; Adegboyegun Adekunle, E.; Eluyela Damilola, F.; Falaye Adebajo, J.; Ajayi Abiodun, S.	2020	Article	Quantitative	A sample of 240 ROSCAs	No	No	Yes	Yes
6	Women and money: Lessons from Senegal.	Senegal	Guérin, Isabelle.	2006	Article	Qualitative	The empirical data for this paper were derived from field studies	Yes	Yes	Yes	No
7	The Dynamics of Education and Stokvels in South Africa	South Africa	Ngcobo, L.	2019	Article	Quantitative	Six hundred self-administered questionnaires were handed out to the stokvel members in the two cities of Gauteng	No	No	No	Yes
8	The role of stokvels in improving people's lives: The case in orange farm, Johannesburg, South Africa.	South Africa	Matuku, S.; Kaseke, E.	2014	Article	Qualitative	The study population consisted of female adults (aged 30 years and above) who were members of stokvels and living in Orange Farm in Johannesburg	Yes	No	Yes	No

S/N	Title	Country of study	Authors'	Year	Type of document	Research method	Sample	Agency in women	Food security and well-being	Behavioral economics	Economic leverage
9	Strengthening informal social security to provide meaningful social protection: The case of stokvels in Soweto	South Africa	Nkosiya, D.; Kaseke, E.	2018	Article	Qualitative	A snowballing sampling technique -stokvels within Soweto - Purposive sampling, -interviews, focus group discussions and the key informants interviews	Yes	No	Yes	No
10	The role of stokvels in South Africa: A case of economic transformation of a municipality.	South Africa	Mduduzi, J. K.; Bophela, Njabulo Khumalo.	2019	Article	Mixed methods	A sample size of 395 stokvel groups' respondents --quantitative research -simple random probability sampling method	No	No	No	Yes
11	Stokvels as vehicles of wealth accumulation amongst migrants in Johannesburg.	South Africa	Katende, K.	2016	Thesis	Mixed methods	-11 migrants --nationalities --members of stokvels living in the inner city of Johannesburg -interviews	No	Yes	Yes	Yes
12	Informal finance for the middle and high income individuals in South Africa : a case study of high budget "stokvels" in Pretoria.	South Africa	Kibuuka, L. E.	2006	Thesis	Qualitative	Thirteen groups were involved in this study	No	No	Yes	Yes
13	The Politics of Formalization and Financialization: Informal Savings and Credit Clubs in urban South Africa.	South Africa	Detlev K.	2012	Conference paper	Qualitative– Narrative	N/A	No	No	Yes	
14	Self-Organization and Financialization from Below in an All-Male Savings Club in Soweto.	South Africa	Krige, D.	2014	Article	Qualitative	An all-male Soweto savings club of seven members (observation and	No	No	Yes	Yes
15	The motivation and success factors of Zimbabwean grocery stokvels in Cape Town, South Africa.	South Africa	Mabika, S.	2018	Thesis	Mixed methods	One-on-one semi-structured interviews - leaders of Zimbabwean grocery stokvels, their spouses, and members of their families who did not belong to their stokvels	Yes	Yes	Yes	No
16	Success factors and gender participation of stokvels in South Africa.	South Africa	Ngcobo, L.; Chisasa, J.	2019	Article	Quantitative	A total of 386 respondents	No	No	Yes	Yes
17	The nature and benefits of participating in burial society stokvels in South Africa.	South Africa	Ngcobo, L.; Chisasa, J.	2018	Article	Quantitative	A total of 386 stokvel members (both genders)	Yes	No	Yes	Yes
18	Rotating savings and credit associations and the pursuit of self-discipline: A case study in South Africa.	South Africa	Aliber, M.	2001	Article	Mixed methods	A total of 340 stokvel members (both genders: 327 women and 13 men)	Yes	Yes	Yes	Yes
19	Rotating credit associations: their formation and use by poverty-stricken African women in Rhini, Grahamstown, Eastern Cape.	South Africa	Buijs, G.	2002	Article	Qualitative (unstructured interviews)	A total of 100 ROSCA members (both genders)	Yes	No	Yes	Yes

