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Factors influencing the usage of multivitamin supplements in the greater Durban area: Implications for marketing

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GLOSSARY OF ACRONYMS

CASI - Computer-Assisted Self-Administered Interviews

DS – Dietary Supplements

FDA – Food and Drug Administration

MVS – Multivitamin Supplements

SA – South Africa

TPB - Theory of Planned Behaviour

US – United States

VS – Vitamin Supplements

ABSTRACT

The South African market for vitamin supplements (VS) is due to reach 7,021 million South African Rand (ZAR) by 2026. Lifestyle diseases and active lifestyle trends drive this growth. Poor dietary practices are a great concern in developing countries such as South Africa (SA) and have the potential to cause long-lasting diseases and high public health spending. Multivitamin supplements (MVS) help address these issues; however, literature on the factors influencing the usage of MVS amongst South African consumers is lacking.

Current studies reveal that other factors not considered in the existing research could be crucial influences on the usage of dietary supplements (DS). The theory of planned behaviour (TPB) framed this study and addressed the gap in knowledge by exploring the beliefs of South African MVS users and non-users towards MVS usage, their perceived health status and the value they place on health. Additionally, unlike many previous studies on DS, this study focused exclusively on the MVS sub-category and did not limit its focus to university students or females only.

The study followed a descriptive research design that adopted a quantitative approach. Using the mall intercept technique, a convenience sample of 385 participants aged 18 years and over was selected from shopping malls in the greater Durban area. Self-administered online questionnaires were utilised to gather data on respondents' multivitamin usage patterns and the factors influencing such usage.

The main findings of the study indicate that MVS users had lifestyle characteristics associated with health. MVS user groups placed a high value on health; however, non-users tended to have a slightly higher perceived health status than users. Overall, users had stronger behavioural beliefs towards MVS consumption than non-users; however, both user groups showed positive attitude scores toward MVS consumption. Doctors were the only subjective norm to exert positive social pressure on users and non-users to consume MVS. Non-users were more price-sensitive when picking an advanced MVS than users. Both user groups preferred a gender- and lifestyle-specific MVS.

Key words: Behavioural beliefs, Dietary supplements, Health, Multivitamin supplements, Perceived health status, Subjective norm

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CHAPTER 1: OVERVIEW OF THE STUDY

1.1 Introduction

Multivitamin supplements (MVS) are a type of dietary supplement (DS) that comprise vitamins and dietary minerals (Hollenstein, 2007). Some consumers take an active part in their health by frequenting the gym and following specific diets. For many, taking one or more DS is a natural complement to an overall health plan (Hollenstein, 2007).

Traditionally, a DS was taken to maintain a satisfying diet and although this remains an important motive for some, others also take DS anticipating extra health advantages (Webb, 2006). These may include improving immunity, lessening the likelihood of a chronic illness, or treating a non-deficiency condition. The choice to take DS may also be affected by suggestions from individuals or a media message and compelling marketing materials at the store level (Webb, 2006).

This research analysed the factors impacting the adoption of MVS to determine the category drivers and obstacles to consumption. The study acquired a comprehensive knowledge of the customer and their connection with the MVS sub-category in the greater Durban region.

1.2 Background to and motivation for the study

Concerns about the potential global impact of poor dietary habits on chronic diseases and public health spending are growing in both emerging and industrialised nations (Faherty & Hough, 2021). While there is overwhelming data linking nutritional deficiency to potentially higher risks for chronic illnesses, scientists and health practitioners are beginning to recognise the role of DS in actions aimed at preventing disease and promoting health (Faherty & Hough, 2021). According to Sasha Watkins, a South African dietitian, malnutrition affects the health of individuals who cannot afford a balanced diet; hence, MVS are essential (Visser, 2017). Additionally, the relative ageing of the global population is a significant motivator for the use of DS in raising population health levels in a nation (Research and Markets, 2022). Despite the inherent risks associated with poor eating habits, there are signs that consumers are becoming more health-conscious, as seen by the rise in spending in the VS category (Research and Markets, 2022). For instance, the South African VS market is predicted to reach 7,021 million South African Rands in 2026 with a compound annual growth rate of 14.3% for the forecast period 2022 to 2026 (Research and Markets, 2022). However, the underlying consumer beliefs driving this growth, particularly MVS growth, are currently unknown in SA. In addition, the beliefs towards MVS usage among non-users in unknown. Therefore, a deeper understanding of the motivations behind MVS adoption and non-adoption will help to enhance value creation for both South African consumers and MVS product marketers.

1.3 Research problem

Numerous studies have been undertaken to ascertain the factors that influence the use of DS both internationally and locally, most notably among the student population. DS is influenced by such factors as gender, social influence, diet, perceived control, age, income, physical activity, history of chronic diseases and belief about the benefits (Faherty & Hough, 2021).

The majority of studies focus on the larger DS category, with only a few focusing exclusively on the MVS sub-category among a specific demographic group. Several global studies focus on the entire DS category with a large focus on use relating to university students (Aina & Ojedokun, 2014; Al-Johani *et al.,* 2020; Faherty & Hough, 2021; Lieberman *et al.*, 2014; Maria *et al.,* 2015; Noor *et al.*, 2014; Rossalia *et al.,* 2017; Sharma *et al*., 2014; Tully, 2014). South African studies also focus on usage within the larger DS category (Braun & Venter, 2008; Duvenage, 2015; Pillay & Pillay, 2019, Steele & Senekal, 2005), with two of these studies sampling university students only (Pillay & Pillay, 2019; Steele & Senekal, 2005). In addition, only a few global studies have utilised the theory of planned behaviour (TPB) to frame their studies relating to the consumption of DS among adult females or the student population (Conner *et al.*, 2001; Lino *et al.*, 2014; Noor *et al*., 2014; Housman *et al*., 2011) or MVS among the female student population (Pawlak *et al*., 2008; Pawlak *et al.,* 2005).

Pawlak *et al*. (2008) found that the TPB model explained approximately 53% of behavioural variance in their study. This suggests that other characteristics not studied in the research may affect the usage of MVS (Pawlak *et al.,* 2008). Studies have revealed that frequent DS users rated their health as worse than occasional DS users or non-users (Lyle *et al*., 1998; Satia-Abouta *et al.,* 2003; Steele & Senekal, 2005). In contrast, Ervin *et al*. (1999) discovered that DS users were more inclined to perceive their health as excellent or very good. Pawlak *et al.* (2008) infer that further research is needed to determine if respondents' perceived health status might influence MVS usage. The current literature shows that perceived health status may affect DS usage. However, further research is required to ascertain whether the perceived health status of MVS users and non-users influences MVS use, particularly among adult consumers.

To predict health-related behaviour, Conner *et al*. (2001) suggested adding health value as a separate variable to the TPB model. The authors found evidence that individuals who place a high value on their health are more inclined to take DS by precaution. Thus, it may be that for some health behaviours perceived to be protective, health value is an essential determinant of the performance of the behaviour (Conner *et al.,* 2001). It is clear from the current literature that health value may play a role in DS consumption; however, further research is needed to determine if health value plays a role in MVS consumption particularly amongst adult consumers.

Studies indicate that the lifestyle characteristics of DS users are associated with health (Block, Sinha, & Gridley., 1994; Foote *et al*., 2003; Ishihara *et al*., 2003; Kim *et al.,* 1993; Slesinski *et al*., 1996; Slesinski *et al*., 1995; Suber & Block, 1990). However, in Ishihara *et al*. (2003), DS users also showed negative lifestyle factors. Research on the health-related lifestyle characteristics of MVS users and non-users, particularly among the adult population, is lacking. The research aimed to address such research gaps by exploring the factors influencing the usage of MVS amongst the adult population in the greater Durban area. A conceptual framework was created to help explore the beliefs of MVS users and non-users towards MVS usage, their health-related lifestyle characteristics, perceived health status and the value they place on health.

Although MVS continues to be the most popular sub-category of DS in SA (Euromonitor International, 2019; Insight Survey, 2022), there is a dearth of empirical research on the marketing implications of the factors influencing MVS usage and the type of MVS preferred by MVS users and non-users. Commercial reports tend to focus on the size of the vitamin supplement market in terms of sales, innovation and technology in the industry as well as the key manufacturers and distributors within a region (Euromonitor International, 2019; Insight Survey, 2022). However, these reports lack insights into the beliefs of MVS users and non-users towards MVS consumption as well as the type of MVS preferred by users and non-users. This research also addresses this knowledge gap because marketers of MVS need to understand the beliefs behind MVS usage or non-usage and the type of MVS preferred by users and non-users of MVS in order to develop successful marketing strategies to expand MVS adoption in South Africa (SA). The marketing implications of the resulting behaviour are examined, with recommendations provided to marketers. Additionally, unlike many previous studies on DS, this study focused exclusively on the MVS sub-category and did not limit its focus to university students or females only.

1.4 Research questions

These research questions guided the investigation:

1. What are the health-related lifestyle characteristics of MVS users and non-users in the greater Durban area?
2. What is the perceived health status of MVS users and non-users in the greater Durban area?
3. What is the value placed on health by MVS users and non-users in the greater Durban area?
4. What are the behavioural beliefs toward MVS consumption among users and non-users in the greater Durban area?
5. What are the normative beliefs toward MVS consumption among users and non-users in the greater Durban area?

6. What are the control beliefs toward MVS consumption among users and non-users in the greater Durban area?
7. What types of MVS do users and non-users of MVS in the greater Durban area prefer?
8. What are the marketing implications of the factors influencing MVS usage in the greater Durban area?

1.5 Research objectives

In accordance with the aforementioned questions, the research aimed:

1. To explore the health-related lifestyle characteristics of MVS users and non-users in the greater Durban area.
2. To determine the perceived health status of MVS users and non-users in the greater Durban area.
3. To determine the value placed on health by MVS users and non-users in the greater Durban area.
4. To explore the behavioural beliefs toward MVS consumption among users and non-users of MVS in the greater Durban area.
5. To explore the normative beliefs toward MVS consumption among users and non-users of MVS in the greater Durban area.
6. To explore the control beliefs toward MVS consumption among users and non-users of MVS in the greater Durban area.
7. To explore the type of MVS preferred among users and non-users of MVS in the greater Durban area.
8. To explore the marketing implications of the factors influencing MVS usage in the greater Durban area

1.6 Overview of research methodology

The study was quantitative in nature, utilising a descriptive research design. A convenience sample of 385 participants aged 18 and over was recruited from five shopping malls in the greater Durban area. The responses to the self-administered online questionnaire were analysed using Survey Monkey. In Chapter 3, the research methodology is explored in further depth.

1.7 Delimitation of the study

The research was confined to 385 participants from the greater Durban area in one South African province (KwaZulu-Natal). The research was limited to participants aged 18 and over who shopped at the five participating shopping centres.

1.8 Significance/contribution of the study

According to the researcher's knowledge, this study was the first investigation of the factors influencing the usage of MVS by consumers in SA's general population. The study contributed to knowledge creation by exploring consumers' health behaviour in the greater Durban area regarding MVS within the theory of planned behaviour (TPB) framework.

The study investigated the category drivers and barriers to MVS consumption; as a result, a detailed picture of the consumer and their interaction with the MVS sub-category in the greater Durban area was established. Additionally, unlike many previous studies on DS, this study did not limit its focus to university students only. The insights generated will potentially aid retailers, marketers and manufacturers of MVS by contributing to overall brand strategy optimisation, including positioning and communication, to generate brand growth. These insights can also aid the government in formulating educational campaigns about nutrition and MVS consumption. The study findings might also serve as a springboard for more research on the factors impacting MVS use in SA.

1.9 Structure of the study

This dissertation consists of five chapters and is structured as follows:

Chapter 1: Overview of the study

This chapter introduces the research as well as a background and motivation for the study. It includes the research problem, followed by the research questions and objectives for the study. A chapter-by-chapter synopsis of the research is given, along with a description of the delimitations.

Chapter 2: Literature review

This chapter discusses significant elements related to the research topic. It examines past research on the factors that influence the use of MVS and demonstrates how the study helps to fill the gaps in the current literature. This chapter also discusses the study's theoretical background.

Chapter 3: Research methodology

In this chapter, the study's research approach is described and justified. The chapter discusses the sampling framework, data collection instrument and procedures, and the data analysis method used in this study.

Chapter 4: Research findings

This chapter presents the study's findings. The data was analysed using descriptive statistics and illustrated in a tabular format.

Chapter 5: Conclusion and recommendations

The study's key findings are outlined in the final chapter in connection to the study's objectives. Based on the study's findings, conclusions are reached, and suggestions are provided to marketers and future researchers.

1.10 Conclusion

This chapter introduced the study and provided background and motivation for this research. It featured an outline of the research questions and objectives, a summary of each chapter, and a discussion of the study's delimitations. The following chapter provides an overview of the relevant literature and theory.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter is divided into five sections. The first section provides background information on DS, vitamin supplements (VS) and MVS, including definitions, advantages, market analysis, and regional and global trends. Part two summarises past studies on the factors affecting the use of DS and MVS in SA and abroad. Part three discusses the type of MVS preferred by users and non-users. Part four discusses the implications of the factors influencing MVS usage for marketing. The last section of the chapter discusses the ideas that guided the development of the research questions and the analysis of the data collected throughout the investigation. The health belief model, the precaution adoption process model, the theory of reasoned action, the theory of planned behaviour and the conceptual framework are discussed in this section.

2.2 Dietary supplements, vitamin supplements and multivitamin supplements

This section focuses on the definitions and benefits of DS, VS and MVS, as well as market analysis and trends, both internationally and locally. There is a lack of freely available market analysis reports on DS/VS on the internet; hence, the researcher focused on snippets of available information on market research websites. In addition, there are currently no specific market reports on MVS, hence the researcher focused on the larger DS and VS categories.

2.2.1 Background and definitions

DS are foods consumed in unit dose forms, such as tablets, capsules, or elixirs (Mason, 2007). The majority are nutrient-dense products that the body uses to grow cells, bone and muscle, to replenish coenzymes lost to infection and disease and to maintain overall health (Mason, 2007). A critical aspect of this definition is that DS are products consumed in unit quantities in addition to regular food consumption. This is in contrast to other nutrient-dense foods, such as fortified and functional foods (Mason, 2007). According to Kaminski, Kregielska-Narozna & Bogdanski (2020:13) the most popular DS among adults in the US in 2019 were “multivitamins, vitamin D, vitamin c, protein, calcium, vitamin b or vitamin b complex, omega-3 fatty acids, green tea, magnesium, probiotics, iron, vitamin e, and turmeric”. VS are a category of DS. These products contain one or more vitamins/minerals, and examples of VS include: MVS, beta-carotene, iron, vitamin C and vitamin E. MVS are a type of DS/VS that contains a combination of vitamins and dietary minerals in a single product (Hollenstein, 2007). Tablets, capsules, pastilles, powders, liquids, and injectable forms of MVS are all readily available.

Supplementation has two fundamental goals: treat or prevent nutritional deficiency and minimise the risk of non-deficiency illness to achieve optimal health (Mason, 2007). VS were developed in the early twentieth century solely to prevent and treat vitamin deficiency illnesses such as scurvy, beriberi and

pellagra (Mason, 2007). As a result, dietary recommendations like the dietary reference intake were created by the FDA (Food and Drug Administration) in the US to expand the already-existing recommendations known as recommended dietary allowances. The levels of nutrients needed to prevent insufficiency were used to compute the dietary reference intake (Food and Drug Administration, 2022).

Historically, DS (like cod liver oil and iron pills) and MVS were used to complement the diet to guarantee that nutritional needs were satisfied (Webb, 2006). They were taken to ensure that diets had an appropriate quantity of essential nutrients to prevent overt deficiency sickness and avoid other, more subtle, negative repercussions of nutrient shortage. While this remains a key consideration for many people, others are increasingly taking DS to acquire additional health advantages (Webb, 2006).

According to dietician Dawn Lerman, a daily MVS may help establish a firm foundation for one's health (Kassel, 2020). Additionally, it protects an individual if they are anxious, sleeping poorly, or not exercising enough. Even while eating a balanced diet, these illnesses may impede the body's capacity to absorb nutrients properly from food (Kassel, 2020).

Rodder (2021) asserts that the human body requires micronutrients to function effectively. Apart from the well-known vitamin C, calcium, iron, magnesium and potassium, a good MVS should include the following:

- Thiamine, riboflavin, and niacin
- Vitamin B6, B12, and folate
- Selenium, and zinc
- Vitamins A, E, and K
- Vitamin D

2.2.2 Importance of vitamins and minerals

Vitamins are naturally-occurring chemical molecules that are necessary for survival, growth, and optimal physiological function (Ball, 2004). They are required in minute quantities and do not supply energy via the diet. They are either absent from the body's synthesis or are produced from a limited number of food precursors. Inadequate vitamin and precursor intake produces specific unfavourable signs and symptoms that, if no irreversible damage has occurred, may be corrected by delivering appropriate vitamin and precursor doses (Ball, 2004). Table 2-1 illustrates the uses and dietary sources of vitamins.

Table 2-1: Uses and dietary sources of vitamins

VITAMIN	WHAT WE USE IT FOR	GOOD SOURCES
A	For healthy vision, skin, bones, teeth & reproduction	Liver, Eggs, Fish, Milk, Carrots, Sweet Potato, Pumpkin, Spinach
B1 THIAMIN	Helps convert food into energy and is critical for nerve function	Soy, Watermelon, Tomato, Spinach
B2 RIBOFLAVIN	Helps convert food into energy and supports healthy skin, hair, blood & brain	Dairy, Meat, Green Leafy Veggies, Enriched Wheat, Oysters
B3 NIACIN	Helps convert food into energy and is essential for healthy nervous system	Beef, Chicken, Shrimp, Avocado, Peanuts, Tomato, Spinach
B6 PYRIDOXINE	Helps make red blood cells and improves sleep, appetite & mood	Chicken, Tofu, Banana, Watermelon, Fish, Legumes
B7 BIOTIN	Helps convert food to energy & break down glucose	Whole Grains, Eggs, Almonds, Soybeans, Fish
B9 FOLATE	Vital for new cell creation and DNA synthesis	Legumes, Spinach, Leafy Greens, Chickpeas, Tomato, Asparagus
B12	Breaks down fatty acids & amino acids, helps make red blood cells	Dairy, Beef, Poultry, Fish, Eggs
C	Acts as an antioxidant, helps make new cells, & improves immune system	Fruit & Fruit Juices, Pepper, Broccoli, Tomato, Spinach
D	Strengthens and helps form bones & teeth via calcium & phosphorus	Egg Yolk, Fatty Fish, Liver, Sunlight
E	Acts an an antioxidant, helps stabilize cell membranes	Nuts, Avocado, Tofu, Whole Grains, Seeds
K	Essential for blood clotting and helping to regulate blood calcium	Broccoli, Brussels Sprouts, Liver, Leafy Greens

Source: Basic knowledge 101 (2022)

It is impossible to quantify the amount of minerals that are considered necessary nutrients (Webb, 2006). Numerous minerals, including calcium, iron and zinc, are needed in substantial daily milligrams. Others are necessary but in considerably lower microgram amounts and are often called trace elements (Webb, 2006). Table 2-2 illustrates the uses and dietary sources of minerals.