S/N	Title	Country of study	Authors'	Year	Type of document	Research method	Sample	Agency in women	Food security and well-being	Behavioral economics	Economic leverage
20	Stokvels: An investment opportunity in urban agriculture.	South Africa	Calitz, Andre P.; Cullen, M. D. M.; Sonti, W.	2018	Conference paper	Quantitative	A total of 152 stokvel members (women 120, men 32)	Yes	Yes	Yes	Yes
21	Investigating informal savings as income generating and poverty alleviating tool in Nelson Mandela Bay Municipality.	South Africa	Netnou, N. S.	2012	Thesis	Mixed methods	A sample of informal savings groups of women in the surrounding areas of the Nelson Mandela Bay Municipality. The researcher interviewed members from three stokvel groups that operate in different locations of the Nelson Mandela Bay Municipality	Yes	No	Yes	Yes
22	Reaping Profits at the Bottom of the Pyramid: Exploring different industries funded by stokvels in South Africa.	South Africa	Skenjana, B.	2015	Conference paper	Qualitative	Case studies of three stokvel groups	No	No	No	Yes
23	Defying the Odds, Not the Abuse: South African Women's Agency and Rotating Saving Schemes, 1994-2017.	South Africa	Nyandoro, M.	2018	Article	Mixed methods	The initial stage of this work involved carrying out extensive desktop research and analysis of secondary literature, including media sources on rotating schemes. In the second stage, limited archival research and oral interviews with a South African colleague who requested anonymity were conducted to discern ordinary South Africans' and stokvel representatives' opinions	Yes	No	No	No
24	Stokvels—A hidden economy: unpacking the potential of South African traditional saving schemes.	South Africa	African Response	2018	Article	Quantitative	A total 200 stokvel members (both genders) aged 16 years and above	No	No	Yes	Yes
25	Informal savings groups in South Africa: investing in social capital. University of Cape Town.	South Africa	Irving, M.	2005	Article	Qualitative	A focus group was conducted with 12 women who participate in a ROSCA-type Informal Saving group (ISG). Members are all employed as researchers and translators in the Khayelitsha community	No	No	Yes	Yes
26	'That's how we help each other': Community savings groups, economic empowerment and HIV risk among female sex workers in Iringa, Tanzania.	Tanzania	Mantsios, A.; Shembilu, C.; Mbwambo, J.; Likindikoki, S.; Sherman, S.; Kennedy, C.; Kerrigan, D.	2018	Article	Qualitative	Twenty-seven in-depth interviews (IDIs) with 15 Female sex workers (FSWs) over time and four focus group discussions (FGDs) with 35 female sex workers participating in Michezo, and 10 key informant interviews with group collectors	Yes	No	No	No
27	The role of savings and internal lending communities in women's economic empowerment: a case of Morogoro municipality, Tanzania.	Tanzania	Mulimila, S.	2019	Thesis	Mixed methods	A semi-structured questionnaire was used and administered to 100 women who are saving, and to internal community members. Two FGDs were conducted, which comprised of men and women SILC members. Each group had eight members (four men and four	Yes	No	No	No

S/N	Title	Country of study	Authors'	Year	Type of document	Research method	Sample	Agency in women	Food security and well-being	Behavioral economics	Economic leverage
							women) in each group. Men were included to find out their perception since most of them have spouses who are SILC beneficiaries. A key informant interview was conducted using an interview guide administered to three key informants (one SILC project coordinator and two community resource persons (facilitators)).				
28	An appraisal of the role of women's rotating savings and credit associations on household livelihoods: a case of Mkhosana township in Victoria Falls.	Zimbabwe	Nyoni, Y. V.	2016	Thesis	Mixed methods	The study population was drawn from residents of Mkhosana township ward 11 of Victoria Falls. A total of 32 respondents from five ROSCAs	Yes	No	Yes	No

8.2 Stakeholder mapping appendices

Appendix 3: Stakeholder mapping ethics approval



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room G50- Old Main Building
Groota Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: hrec-enquiries@uct.ac.za

Website: www.health.uct.ac.za/fhs/research/humanethics/forms

27 September 2021

HREC REF:456/2021

Prof E Lambert

Division of Physiological Sciences
Department of Human Biology
Email: Vicky.Lambert@uct.ac.za
Student: LKWAKI001@myuct.ac.za

Dear Prof Lambert

PROJECT TITLE: THE POTENTIAL OF ROTATING SAVINGS AND CREDIT ASSOCIATIONS (OCSA'S)/STOKVELS TO INFLUENCE HEALTHY FOOD CHOICES AND FOOD SECURITY IN SOUTH AFRICA: A STAKEHOLDER MAPPING AND ANALYSIS-PHD CANDIDATE-MR AKIM LUKWA

Thank you for your response letter, addressing the issues raised by the Faculty of Health Sciences Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, dated 17 March 2020: 06 July 2020 & 01 July 2021.