Table 2-2: Uses and dietary sources of minerals

MINERAL	WHAT WE USE IT FOR	GOOD SOURCES
CALCIUM	The most abundant in the body. For strong bones and blood clotting	Dairy, Leafy Greens, Seeds, Nuts, Dates, Tofu
MAGNESIUM	Helps maintain normal nerve and muscle function & a healthy immune system	Nuts, Spinach, Fish, Avocado, Whole Grains
PHOSPHORUS	Used in all cell functions- used more than any other mineral	Fish, Poultry, Eggs, Leafy Greens, Avocado, Oats, Legumes
POTASSIUM	Regulates major biological processes, muscle contraction, regulates heartbeat	Most Fruits & Veggies, Nuts, Seeds, Fish
SODIUM	Maintains water balance, produces digestive juices, other biological processes	Table Salt, Fish, Nuts, Seeds, Added to many foods
CHLORIDE	Acts as an electrolyte, aids digestion, regulates blood pH	Table Salt, Olives, Tomato, Celery, Rye, Seaweed
SULFUR	Helps with digestion, waste elimination, & bile secretion	Eggs, Avocado, Garlic, Cabbage, Poultry, Fish, Soy
IRON	Essential for red blood production (hemoglobin)	Legumes, Dried Fruit, Whole Grains, Spinach, Liver, Tofu
COPPER	Helps with the absorption and metabolism of iron	Nuts & Seeds, Shellfish, Potatoes, Dried Fruit
ZINC	Supports the immune system & aids in the healing of wounds	Shellfish, Nuts & Seeds, Dairy, Meat

*MACRO MINERALS / ELECTROLYTES
*MICRO MINERALS / TRACE MINERALS

Other trace minerals include Manganese, Iodine, Chromium, Cobalt, Selenium, & Fluoride

Source: Cheat day design (2022)

2.2.3 Global dietary supplement market analysis

The worldwide DS market was worth 151,9 billion US Dollars in 2021 and is forecast to increase at an 8,9% compound annual growth rate between 2022 and 2030 (Grand View Research, 2022). Due to the high demand for energy and weight management among employed professionals and sports people, vitamins dominated the worldwide DS market in 2021, representing more than 30% of sales (Grand View Research, 2022). Due to the greater convenience associated with MVS (compared to individual vitamins), users consume it as pills, powder and liquid (Grand View Research, 2022). As mentioned earlier, MVS forms part of the DS and VS category. Understanding the global VS market can provide insights into MVS trends.

2.2.4 Global vitamin supplement market analysis

It is estimated that the global VS market was worth about 46,9 billion US Dollars in 2021 (Research and Markets, 2021). The market is anticipated to grow at a compound annual growth rate of 6,2%, reaching about 71.4 billion US Dollars in 2028 (see Figure 2-1) (Insight Survey, 2022).

Figure 2-1: Global VS market value 2021 & 2028

Source: Insight Survey (2022)

Demand for immune-boosting products is also increasing due to the COVID-19 epidemic (Green, 2021). This demand is because B vitamins, vitamin C, and vitamin D all have immune-boosting qualities (Davidson, 2021). However, the worldwide market continues to be adversely impacted by the COVID-19 outbreak and continuous lockdown restrictions (Nutra science, 2021). This is partly due to the pandemic's detrimental effect on global supply networks, which resulted in increased pricing and limited accessibility (Nutra science, 2021). On the other hand, industry participants' greater adoption of sustainable packaging in their goods is boosting sales among an increasing number of environmentally-concerned customers globally (Bargh, 2021).

Regulations inhibit VS introductions and impede online sales in several countries globally (Biomérieux, 2021). This is partly due to the fact that VS must pass both new and current testing and assessment processes before being introduced to the market (Biomérieux, 2021). Simultaneously, deceptive promotion of the advantages of VS is likely to foster consumer distrust, especially over the efficacy of these supplements in treating and preventing COVID-19 (Schleicher, 2021). Finally, the toxicity associated with VS use contributes to customer apprehension, which includes worries about overdosing on certain VS (Peters, 2020).

The worldwide VS market may be categorised by type into MVS, vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, and vitamin K (Fortune Business Insights, 2021). The market may be split by form into tablets, capsules, soft gels, powders, and gummies (Fortune Business Insights, 2021). Between 2021 and 2028, the gummies category is predicted to increase at the quickest pace, with a compound annual growth rate of 7,0%, owing to its jelly-like consistency, portability, improved flavour, pleasant tongue feel, and necessary nutrients (Research and Markets, 2021). The increase in the gummy vitamin format, in particular, is contributing to the worldwide market's expansion (Cision, 2021). Interestingly, the South African market for VS is set to grow at more than double the global market rate.

2.2.5 South African vitamin supplement market analysis

According to Figure 2-2, the South African VS market is predicted to reach 7,021 million South African Rands in 2026 with a compound annual growth rate of 14.3%, for the forecast period 2022 to 2026 (Research and Markets, 2022).

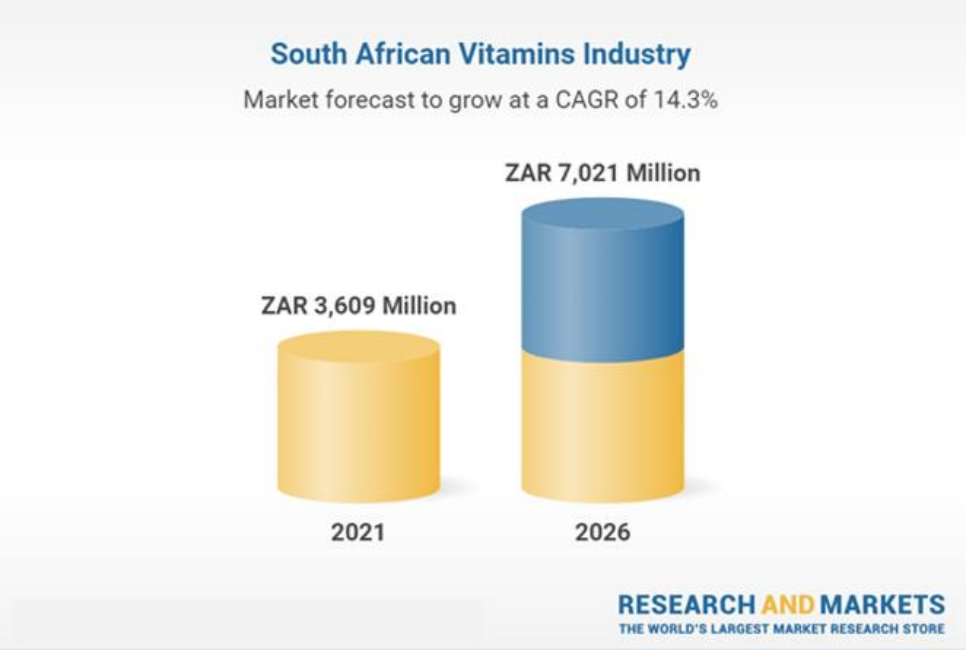

Figure 2-2: South African VS market value 2021 & 2026

Source: Research and Markets (2022)

This market expansion may be due to numerous factors, including local and worldwide consumers being more health-conscious and consuming more vitamins (Research and Markets, 2022). These factors, amongst others within the literature, will be discussed in the next section.

2.3 Factors influencing the usage of dietary supplements and multivitamin supplements

Numerous studies have been undertaken to ascertain the factors that influence the use of DS, both internationally and locally, most notably among the student population. The majority of studies focus on the larger DS category, with only a few focusing exclusively on the MVS sub-category among a specific demographic group. The following discussion uncovers the factors influencing the usage of DS and MVS that appear in the literature. Studies examining the factors influencing the use of DS and MVS, as well as studies utilising the TPB, are examined. In addition, studies highlighting health-related lifestyle factors, perceived health status and the value placed on health as related factors (that influence DS and MVS use) are discussed.

2.3.1 Health-related lifestyle

According to Block, Sinha, and Gridley (1994), Foote *et al*. (2003), Ishihara *et al*. (2003), Slesinski *et al*. (1996) and Slesinski *et al*. (1995), the lifestyle characteristics of DS users are associated with health. DS users have been characterised as having a positive attitude toward their health. (Kim *et al.* 1993; Slesinski *et al.* 1996; Suber & Block, 1990); however, in Ishihara *et al.* (2003) DS users also showed negative lifestyle factors. The authors assumed that the urban lifestyle influenced these associations. These individuals may be aware of their unhealthy behaviour and purposefully try to make up for it by using DS (Ishihara *et al*., 2003). The following discussion unravels the health-related lifestyle factors noted in the literature that affect DS/MVS use, intending to identify the gaps in knowledge.

2.3.1.1 Smoking

Block, Sinha, and Gridley (1994) revealed that DS users were less likely to smoke. In contrast, Lieberman *et al.* (2014) and Lacerda *et al.* (2015) discovered that DS use was more prevalent among smokers than non-smokers. According to Ishihara *et al*. (2003), DS users in Japan were likely to have formerly smoked or never smoked. Similarly, according to a study by Wang *et al*. (2022), the highest percentage of DS users in Inner Mongolia, China, were non-smokers. The research indicates that smoking is a lifestyle factor that may affect DS use. However, more investigation is required to determine if smoking is a lifestyle factor that affects MVS use, particularly among the adult population.

2.3.1.2 Alcohol consumption

Block, Sinha, and Gridley (1994) revealed that DS users were less likely to drink excessively. Similarly, Sharma *et al*. (2014) discovered a significant association between DS use and abstinence from alcohol. In contrast, according to Ishihara *et al*. (2003), DS use did not associate with alcohol consumption in men and was higher in women who drink moderately. Prior studies had reported alcohol consumption in DS users as either having no association (Kim *et al*., 1993) or as showing more users among moderate drinkers (Suber & Block, 1990; Slesinski *et al*., 1995). The findings suggest that drinking alcohol is a

lifestyle component that may affect DS usage. However, additional research is needed to discover whether drinking alcohol is a lifestyle factor influencing MVS use among adults.

2.3.1.3 Physical activity

Foote *et al*. (2003) conducted a study in the US to determine the factors associated with DS use among healthy adults of five ethnicities. Factors associated with DS use were examined among those who reported an absence of chronic disease. In all ethnic groups, DS use increased with physical activity and decreased with obesity. In a related finding, Ishihara *et al*. (2003) discovered that DS users exercised more frequently than non-users. DS use and regular physical activity were statistically significantly correlated, according to Al-Johani *et al*. (2020). Similarly, researchers Bailey *et al*. (2013) and Mullie *et al*. (2011) discovered that DS users were more likely than non-users to exercise regularly. From the analysis above, it can be inferred that exercise impacts DS usage. More research is needed to determine whether comparable conclusions may be drawn regarding the use of MVS.

2.3.1.4 Diet

Ishihara *et al*. (2003) discovered that DS users had a lower frequency of eating prepared food and a higher frequency of eating out when compared to non-users. A high frequency of eating out can be seen as a negative lifestyle factor. In contrast, Foote *et al*. (2003) found that DS use tended to increase with fruit and dietary fibre intake and decrease dietary fat intake. In a study conducted among students in a Polish medical university, most DS users described their diet as somewhat healthy or healthy (Merwid-lad *et al*., 2022). In contrast, a South African study on under-16 rugby players revealed that almost half of the sample in the survey thought that their diets were inadequate (Duvenage, Meltzer & Chantler, 2015). A study by Tully (2014) discovered, among US college students, that MVS users had better diets than non-users. The investigations above suggest that a person's diet, whether healthy or unhealthy, can affect how often they use DS. Further research is needed to determine if adults with healthy diets are more likely to consume MVS and whether they are satisfied with their diets,

2.3.2 Perceived health status

A study of South African university students revealed that frequent DS users rated their health worse than occasional DS users or non-users (Steele & Senekal, 2005). This finding reinforces the results of prior investigations (Lyle *et al.*, 1998; Satia-Abouta *et al.*, 2003). In contrast, a study of adults aged 20 years or older revealed that DS users were more inclined to perceive their health as excellent or very good (Ervin *et al*., 1999). According to Pawlak *et al.* (2008), the perceived health status of participants may be an independent predictor of the use of MVS; as such, further investigation is required.

2.3.3 Value placed on health

Two studies investigated the role of health value in DS use (Chung *et al*., 2012; Conner *et al.,* 2001). Health value can be defined as the degree to which an individual regards their health as important (Lau, Hartman, & Ware, 1986). Earlier research suggests that health value is more likely to be predictive of preventive health behaviours (Kristiansen, 1985; Weiss & Larsen, 1990). Similarly, Conner *et al.* (2001) found evidence that individuals who place a high value on their health are more inclined to take DS as a precaution. Thus, it may be that for some health behaviours perceived to be protective, health value is an important determinant of performance of the behaviour (Conner *et al.,* 2001). Chung *et al.* (2012) found that health value did not influence attitudes toward using DS. Furthermore, a study conducted by Pajor *et al.* (2017) among Dutch adults found no significant differences between DS users and non-users regarding health value. It is clear from the current literature that health value may play a role in MVS consumption as daily MVS consumption can be considered preventative health behaviour. To the researcher's knowledge, no research has been conducted to assess the value placed on health among MVS users and non-users. This study addresses this gap in knowledge among the adult population.

2.3.4 Behavioural beliefs

The perceived likelihood of a behaviour's outcome and the appraisal of that outcome make up behavioural beliefs. The TPB assumes that adopting a positive attitude toward a behaviour is based on the conviction that the behaviour is either likely to produce positive consequences or is unlikely to produce negative outcomes (Lino *et al*., 2014). The following discussion highlights behavioural beliefs influencing DS/MVS usage in the literature. The discussion intends to identify knowledge gaps and common behavioural factors to aid in constructing the questionnaire for the study.

2.3.4.1 Improvement of health

Research indicates that adults with a history of chronic illness are more inclined to consume DS than those without (Alsaleem *et al*., 2021; Guo *et al*., 2009; Lee & Kim, 2009). According to several studies amongst the adult population, the primary purpose of buying DS is to improve and maintain overall health (Chiba *et al*., 2017; Garcia-Cazarin *et al*., 2014; Kofoed *et al*., 2015; Pajor *et al*., 2017). In a study conducted in Poland, most students choosing DS indicated an improvement in health as one of the main reasons (Merwid-lad *et al*., 2022). Similar reasons for supplementation were mentioned in other studies (Alqrache *et al*., 2021; Barnes *et al.,* 2016; Hamulka *et al*., 2020; Lieberman *et al.,* 2014 Zezelj *et al.*, 2018). The research indicates that improving health and being healthy is essential to DS use; however, more investigation is required to determine if these factors affect MVS use.

2.3.4.2 Obtaining nutrients missing from the diet

Aina and Ojedokun (2014), Dickinson *et al*. (2014) and Saini and Hasan (2020) discovered that participants utilised DS to supplement their diets and adjust for deficits. In addition, according to research conducted by Pawlak *et al.* (2008), consuming MVS to supplement missing nutrients in the diet was one of only two behavioural beliefs that significantly impacted the intention to consume MVS among US female students. Among medical students in Poland, DS was used to prevent or treat a variety of microelement or nutrient deficiencies (Merwid-lad *et al.*, 2022). Similar dietary demands or nutrient deficits were the main justifications for taking DS in other nations such as Croatia and the United States (US) (Alqrache *et al*., 2021; Barnes *et al.*, 2016; Hamulka *et al*., 2020; Lieberman *et al.*, 2014 Zezelj *et al.*, 2018).

Steele and Senekal (2005) found that students selected DS over food because they felt food lacked the necessary nutrients. This finding was confirmed by Pajor *et al*. (2017), who noticed that one of the reasons Dutch adults used DS was because they considered the quality of food items had deteriorated lately; the respondents believed food had significantly fewer vitamins and minerals. The literature indicates that DS supplements a non-nutritious diet and a diet of poor-quality nutritious food. A gap in the literature exists as to whether adult MVS users and non-users believe that taking a MVS would help them to get the nutrients they do not get from their diet. This study addresses this gap among adult MVS users and non-users.

2.3.4.3 Mental and physical energy

Wang *et al*. (2022) studied the Mongolian population to determine DS use and influencing factors. The authors found that respondents with occupations requiring mental effort had a higher DS usage rate than those engaged in occupations requiring physical exertion. In contrast, Austin *et al*. (2015) discovered that increasing DS use was related to high-intensity operational employment among US coast guard personnel. According to Austin *et al.* (2015), providing more energy is an often-cited reason for DS usage among US coast guard personnel. Similarly, Salgado *et al*. (2014) discovered that Brazilian road runners take DS to increase their energy, performance, and stamina.

Researchers have found that Caucasian female students (Pawlak *et al*., 2008) and African American female students (Pawlak *et al*., 2005) believe that taking MVS would give them extra energy. This finding is supported by Lieberman *et al*. (2014), who found that students use DS to increase their energy levels. The rationale for taking DS to improve energy levels was also examined in a study involving multiple populations worldwide. It was determined that the decreased fatigue levels observed by participants following the introduction of various supplements could have been due to pre-existing deficiencies being addressed (Tardy *et al.*, 2020). In a study involving Saudi Arabian students, the main reasons for DS consumption were to relieve fatigue or to improve concentration. Similarly, Merwid-lad

et al. (2022) found that Polish students use DS to increase cognition, concentration, or alertness. It is clear from the current literature that gaining extra energy may play a role in MVS consumption among students; however, it is not appropriate to assume that this will also apply to the adult population. The literature also states that fighting fatigue and tiredness and improving concentration are important factors in the consumption of DS. Further investigation is required to determine if these factors influence adults' MVS consumption.

2.3.4.4 Looking and feeling good

Hoseini *et al*. (2021) discovered that one of the identified personal factors impacting DS usage is the perceived advantages of DS. In a similar vein, Alfawaz *et al.* (2017), Merwid-lad *et al*. (2022) and Zaki *et al*. (2014) demonstrated that females use DS mostly to appear attractive and maintain healthy hair. Pawlak *et al*. (2008) examined the factors relating to MVS utilisation among Caucasian female college students, utilising the TPB. The belief that MVS would enhance mood and looks was shown to be significant (Pawlak *et al*., 2008). These findings also complement the results of Rofail *et al.* (2011), who found that females aged 17 to 25 identified body image and physical attractiveness as significant motives for DS use. The use of DS for change in appearance is widespread (Field *et al.*, 2014), mainly through the intention of weight change (El Khoury & Antoine-Jonville, 2012; Lieberman *et al*., 2014; McCreary *et al.*, 2007; Newberry *et al*., 2001; Valentine *et al*., 2017). A gap in the literature exists in understanding whether adult MVS users and non-users believe taking a MVS would help them look and feel good. This study addresses this gap among adult MVS users and non-users.

2.3.4.5 Immunity

Conner *et al*. (2001) undertook research in the United Kingdom to ascertain why women use DS; the researchers discovered disparities in attitudes between DS users and non-users about the belief that consuming DS would operate as a protective barrier against potential ill-health. DS users were more certain than non-users that consuming DS would help them avoid sickness and preserve their health (Conner *et al.*, 2001). Similarly, a study of pharmacy and nursing students in the US found that both groups cited avoiding disease as a primary motivation for taking DS (Maria *et al.*, 2015). Aina and Ojedokun (2014) demonstrated that DS usage was motivated by the need to increase immunity among students at the University of Lagos. Similarly, Faherty and Hough (2021) and Pillay and Pillay (2019) revealed that students utilised DS to enhance or boost their immune systems. Individuals also believe DS is a preventative measure against colds/influenza, heart disease, anaemia, arthritis/rheumatism, and menstrual problems (Raiten *et al*., 2003). In a recent Sri Lankan study, nearly three-quarters of the population took DS to enhance immunity (Francis, Sooriyaarachchi & Jayawardena 2022). Similarly, a study among Iraqi university students found that the main reason for consuming vitamin supplements was to increase immunity (Ghassan *et al*., 2022). The research indicates that immunity is an important

factor affecting DS use; however, more investigation is required to determine if this factor also affects MVS use.