Approval is granted for one year until the 30 September 2022.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Mr Akim Lukwa will also be involved in this study.

Please quote the HREC REF 456/2021 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

HREC/REF 456/2021sa

Yours sincerely



PROFESSOR M BLOCKMAN

CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637.

Institutional Review Board (IRB) number: IRB00001938

NHREC-registration number: REC-210208-007

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

Appendix 4: Stakeholder mapping consent forms

UCT Research Centre for Health through Physical Activity, Lifestyle and Sport (HPALS)

Department of Human Biology, Faculty of Health Sciences,

University of Cape Town

P.O. Box 115, Newlands 7725, South Africa

Tel: +27 21 650 4561



HREC 456/2021

Version 15 Sept 2021

[Informed consent- online or telephonic interview](#)

The potential of Stokvels to influence healthy food choices and food security in South Africa: A stakeholder mapping and analysis

I hereby give my consent to participate in this study.	Yes	No
I understand I am taking part freely without being coerced into doing so.	Yes	No
I am aware that my answers and opinions will remain confidential.	Yes	No
I understand that I can withdraw from the study at any time without any consequences.	Yes	No
I would like to receive a copy of the publication/s associated with this study when it is complete	Yes	No
I would be willing to be contacted by these researchers for other studies related to this work on access to affordable healthy food.	Yes	No

Interviewee name:

Interviewee e-signature

Interviewee stakeholder grouping:

Interviewer name:

Date:

Appendix 5: Stakeholder mapping questionnaire

Introduction:

The interviewer will introduce themselves and the project. This process will follow 5 steps;

1. The interviewer will establish the purpose for the interview
2. Explain who is involved in the process (community partnership members)
3. Establish credibility for the interview and the interviewer
4. Explain why their cooperation is important in collecting the information
5. Explain what will happen with the collected information and how the stakeholders will benefit.

Key questions:

1. What do you understand by the term stokvel?
2. How does your organisation interact with stokvels?
3. In your organisational and personal interactions with stokvels how best can you describe how they function?
4. In your opinion what are your thoughts on perceived socioeconomic power of stokvels?
5. In what ways can stokvels can be used in improving healthy foods; availability, accessibility and affordability
6. Do you have any thoughts you think are relevant to our research project relative to stokvels?

Summary:

The interviewer will, quickly summarise the major comments heard throughout the interview and ask the key informants if all the major points have been covered. Finally, the key informants will be thanked for their time and after completing the interviews follow-ups and “thank you” notes will be sent to the interviewees.

8.3 Realist evaluation appendices

Appendix 6: Realist evaluation ethics approval



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room 45 E-52-E-Floor- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone (021) 406 6492
Email: hrec-submissions@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

11 August 2022

HREC REF: 200/2022

Dr O Alaba
Health Economics Unit
Public Health & Family Medicine
Email: Olufunke.alaba@uct.ac.za

Dear Dr Alaba

PROJECT TITLE : CONDITIONS THAT INFLUENCE DECISION MAKING OF ROSCAS/ASCAS AS SOCIAL ENTITIES RELATIVE TO FOOD PURCHASING AND FOODWAYS, AMONGST ROSCAS/ASCAS MEMBERS: A REALISTIC EVALUATION

Thank you for your response letter, addressing the issues raised by the Faculty of Health Sciences Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30 August 2023.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

Please quote the HREC REF 200/2022 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637. Institutional Review Board (IRB) number: IRB00001938 NHREC-registration number: REC-210208-007

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice

HREC.REF200.2022

(ICH GCP), South African Good Clinical Practice Guidelines (DoH 2020), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

Appendix 7: Realist evaluation stokvel information page



UCT Research Centre for Health through Physical Activity, Lifestyle and Sport (PALS)
Department of Human Biology, Faculty of Health Sciences,
University of Cape Town
P.O. Box 115, Newlands 7725, South Africa
Tel: +27 21 650 4561

Stokvel Member Information Page

Conditions that influence decision making of ROSCAs/ASCAs as social entities relative to food purchasing and foodways, amongst ROSCAs/ASCAs members: A realist evaluation

What is this study about?