2.3.4.6 Stress management

Braun and Venter (2005) found that DS was used by participants to prevent stress. Similarly, Ishihara *et al.* (2003) found that the prevalence of DS use was higher in those with higher stress levels when compared to non-users. Interestingly, in a South African study among students, the main reason cited by sporadic users of DS was dealing with stress (Steele & Senekal, 2005). A third of medical students in Poland took DS to manage stress (Merwid-lad *et al*., 2022). In other countries, such as Saudi Arabia and Australia, one of the main reasons to take DS is to reduce stress (Alqrache *et al*., 2021; Barnes *et al*., 2016). According to the research, stress management is an important component that can affect DS usage; however, further study is needed to discover whether stress management also plays a role in MVS use.

2.3.4.7 Unpleasant side-effects

In some studies, over 87% of students were aware of some risk that DS posed to their health (Samreen *et al*., 2020), while in others, just 25% of students acknowledged that DS might be hazardous to health (Alqrache *et al.*, 2021). Despite being medical or pharmacy students, approximately 25% of participants in the Bekele *et al*. (2020) study reported reading the patient information leaflet occasionally or never and checking the expiration date occasionally or never. According to Pillay and Pillay (2019), students claimed negative side-effects as a justification for not using DS. The majority of the students polled by Merwid-lad *et al*. (2022) also mentioned negative side-effects such as weariness or sleepiness, headaches or dizziness, and a range of gastrointestinal issues. Alqrache *et al*. (2021), Jahan *et al*. (2021), Kobayashi *et al.* (2017) and Samreen *et al*. (2020) all reported on the same harmful consequences of DS. In contrast, a study by Ghassan *et al.* (2022) found that most medical students believed vitamin supplements had no adverse effects on their health. According to the research, unpleasant side effects may affect DS use, but further study is needed to discover whether this aspect likewise affects MVS usage.

2.3.5 Normative beliefs

According to the TPB, normative pressures are based on two factors that are multiplicatively combined: views about whether or not certain significant persons think you should engage in the behaviour (normative beliefs) and a desire to do as they ask (motivation to comply) (Lino *et al*., 2014). According to research conducted among human immunodeficiency virus-positive African American women, societal pressure to use DS could influence females' decision to consume it (Lino *et al.*, 2014). Pajor *et al*. (2017) found that both adult users and non-users of DS were exposed to a variety of social factors

that influenced their DS consumption. The following discussion focuses on normative beliefs that affect how DS/MVS are used in the literature. In order to help with the creation of the study's questionnaire, the discussion aims to pinpoint knowledge gaps as well as common normative factors.

2.3.5.1 Family, friends and colleagues

According to research by Noor et al. (2014), family members were key reference groups for Malaysian college students regarding DS usage. This is reinforced by Faherty and Hough (2021), who discovered that the most significant social factors are referrals from friends and family. Furthermore, Pawlak *et al*. (2005) indicated that influence from family regarding the use of MVS played an essential role in deciding whether or not to use MVS among African American female students. Similarly, most Polish students took DS after a recommendation by family members, friends, or colleagues (Merwid-lad *et al.*, 2022). A study by Lino *et al*. (2014) concluded that pressure from friends to use DS might influence African American females' decision to use it. In contrast, a study by Housman *et al.* (2011), utilising the TPB, found that teammates significantly influenced student-athletes to use DS.

From the above, it can be inferred that family influence may be an important normative factor in MVS usage among students and DS usage among students and adults. This insight cannot be applied to adult MVS consumers; therefore, more research is required. Friends and colleagues are also important normative factors concerning DS usage among students; however, more research is required to determine if these factors affect MVS usage, particularly among adults.

2.3.5.2 Health care professionals

Research conducted in the urban areas of Rajasthan in India showed that doctors were the most-often-cited source of knowledge about MVS (Saini & Hasan 2020). This is confirmed by Alsaleem *et al.* (2021), who found that the most-often-mentioned reason for using DS among Saudi Arabian health care attendants was guidance from health care professionals. In addition, a South African study on under-16 rugby players revealed that non-dietetic medical professionals were the primary sources of DS recommendations (Duvenage, Meltzer & Chantler, 2015). A comprehensive evaluation of 76 research studies revealed that expert guidance was the most important factor driving individuals to use DS (Teoh *et al*., 2019). According to Teoh *et al*., 2019), around 50% of pregnant and 40% of nursing females took DS based on advice from a health care professional. For the majority of consumers, health care specialists' advice about DS intake was sought, whether it was regarded as a critical aspect when contemplating taking DS (Pike *et al*., 2013), the reason for taking DS (Page *et al*., 2015), or the reason for not consuming DS (Tangkiatkumjai *et al.*, 2014). Similarly, regarding VS, the majority of students in an Iraqi university used them according to doctors’ and pharmacists’ advice (Ghassan *et al*., 2022).

Only 21% of female students in a study by Pawlak *et al*. (2005) strongly agreed, and as many as 49% strongly disagreed with the notion that their doctor would urge them to take an MVS. However, more than 57% of those surveyed stated that it mattered what their doctor said about taking MVS. These results show that respondents thought a doctor's advice was valuable, but many did not think their doctors wanted them to take MVS. Another intriguing conclusion from research by Conner *et al*. (2001) concerned the influence of physicians and other healthcare professionals on the use of DS among adult females. Users of DS expressed a positive pressure to use it, whereas non-users expressed a negative pressure. This finding may imply that people are persuaded by the advice given by health professionals even though they may have differing opinions about the role of DS. Interestingly, just 1% of the sample in this study had used DS on a doctor's order (Conner *et al*., 2001). The current literature suggests that doctors may influence the use of MVS among female students; however, it is worth investigating if this influence applies to MVS users and non-users in the adult population. The literature also states that pharmacists may influence the use of DS. Further investigation is required to determine if pharmacists influence MVS consumption, particularly among adults.

2.3.5.3 Books and magazines

Conner *et al*. (2001) found that both users and non-users of DS viewed books and periodicals as a potent motivator for choosing DS. In support of this finding, a South African study by Braun and Venter (2008) found that the majority of health food store customers obtained knowledge about DS from books and magazines. Books and magazines are normative elements that the research suggests may impact DS use; however, further research is needed to ascertain whether these normative factors impact MVS use.

2.3.5.4 In-store sales staff

In a study by Noor *et al*. (2014), the researchers advise that to guarantee that younger customers in Malaysia receive pertinent and correct information on DS offers, marketers need to ensure that sales employees have good product expertise on DS in-store. The study, however, did not determine the influence that in-store sales staff have on Malaysian students' decision to use DS. According to Mathews (2022), retailers must acknowledge and support the changing roles of their store staff as businesses look to the future. Customers increasingly demand convenience, customisation and a superior shopping experience from retailers. Retail employees will be crucial in helping customers maintain an offline connection as internet purchasing grows (Mathews, 2022). There is a lack of research on in-store sales staff's influence on MVS usage. This study addresses this gap by investigating the importance that MVS users and non-users place on in-store sales staff's advice and the role that in-store sales staff play in recommending MVS consumption.

2.3.6 Control beliefs

The TPB posits that control beliefs are made up of two elements: a perception of the degree to which factors may facilitate or inhibit the performance of the behaviour (power) and the frequency of occurrence of factors likely to facilitate or inhibit the behaviour (control beliefs) (Lino *et al*., 2014). The discussion that follows focuses on control beliefs that affect how DS/MVS are used, as evidenced in the literature. The discussion identifies knowledge gaps as well as common control factors to aid in the development of the study's questionnaire.

2.3.6.1 Remembering to take dietary supplements and multivitamin supplements

According to Faherty and Hough's (2021) study of non-users of DS, 30,4% of students ascribed their non-use to difficulties in developing the habit of taking DS frequently. Notably, fewer than 1% of users admitted they only took DS as they remembered. A healthy lifestyle is built on habit development, and research indicates that DS users are more likely than non-users to embrace health-promoting behaviours such as consuming DS daily (Dickinson *et al*., 2014). This study addresses the knowledge gap to ascertain whether adult MVS users and, in particular, non-users experience similar difficulty consuming MVS daily.

2.3.6.2 Cost and affordability of dietary supplements and multivitamin supplements

Cowan *et al*. (2018) found that the largest income category of adults in the US consumed the most DS. Similarly, Al-Johani *et al*. (2020) discovered a statistically significant relationship between DS usage and increased family income among medical students. An online survey conducted in Sri Lanka determined that participants with the highest income category were more likely to take MVS when compared to other DS (Francis, Sooriyaarachchi & Jayawardena 2022). According to Pawlak *et al.* (2008), the desire to use MVS was significantly impacted by a single control belief that one could afford it. In support of this finding, Pillay and Pillay (2019) revealed that South African students cited cost and DS being a waste of money as reasons for non-use. Furthermore, Conner *et al*. (2001) found that both DS users and non-users found DS expensive, with the effect being more negative for the non-users. The literature alludes to a correlation between income and DS/MVS use among medical students and adults; however, the cost of DS/MVS seems to be an important factor among students when deciding to consume DS/MVS. It is pertinent to conduct further investigation to determine whether adults can afford to purchase MVS and whether the cost of MVS would prevent consumption.

2.3.6.3 Knowledge of dietary supplements and multivitamin supplements

Barnes *et al.* (2016) revealed that DS users believe DS are beneficial but are unaware of the specific advantages or risks associated with their usage. This is further reflected in the non-users examined by Faherty and Hough (2021), 17,6% of whom stated that they lack confidence in selecting a DS for

themselves. Similarly, Pillay and Pillay (2019) revealed that students cited being uncertain about DS as reasons for not utilising DS. This finding is supported by Merwid-lad *et al*. (2022), who found that medical students cited insufficient knowledge as one of the main reasons for not using DS. The literature indicates that students' lack of knowledge of DS can affect their consumption of DS. Further investigation is required to determine if adult MVS users and non-users have enough knowledge of MVS and whether their level of knowledge can impact their decision to consume MVS.

2.3.6.4 Availability of dietary supplements and multivitamin supplements

According to Snyder *et al*. (2009), the ready availability of DS is an important influencing factor for usage. Lino *et al*. (2014) found that the non-availability of DS significantly predicted perceived behavioural control. DS being readily available was rated by DS users as making DS use more likely but not by non-users (Conner *et al.,* 2001). More research is needed to determine if the ready accessibility of MVS might affect adult users' and non-users usage of MVS. In particular, the literature lacks information on the availability of MVS users' preferred brands and the impact of this variable on their consumption.

2.3.6.5 Difficulty swallowing dietary supplements and multivitamin supplements

In a research study by Modi *et al*. (2013), teenagers who had undergone bariatric surgery showed significant rates of nonadherence to MVS therapy, with difficulties swallowing MVS pills highlighted as a reported barrier to adherence. Punzalan *et al*. (2020) focused on issues related to taking DS in their study. Nearly 21 000 problems with DS were reported to the FDA over a ten-year period of which nearly 4,000 had to do with swallowing. The most frequent issue (86%) was choking. The majority (73%) of the reported swallowing issues were connected to using MVS. According to Medical Doctor Vincent Giampapa, trouble swallowing pills is a relatively common condition experienced by children, pregnant women, adults, and seniors (McCoy, 2019). Individuals who cannot swallow pills, including vitamins and minerals, may develop nutritional deficiencies even when eating a healthy diet (McCoy, 2019). It is clear from the literature that some MVS users experience difficulty swallowing MVS however further research is needed to determine if this barrier would prevent MVS usage among users and non-users of MVS.

2.4. Psychographics – type of multivitamin supplements preferred

People from the same socioeconomic class, occupation, and subculture may lead diverse lives. A person's psychographics will reveal their way of living, which is known as their lifestyle. Customers' activities (work, hobbies, shopping, sports, and social events), interests (food, fashion, family, and recreation), and opinions (about themselves, social issues, business, and products) are measured as part of the main AIO (activities, interests and opinions) dimensions. A person's lifestyle encompasses more

than just their socioeconomic status or personality. It depicts a person's entire pattern of behaviour and interaction with others (Kotler & Armstrong, 2008). When properly applied, the lifestyle concept can assist marketers in better understanding how shifting customer values impact purchasing decisions. Customers do not just purchase goods; they also purchase the beliefs and lifestyles those goods represent (Kotler & Armstrong, 2008). In contrast to psychographic data that covers opinions and interests, demographic data relates to the structure of a population, such as age, race, sex, and income. Neither data type should stand alone; psychographic data can be analysed in relation to demographic, geographic, or behavioural data (Birkett, 2020).

2.4.1 Store-branded multivitamin supplements and quality

Maria *et al.* (2015) found that pharmacy and nursing students in the US were less likely to use DS owing to concerns about its quality. Considering the competitive pricing of store branded MVS, it is worth investigating how adult MVS users and non-users perceive the quality of these brands of MVS (BusinessTech, 2022).

2.4.2 Cost versus quality of multivitamin supplements

Several studies have a discovered a link between income and DS usage (Al-Johani *et al*., 2020; Cowan *et al*., 2018; Francis, Sooriyaarachchi & Jayawardena, 2022; Pillay & Pillay, 2019). The affordability of MVS was also a significant factor when determining whether to consume MVS among students (Pawlak *et al*., 2008). Similarly, Conner *et al*. (2001) found that both DS users and non-users found DS expensive, with the effect being more negative for the non-users. To gain insight into the kind of MVS that users and non-users favoured in terms of cost, the researcher reviewed existing studies. The researcher found that no research had been done on the cost-related preferences of MVS users and non-users. Therefore, in this study it was pertinent (due to the lack of existing research) to determine if adult MVS users and non-users prefer an advanced MVS that is more expensive, a value offering or an inexpensive MVS without the full range of ingredients found in more expensive brands.

2.4.3 Multivitamin supplements personalised to gender

According to Webb (2022), men and women have varied dietary needs, some of which are caused by variations in average body sizes. Compared to men, women need more calcium, iron and folic acid. Compared to women, men need more zinc, chromium, riboflavin, niacin, choline, thiamine and vitamins A, C and K. (Webb, 2002).

Alsaleem *et al*. (2021) found that males took DS to bulk up their muscles, while females took them to boost their overall well-being. This is reinforced by research done in Korea that examined the causes of DS consumption by gender (Kim *et al.*, 2011). According to the research, female participants utilised

DS for well-being and energy improvement (Kim *et al.*, 2011). The reasons for utilising vitamin/mineral combination tablets rather than meals varied significantly across male and female students in a study by Steele and Senekal (2005). Males were more likely to take DS due to convenience while females took DS due to their poor diet and to ensure adequate intake of vitamins (Steele & Senekal, 2005). Sharma *et al*. (2014) found that female students were more likely to use DS. Similarly, Pillay and Pillay (2019) revealed a substantial correlation between gender and DS usage, with female students supplementing at a higher rate than male students. These findings corroborate other research indicating that females use more DS (Algaeed *et al*., 2019; Alsaleem *et al*., 2021; Awad & Al-Shaye, 2014; Azizi *et al.*, 2010; El Khoury, Ramadan, & Zeeni, 2015; Bailey *et al*., 2010; Kim *et al*., 2014; Spencer *et al*., 2006; Steele & Senekal, 2005). The literature indicates that males and females take DS for different reasons and supplement at different rates. It is therefore important to determine (as there is a lack of research) if adult MVS users and non-users prefer a MVS that is personalised to their gender (has adjusted nutrient levels for men/women).

2.4.4 Multivitamin supplements personalised to lifestyle

Being an expectant mother for the first time and having pregnancy plans were two separate predictors of DS intake in expectant moms, according to Aronsson *et al.* (2016) and Morin *et al.* (2002). Additionally, according to Picciano and McGuire (2009), 50% of North American women who are pregnant or breastfeeding, use some sort of DS. The literature indicates that the average intakes of thiamine, riboflavin, niacin, folic acid, vitamins B6, B12, and C, iron, and zinc from DS alone were equal to or more than their respective recommended dietary allowances amongst pregnant and breastfeeding DS users in North America (Picciano & McGuire, 2009).

Austin *et al.* (2015) discovered that increasing DS use was related to high-intensity operational employment among US coast guard personnel. The authors concluded that occupation is an important determinant of DS use. The prevalence of DS use by US coast guard personnel is greater than reported for other US armed forces personnel and reflects high levels of participation in aerobic and strength training activities (Austin *et al.*, 2015).

It is clear from the literature that lifestyle (e.g., pregnancy, active) may play a role in DS consumption. To the researcher's knowledge, no research has been conducted on the type of MVS preferred in terms of lifestyle, particularly amongst adults. Therefore, this study aims to determine if adult MVS users and non-users prefer a MVS personalised to their lifestyle needs (e.g., pregnancy, active).

2.4.5 Importance of multivitamin supplement form versus brand

Due to the greater convenience associated with MVS (compared to individual vitamins) in SA, users consume it as pills, powder and liquid (Grand View Research, 2022). In this study it was pertinent (due to the lack of available research) to determine whether adult MVS users and non-users in SA place higher importance on the form of the MVS over the brand.

2.5 Implications for marketing

In order for marketers to derive appropriate marketing target strategies to increase MVS usage, it is crucial to understand the underlying beliefs behind MVS adoption and non-adoption in SA. Armed with such knowledge, marketers can more effectively influence individuals through their advertisements.

According to Bagchi, Nair, and Sen (2019), DS industries rely heavily on marketing strategies to change consumer perceptions. Barnes *et al*. (2016) provided evidence to support this assumption by showing that Australian university students' justifications for using DS were very compatible with marketing claims. In a study by Ziemba (2013), magazine advertising was content analysed to determine whether the societal or egocentric desire for the ideal body and DS advertisements were related. Only 55% of the advertisements had any kind of logic, according to the study, while 68% played to people's egos, frequently with empty promises and obscene imagery (Ziemba, 2013). These findings are consistent with and supportive of research by Main *et al.* (2004) that investigated DS advertising and found that 58% of advertisements employed emotional appeal, while only 43.5% had any kind of reasoning.

According to Pawlak *et al*. (2008), marketing programmes aimed at Caucasian female college students should emphasise the benefits of MVS use (such as how it can improve one's mood and appearance and how it can provide nutrients that one's diet does not provide) as these were important factors influencing the use of MVS in their study. The authors suggested that posters and pamphlets be displayed at student recreation centres, health and grocery stores, eateries frequented by college students, and student health centres. Such posters ought to mention how MVS might improve their health, appearance, and ability to get enough nutrition (Pawlak *et al*., 2008). In contrast, research by Pawlak *et al*. (2005) suggested that normative factors such as the influence of campus physicians, family, and friends should be included in marketing programmes that target populations of college-age African American females to support the use of MVS, as these were important normative influences identified in the study (Pawlak *et al*., 2005).

Chung *et al.* (2012) found that Chinese consumers' distrust of marketers plays a significant role in their attitudes and purchase intentions toward DS. The results of this study about the effect of consumer mistrust on attitudes and purchasing behaviour have significant ramifications for western marketers

exporting to China. The authors recommended that western marketers of soy-based DS should consider taking specific actions to decrease consumer distrust.

In a study among students at six Malaysian universities, Noor *et al*. (2014) suggested that younger consumers take DS for various reasons. As a result, marketers must make specific information available to ensure that the target group of younger consumers can recognise the advantages and value of DS consumption. To guarantee that younger customers receive pertinent and correct information on DS offers, the researchers advise marketers to ensure that sales employees have good product expertise on DS in-store. Furthermore, these products should give younger customers ways to enhance their health and wellbeing as these were identified as important behavioural influences in the study. Lastly, the authors suggest that parents and family members are an important reference category for younger Malaysian consumers who wish to take DS; as a result, marketing messages framed in the context of close family members as a reference category, may create positive influences and attitudes on the benefits of DS consumption for younger consumers (Noor *et al.,* 2014).

The literature highlights the marketing implications of the factors influencing DS and MVS usage among the student population. However, there is a lack of research on the factors influencing MVS usage and the implications thereof for marketing, among the adult population, particularly in SA. This study addresses this gap by assessing the implications for marketing the factors influencing MVS usage among adults and provides recommendations to marketers.

The usage of DS and MVS is influenced by factors mentioned in this chapter, which are considered when devising an appropriate conceptual framework in the next section.

2.6 Theoretical/conceptual background

This section discusses the factors influencing consumer behaviour and the theories used to explain health-related behaviour. In addition, the theory that primarily framed the study is elaborated on. According to Glanz, Rimer, and Viswanath (2008), applying theory to research and health treatments may be beneficial; yet there is scant evidence arguing for any one theory's superiority.

2.6.1 The factors which influence consumer behaviour

Marketing is a human activity that aims to satiate needs and desires through exchange procedures, according to Kotler and Armstrong (2008). The basic component of exchange is most clearly stated in Kotler and Armstrong's (2008) definition. In commercial marketing, the nature of the deal, i.e., a good or service in exchange for cash, is typically evident. Customer satisfaction is a primary marketing concept; hence commercial marketers strive to provide consumers with more satisfaction than their

rivals. Satisfaction is said to affect behaviour regarding favourable word-of-mouth, repeat business and eventually profitability (Kotler & Armstrong, 2008).

Marketers need to comprehend the nature of behaviour to build programmes that modify behavioural patterns. The literature on consumer behaviour frequently draws from various disciplines, including sociology, psychology, and social anthropology. Analysis of the elements that affect behaviour is a crucial component of consumer behaviour (Andraesen, 2002). According to Kotler and Armstrong (2008:135): "Consumer purchases are influenced strongly by cultural, social, personal, and psychological characteristics."

The values and philosophies of a particular community are shared by a group of people. The culture of a given community may have a big impact on how people behave. The ideas of subculture and social class are also cultural elements. Culture is a passed-down way of life and is frequently seen to have the biggest impact on how consumers behave. A subculture is a group of individuals who belong to a culture but differ from the prevailing culture regarding their views and values. Marketers can use these groups by breaking up the market into numerous smaller sections. Social class is assessed as a mix of employment, income, schooling, wealth, and other characteristics rather than being defined by a single element, such as income (Kotler & Armstrong, 2008).

Because humans are social creatures, the society or the individuals they are exposed to impact their purchasing decisions. Humans strive to mimic others and foster a desire to fit in with their peers. Relevant social aspects include roles, families, and peer groups. The buyer's family has a significant impact on their behaviour. People form their preferences as a child by observing their family make purchases, and they maintain those tastes as they age. Therefore, businesses are curious about which family members affect particular purchases most. Reference groups are associations a customer has with and may desire to join, such as social groups, professional organisations, or small-group friendships. Depending on the product and brand, reference groups have different effects. The tasks a person is expected to complete comprise their role; every role is associated with a status level (Kotler & Armstrong, 2008).

Consumers' circumstances have an impact on what they buy. These individual characteristics range from person to person, leading to diverse views and purchasing patterns. Age, profession, lifestyle, and personality are examples of personal aspects. The life cycle and consumers' age could influence their purchasing decisions. The purchasing preferences vary depending on the age level. Lifestyle is the term used to describe how a person interacts with his or her environment and how they live in a society. It is a significant consumer behaviour factor, along with occupation. Personality refers to a person's outlook on life, why people differ, and all of their distinctive characteristics (Kotler & Armstrong, 2008).

A good understanding of human psychology is necessary to comprehend consumer behaviour. Although difficult to measure, psychological factors can impact a buyer's decision. Psychological factors include motivation, perception, learning, beliefs, and attitudes. The internal urge we have to obtain what we need is called motivation. Each person has unique needs related to physiology, security, relationships, esteem, and self-actualisation. Nature prioritises basic necessities like food, drink, and sleep while placing the lowest priority on other needs. Therefore, when a need is more urgent, it transforms into a motive and pushes the person to seek fulfilment. Consumer perception refers to a process through which a customer collects facts on specific products and interprets those facts to build an accurate perception. A person typically wants to learn more about the product before making a purchase. Experience is another way that learning develops through time. The ability to learn depends on knowledge and abilities. While practice can aid in developing skills, the only method to learn new things is through experience (Andraesen, 2002). The attitudes and opinions of the consumer also influence the buying choice; as a result, the consumer behaves specifically toward a product based on this mentality. This mentality significantly affects the brand image of a product. Therefore, to build their marketing strategies, marketers work very hard to comprehend consumer attitudes (Kotler & Armstrong, 2008).

2.6.2 The health belief model

The health belief model (Figure 2-3) states that individuals are more inclined to participate in health behaviour to avoid life-threatening situations (Glanz, Rimer, and Viswanath 2008). A frequent defence for the use of DS is vulnerability to sickness, although Conner *et al.* (2001) found no relationship between sensitivity to illness and DS use.

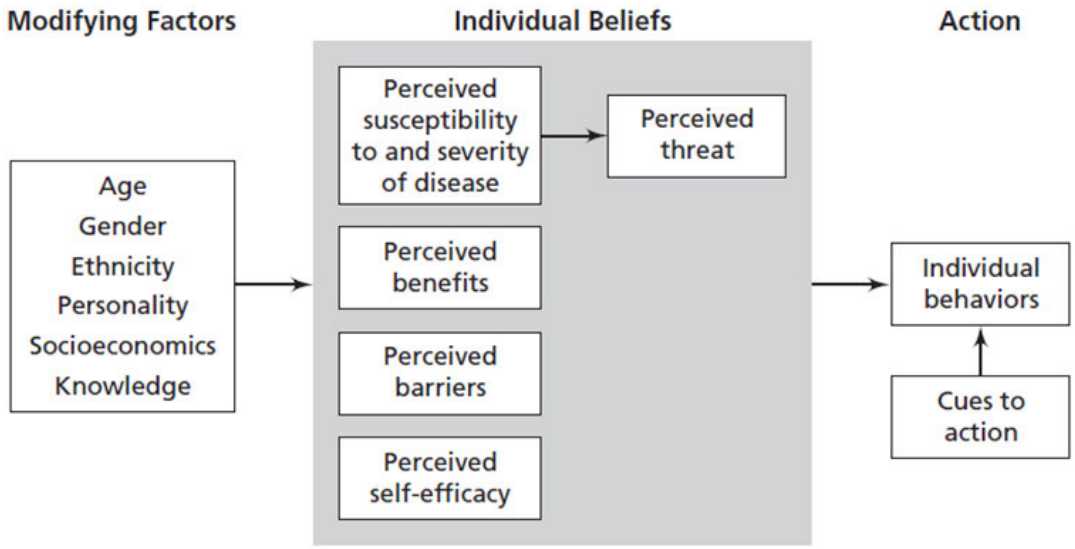

Figure 2-3: The health belief model

Source: Glanz *et al*. (2008:49)

2.6.3 The precaution adoption process model

The precaution adoption process model (Figure 2-4) assumes that individuals pass through stages before adjusting their behaviour and indicates a stage of unawareness of a risk (Glanz, Rimer, and Viswanath, 2008).

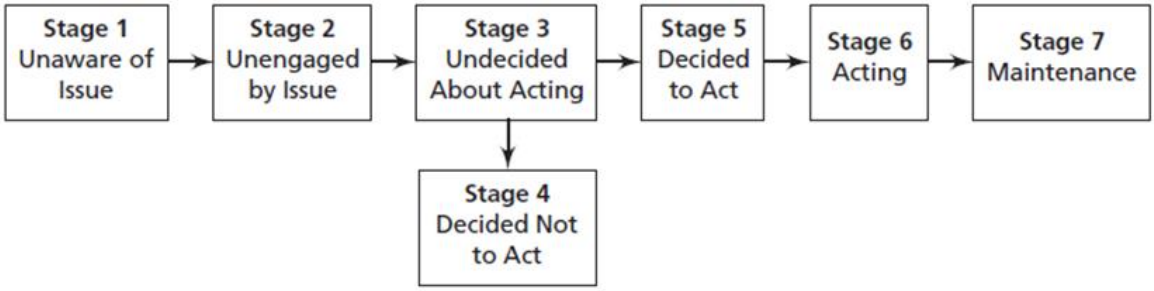

Figure 2-4: The precaution adoption process model

Source: Glanz, Rimer, and Viswanath (2008:127)

The model tries to clarify the stages people experience when practicing health-protective behaviours and identify the factors that affect their transition from one stage to the next (Glanz, Rimer, and Viswanath, 2008). There are many reasons for using MVS in addition to protecting one's health. Hence this model will not be suitable for the current study.

2.6.4 The theory of reasoned action

The theory of reasoned action (Figure 2-5) indicates that the most crucial element influencing behaviour is behavioural intention (Glanz, Rimer, and Viswanath. 2008).

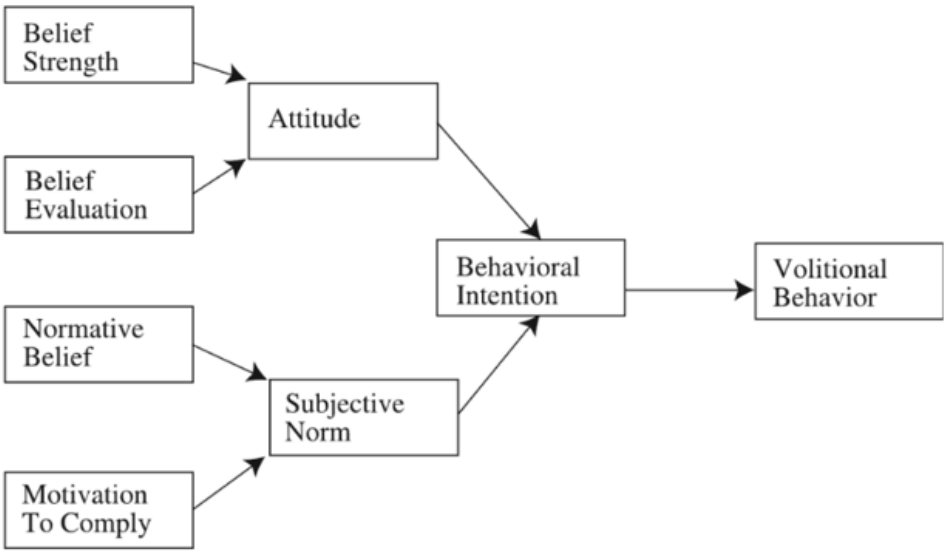

Figure 2-5: The theory of reasoned action

Source: Dillard and Shen (2002:263)

The theory of reasoned action's goal is to take volitional behaviour into consideration. A wide range of behaviours, such as those that are sudden, impetuous, habitual, driven by appetites, or simply scheduled, are excluded as they may not be voluntary or because they may not need an actor to make a deliberate choice (Dillard & Shen, 2002). Circumstantial and internal factors contributing to non-volitional behaviour have been demonstrated to influence DS usage (Dillard & Shen, 2002). As a result, this model will be inadequate for the present investigation.

2.6.5 The theory of planned behaviour

The TPB adds perceived control to the theory of reasoned action, which considers occurrences where individuals cannot exert free will regarding the behaviour (Ajzen, 1991). Between 1985 and January 2004, 610 studies were published in the PsycINFO database and 222 research articles were published in the Medline database using the TPB as its theoretical foundation (Francis *et al.*, 2004). Glanz, Rimer, and Viswanath (2008) argue there is an absence of adequate data to decide on the appropriate health-related theory to use, therefore researchers should select theories based on empirical support and the needs of the study.

Godin and Kok (1996) reviewed the TPB's applicability to various health-related behavioural categories, including habit formation, physical activity, condom use, and oral hygiene. They concluded that all the studies provided information to verify the efficiency of the TPB (Godin & Kok, 1996).

Hence the TPB is a justified foundation for constructing the study's conceptual framework and can shed light on the factors that play a role in an individual's enthusiasm to consume MVS.

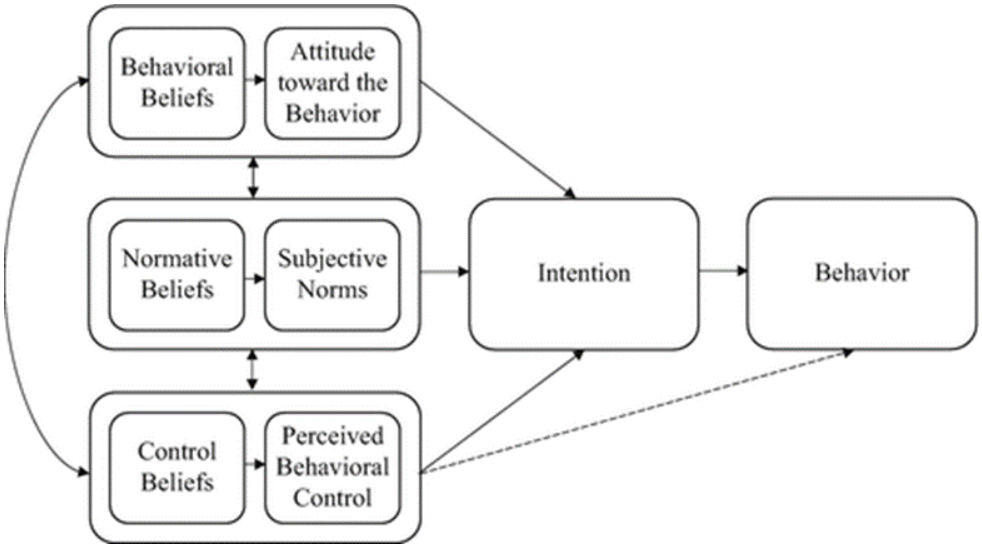

Figure 2-6: The TPB

Source: Ajzen (1991:182)

According to the TPB (Figure 2-6), the intention to engage in a certain behaviour (such as MVS consumption) is directly influenced by three things, i.e., attitude, subjective norms and perceived behavioural control (Ajzen, 1991). It is believed that behavioural ideas about the implications of a behaviour and the consequences connected to those implications have an impact on attitudes toward a particular behaviour. Attitudes toward a given behaviour involve an appraisal of the behaviour (Ajzen, 1991).

Subjective norms are societal forces that influence whether or not to perform a behaviour (Ajzen, 1991; Pawlak *et al*., 2008). It is theorised that normative beliefs about how a reference group would prefer an individual to behave drive subjective norms (Ajzen, 1991; Pawlak *et al*., 2008).

Perceived behavioural control is an apparent ease of executing the behaviour and is affected by circumstantial and internal reasons that may hinder or enable the accomplishment of the behaviour (Ajzen 1991; Pawlak *et al*., 2008).

A few global studies have utilised the TPB to frame their studies relating to the consumption of DS among adult females or the student population (Conner *et al*., 2001; Lino *et al*., 2014; Noor *et al*., 2014; Housman *et al*., 2011) or MVS among the female student population (Pawlak *et al*., 2008; Pawlak *et al*., 2005).

According to Conner *et al*., 2001, the attitude was the strongest predictor of intentions (to use DS) alone, accounting for 70% of variance together with subjective norms and perceived behavioural control. The authors emphasised the TPB's potential for examining supplement-taking behaviour while shedding light on the factors affecting a person's reasons for using DS.

According to Lino *et al*. (2014), attitudes, subjective norms, and perceived behavioural control are significant predictors of African-American women's desire to use DS for human immunodeficiency virus control. The TPB can be utilised to better identify and comprehend salient beliefs that surround intentions to adopt alternative medicines for the treatment of sickness, according to the study's conclusions. These ideas can be utilised to create interventions for human immunodeficiency virus care and treatment (Lino *et al.*, 2014).

Noor *et al*. (2014) conducted research among six Malaysian universities using the TPB as a framework. The authors found that the intensity of the relationships between informational influence, customer attitude, and intention to purchase DS was significantly influenced by health motivation (Noor *et al*., 2014).

Housman *et al*. (2011) used the TPB to examine the factors that influence female National Collegiate Athletic Association Division 1 student-athletes' use of sport-related nutritional supplements. The TPB-based model explained 64–66% of the variance in behavioural intention and 18% of the variance in behaviour, with subjective norm serving as the greatest predictor of intention to take DS (Housman *et al*., 2011).

Pawlak *et al*. (2008) used the TPB to examine the determinants of MVS usage amongst Caucasian female university students. Attitudes, subjective norms, and behavioural control all had an effect on behavioural intention to adopt MVS (Pawlak *et al*., 2008). These findings provide support to the TPB's use in predicting both behavioural intention and MVS use (Pawlak *et al.*, 2008). When considered together, attitude, subjective norms, and perceived behavioural control all predicted behavioural intention in a substantial way. Thus, both a favourable attitude regarding MVS and a perceived increase in control over MVS use was related with a greater behavioural intention to use MVS (Pawlak *et al.*, 2008). These findings contrast with earlier research by Pawlak *et al*. (2005) on African American female students. Subjective norms had the largest influence on African American behavioural intention to use MVS in that study. On the other hand, attitude exerted the least influence (Pawlak *et al.*, 2005).

According to Pawlak *et al.* (2008), the components included in the TPB model explained around 53% of the variance in behaviour. This suggests that other characteristics not studied in the research may have an effect on whether Caucasian female college-aged students take MVS (Pawlak *et al.*, 2008). The authors conclude that perceived health status of respondents might be an independent predictor for MVS usage. Additionally, Conner *et al.* (2001) advised that health value be incorporated as a separate variable in the TPB model to predict health-related behaviour. Another often-mentioned reason for supplement use is susceptibility to illness (Pawlak *et al.*, 2008). Conner *et al*. (2001) discovered, however, that vulnerability to illness had no effect on females' use of DS. There have been numerous studies indicating that the lifestyle characteristics of DS users are associated with health (Block, Sinha, & Gridley., 1994;

Foote *et al*., 2003; Kim *et al.* 1993; Slesinski *et al*., 1996; Slesinski *et al*., 1995; Suber & Block, 1990) however, in Ishihara *et al.* (2003) DS users also showed negative lifestyle factors. There is a lack of research on the health-related lifestyle characteristics of MVS users and non-users particularly among the adult population.

To the researcher's knowledge there is also a lack of research on the marketing implications of the factors influencing MVS usage among the adult population. A deeper understanding of the underlying consumer beliefs driving MVS adoption or preventing MVS adoption will help enhance marketing target strategies and create value for customers.

2.6.6 The conceptual framework

The TPB has been a very useful and influential theory in research related to the focus of this study, as was made clear from the preceding discussion. However, it does have some limitations in that it does not include other factors like the value placed on health, perceived health status, and a healthy lifestyle that may affect MVS use. As a result, a conceptual framework has been devised for this study that is based mainly on the TPB but also includes other components that have been identified in the literature as having possible importance.

The conceptual framework for this study is shown in Figure 2-7. This study addressed the gap in knowledge by exploring the beliefs of MVS users and non-users towards MVS usage as well their health-related lifestyle characteristics, perceived health status and the value they place on health. The marketing implications of the resulting behaviour are also examined, with recommendations provided to marketers. Additionally, unlike many previous studies on DS, this study focused exclusively on the MVS sub-category and did not limit its focus to university students or females only.