South Africa has a complicated problem of adult obesity and household food insecurity, particularly in women from disadvantaged communities. In this country, there are over 800,000 stokvels, of which 1 in 5 are so-called "grocery stokvels". These ROSCAs/ASCAs are used as a method of informal savings, and often as a way of combining resources to bulk purchase items for discounts.

The primary aim of this study is to investigate how ROSCAs/ASCAs, as social entities create conditions that influence decision-making concerning food purchasing and food-ways, amongst their members. We want to explore the decision making process of stokvels relative to food purchasing and food-ways, amongst their members.

We are a team of researchers from the University of Cape Town, representing public health interests, to address healthy food choice decisions, food security, and healthy equity.

You have been identified as one of the stokvel members. We would like to invite you to be interviewed as part of this study.

In our interviews with you and other stokvel members, we hope to:

- understand the decision making of ROSCAs/ASCAs relative to food purchasing and pathways
- identify conditions that in the decision making of ROSCAs/ASCAs relative to food purchasing and pathways
- investigate conditions that influence the decision making of ROSCAs/ASCAs relative to food purchasing and pathways amongst their members.

What is expected of me if I choose to participate?

If you agree to participate, we will conduct individual, audio-recorded interviews or ask you to participate in a focus group discussion, face-to-face with all COVID-19 protocols observed.

Interviews will be semi-structured and focus groups, but guided according to our aims, as mentioned above. Interviews are not expected to last longer than 20-30 min while, the focus groups are not expected to go beyond 60 minutes. Your participation in this study is entirely voluntary. There will be no negative consequences should you decide not to participate. Furthermore, you are free to withdraw at any stage, and to have your data deleted from record.

Potential benefits and risks

There are no personal risks associated with participating in this study. Indirect benefits will be to provide insights into how stokvel members make their decisions relative to food purchasing and pathways. Also, we hope to initiate inter-sectoral engagement between various organisations and local stokvels, as a means toward improving access to healthy food. It is our hope that this may indirectly help to mitigate the complicated problem of obesity and food insecurity.

The researchers undertake to share the study findings with you as a study participant.

Confidentiality

All the information collected from you and other participants will be anonymous and kept strictly confidential. Participants and organisations will be assigned a code that will only be known to the research team members. The research team undertakes that all information provided by you will be used only for the study. The recordings and transcriptions of the study will be destroyed 5 years after completion of the study. In the intervening time, they will be stored on a secure server.

Ethical Approval

Ethical approval for this study has been obtained from the Human Research Ethics Committee of the University of Cape Town.

Questions

Members of the research team will answer any questions you have about this study. If you have any queries or concerns about the conduct of this study, you may contact the Health Research Ethics Committee of the University of Cape Town.

Principal Investigator

Prof Estelle Victoria (Vicki) Lambert, PhD Director |

International Collaborating Centre of Sports Medicine,

Department of Human Biology, Faculty of Health Sciences | University of Cape Town Vicki.Lambert@uct.ac.za

| 021 650 4571 (w) | 082 312 6890 (c)

Appendix 8: Realist Evaluation Informed Consent

UCT Research Centre for Health through Physical Activity, Lifestyle and Sport (PALS)
Department of Human Biology, Faculty of Health Sciences,

University of Cape Town

P.O. Box 115, Newlands 7725, South Africa

Tel: +27 21 650 4561



Informed consent

Conditions that influence decision making of ROSCAs/ASCAs as social entities relative to food purchasing and foodways, amongst ROSCAs/ASCAs members: A realist evaluation

I hereby give my consent to participate in this study.	Yes	No
I understand I am taking part freely without being forced into doing so.	Yes	No
I am aware that my answers and opinions will remain private.	Yes	No
I understand that I can stop participating in the study at any time without any consequences.	Yes	No
I would like to receive information from this study when it is complete	Yes	No

Interviewee name:
Interviewee signature
Interviewee focus grouping:
Interviewer name:
Date:

Appendix 9 : Realist Evaluation In-depth Questionnaire

Questionnaire- In-depth in-person interview

Welcome remarks to the potential study participant:

- Greet and introduce yourself.
- Our research intends to understand conditions that influence the decision making of ROSCAs/ASCAs as social entities relative to food purchasing and food-ways, amongst ROSCAs/ASCAs members.
- You are free not to participate in this interview should you choose not to and even after accepting to be part of this interview you can withdraw at any time.
- We will be recording this on our on an audio recorder to help us remember the important points from this discussion.
- We will not share the audio recording with anybody else and your identity will be kept strictly confidential.
- If you have any general questions about the interview, now would be the time to express them, otherwise we look forward to an open, honest discussion with you.