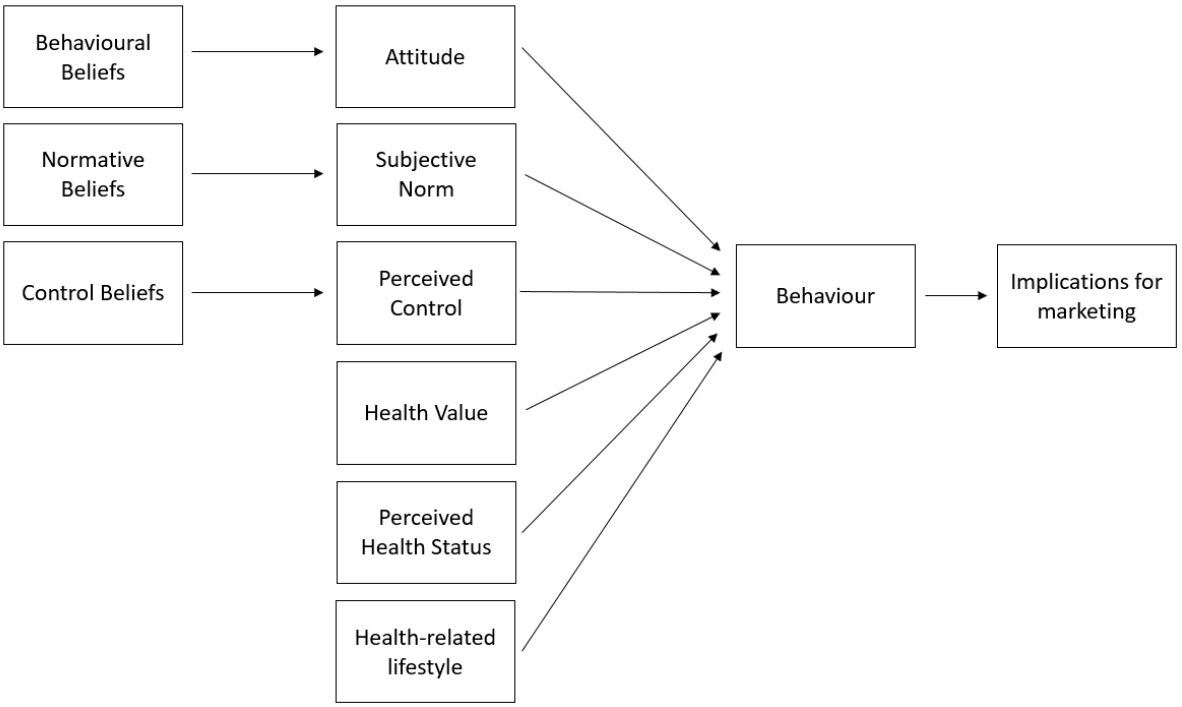

Figure 2-7: The conceptual framework for the study

2.7 Conclusion

This chapter provided context for, defined, and discussed the advantages of DS, VS and MVS, as well as an analysis of worldwide and local markets and trends. Additionally, it examined essential literature and theory related to the topic. The literature review found that the factors affecting DS and MVS use are complicated. Personal factors such as perceived advantages of DS, sickness history, physiological state, sociodemographic traits, and lifestyle factors all contribute to the use or non-use of DS. Socioeconomic issues such as subjective norms, food prices, perceived control, and the financial interests of the sectors engaged in the manufacturing and marketing of DS were also cited as reasons for DS use or non-use. Gaps in the literature were identified which resulted in the creation of a conceptual framework, exploring the beliefs of MVS users and non-users towards MVS usage, as well as their health-related lifestyle characteristics, perceived health status and the value they place on health. The next chapter covers the research methodology utilised to answer the research questions.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a structured and methodical strategy for seeking a solution to a previously defined issue (Sekaran & Bougie, 2016). The necessary measures are taken to identify the relevant elements influencing the situation. After identifying the problem, the information received from the collected data is analysed. Subsequently, remedial steps might be used to resolve the issue (Sekaran & Bougie, 2016).

This chapter discusses and justifies the research methodology that was utilised in this study. The chapter begins by outlining the research philosophy, design and approach that underpinned the study. Thereafter, the study site, target population and sampling strategy are outlined. Also covered in this chapter are the data collection, quality control and analysis techniques. The chapter concludes with pertinent ethical considerations.

3.2 Research philosophy

According to Saunders, Lewis and Thornhill (2016:124), "research philosophy refers to a system of beliefs and assumptions about the development of knowledge". There are five main research philosophies, according to Saunders, Lewis and Thornhill (2016:135): "positivism, interpretivism, pragmatism, critical realism and postmodernism".

Positivism is an approach that explores a phenomenon objectively and independently of individuals participating in a study. Positivism applies a naturalist perspective to observed social phenomena to generate generalisations that establish precedents and become law-like. Interpretivism is focused on recognising the distinctions between people as social actors and argues for the researcher's need to comprehend these differences. Pragmatism argues that the research issue is the primary determinant of the research philosophy selected. Depending on the nature of the study subject, it is possible to operate within both positivism and interpretivism; for instance, when a qualitative research method is used to gain subjective meanings and interpretations as the main source of knowledge and thereafter a quantitative research method is used to gain objective views on the knowledge obtained from the qualitative research (Saunders, Lewis & Thornhill, 2016). Critical realism seeks to explain what we see and experience in terms of the fundamental forces that shape reality. Postmodernism strongly focuses on the function of language and power dynamics in an effort to challenge conventional wisdom and give voice to disfavoured, alternative viewpoints (Saunders, Lewis & Thornhill, 2016).

The positivism research philosophy was adopted for this investigation as the primary goal was to determine the factors influencing the use of MVS among users and non-users in SA. The research was conducted objectively as the beliefs of the researcher did not affect how data was collected or analysed,

hence enhancing the trustworthiness of the data and insights gained by this study. A highly structured questionnaire was used to collect quantitative data from a sizeable sample of 385 respondents. This data enabled the researcher to analyse the factors driving MVS usage, leading to substantial implications for MVS marketers.

3.3 Research design

Cooper and Schindler (2014) assert that the research design lays out the data collection, measurement, and analysis strategy. Various research methodologies include exploratory, descriptive, and causal studies (Cooper & Schindler, 2014).

Descriptive research aims to describe a population, situation, or phenomenon precisely and methodically (Cooper & Schindler, 2014). It can respond to 'who,' 'what,' 'when,' and 'where' questions (Cooper & Schindler, 2014). A descriptive research strategy may employ a range of research approaches to investigate one or more variables (McCombes, 2022). Contrary to experimental research, the researcher merely observes and measures the variables, not controlling or influencing any of them (McCombes, 2022).

Descriptive research is the approach of choice when the goal of the study is to find qualities, frequencies, trends, and classifications (McCombes, 2022). It is beneficial when a subject or research issue is poorly understood (McCombes, 2022). This study adopted a descriptive cross-sectional research design due to a dearth of knowledge about the factors influencing the use of MVS among the South African population.

A cross-sectional study seeks to address research issues when data is gathered once over a brief time period (Sekaran & Bougie, 2016). This cross-sectional research gives a snapshot of the beliefs linked to MVS consumption at a particular moment in time.

3.4 Research approach

There are three distinct research approaches, according to Sekaran and Bougie (2016): qualitative, mixed, and quantitative. Each has advantages and disadvantages depending on the details of the study and the issue the researcher is trying to resolve. To choose the optimal research strategy, it is vital to appreciate the benefits of all possible research techniques (Sekaran & Bougie, 2016).

A qualitative approach is where the researcher often asserts information based on constructivist, advocacy/participatory, or both viewpoints (Creswell, 2014). It also utilises phenomenology, narratives, grounded theory studies, ethnographies, and case studies as research approaches. The primary goal of the investigator's emergent, open-ended data collection is to identify themes in the data (Creswell, 2014). Compared to the majority of quantitative methods, qualitative research is economical and efficient (Cooper & Schindler, 2014). On the other hand, data analysis may be time-consuming owing

to the use of open-ended questions and the need to analyse each question independently (Saunders, Lewis & Thornhill, 2016).

Quantitative and qualitative methodologies are blended in a number of ways in mixed methods research, from simple, contemporaneous forms to more intricate, sequential ones (Saunders, Lewis & Thornhill, 2016). Collecting data also involves gathering numerical and textual data in order to have both quantitative and qualitative information in the final database (Creswell, 2014). Mixed approach research may help researchers solve topics not covered by qualitative and quantitative research; however, it is time-consuming and expensive (Saunders, Lewis & Thornhill, 2016).

According to Saunders, Lewis and Thornhill, (2016), "Quantitative research examines relationships between variables, which are measured numerically and analysed using a range of statistical and graphical techniques." It can be utilised to spot trends and averages, formulate hypotheses, look at causal relationships, and extrapolate results to bigger groups (Sekaran & Bougie, 2016).

After evaluating the advantages and disadvantages of all three methods, the quantitative approach was chosen for this study. There are several advantages to employing quantitative data, such as using numbers and statistics to analyse and comprehend outcomes that may be generalised to the whole population (Cooper & Schindler, 2014). In addition, it allows researchers to gather massive amounts of data quickly and is easier to analyse (Sekaran & Bougie, 2016).

3.5 Study site

Due to time restrictions and convenience, shopping malls in the greater Durban area were selected as the study's locations. The researcher obtained gatekeeper permission to conduct the survey at five participating shopping centres. Using shopping malls as a study site has several advantages (Kuhn, 2019). To begin with, it is often simpler to persuade someone to engage in a mall intercept survey than by phone or email. Mall intercepts can engage shoppers before or after they have purchased MVS, which can assist in obtaining accurate data on pertinent questions within the questionnaire. It is more accurate to inquire when or immediately after this experience took place rather than weeks or months afterwards (Kuhn, 2019). In addition, the shopping malls selected for the study had diverse shoppers who likely helped to reduce sample bias.

3.6 Target population

Sekaran and Bougie (2016) state that a population is the total group of individuals, events, or items that an investigator wants to examine. It is the population, event, or objects about which the researcher aims to draw conclusions. This research targeted adult individuals from the greater Durban region. According to the most recently available census data, Durban is a part of the eThekwini Metropolitan Municipality,

which consists of surrounding towns and has a population of around 3.44 million (see Table 3-1) (Statistics South Africa, 2011).

Table 3-1: Age and gender distribution of eThekwini Metropolitan Municipality

ETH:	1996			2001			2011		
eThekwini	Male	Female	Total	Male	Female	Total	Male	Female	Total
0 - 4	128 894	129 905	**258 800**	136 709	136 390	**273 098**	165 537	162 435	**327 972**
5 - 9	126 825	127 512	**254 337**	142 581	144 028	**286 609**	135 124	133 421	**268 545**
10 - 14	128 541	131 342	**259 883**	146 567	148 251	**294 818**	136 579	133 184	**269 763**
15 - 19	127 647	133 248	**260 895**	157 827	165 517	**323 343**	156 287	162 252	**318 539**
20 - 24	154 078	155 482	**309 561**	162 918	168 556	**331 474**	207 947	204 778	**412 726**
25 - 29	138 203	138 024	**276 226**	156 719	159 604	**316 324**	203 289	192 292	**395 581**
30 - 34	116 619	124 519	**241 138**	123 866	132 562	**256 429**	154 042	145 125	**299 167**
35 - 39	99 580	103 940	**203 520**	111 027	124 980	**236 007**	125 590	121 792	**247 382**
40 - 44	80 793	83 884	**164 677**	91 639	103 393	**195 032**	96 104	103 063	**199 167**
45 - 49	68 047	68 876	**136 923**	72 870	81 771	**154 641**	78 473	96 459	**174 931**
50 - 54	49 182	52 174	**101 356**	62 103	66 991	**129 094**	65 340	80 383	**145 722**
55 - 59	36 368	41 839	**78 207**	42 362	49 629	**91 991**	53 412	66 559	**119 972**
60 - 64	25 008	35 740	**60 749**	30 127	42 206	**72 333**	42 673	54 828	**97 501**
65 - 69	18 860	27 295	**46 155**	19 536	30 484	**50 020**	26 164	37 328	**63 492**
70 - 74	12 213	17 897	**30 110**	13 665	23 415	**37 080**	16 971	27 862	**44 833**
75 - 79	7 470	11 771	**19 242**	8 072	13 774	**21 846**	9 516	18 050	**27 566**
80 - 84	3 429	6 535	**9 964**	4 372	8 504	**12 876**	5 371	11 658	**17 029**
85+	1 973	4 464	**6 438**	2 076	5 030	**7 107**	3 988	8 484	**12 473**
Total	**1 323 731**	**1 394 449**	**2 718 180**	**1 485 038**	**1 605 084**	**3 090 122**	**1 682 406**	**1 759 955**	**3 442 361**

Source: Census 2011 Municipal Report KwaZulu-Natal (2011:95)

This research study focused on beliefs around MVS; hence, the adult population would be acceptable for the study. In SA, a person aged 18 and above is considered an adult; therefore, they can make choices on their own (Strode *et al.*, 2010). In addition, unlike previous research on DS, which tended to concentrate on students, the general public would be targeted to get insights from various demographic categories. This is of importance as there may be age-related influences on MVS use. There is currently no available data on those individuals aged 18 and above living in eThekwini Metropolitan Municipality; therefore, the total population of 3.44 million was used as the target population for this study (Statistics South Africa, 2011).

The demographic split of the Municipality is as follows (Statistics South Africa, 2011):

- Race - Black African 73.8%, Indian/Asian 16.7%, White 6.6%, Coloured 2.5% and Other 0.4%;
- Gender - Female 51.1%, Male 48.9%

3.7 Sample

Sampling is the procedure of picking a sufficient number of representative components from a population to generalise the sample's characteristics or qualities to the population's constituents (Sekaran & Bougie, 2016).

3.7.1 Sampling method

The researcher placed a high level of attention on selecting the best sample technique because it not only improves the data's correctness but also lowers costs, increases efficiency, and offers more flexibility (Sekaran & Bougie, 2016).

Two fundamental sampling designs exist: probability and non-probability sampling (Sekaran & Bougie, 2016). In probability sampling, the chance of selecting each item from the population of interest is defined and is usually the same in all instances. This means that research questions and goals that require the investigator to statistically estimate the target population's traits from the sample may be answered and attained. Probability sampling may be either unconstrained in the case of simple random sampling or constrained in the case of complex probability sampling (see Table 3-2) (Sekaran & Bougie, 2016).

Table 3-2: Probability and non-probability sampling designs

Sampling design	Description	Advantages	Disadvantages
Probability sampling			
1. Simple random sampling	All elements in the population are considered and each element has an equal chance of being chosen as the subject.	High generalizability of findings.	Not as efficient as stratified sampling.
2. Systematic sampling	Every *n*th element in the population is chosen starting from a random point in the sampling frame.	Easy to use if sampling frame is available.	Systematic biases are possible.
			essential.
4. Cluster sampling	Groups that have heterogeneous members are first identified; then some are chosen at random; all the members in each of the randomly chosen groups are studied.	In geographic clusters, costs of data collection are low.	The least reliable and efficient among all probability sampling designs since subsets of clusters are more homogeneous than heterogeneous.
5. Area sampling	Cluster sampling within a particular area or locality.	Cost-effective. Useful for decisions relating to a particular location.	Takes time to collect data from an area.
6. Double sampling	The same sample or a subset of the sample is studied twice.	Offers more detailed information on the topic of study.	Original biases, if any, will be carried over. Individuals may not be happy responding a second time.
Nonprobability sampling			
7. Convenience sampling	The most easily accessible members are chosen as subjects.	Quick, convenient, less expensive.	Not generalizable at all.
8. Judgment sampling	Subjects selected on the basis of their expertise in the subject investigated.	Sometimes, the only meaningful way to investigate.	Generalizability is questionable; not generalizable to entire population.
9. Quota sampling	Subjects are conveniently chosen from targeted groups according to some predetermined number or quota.	Very useful where minority participation in a study is critical.	Not easily generalizable.

Source: Sekaran and Bougie (2016:250)

In non-probability sampling designs, there are no probabilities connected with the selection of sample individuals from the population (Sekaran & Bougie, 2016). This indicates that the conclusions of the sample findings cannot be reliably extended to the whole population. On occasion, researchers may be

less concerned with generalisability than gathering early data quickly and affordably, in which case non-probability sampling is excellent. Non-probability sampling methods are often grouped under convenience and purposive sampling subcategories (Sekaran & Bougie, 2016).

Probability and non-probability sampling strategies are outlined in further detail in Table 3-2. The table emphasises the many classifications and explanations of each sample design, as well as the benefits and drawbacks.

In all kinds of research, using the entire population would be ideal; however, in most cases, it is impractical to include every respondent since the population is often restricted (Etikan, Musa & Alkassim, 2016). This is why the majority of researchers use sample-based methods such as convenience sampling. Members of the target population who fit certain characteristics, such as being easier to reach, nearby geographically, available at a specified time, or eager to participate, are chosen for the research in this type of sampling. Convenience samples are sometimes referred to as accidental samples due to the fact that participants may be included if they are geographically placed near to the location where the investigator is gathering data (Etikan, Musa & Alkassim, 2016).

Convenience sampling approaches are applicable to qualitative and quantitative research; however, they are applied more often in quantitative studies, while purposeful sampling is utilised more frequently in qualitative research (Etikan, Musa & Alkassim, 2016). The method of choice for this study was convenience sampling, given time and financial constraints, as well as because the technique is effective and efficient. A representative sample significantly decreases sample bias (Sekaran & Bougie, 2016). Shopping malls in the greater Durban area were conveniently targeted as these shopping malls had diverse shoppers, thereby helping to reduce sampling bias.

3.7.2 Sample size

Sekaran and Bougie (2016) state that a sample size between 30 and 500 is adequate for research. Using a sample size calculator (see Figure 3-1) with a 95% confidence level, a 5% margin of error, and a target population of 3.44 million, a sample size of 385 participants was calculated for this investigation (Survey Monkey, 2022). All 385 respondents who agreed to participate completed the questionnaire in full, resulting in a 100% response rate.

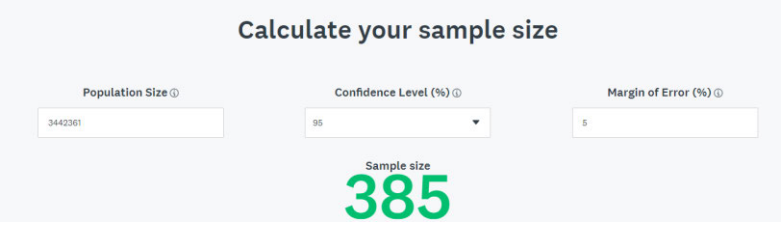

Figure 3-1: Sample size calculator

Source: surveymonkey.com (2022)

3.8 Data collection

Data collection is acquiring or reliably amassing information for further analysis (Sekaran & Bougie, 2016). A variety of information sources are available. This section outlines the aims of primary and secondary data before discussing questionnaires as a tool in survey design.

3.8.1 Source of data

There are two sorts of data sources, according to Sekaran and Bougie (2016): primary data and secondary data. Primary data alludes to data directly obtained by an investigator for a specific study objective. Interviews, observations, focus groups, and surveys are key data collection techniques (Sekaran & Bougie, 2016). Secondary data is obtained when a researcher uses previously published materials and studies (Cooper & Schindler, 2014). Books, journal papers, case studies, company websites, government publications, and statistical bulletins are examples of secondary data sources (Sekaran & Bougie, 2016). For this study, primary data was gathered as literature on the factors influencing the usage of MVS amongst South African consumers seems to be lacking.