Ice-Breakers:

1. How has your day been?
2. What do you do for a living?
3. How long have you lived here?

Any other questions the interviewer deems necessary to allow the interviewee to feel comfortable

General Stokvel Questions:

1. Are you a member of a grocery stokvel?
2. Could you please tell us how old you are?
3. Please tell me a little bit about your stokvel.
4. How and when did your group start?
5. What was the purpose of your group when it started? And has it changed?
6. Does your stokvel have any rules? Can you please elaborate? *(ask relevant probing questions to the response of this question)*
7. How many members are in your group?
8. How much do you contribute to the stokvel?
9. How frequent do you pay the contributions; daily, fortnight, weekly or monthly?
10. How do you keep track of each member's contributions?
11. How many times do you do the grocery distributions in a year?
12. Who decides the type of food that is bought in your stokvel?
13. From which shop or shops do you purchase the food from?

14. Does the shop or shops offer you discounts when you do the bulk purchases?
15. Are you also offered transport from the shop to the house where you will be distributing the food?
16. What do you do if a member fails to contribute at a meeting? *Interviewer can steer the interview in a new direction should the responses reveal interesting findings. Interviewer can ask questions not shown above should he feel it is relevant to the direction of the interview*
17. What is the procedure if members wish to terminate their membership of the grocery stokvel?
18. Do you currently put your stokvel contributions in the bank?
19. What benefit do you gain from putting your money in the bank?
20. As a member of a stokvel, what do you consider to be the most significant attribute or characteristic which contributes to the success of your stokvel, by comparison with that of others?

Closing remarks:

Ask the interviewee if he/she has anything more to add to the interview and then thank him/her for their time.

END

Appendix 10: Realist Evaluation Focus Group Discussions Questionnaire

Questionnaire- Focus Group Discussions

Welcome remarks to the potential study participant:

- Greet and introduce yourself.
- Our research intends to understand conditions that influence the decision making of ROSCAs/ASCAs as social entities relative to food purchasing and food-ways, amongst ROSCAs/ASCAs members.
- You are free not to participate in this focus group discussion should you choose not to and even after accepting to be part of this focus group you can withdraw at any time.
- We will be recording this on our on an audio recorder to help us remember the important points from this discussion.
- We will not share the audio recording with anybody else and your identity will be kept strictly confidential.
- If you have any general questions about the interview, now would be the time to express them, otherwise we look forward to an open, honest discussion with you.

Ice-Breakers:

1. How has your day been?

Any other questions the interviewer deems necessary to allow the interviewee to feel comfortable

General Stokvel Questions:

1. Why are you a member of a grocery stokvel?
2. Could you please share your understanding of grocery stokvels?
3. Tell us your personal insights on your own grocery stokvel?
4. How and when did your group start?
5. What is the composition of the membership of the grocery stokvel, with respect to how many are in formal employment and how many informally employed? Does the composition reflect the wishes or preferences of the members, or did it evolve without any preferences being expressed?
6. Why do members prefer to join grocery stokvels over purchasing groceries as individual consumers?
7. How do members decide which products should be purchased? How do they resolve disagreements concerning purchases?
8. Does your stokvel have any rules? Can you please elaborate? *(ask relevant probing questions to the response of this question)*
9. Do you think defaulting members are a big concern in grocery stokvels, if yes please explain?
10. What are the penalties imposed on members who cannot pay their fixed monthly contributions?
11. What comes into your mind when you hear the term "healthy eating"?
12. Do you think at the moment grocery stokvels are buying healthy foods, give an explanation to support your response?

13. Generally, in grocery stokvels who decides the type of food that is bought?
14. From which shop or shops do you purchase the food?
15. Do you think those shops you buy from have power over what you can buy? Please give an explanation to your response.
16. As a member of a grocery stokvel, what sorts of problems do you encounter and how do you overcome them?
17. Can men join your stokvel? If no, why not?
18. Who carries the heavy bulk purchases? Do female members perform the task on their own?
19. What would you say are the principal benefits of belonging to grocery stokvels? Are members motivated to join owing to making significant savings, or do they do so to work together with others as a team?

Closing remarks:

Ask group of participants has anything more to add to the discussion and then thank them for their time.

END

8.4 DCE Appendices

Appendix II: DCE Ethics Approval



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room 45 E-52-E-Floor- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: hrec-submissions@uct.ac.za
Website: www.health.uct.ac.za/home/human-research-ethics

22 May 2023

HREC REF: 303/2023

Dr O Alaba

Health Economics Division
School of Public Health & Family Medicine
Email: Olufunke.alaba@uct.ac.za
Student: lkwaki001@myuct.ac.za

Dear Dr Alaba

PROJECT TITLE: AN ASSESSMENT OF THE UTILIZATION OF STOKVELS OR ROTATING SAVINGS AND CREDIT ASSOCIATIONS TO INFLUENCE HEALTHY EATING IN SOUTH AFRICA-SUB-STUDY LINKED TO 456/2021 & 200/2022- (PHD CANDIDATE-MR AKIM LUKWA)

Thank you for your response letter addressing the issues raised by the Faculty of Health Sciences Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study, subject to updating HREC REF 456/2021.

Approval is granted for one year until the 30 May 2024.

Please submit a progress form, using the standardised Annual Report Form (FHS016) if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Mr Akim Lukwa will also be involved in this study.

Please quote HREC REF 303/2023 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely


PROFESSOR M BLOCKMAN
CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE

HREC/raf 303 2023

Participant Identifier:

Date:.....

Appendix 12: Discrete Choice Experiment Questionnaire

Information Sheet and Consent Form: Learning more about stokvels and factors that influence food choice decisions

My name is **AKIM TAFADZWA LUKWA**. I am a PHD student with University of Cape Town.

You are being asked to participate in a survey titled, “Learning more about stokvels and factors that influence food choice decisions”.

This research is under the guidance of Professor Estelle Victoria Lambert, Dr. Olufunke Alaba, Dr. Feyi Wayas, and Dr. Amarech Obse (University of Cape Town).

We would really appreciate it if you agree to participate. You are allowed to withdraw at any stage and you won't be required to give any explanation. If you feel you need to consult someone before agreeing to participate, you may do so freely. **Participation is voluntary and you may refuse** to continue without any consequences.

As we are going through the consent form, feel free to ask if you don't understand anything and we will be happy to give further explanation.

Why have I been invited to complete this survey?

You are being invited to complete this survey because we value your experience as stokvel member. Your answers will add to our understanding and knowledge of how stokvels and other factors may influence food choice decisions in South Africa.

Purpose of the research

The purpose of the study is to gain insight into factors affecting the food choice decisions in South Africa. We hope to be able to use the information from this survey to motivate for policies and practices that may increase demand for and access to healthy, affordable food. We are particularly interested in the potential role for stokvels, in contributing to demand for and access to healthy, affordable food.

Your answer should describe what YOU think or prefer, not what you think you should say or what you think we would like to hear. There are no right and no wrong answers, it is only about what you like. Do not worry if the choices are not available to you at the present time. Your choice can represent what you hope for, or what you would choose, given a choice. Remember to ü tick only one.

Description of tasks

Part I: You are asked to choose only the alternative you prefer most.

For **staples** (long shelf items) please select the attributes you consider most important when making your food choices.

Attribute 1: To purchase your staples (long-shelf life groceries) how far are you willing to travel to the shops? (ü tick only one)

Choices include:

- 1 = less than 1 km
- 2 = between 1km -3km
- 3 = between 3km- 5km
- 4 = more than 5 km

Attribute 2: What do you look for when buying your staples (long-shelf life) groceries? (ü tick only one)

Choices include:

- 1 = value for money
- 2 = perceived food quality
- 3 = price
- 4 = taste preference
- 5 = shelf life (how long it can keep before going “off”)

Attribute 3: What is most important to you when you do your grocery shopping for staples (long-shelf life items)?

Choices include:

- 1 = cleanliness of the shop
- 2 = how you are treated at the shop

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- 3=access to buy the groceries on credit
- 4=deals and offers

Attribute 4: What do you consider most important when buying your staples (long-shelf life groceries)?

Choices include:

- 1 = there are nutrition or ingredients labels
- 1 = the product is made locally
- 3 = there is a “best before” label
- 4 = there is a “two for one” option
- 5 = the product has no preservatives

Attribute 5: What would you most prefer when shopping for your staples (long-shelf life groceries)?