3.8.2 Survey method

A survey is a measuring process used to collect data during a rigid interview, either with or without an interviewer. Each responder receives carefully written, methodically ordered, and precisely phrased questions. The survey's objective is to generate comparable data from various subgroups of the selected sample in order to identify commonalities and differences. The survey approach provides a number of benefits in addition to some disadvantages (Cooper & Schindler, 2014).

Surveys are an excellent method to collect a large amount of data from many respondents and they are relatively inexpensive. A large population may be accurately represented by surveys on a broad level. The data being collected results in a broader perspective of the characteristics of the population due to the consistently high response rate. Survey research is also dependable due to survey questions being standardised (Cooper & Schindler, 2014).

Survey research has several limitations, much like any other data-gathering techniques. The survey that the researcher has used from the start, as well as the way it was administered, cannot be modified at any point throughout the data collection process. Survey validity might sometimes be problematic. Given that survey questions are standardised, it might be difficult to ask anything other than rather generic questions that a diverse group of individuals would understand. In light of this, survey results might not be as trustworthy as those produced from data collection methods that permit a researcher to carry out a more in-depth investigation of the research topic. Additionally, respondents may not provide accurate answers to questions that are controversial due to their likely difficulty in retaining the relevant facts (Cooper & Schindler, 2014).

3.8.3 Questionnaires

The questionnaire is the most prevalent data collection tools used in survey design (Saunders, Lewis & Thornhill, 2016). Typically, questionnaires are aimed at gathering vast volumes of quantitative data. Respondents may get them personally, online, or via mail (Sekaran & Bougie, 2016). It is effective for gathering responses from a large sample before quantitative analysis since every respondent receives the exact same set of questions (Saunders, Lewis & Thornhill, 2016). Compared to interviews and observation, questionnaires are cheaper and take less time, but they have a higher chance of non-response and non-response errors (Sekaran & Bougie, 2016). The researcher mitigated these risks by using computer-assisted self-administered interviews (CASI). This method is discussed in further detail in Section 3.8.4.2.

3.8.4 Types of questionnaires

Questionnaire design varies based on how it is presented and collected, as well as the level of interaction between the investigator and the participants (Saunders, Lewis & Thornhill, 2016).

Saunders, Lewis and Thornhill (2016) state that the choice of questionnaire depends on several aspects relating to the research questions and objectives of the study, including in particular the following:

- the significance of ensuring that respondents' responses are not corrupted;
- the required sample size, considering the expected response rate;
- the number of questions required;
- the time frame for completing data collection;
- the financial ramifications of data collection and input;
- the availability, cost, analysis and reporting features of online survey tools.

3.8.4.1 Non-electronic questionnaires

When the survey is restricted to a narrow geographical area, handing out printed questionnaires in person is efficient (Sekaran & Bougie, 2016). The essential advantage is that the researcher or a study team member can collect all completed responses rapidly. Respondents may get an immediate explanation for any questions they may have concerns about. In addition, the researcher has the opportunity to introduce the aim of the study and urge respondents to offer frank comments. It is less expensive, takes less time, and requires less skill to administer questionnaires to many people concurrently than compared to interviews (Sekaran & Bougie, 2016). However, individually-delivered surveys are disadvantageous due to their time, printing costs and labour-intensive nature. Consequently, electronic surveys are widely employed nowadays (Cooper & Schindler, 2014).

3.8.4.2 Electronic and online questionnaires

Academics favour web surveys since they may achieve a higher response rate at a reduced cost, as well as the option to include multimedia content (Couper, 2000). These surveys provide additional benefits, including increased speed, simple administration, more adaptability and reduced response input time. In addition, self-administered online questionnaires remove the researcher's answer input load and data entry errors after data collection (Evans & Mathur, 2018). Whilst self-administered online surveys allow participants to complete a survey at their leisure (Revilla & Saris, 2013), non-response bias that affects generalisability is a concern that must be considered (Couper, 2000).

Non-response bias is mitigated to varying degrees by numerous survey delivery mechanisms on the web. It is difficult to determine refusals in online surveys sent by email since some recipients may disregard e-mail invites. Low involvement is a further key disadvantage. People may not take email invites seriously due to the volume of emails and spam they receive (Dillman, Smyth & Christian, 2014). An unwanted email is often seen as a violation of privacy, and the invitation to the survey may be withdrawn or the investigator may get email complaints from participants (Sekaran & Bougie, 2016). Furthermore, the email invite may not be seen by the respondent as it may end up in their email spam folder.

In addition, publishing survey invitations on social networks, discussion boards, and chat rooms might be considered impolite or disrespectful (Cooper & Schindler, 2014). Many consider this kind of posting to be spam, and the researcher may get several irate responses from members of online communities (Cooper & Schindler, 2014). Certain investigators circumvent the issue of limited participation by utilising web survey panels which are made up of dedicated respondents who complete surveys on a regular basis in exchange for remuneration (Calcano, 2020; Revilla *et al*., 2016). However, this jeopardises the response quality and generalisability of the research as these trained panellists complete as many surveys as possible to increase their income (Jones, House & Gao, 2015). In addition to these limitations, the online survey underrepresents people who are older, less educated, and without internet access (Dillman, Smyth & Christian, 2014).

Based on technical advancement, various methods for conducting surveys have been invented and are undergoing continual improvement (Groves, 2011). As a result of the rapid proliferation of smartphones, investigators are faced with the conundrum of how to utilise them to ensure acceptable response rates and minimise prejudice in the population of interest (Watson *et al*., 2015). Online surveys are shown on a number of devices that have varied screen dimensions and response entry systems. Consequently, survey researchers must also evaluate the impact of data entry devices on response quality. For data submission, computer-assisted personal interviews frequently use an online survey form. However, this method still has the standard interviewer bias problem (Couper, 2011).

Smartphones have significant benefits over laptop computers as response input devices for fieldwork (Ha, Zhang & Jiang, 2020). Firstly, cellular internet service offers a far larger coverage area than Wireless Fidelity. Using non-Wireless Fidelity methods for internet connectivity on laptop computers is far less dependable. Tablets are viable options to laptops, although they are not as portable as smartphones and cost significantly more to use with cellular data. Secondly, smartphones have a larger battery capacity and are more portable than laptops (Ha, Zhang & Jiang, 2020).

By leveraging the benefits of human interviewers, such as CASI, it may be possible to circumvent the issues of poor response rates as well as privacy concerns for online questionnaires (Ha, Zhang & Jiang, 2020). To avoid interviewer bias, the researcher's participation in CASI can be confined to participant recruitment and technical assistance on demand. The CASI method combines the benefits of a self-administered online survey methodology with the appealing interviewer recruitment through in-person interviews (Ha, Zhang & Jiang, 2020). Respondents are not concerned with being recognised since their responses do not originate from their device and there will be no evidence of their identity. This approach provides more privacy protection than web-based surveys (Hoonakker & Carayon, 2009). By creating a feeling of urgency and the difficulty of refusing a request for assistance in front of the interviewer, CASI is able to obtain high cooperation rates. Through the interviewer's self-identification, trust may be built. Changing the function of interviewers in self-administered online surveys from interviewers to recruiters is a potential alternative to computer-assisted personal interviews and web surveys (Ha, Zhang & Jiang, 2020).

For the sorts of reasons outlined above, the researcher used the CASI method for this study. Respondents were recruited from five shopping malls in the greater Durban area and immediately completed a self-administered online questionnaire via an Apple iPhone 7 Plus smartphone, which on average took respondents seven minutes to complete. The online questionnaire was created using a paid monthly plan from Survey Monkey. Survey Monkey is a cloud-based survey platform that allows researchers to develop, deliver, and analyse questionnaires. By randomising questions, pages, blocks, and orders, Survey Monkey supports researchers in minimising data bias. In addition, it assists researchers with various inquiry forms, such as video, matrix, rating and ranking. Researchers can personalise the respondent experience thanks to looping, question and page skip logic, and advanced survey logic (Survey Monkey, 2022).

3.8.5. Construction of the questionnaire

A TPB questionnaire manual for health services by Francis *et al*. (2004) was used to help design the questionnaire in line with the study's research questions and objectives. The researcher applied the recommendations from the manual (utilising past studies on the TPB), by determining the most frequently perceived advantages and disadvantages of performing the behaviour (MVS usage); the most important people or groups of people who would approve or disapprove of the behaviour (MVS usage)

and the perceived barriers or facilitating factors which could make it easier or more difficult to adopt the behaviour (MVS usage). In addition, the questions in the questionnaire relating to health and lifestyle and psychographics (preferred MVS) were all adapted utilising findings from past studies. Table 3-3 illustrates the studies from which the questionnaire's questions were adapted.

Table 3-3: Studies utilised in the construction of the questions in the questionnaire

Objectives	Section and questions	Studies
1. To explore the health-related lifestyle characteristics of MVS users and non-users in the greater Durban area.	Section B: Health and Lifestyle - Questions 8, 9, 10, 12 and 13	Al-Johani *et al.* (2020), Bailey *et al*. (2013), Block, Sinha, and Gridley (1994), Duvenage, Meltzer and Chantler (2015), Foote *et al*. (2003), Ishihara *et al*. (2003), Kim *et al*. (1993), Lacerda *et al*. (2015), Lieberman *et al*. (2014), Merwid-lad *et al*. (2022), Mullie *et al*. (2011), Suber and Block (1990), Slesinski *et al*. (1995), Tully (2014), Wang *et al*. (2022)
2. To determine the perceived health status of MVS users and non-users in the greater Durban area.	Section B: Health and Lifestyle - Question 11	Ervin *et al*. (1999), Lyle *et al*. (1998), Pawlak *et al*. (2008), Satia-Abouta *et al.* (2003), Steele and Senekal (2005)
3. To determine the value placed on health by MVS users and non-users in the greater Durban area.	Section B: Health and Lifestyle - Questions 14.1 - 14.4	Chung *et al*. 2012, Conner *et al*. (2001), Kristiansen (1985), Lau, Hartman, and Ware, (1986), Pajor *et al*. (2017), Weiss and Larsen (1990)
4. To explore the behavioural beliefs toward MVS consumption among users and non-users of MVS in the greater Durban area.	Section C: Behavioural Beliefs - Questions 15.1 - 15.18	Aina and Ojedokun (2014), Alfawaz *et al.* (2017), Alsaleem *et al.* (2021), Alqrache *et al.* (2021), Austin *et al*. (2015), Barnes *et al*. (2016), Bekele *et al.* (2020), Braun and Venter (2005), Chiba *et al*. (2017), Conner *et al.* (2001), Dickinson *et al*. (2014), El Khoury and Antoine-Jonville (2012), Faherty and Hough (2021), Francis, Sooriyaarachchi & Jayawardena 2022), Garcia-Cazarin *et al*. (2014), Ghassan *et al*. (2022), Guo *et al*. (2009), Hamulka *et al*. (2020), Hoseini *et al.* (2021), Ishihara *et al*. (2003), Jahan *et al*. (2021), Kobayashi *et al*. (2017), Kofoed *et al*. (2015), Lee and Kim (2009), Lieberman *et al.* (2014), Maria *et al*. (2015), McCreary *et al.* (2007), Merwid-lad *et al.* (2022), Newberry *et al*. (2001), Pajor *et al*. (2017), Pawlak *et al.* (2008), Pawlak *et al*. (2005), Pillay and Pillay (2019), Raiten *et al*. (2003), Saini and Hasan (2020), Salgado *et al*. (2014), Samreen *et al.* (2020), Steele and Senekal (2005), Tardy *et al*. (2020), Valentine *et al*. (2017), Wang *et al*. (2022), Zaki *et al.* (2014), Zezelj *et al*. (2018)
5. To explore the normative beliefs toward MVS consumption among users and non-users of MVS in the greater Durban area.	Section D: Normative Beliefs - Questions 16.1 - 16.14	Alsaleem *et al*. (2021), Braun and Venter (2008), Conner *et al.* (2001), Duvenage, Meltzer & Chantler (2015), Faherty and Hough (2021), Ghassan *et al*. (2022), Housman *et al*. (2011), Mathews (2022), Merwid-lad *et al.* (2022), Noor *et al*. (2014), Page *et al*. (2015), Pawlak *et al.* (2005), Pike *et al*. (2013), Saini & Hasan (2020), Tangkiatkumjai *et al*. (2014), Teoh *et al*. (2019)
6. To explore the control beliefs toward MVS consumption among users and non-users of MVS in the greater Durban area.	Section E: Control Beliefs - Questions 17.1 - 17.10	Al-Johani *et al.* (2020), Barnes *et al*. (2016), Conner *et al*. (2001), Cowan *et al.* (2018), Dickinson *et al.* 2014), Faherty and Hough (2021), Francis, Sooriyaarachchi and Jayawardena (2022), Lino *et al*. (2014), McCoy (2019), Merwid-lad *et al*. (2022), Modi *et al*. (2013), Pawlak *et al*. (2008), Pillay and Pillay (2019), Punzalan *et al*. (2020), Snyder *et al*. (2009)
7. To explore the type of MVS preferred among users and non-users of MVS in the greater Durban area.	Section F: Psychographics - Questions 18.1 - 18.7	Algaeed *et al*., 2019; Al-Johani *et al*. (2020), Alsaleem *et al.* (2021), Aronsson *et al*. (2016), Austin *et al*. (2015), Awad and Al-Shaye (2014), Azizi *et al*. (2010), Bailey *et al.* (2010), Conner *et al*. (2001), Cowan *et al*. (2018), El Khoury, Ramadan, and Zeeni (2015), Francis, Sooriyaarachchi and Jayawardena, (2022), Grand View Research (2022), Kim *et al*. (2014), Kim *et al*. (2011), Kotler and Armstrong (2008), Maria *et al*. (2015), Morin *et al.* (2002), Pawlak *et al*. (2008), Picciano and McGuire (2009) Pillay and Pillay (2019), Sharma *et al*. (2014), Spencer *et al.* (2006), Steele and Senekal (2005), Webb (2022)

Open-ended and closed-ended questions are two types of questions used in questionnaires (Sekaran & Bougie, 2016). Open-ended questions are unstructured, free-form inquiries that let respondents express themselves in plain text according to their understanding, emotion, and level of knowledge (Cooper & Schindler, 2014). A closed-ended question, on the other hand, requires responders to select from a group of options provided by the investigator. Closed-ended questions enable participants to make rapid selections from the numerous provided options. They also facilitate the researcher's coding of data for further analysis (Sekaran & Bougie, 2016). Closed-ended questions were used in this study. Given that respondents were to be approached via mall intercepts, it was thought that a survey that could be completed quickly and easily would be more likely to encourage participation as it would be less disruptive to shoppers.

The questionnaire was divided into six sections. Section A related to the demographics of the respondents and included categories such as gender, age, race, marital status and educational level. A nominal scale was used for these categories. A nominal scale enables the investigator to allocate subjects to particular categories (Sekaran & Bougie, 2016). Regarding the marital status variable, for instance, respondents were divided into two categories: single and married. Codes 1 and 2 were allocated to these two groupings. A benefit of a nominal scale is that it is simple to obtain statistics from closed-ended questions, there is no magnitude on a nominal scale, and it is separated into two or more categories where a specific question's response might fall into either group (Saunders, Lewis & Thornhill, 2016).

Section B encompassed questions on health and lifestyle and included categories such as: frequency of smoking, exercise and alcohol use; perceived quality of health; satisfaction with eating habits; perceived quality of diet and value placed on health. Sections C, D and E included questions on behavioural beliefs, normative beliefs and control beliefs, which are the key constructs of the TPB. The final part of the questionnaire, Section F, contained questions relating to the psychographics of respondents in relation to MVS choices.

Variations of the Likert scale were used for Sections B to F. A Likert scale is often used to examine changes in attitudes, knowledge, perceptions, values, and behaviour (Vagias, 2006). This scale is made up of a number of statements from which respondents can select how they want to respond (Vagias, 2006). Typically, researchers regard Likert scales as interval scales because it enables the computation of means (Cooper & Schindler, 2014). A copy of the questionnaire is attached as Appendix A.

3.9 Data quality control

In every research study, it is essential that the data obtained is accurate and useful. For the study to be effective, the instruments' reliability and validity must be presented (Sekaran & Bougie, 2016).

3.9.1 Validity

Sekaran and Bougie (2016) propose that the three basic components of validity are content validity, criterion validity, and construct validity. The researcher employed construct validity and content validity as validity metrics for this study.

3.9.1.1 Content validity

The content validity of a measuring device is the degree to which it appropriately answers the research questions and demonstrates that it accurately represents a sample of the researched subject matter (Cooper & Schindler, 2014). Gomez *et al*. (2020) assert that expert judgement, or informed opinion from people with experience in the subject who are considered by others as qualified experts and who are able to provide information, facts, judgments, and evaluations, can be used to achieve content validation. The researcher's supervisor, a statistician, and academics with solid research methods understanding reviewed the questionnaire. After consulting the experts, no questions on the questionnaire were changed. Each survey question was cross-referenced with the study research questions, as shown in Table 3-4, to guarantee further that every subject was covered.

Table 3-4: Cross-referencing of research questions with questions from the questionnaire

Research questions	Section	Questions
1. What are the health-related lifestyle characteristics of MVS users and non-users in the greater Durban area?	Section B: Health and Lifestyle	Questions 8, 9, 10, 12 and 13
2. What is the perceived health status of MVS users and non-users in the greater Durban area?	Section B: Health and Lifestyle	Question 11
3. What is the value placed on health by MVS users and non-users in the greater Durban area?	Section B: Health and Lifestyle	Questions 14.1 - 14.4
4. What are the behavioural beliefs toward MVS consumption among users and non-users in the greater Durban area?	Section C: Behavioural Beliefs	Questions 15.1 - 15.18
5. What are the normative beliefs toward MVS consumption among users and non-users in the greater Durban area?	Section D: Normative Beliefs	Questions 16.1 - 16.14
6. What are the control beliefs toward MVS consumption among users and non-users in the greater Durban area?	Section E: Control Beliefs	Questions 17.1 - 17.10
7. What types of MVS do users and non-users of MVS in the greater Durban area prefer?	Section F: Psychographics	Questions 18.1 - 18.7

3.9.1.2 Construct validity

Construct validity concerns the extent to which a measure accurately assesses what it is supposed to (Cooper & Schindler, 2014). A TPB questionnaire manual for health services by Francis *et al*. (2004) was employed for construct validity in this study since the instrument's independent variables are largely based on the TPB. As a result of a request from behavioural researchers in the field of health care, the manual has undergone numerous reviews and testing methods (Francis *et al.*, 2004).

The researcher used the steps as outlined by Francis *et al.* (2004) to construct the questionnaire:

- Identify the target population - This research targeted adult individuals from the greater Durban region.
- Select a representative sample from this population in the most effective way possible - Shopping malls in the greater Durban area were conveniently targeted as these shopping malls had diverse shoppers, thereby helping to reduce sampling bias.
- Identify the most common perceived advantages and disadvantages of performing the behaviour - The questions in the questionnaire relating to behavioural beliefs were all adapted utilising findings from past studies.
- Determine the most important people who would approve or disapprove of the behaviour - The questions in the questionnaire relating to normative beliefs were all adapted utilising findings from past studies.
- Identify the perceived barriers or facilitating factors which could make it easier or more difficult to adopt the behaviour - The questions in the questionnaire relating to control beliefs were all adapted utilising findings from past studies.
- Pilot test the draft and reword items if necessary - The respondents in the pilot study indicated that the content and layout of the questionnaire were adequate and the wording was easy to understand. Therefore, no modifications were necessary to the instrument.
- Assess the test-retest reliability of the indirect measures by administering the questionnaire twice to the same group of respondents, with an interval - The questionnaire showed perfect test-retest reliability among the ten respondents (i.e., all the responses between the two tests perfectly matched).