Choices include:

- 1 = shop on-site (you choose and transport own goods)
- 2 = shop on site and delivery to your home for a small fee
- 3 = shop online & delivered to central point in community
- 4 = bulk shopping delivered to central point in community

Attribute 6: How often are you most likely to do shopping for your staples (long-shelf life groceries)?

Choices include:

- 1= as needed
- 2 = weekly
- 3 = monthly
- 4 = quarterly
- 5 = every 6 months
- 6 = yearly

For **non-staples** (perishables) please select the attributes you consider most important when making your food choices.

Attribute 1: To purchase your non-staples (perishables) how far are you willing to travel to the shops?

Choices include:

- 1 = less than 1 km
- 2 = between 1km -3km
- 3 = between 3km- 5km
- 4 = more than 5 km

Attribute 2: What do you look for when buying your non-staples (perishables) groceries?

Choices include:

- 1 = value for money
- 2 = perceived food quality
- 3 = price
- 4 = taste preference
- 5= freshness

Attribute 3: What is most important to you when you do your non-staples (perishables) grocery shopping?

Choices include:

- 1= cleanliness of the shop
- 2= how you are treated at the shop
- 3=access to buy the groceries on credit
- 4=deals and offers

Attribute 4: What do you consider most important when buying your non-staples (perishables)?

Choices include:

- 1 = the product is made locally
- 2= there is a “two for one” option
- 3 = the product has no preservatives

Attribute 5: What would you most prefer when shopping for your non-staples (perishables)?

Choices include:

Participant Identifier:

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- 1 = shop on-site (you choose and transport own goods)
- 2 = shop on site and delivery to your home for a small fee
- 3 = shop online & delivered to central point in community
- 4 = bulk shopping delivered to central point in community

- 4 = our health
- 5 = our community and neighbourhood

Attribute 6: How often are you most likely to do shopping for your non-staples (perishables)?

Choices include:

- 1 = as needed
- 2 = weekly
- 3 = monthly
- 4 = quarterly

For all household food choices please select the attributes you consider most important.

Attribute 1: Which of the following person/s has/have the greatest impact on your household food choices.

Choices include:

- 1 = the person/s who earn money for the household
- 2 = the person/s who plans the household menu
- 3 = the person/s who prepare the food in the household
- 4 = person/s with health concerns and require certain foods
- 5 = oldest member/s of the household

Attribute 2: Which of the following factors has the greatest impact on your household food choices.

Choices include:

- 1 = our household income and grants
- 2 = our household access to transport
- 3 = our culture or beliefs

The next series of questions are about **stokvels**, and your preferences if you are given a choice.

Attribute 1: Which of the following best describes why you prefer to belong to a stokvel? (ü tick only one)

Choices include:

- 1 = To relax and have a good time, to meet with my friends
- 2 = To learn new things about money, my health or food
- 3 = To help save money for my household
- 4 = To be able to make my own decisions about how I spend the money I save.
- 5 = To use our collective buying power to get good deals on food and other items

Attribute 2: If you had a choice, which best describes what you would do with the money you earn as a member of a stokvel?

Choices include:

- 1 = To buy enough good quality food for my household
- 2 = To pay for my children's education
- 3 = To buy electronic devices, tv, appliances, DSTV, etc.
- 4 = To buy land, a house or plot
- 5 = To buy a car

Attribute 3: If you could choose, what would be the best way for your stokvel to improve your access to healthy, affordable food?

Choices include:

- 1 = Bulk buy fruits/vegetables/meat from local farmers
- 2 = Annual holiday bulk purchase of staples
- 3 = Stokvel develops its own vegetable garden
- 4 = Short courses on "what is healthy food?", "Reading food"

Participant Identifier:

Date:.....

labels”, and “Cooking and eating healthy food on a budget?”

- 5 = Monthly stokvel discount vouchers for purchase of fruits & vegetables at major retail chains

Attribute 4: If you could choose, what would be the best way for your stokvel to improve your access to healthy, affordable food?

Choices include:

- 1 = Adequate storage and a working refrigerator at home
- 2 = Transport to and from retail stores, wholesale or farms
- 3 = Discount vouchers on fresh food items
- 4 = No load shedding making it difficult to prepare food
- 5 = Food labels that show me which foods are “healthy” (for example, a “stoplight” to show green, yellow and red foods as healthy, less healthy, most unhealthy)

Part 2. After completing these preliminary questions, you will be asked to choose your best set of options, that given a choice, influence your food choice decisions. We will also ask, that given a choice, which set of options is most likely to influence the food choice decisions of your stokvel.