In addition, to assure the construct validity of the survey questions, they were derived from prior research on DS use, particularly those using the TPB as a theoretical framework (Conner *et al*., 2001; Pawlak *et al.*, 2008; Pawlak *et al.*, 2005) as shown in Table 3-3.

According to Bhandari (2022), construct validity can also be assessed utilising a pilot study. Typically, a pilot study is undertaken as a trial run (Cooper & Schindler, 2014). According to Sekaran and Bougie (2016), a pilot study is a simulation of the data-gathering process. A small sample of respondents typical

of the whole population is given the instrument. Respondents are requested to identify any sections of the instrument that are unclear. A pilot study guarantees that the questionnaire is realistic and that the researcher's expectations about data collection for the study are satisfied (Saunders, Lewis & Thornhill, 2016). Connelly (2008) suggested that 10% of the entire sample be used for a pilot study. In this investigation, 39 respondents were conveniently picked for the pilot study to save costs and time. Respondents were asked to provide feedback on the content, wording, layout, length and any other pertinent issues in the questionnaire. The respondents indicated that the content and layout of the questionnaire was adequate and the wording easy to understand. In relation to length of the questionnaire, some respondents indicated that the questionnaire was rather lengthy and recommended that the estimated time to complete the questionnaire be mentioned verbally to respondents (in addition to it being mentioned on the information sheet) prior to start of the questionnaire. None of the respondents raised any pertinent issues in relation to the questions themselves. Therefore, no modifications were necessary to the study instrument.

3.9.2 Reliability

Reliability deals with the consistency of a measurement across time (Sekaran & Bougie, 2016). For direct measures, an indicator of internal consistency, such as Cronbach's Alpha, may be used to prove reliability by determining whether the items on the scale measure the same concept (Francis *et al*., 2004). It is inappropriate to employ an internal consistency criterion such as Cronbach's Alpha to assess the reliability of indirect measures (used in this study) since people may rationally hold both positive and negative beliefs regarding a behaviour. For instance, a person may be very driven to comply with their doctor's expectations yet may not be motivated to comply with their family's expectations. Therefore, it is illogical to reject some of these beliefs from overall assessments based on their low or negative correlations. In this scenario, the test-retest reliability approach of measuring reliability would be acceptable (Francis *et al*., 2004).

3.9.2.1 Test-retest reliability

Test-retest reliability is a measure of reliability obtained by administering the same test twice over a period of time to a group of individuals. The scores from Time 1 and Time 2 can then be compared in order to evaluate the test for stability over time (Cooper & Schindler, 2014). Test-retest reliability is used when measuring something that is expected to stay constant in a sample (Middleton, 2022).

At different times, a variety of variables might affect survey results, such as the respondents' moods or the environment's impact on their ability to provide correct responses. How well a procedure holds up over time can be evaluated using test-retest reliability. The smaller the difference between the two sets of results, the higher the reliability of the instrument (Middleton, 2022).

In this investigation, ten respondents were conveniently chosen for the test-retest reliability survey in order to save costs and time. The survey was administered using the CASI method via a Survey Monkey test link. After seven days, the survey was administered again to the 10 respondents utilising a separate test link. The time interval of seven days was chosen to reduce the possibility of respondents remembering their initial responses.

The questionnaire showed perfect test-retest reliability among the ten respondents (i.e., all the responses between the two tests perfectly matched). According to Sekaran and Bougie (2016), this result indicates that the measure was consistent over time; hence the questionnaire used in the study can be considered reliable.

3.10 Data analysis

Data analysis is the practice of gathering, modelling, and analysing data to gain insights that support decision-making (Cooper & Schindler, 2014). There are two main types of statistical analysis: descriptive and inferential (Cooper & Schindler, 2014).

Descriptive statistics organise and summarise the properties of a data set (Bhandari, 2022). A data set is a group of related data (Snijders, Matzat & Reips, 2012). In the context of tabular data, a set of data relates to one or more database tables, where each row refers to a specific entry in the corresponding data set and each column to a specific variable (Snijders, Matzat & Reips, 2012). In descriptive statistics, there is no ambiguity; the statistics describe the acquired data clearly. After collecting data for quantitative research, the first phase of statistical analysis is to define attributes of the responses, such as the mean of one variable or the relationship amongst variables (Bhandari, 2022).

Inferential statistics, on the other hand, are used to create population estimates and test population-related hypotheses in order to derive population-related conclusions (Bhandari, 2022). In order to draw reliable statistical conclusions, inferential statistics needs the use of a probability sampling procedure (Bhandari, 2022). In keeping with the research design discussed earlier, descriptive statistics were used in this study.

3.10.1 Descriptive statistics

In order to provide descriptive statistics for variables, frequencies, as well as measures of central tendency and dispersion, may be used (Sekaran & Bougie, 2016). Cooper and Schindler (2014) explain that the mean, median, and mode are metrics of central tendency, whereas the variance, range, and standard deviation are measures of dispersion.

Frequencies are the number of occurrences of an event in a research study and can be represented by frequency tables, bar charts, or pie charts (Sekaran & Bougie, 2016).

Likert-type items are single questions that employ some component of the original Likert response options (Clason & Dormody, 1994). Likert scale data, on the other hand, is formed with a set of four or more Likert-type items that are aggregated into a single composite score throughout the data analysis process. Combining the elements allows for a quantitative evaluation of a personality or character trait. Usually, the investigator is mainly interested in the composite score that depicts the character/personality feature (Boone & Boone, 2012). As the questionnaire contained Likert-type items as opposed to Likert scale data, frequencies instead of standard deviations were used to indicate variability.

The mean or average provides an overview of the data and is calculated as the total of all values divided by the number of values (Sekaran & Bougie, 2016). The mean is only one of the three measures that incorporates information from every value in a data set. It is the most popular statistical formula and is the measure most resistant to sampling variation. The most common response value is known as the mode. A data set may have zero, one, or several modes (Saunders, Lewis & Thornhill, 2016).

The mean and mode were used in the study to summarise the frequency distributions of the data. The nominal and interval data were summarised using frequency tables to help distinguish patterns and trends in the data.

The 5-point Likert scale weights were reversed for negative statements only, as follows: (i.e. Strongly disagree (SD) = 5, Disagree (D) = 4, Neither agree nor disagree (N) = 3, Agree (A) = 2, Strongly agree (SA) = 1). This was done to obtain more consistent scores across the main constructs of the study (i.e., behavioural beliefs, normative beliefs and control beliefs) as per the manual for contructing questionaires based on the TPB by Francis *et al.* (2004). This reversal should be borne in mind when interpreting the results below.

Additionally, the researcher used an indirect method, outlined by Francis *et al.* (2004) to calculate attitude, subjective norm and perceived behavioural control scores using the mean:

- For each behavioural belief, the behavioural belief mean on the Likert scale was multiplied by the relevant outcome evaluation mean. The resulting product created the attitude score.
- For each normative belief, the normative belief mean on the Likert scale was multiplied by the motivation to comply mean. The resulting product created the subjective norm score.
- For each control belief, the control belief mean on the Likert scale was multiplied by the perceived power to influence behaviour mean. The resulting product created the perceived behavioural control score.

The attitude, subjective norm and perceived behavioural scores for users and non-users of MVS were presented in a tabular format and interpreted using a range of 1-25 as follows:

- **Attitude -** 1 = Strong negative attitude, 4 = Moderate negative attitude, 9 = Neutral, 16 = Moderate positive attitude, 25 = Strong positive attitude.
- **Subjective Norm** - 1 = Strong negative social pressure, 4 = Moderate negative social pressure, 9 = Neutral, 16 = Moderate positive social pressure, 25 = Strong positive social pressure.
- **Perceived behavioural control** - 1 = Strong negative level of control, 4 = Moderate negative level of control, 9 = Neutral, 16 = Moderate positive level of control, 25 = Strong positive level of control.

3.11 Ethical considerations

The University of KwaZulu-Natal granted the study ethical clearance (see Appendix D). The online questionnaire was programmed with an informed permission form that guaranteed respondents that the research was completely anonymous and that their responses would not be used outside the study (see Appendix B). Respondents were reassured that their participation in the study was optional and that withdrawal from the research with no negative repercussions was possible. The respondents were also notified that the electronic data would be retained securely for five years before being deleted.

Furthermore, permission was sought from the participating shopping centres in the form of gatekeeper letters before the study was conducted on their premises (see Appendix E).

3.12. Conclusion

This chapter addressed the techniques utilised for data collection and analysis. It underlined the primary motives for the researcher's choice of methodologies. To gather relevant and dependable data, careful attention was made to the adoption of a suitable research instrument to include the purpose and goals of this study. Ethical issues that were of concern in the research were also discussed. The next chapter looks at the presentation and analysis of the results.

CHAPTER 4: DATA ANALYSIS AND FINDINGS

4.1 Introduction

The study's findings are presented, analysed, and discussed in this chapter. The researcher used descriptive statistics, such as the mode, mean, and frequency distribution, to interpret the data. In addition, the mean scores for behavioural, normative, and control beliefs were used to generate the attitude score, subjective norm score, and perceived behavioural score relating to MVS usage. The chapter opens with a biographical profile of the whole sample and profiles of MVS users and non-users within the sample. The findings are then presented in a tabular format for each question in the questionnaire and interpreted and discussed in relation to relevant literature on DS and MVS and the conceptual framework. DS and MVS are not exactly the same; however, as there is limited MVS-specific research on the topic, some findings will be discussed in relation to studies on DS (the MVS sub-category falls under the broader DS category).

4.2 Biographical profile of the sample

The minimum sample size for this investigation, as stated in Chapter 3, was determined to be 385 respondents. The researcher achieved the required sample of 385 respondents using the CASI technique via mall intercepts. Table 4-1 lists the 385 respondents' biographical information.

In terms of the composition of the sample respondents, there were more females (58,70%) than males (41,30%). This is in line with the gender split within the eThekwini municipality of 51% females and 49% males (Statistics South Africa, 2011). As shown in Table 4-1, the mode for respondents age (33.25%) was between the ages of 21 and 30. The second largest group were 31-40-year-olds (26,49%). Most of the respondents (47,27%) were Indian, followed by Black (22,60%), White (19,22%), Coloured (8,83%) and Other (2,08%). This is in contrast to the racial split within the eThekwini municipality which is Black (73,8%), Indian (16,7%), White (6,6%), Coloured (2,5%) and Other (0,4%) (Statistics South Africa, 2011). The data indicated that 54,29% of respondents were married, with 45,71% being single. The total sample was well educated, with 29,61% in possession of a degree and 21,82% in possession of a postgraduate degree. The majority of the sample contained users of MVS (59,48%), with non-users of MVS making up 40,52%. This finding is aligned with other studies where the majority of the sample contained users of DS (Aina & Ojedokun, 2014; Alsaleem *et al*., 2021; Braun & Venter, 2008; Faherty & Hough, 2021; Lieberman *et al*., 2014; Pajor *et al*., 2017; Saini & Hasan, 2020).

Table 4-1: Biographical profile of the total sample

		n	%
Gender	Male	159	41,30%
	Female	226	58,70%
	Prefer not to say	0	0,00%
	Total	*385*	*100,00%*
Age in Years	18-20	7	1,82%
	21-30	128	33,25%
	31-40	102	26,49%
	41-50	71	18,44%
	51-60	59	15,32%
	61+	18	4,68%
	Total	*385*	*100,00%*
Race	Black	87	22,60%
	Coloured	34	8,83%
	Indian	182	47,27%
	White	74	19,22%
	Other	8	2,08%
	Total	*385*	*100,00%*
Marital Status	Single	176	45,71%
	Married	209	54,29%
	Total	*385*	*100,00%*
Education Level	Matric	104	27,01%
	Diploma	65	16,88%
	Degree	114	29,61%
	Postgraduate Degree	84	21,82%
	Other	18	4,68%
	Total	*385*	*100,00%*
Multivitamin Usage	Users	229	59,48%
	Non-users	156	40,52%
	Total	*385*	*100,00%*

4.2.1 Biographical profile of users of multivitamin supplements

Table 4-2 presents a biographic profile of the MVS users only.

Table 4-2: Biographical profile of users

		n	%
Gender	Male	91	39,74%
	Female	138	60,26%
	Prefer not to say	0	0,00%
	Total	*229*	*100,00%*
Age in Years	18-20	3	1,31%
	21-30	45	19,65%
	31-40	65	28,38%
	41-50	56	24,45%
	51-60	45	19,65%
	61+	15	6,55%
	Total	*229*	*100,00%*
Race	Black	31	13,54%
	Coloured	21	9,17%
	Indian	126	55,02%
	White	47	20,52%
	Other	4	1,75%
	Total	*229*	*100,00%*
Marital Status	Single	87	37,99%
	Married	142	62,01%
	Total	*229*	*100,00%*
Education Level	Matric	53	23,14%
	Diploma	50	21,83%
	Degree	62	27,07%
	Postgraduate Degree	53	23,14%
	Other	11	4,80%
	Total	*229*	*100,00%*

The majority of MVS users in the sample were female (60,26%). This finding is aligned with numerous other studies which revealed that females are more likely to use DS (Algaeed *et al*., 2019; Alsaleem *et al*., 2021; Bailey *et al*., 2010; Kim *et al*., 2014; Pillay & Pillay, 2019; Sharma *et al*., 2014; Spencer *et al*., 2006; Steele & Senekal, 2005). The majority of users (52,83%) fell in the 31-50 age bracket. Users were more likely to be married (62,01%) and well educated (Degree - 27,07%, Postgraduate degree - 23,14%).

4.2.2 Biographical profile of non-users of multivitamin supplements

A biographical profile of non-MVS users appears in Table 4-3.

Table 4-3: Biographical profile of non-users

		n	%
Gender	Male	68	43,59%
	Female	88	56,41%
	Prefer not to say	0	0,00%
	Total	*156*	*100,00%*
Age in Years	18-20	4	2,56%
	21-30	83	53,21%
	31-40	37	23,72%
	41-50	15	9,62%
	51-60	14	8,97%
	61+	3	1,92%
	Total	*156*	*100,00%*
Race	Black	56	35,90%
	Coloured	13	8,33%
	Indian	56	35,90%
	White	27	17,31%
	Other	4	2,56%
	Total	*156*	*100,00%*
Marital Status	Single	89	57,05%
	Married	67	42,95%
	Total	*156*	*100,00%*
Education Level	Matric	51	32,69%
	Diploma	15	9,62%
	Degree	52	33,33%
	Postgraduate Degree	31	19,87%
	Other	7	4,49%
	Total	*156*	*100,00%*

The majority of MVS non-users in the sample were female (56,41%). Most non-users (53,21%) fell in the 21-30 age bracket. Non-users were more likely to be single (57,05%) and in possession of a degree (33,33%) or Matric (32,69%).

4.3 Findings

This section focuses on the findings related to each question asked in the questionnaire (see Appendix A). The section starts with questions regarding the health and lifestyle of respondents, followed by those regarding behavioural beliefs, normative beliefs, control beliefs and psychographics in relation to MVS use.

4.3.1 Question 8: How often do you smoke?

The majority of MVS users (72,05%) and non-users (69,87%) were non-smokers in this study (Table 4-4). Similarly, according to a study by Wang *et al*. (2022), the highest percentage of DS users were non-smokers. These findings indicate that smoking may be a lifestyle factor that influences the use of MVS.

Table 4-4: Smoking frequency of users versus non-users

	Never	Occasionally	1-2 times per week	3-4 times per week	5-6 times per week	Daily	Total	Mean
Users	72,05%	5,24%	0,44%	0,87%	0,87%	20,52%	59,48%	1,51
	165	12	1	2	2	47	229	
Non-users	69,87%	8,97%	1,28%	1,92%	0,00%	17,95%	40,52%	1,33
	109	14	2	3	0	28	156	
Total	71,17%	6,75%	0,78%	1,30%	0,52%	19,48%	100,00%	1,44
	274	26	3	5	2	75	385	

4.3.2 Question 9: How often do you consume alcohol?

The majority of MVS users (54,15%) in this study were non-drinkers of alcohol (Table 4-5).

Table 4-5: Alcohol consumption frequency of users versus non-users

	Never	Occasionally	1-2 times per week	3-4 times per week	5-6 times per week	Daily	Total	Mean
Users	54,15%	30,13%	10,04%	4,80%	0,00%	0,87%	59,48%	0,31
	124	69	23	11	0	2	229	
Non-users	50,00%	34,62%	8,97%	2,56%	3,85%	0,00%	40,52%	0,36
	78	54	14	4	6	0	156	
Total	52,47%	31,95%	9,61%	3,90%	1,56%	0,52%	100,00%	0,33
	202	123	37	15	6	2	385	

Similarly, Sharma *et al*. (2014) discovered a significant association between DS use and abstinence from alcohol. A further 30,13% of users reported drinking only occasionally. This finding is consistent with Block, Sinha, and Gridley (1994), who found that DS users are less likely to drink excessively.

4.3.3 Question 10: How often do you exercise?

The analysis revealed that 40,61% of MVS users exercised at least three times per week (Table 4-6).

Table 4-6: Exercise frequency of users versus non-users

	Never	Occasionally	1-2 times per week	3-4 times per week	5-6 times per week	Daily	Total	Mean
Users	6,55%	34,93%	17,90%	27,07%	5,24%	8,30%	59,48%	1,83
	15	80	41	62	12	19	229	
Non-users	17,95%	35,26%	19,87%	14,74%	9,62%	2,56%	40,52%	1,3
	28	55	31	23	15	4	156	
Total	11,17%	35,06%	18,70%	22,08%	7,01%	5,97%	100,00%	1,62
	43	135	72	85	27	23	385	

In contrast, 26,92% of non-users exercised at least three times per week. Non-users were more likely never to exercise (17.95%) when compared to users (6.55%), and they are less likely to exercise 3-4 times a week (14.74%) and daily (2.56%) when compared to users (3-4 times per week - 27,07%, daily - 8,30%). In general, non-users exercised less often (1,3) per week than users (1,83). Aligned with these findings, Al-Johani *et al*. (2020) revealed an association between DS usage and regular physical activity. Similarly, Bailey *et al*. (2013) and Mullie *et al*. (2011) found that DS users were more inclined than non-users to exercise regularly.

A healthy lifestyle is built on habit development, and research indicates that VS users are more likely than non-users to embrace health-promoting behaviours like frequent exercise (Dickinson *et al*., 2014).

4.3.4 Question 11: Which of the following words best describes your overall health?

When asked to report on their overall health, the mode for users (48,03%) and non-users (44,87%) revealed that both groups perceived their health to be good (Table 4-7).

Table 4-7: Perceived health status of users versus non-users

	Poor	Fair	Good	Very Good	Excellent	Total	Mean
Users	3,93%	24,02%	48,03%	17,90%	6,11%	59,48%	2,98
	9	55	110	41	14	229	
Non-users	1,28%	29,49%	44,87%	10,90%	13,46%	40,52%	3,06
	2	46	70	17	21	156	
Total	2,86%	26,23%	46,75%	15,06%	9,09%	100,00%	3,01
	11	101	180	58	35	385	

Non-users were more likely to describe their overall health as being excellent (13,46%) than users (6,11%) and less likely to state that their overall health is poor (1,28%) when compared to users (3,93%). Non-users tended to have a slightly higher perceived health status (3,06) than users (2,98). This finding is consistent with a South African study on the student population by Steele and Senekal (2005). The authors found frequent supplement users rated their health as worse than non-users. These results are also backed up by prior investigations (Lyle *et al.,* 1998; Satia-Abouta *et al.,* 2003). The data revealed that 75,98% of users in this study rated their health as either poor, fair or good. In contrast, a study of adults aged 20 years or older revealed that DS users were more inclined to rate their health as excellent or very good (Ervin *et al.,* 1999).