The above attributes will be interchanged in different choice sets and you will have to choose your best option. **NB: You cannot choose both options in one choice set.**

Participant Identifier:

Date:.....

Questions to check if participants understands the Interview process

- *If you decide not to take part in this research study, do you know what your options are?*
- *Do you know that you do not have to take part in this research study, if you do not wish to? Do you have any questions?*
- *If you agree to take part, do you know if you can stop participating?*
- *Do you know that you may not respond to the questions that you do not wish to respond to?*
- *If you decide to take part in the study, do you know how much time will the Interview take?*
- *Do you have any more questions?*

Risks and Confidentiality

Some of the questions to be asked are personal and you may feel uncomfortable. You can refuse to answer without any consequences and move on to the next question or stop. It is fine. You are not expected to provide reasons for why you don't want to answer. We however, assure you that whatever information you provide, it will be kept safe and will not be leaked to anyone. We may not have much control over the people participating in the focus group with you, but we reiterate to them the importance of confidentiality.

Signature of Participant _____

Date _____

Day/month/year

The questionnaire will be stored in a locked locker only accessible to the research team. The questionnaire will be destroyed 5 years after research completion.

Benefits

Though you are being compensated (R250) for your time taken in participating in this study there will be no direct benefit to you, but your participation is likely to help us find out more about the preferences of healthy eating in South Africa. This will help the relevant stakeholders in public health in future decision making to ensure healthy eating and reduce the burden of non-communicable diseases in South Africa.

Reimbursements: Those participating in the study will be compensated for their time with R250.

Questions to check if patient understands the Risks and Benefits

- *Can you tell me if you have understood correctly the risks and benefits that you will have if you take part in the study?*
- *Do you have any other questions?*
-

Certificate of Consent

I have been invited to participate in research about assessing the utilisation of stokvels or rotating savings and credit associations to influence healthy eating in South Africa. I have read the foregoing information or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study

Name of Participant _____

If signing on behalf of participant

Participant Identifier:

Date:.....

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness _____

Signature of witness _____

Date _____

Day/month/year

Statement by the researcher/person taking consent

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Print Name of Researcher/person taking the consent _____

Signature of Researcher /person taking the consent _____

Date _____

Choice Set I

Part II: General demographics

This part concerns general demographics, questions additional questions which will provide additional details to better understand preferences relative to healthy eating.

Please answer the following questions, encircle the right answer where multiple options are given.

General demographics

1. What is your age?

..... Years

2. What is your gender?

Male

Female

3. What type of dwelling do you stay in?

Informal settlement/ Shack

Rented apartment/ House

Owned apartment/ House

4. What is your marital status?

Single (never married)

Married or partnership

Widowed

Divorced

Separated

5. What is your highest level of education?

Grade 0-7

Grade 8-12

National Qualification Level (NQL; Higher Education)

Bachelor or equivalent

Master or equivalent

Doctoral or equivalent

6. What is your type of employment?

Student

Participant Identifier:

Date:.....

- Unemployed
- Self-employed
- Employed

7. How many people live in your household?

.....

Questions relating to choice of facility

8. How long have you been a member of the stokvel?

- Less than 2 months
- Between 2 months and 6 months
- Between 6 months and 1 year
- More than 1 years

9. How frequent do you pay the contributions?

- Daily
- Fortnight
- Weekly
- Monthly

10. How long have you been a member of a stokvel?

.....

11. How much is your contribution?

.....

12. How do you travel to the shops?

- Walking
- Public taxi
- Private taxi
- Bus
- Private car

13. How much time does it take you to reach the shops/supermarket?

- 0-15 minutes
- 15-30 minutes
- 30 minutes to 1 hour

Participant Identifier:

Date:.....

More than 1 hour

14. Where do you stay?

.....

15. Which is the nearest shop/supermarket to your home?

.....

16. List some of the barriers you think are stopping you from consuming healthy food choices.

.....
.....
.....
.....

Are there any factors about the preference for healthy food options that are important to you but that are not considered in the questions mentioned above? Or do you think some answering possibilities should be further specified?

Please rate on a scale from 1 to 7 how difficult this questionnaire was to you.

1 (extremely easy)	2	3	4	5	6	7 (extremely difficult)

Thank you so much for your participation. It is greatly appreciated