According to Pawlak *et al.* (2008), a participant's subjective state of health may be a significant predictor of MVS use. It is plausible that users in the current study may have formed the intention to use MVS and ultimately acted on that intention due to their health status not being ideal. According to the TPB, this intention may have been formed in combination with their attitude towards MVS, subjective norms and perceived behavioural control. On the other hand, non-users may have been satisfied with their perceived health status thereby not forming the intention to use MVS to improve health.

4.3.5 Question 12: How satisfied are you with your eating habits?

As depicted in Table 4-8, MVS users were more likely to be satisfied to some extent (50,65%) with their eating habits when compared to non-users (47,44%).

Table 4-8: Satisfaction with eating habits of users versus non-users

	Very unsatisfied	Somewhat unsatisfied	Neither satisfied nor unsatisfied	Somewhat satisfied	Very satisfied	Total	Mean
Users	4,80%	26,64%	17,90%	37,99%	12,66%	59,48%	3,27
	11	61	41	87	29	229	
Non-users	10,26%	30,77%	11,54%	35,26%	12,18%	40,52%	3,08
	16	48	18	55	19	156	
Total	7,01%	28,31%	15,32%	36,88%	12,47%	100,00%	3,19
	27	109	59	142	48	385	

In relation, non-users were more inclined to be unsatisfied to some extent (41,03%) with their eating habits when compared to users (31,44%). On average, users tended to be slightly more satisfied with their eating habits (3,27) when compared to non-users (3,08). It is plausible that these users may be taking MVS to obtain nutrients missing from their diets even though they are satisfied with their eating habits. This theme will be discussed further in section 4.3.8.2. In contrast to this study's findings, Duvenage, Meltzer and Chantler (2015) investigated the diet and supplement usage of South African under-16 rugby players where almost half of the sample thought their diets were inadequate.

4.3.6 Question 13: Which of the following words best describes how healthy your diet is?

Table 4-9 indicates that users were more likely to describe their diets as somewhat healthy or very healthy (57,20%) when compared to non-users (46,16%).

Table 4-9: Perceived diet status of users versus non-users

	Very unhealthy	Somewhat unhealthy	Neither healthy nor unhealthy	Somewhat healthy	Very healthy	Total	Mean
Users	4,37%	22,27%	16,16%	44,10%	13,10%	59,48%	3,39
	10	51	37	101	30	229	
Non-users	3,21%	28,85%	21,79%	34,62%	11,54%	40,52%	3,22
	5	45	34	54	18	156	
Total	3,90%	24,94%	18,44%	40,26%	12,47%	100,00%	3,32
	15	96	71	155	48	385	

In comparison, non-users were more likely to describe their diets as very unhealthy or somewhat unhealthy (32,06%) compared to users (26,64%). The mean scores for both users and non-users skew marginally towards somewhat healthy, with users having a slightly healthier perceived diet status (3,39) than non-users (3,22). This is aligned with the findings of Tully (2014), whose research indicated that

MVS users had better diets than non-users. Furthermore, a study by Merwid-lad *et al*. (2022) revealed that the majority of DS users described their diet as being somewhat healthy or healthy.

4.3.7 Question 14: How much do you agree or disagree with each of the following statements? (Health Value)

This question contained four statements relating to the health value construct. According to Conner *et al.* (2001), health value may be a factor that influences the intention to use MVS. The findings for this question are presented in a tabular format. A 5-point Likert scale was used for this question (i.e. Strongly disagree (SD) = 1, Disagree (D) = 2, Neither agree nor disagree (N) = 3, Agree (A) = 4, Strongly agree (SA) = 5).

4.3.7.1 If you don't have your health you don't have anything

As demonstrated in Table 4-10, most users (84,72%) and non-users (84,62%) either agree or strongly agree that health is the most critical aspect of their life. The mean for users (4,34) and non-users (4,31) skew towards strongly agree. Similarly, a study conducted by Pajor *et al.* (2017) among Dutch adults found no significant differences between DS users and non-users regarding health value. In contrast, other studies have shown that DS users are more health concerned than non-users (Block, Sinha & Gridley, 1994; Kirk *et al*., 1999). Furthermore, Conner *et al.* (2001) found evidence that individuals who place a high value on their own health are more inclined to take DS by way of precaution.

Table 4-10: If you don't have your health you don't have anything

	SD	D	N	A	SA	Total	Mean
Users	1,75%	3,49%	10,04%	27,95%	56,77%	59,48%	4,34
	4	8	23	64	130	229	
Non-users	1,28%	5,13%	8,97%	30,13%	54,49%	40,52%	4,31
	2	8	14	47	85	156	
Total	1,56%	4,16%	9,61%	28,83%	55,84%	100,00%	4,33
	6	16	37	111	215	385	

4.3.7.2 There are many things I care about more than my health

The majority of users (67,69%) and non-users (73,72%) strongly disagree or disagree with this statement (Table 4-11). This finding indicates that users and non-users are likely to place their health above other aspects of their life.

Table 4-11: There are many things I care about more than my health

	SD	D	N	A	SA	Total	Mean
Users	35,81%	31,88%	18,34%	11,35%	2,62%	59,48%	2,13
	82	73	42	26	6	229	
Non-users	30,77%	42,95%	12,82%	12,18%	1,28%	40,52%	2,1
	48	67	20	19	2	156	
Total	33,77%	36,36%	16,10%	11,69%	2,08%	100,00%	2,12
	130	140	62	45	8	385	

4.3.7.3 Good health is only of minor importance in a happy life

As demonstrated in Table 4-12, most users (50,66%) and non-users (51,28%) strongly disagree that good health is only a minor importance in a happy life.

Table 4-12: Good health is only of minor importance in a happy life

	SD	D	N	A	SA	Total	Mean
Users	50,66%	30,13%	4,80%	8,30%	6,11%	59,48%	1,89
	116	69	11	19	14	229	
Non-users	51,28%	32,69%	3,85%	7,05%	5,13%	40,52%	1,82
	80	51	6	11	8	156	
Total	50,91%	31,17%	4,42%	7,79%	5,71%	100,00%	1,86
	196	120	17	30	22	385	

The mean for users (1,89) and non-users (1,82) skew towards strongly disagree. This finding indicates that both user groups are likely to place high importance on good health as a measure of their happiness.

4.3.7.4 There are only a few things more important than good health

The data revealed that 47,59% of users and 53,21% of non-users either strongly disagree or disagree that there may be other things in life more important than health (Table 4-13). On the other hand, 42,36% of users and 40,38% of non-users either agree or strongly agree that there may be other things in life more important than health. This finding indicates that users and non-users are unlikely to prioritise other aspects of their life above good health.

Table 4-13: There are only a few things more important than good health

	SD	D	N	A	SA	Total	Mean
Users	25,76%	21,83%	10,04%	28,82%	13,54%	59,48%	2,83
	59	50	23	66	31	229	
Non-users	24,36%	28,85%	6,41%	27,56%	12,82%	40,52%	2,76
	38	45	10	43	20	156	
Total	25,19%	24,68%	8,57%	28,31%	13,25%	100,00%	2,8
	97	95	33	109	51	385	

4.3.8 Question 15: How much do you agree or disagree with each of the following statements? (Behavioural beliefs)

This question contained nine paired statements relating to the behavioural beliefs of MVS users and non-users. Attitude is the extent to which the execution of a behaviour is favourably or adversely appraised. Attitude reflects a person's beliefs about the behaviour (behavioural belief) and the importance that person puts on the behaviour's result (outcome evaluation) (Ajzen, 1991). The attitude score for users and non-users of MVS is presented in a tabular format and interpreted using a range of 1-25: 1 = Strong negative attitude, 4 = Moderate negative attitude, 9 = Neutral, 16 = Moderate positive attitude, 25 = Strong positive attitude. A 5-point Likert scale was used for this question for positive beliefs, as follows: Strongly disagree (SD) = 1, Disagree (D) = 2, Neither agree nor disagree (N) = 3, Agree (A) = 4, Strongly agree (SA) = 5).

4.3.8.1 Using multivitamin supplements to improve health

As shown in Table 4-14, most users (51,53%) agree that taking a MVS every day would improve their health. In contrast, the mode for non-users (35,90%) indicates neutrality. The mean (4,13) for users indicates a slight skew towards strongly agree. On the other hand, the mean for non-users (3,37) shows a slight skew towards agree.

The majority of users (98,69%) and non-users (96,15%) agree or strongly agree that being healthy is essential to them. Although the mean score for non-users (4,56) indicates a firm belief in the importance of health, they are unlikely to believe as strongly that taking MVS every day would improve their health (3,37). In contrast, the gap in the mean scores between the behavioural belief (4,13) and outcome evaluation (4,69) for users is much smaller compared to non-users; this indicates that users are more inclined than non-users to believe that taking a MVS will improve their health.

The resulting attitude score for users (19,37), relative to a possible total of 25 (5x5), indicates a moderate to strong positive attitude in favour of using MVS daily to improve health. The attitude score for non-users (15,37) shows a weak to moderate positive attitude toward daily MVS usage for health improvement. According to the TPB, this favorable attitude, with subjective norms and perceived

behavioral control, may have contributed to creating a behavioral intention to use MVS across both user groups. This finding aligns to several other studies where the main purpose of buying DS was to improve overall health (Chiba *et al*., 2017; Garcia-Cazarin *et al*., 2014; Kofoed *et al*., 2015; Pajor *et al*., 2017, Pillay and Pillay (2019). In conclusion, the use of MVS to improve health is a factor that might impact the MVS use of both user groups in the research.

Table 4-14: Using MVS to improve health

Behavioural Belief: Taking a multivitamin supplement every day would improve my health							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,44%	1,75%	14,41%	51,53%	31,88%	59,48%	4,13
	1	4	33	118	73	229	
Non-users	8,33%	7,69%	35,90%	35,26%	12,82%	40,52%	3,37
	13	12	56	55	20	156	
Total	3,64%	4,16%	23,12%	44,94%	24,16%	100,00%	3,82
	14	16	89	173	93	385	
Outcome Evaluation: Being healthy is important to me							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,00%	0,00%	1,31%	27,95%	70,74%	59,48%	4,69
	0	0	3	64	162	229	
Non-users	1,28%	0,00%	2,56%	33,33%	62,82%	40,52%	4,56
	2	0	4	52	98	156	
Total	0,52%	0,00%	1,82%	30,13%	67,53%	100,00%	4,64
	2	0	7	116	260	385	
Attitude Score							
Users	Behavioural Belief (4,13) x Outcome Evaluation (4,69) =						19,37
Non-users	Behavioural Belief (3,37) x Outcome Evaluation (4,56) =						15,37

4.3.8.2 Using multivitamin supplements to obtain nutrients

As demonstrated in Table 4-15, most users (55,02 %) and the mode for non-users (39,74 %) indicate agreement with using MVS to obtain missing nutrients.

Table 4-15: Using MVS to obtain nutrients

Behavioural Belief: Taking a multivitamin supplement every day would help me to get nutrients I do not get in my diet							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,44%	1,75%	9,17%	55,02%	33,62%	59,48%	4,2
	1	4	21	126	77	229	
Non-users	8,97%	13,46%	21,79%	39,74%	16,03%	40,52%	3,4
	14	21	34	62	25	156	
Total	3,90%	6,49%	14,29%	48,83%	26,49%	100,00%	3,88
	15	25	55	188	102	385	
Outcome Evaluation: Getting all the nutrients I need is important to me							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,00%	0,44%	2,62%	43,23%	53,71%	59,48%	4,5
	0	1	6	99	123	229	
Non-users	2,56%	0,00%	10,26%	43,59%	43,59%	40,52%	4,26
	4	0	16	68	68	156	
Total	1,04%	0,26%	5,71%	43,38%	49,61%	100,00%	4,4
	4	1	22	167	191	385	
Attitude Score							
Users	Behavioural Belief (4,2) x Outcome Evaluation (4,5) =						18,9
Non-users	Behavioural Belief (3,4) x Outcome Evaluation (4,4) =						14,96

The mean (4,2) for users suggests a minor skew towards strongly agree. On the other hand, the mean for non-users (3,4) shows a slight skew towards agree.

Most users (96,94 %) and non-users (87,18%) agree or strongly agree that having all the nutrients required is vital to them. Although the mean score for non-users (4,26) indicates a high conviction in obtaining all necessary nutrients, they are less likely to think that taking MVS every day would help provide nutrients lacking in their diets (3,40). In contrast, the mean scores between the behavioural belief (4,2) and outcome evaluation (4,5) for users are much smaller compared to non-users, suggesting that users are more inclined than non-users to believe that taking a MVS will help them to obtain the nutrients missing from their diet.

The obtained attitude score for users (18,9) shows a moderate to strong positive attitude about supplementing their meals with MVS. The attitude score for non-users (14,48) shows a weak to moderately positive attitude toward supplementing their meals with MVS. According to the TPB, this favourable attitude, in conjunction with subjective norms and perceived behavioural control, may have contributed to creating a behavioural intention to use MVS for both user groups. These findings were

consistent with past studies in which DS users were shown to utilise DS to compensate for dietary deficiencies (Aina & Ojedokun, 2014; Braun & Venter, 2008; Dickinson *et al.,* 2014; Hamulka *et al*., 2020; Merwid-lad *et al.,* 2022; Saini & Hasan, 2020; Steele & Senekal, 2005; Zezelj *et al*., 2020). In addition, according to research conducted by Pawlak *et al.* (2008), consuming MVS to supplement missing nutrients in the diet was one of only two behavioural beliefs that significantly impacted the intention to consume MVS.

4.3.8.3 Using multivitamin supplements to obtain extra energy

As indicated in Table 4-16, the mode for users (44,98%) indicates agreement that using an MVS daily would result in more energy.

Table 4-16: Using MVS to obtain extra energy

Behavioural Belief: Taking a multivitamin supplement every day would give me extra energy							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	1,31%	4,37%	15,72%	44,98%	33,62%	59,48%	4,05
	3	10	36	103	77	229	
Non-users	10,26%	10,90%	34,62%	30,77%	13,46%	40,52%	3,26
	16	17	54	48	21	156	
Total	4,94%	7,01%	23,38%	39,22%	25,45%	100,00%	3,73
	19	27	90	151	98	385	
Outcome Evaluation: Getting extra energy is important to me							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,44%	0,44%	3,93%	48,47%	46,72%	59,48%	4,41
	1	1	9	111	107	229	
Non-users	2,56%	0,00%	10,90%	53,85%	32,69%	40,52%	4,14
	4	0	17	84	51	156	
Total	1,30%	0,26%	6,75%	50,65%	41,04%	100,00%	4,3
	5	1	26	195	158	385	
Attitude Score							
Users	Behavioural Belief (4,05) x Outcome Evaluation (4,41) =						17,86
Non-users	Behavioural Belief (3,26) x Outcome Evaluation (4,14) =						13,5

In contrast the mode for non-users (34,62%) expresses neutrality. The mean score of 4,05 suggests that users tend to agree that MVS would supply more energy, but the mean score of 3,26 for non-users indicates a slight bias towards agreement.

The majority of users (95,19%) and non-users (86,54%) agree that obtaining extra energy is essential to them. Although non-users' mean score of 4,14 suggests a significant conviction in the importance of obtaining extra energy, they are less likely to think that taking MVS daily would help them get this extra energy (3,26). In contrast, the difference in mean scores between the behavioural belief (4,05) and outcome evaluation (4,41) is less for users than non-users. This suggests that users are more inclined than non-users to believe that taking a MVS can provide extra energy.

The user attitude score of 17,86 shows moderate to strong support for adopting MVS to get more energy. The attitude score for non-users (13,5) shows a weak to moderately favourable attitude toward using MVS to increase energy levels. According to the TPB, this favourable attitude, in conjunction with subjective norms and perceived behavioural control, may have contributed to creating a behavioural intention to use MVS for both users and non-users. Similarly, in research conducted by Faherty and Hough (2021), consumers reported using DS to boost their energy levels. Salgado *et al.* (2014) state that Brazilian road runners take DS to improve their energy, performance, and endurance. Moreover, Lieberman *et al*. (2014) discovered that students use DS to increase their energy levels.

4.3.8.4 Using multivitamin supplements to look and feel good

As shown in Table 4-17, the mode for users (41,05%) shows agreement that taking a MVS every day would help them look and feel good.

Table 4-17: Using MVS to look and feel good

Behavioural Belief: Taking a multivitamin supplement every day would help me look and feel good							
	SD	D	N	A	SA	Total	Mean
Users	0,87%	4,37%	20,96%	41,05%	32,75%	59,48%	4
	2	10	48	94	75	229	
Non-users	7,69%	12,18%	35,26%	32,05%	12,82%	40,52%	3,3
	12	19	55	50	20	156	
Total	3,64%	7,53%	26,75%	37,40%	24,68%	100,00%	3,72
	14	29	103	144	95	385	
Outcome Evaluation: Looking and feeling good is important to me							
	SD	D	N	A	SA	Total	Mean
Users	0,00%	0,00%	3,49%	42,79%	53,71%	59,48%	4,5
	0	0	8	98	123	229	
Non-users	1,28%	2,56%	1,28%	51,92%	42,95%	40,52%	4,33
	2	4	2	81	67	156	
Total	0,52%	1,04%	2,60%	46,49%	49,35%	100,00%	4,43
	2	4	10	179	190	385	
Attitude Score							
Users	Behavioural Belief (4) x Outcome Evaluation (4,5) =						18
Non-users	Behavioural Belief (3,3) x Outcome Evaluation (4,33) =						14,29

In contrast, the mode for non-users (35,26%) shows neutrality. The mean score (4) indicates that users tend to agree that MVS would help them look and feel good. On the other hand the mean score for non-users (3,3) shows a slight skew towards agree.

The majority of users (96,50%) and non-users (94,87%) agree to some extent (agree and strongly agree) that looking and feeling good is essential to them. Although the mean score for non-users (4,33) indicates a firm belief in the importance of looking and feeling good, they are unlikely to believe as strongly that taking MVS every day would help them look and feel good (3,3). In contrast, the gap in the mean scores is smaller between the behavioural belief (4) and outcome evaluation (4,50) for users compared to non-users, indicating that users are more inclined than non-users to believe that taking a MVS can help them to look and feel good.

The attitude score for users (18) indicates a moderate to strong positive attitude in favour of using MVS every day to look and feel good. The attitude score for non-users (14,29) shows a weak to moderate positive attitude in favour of using MVS every day to look and feel good. According to the TPB, this favourable attitude, in conjunction with subjective norms and perceived behavioural control, may have

contributed to creating a behavioural intention to use MVS for both users and non-users. These findings support of those of Hoseini *et al.* (2021), found that individuals utilised DS to enhance skin health and appearance, as well as their mood.

Similarly, and Alfawaz *et al*. (2017), Merwid-lad *et al*. (2022), Zaki *et al*. (2014) found that females mostly use DS to seem attractive and maintain healthy hair. Pawlak *et al.* (2008) examined the factors of MVS utilisation among Caucasian female college students using the TPB. The assumption that MVS would enhance mood and looks was shown to influence behavioural intention strongly. The study findings also complement the results of Rofail *et al*. (2011), who found that females aged 17 to 25 identified body image and physical attractiveness as significant motives for MVS use. The above findings show that the usage of MVS to look and feel good is a factor that may influence the MVS use of both study user groups.

4.3.8.5 Using multivitamin supplements to prevent common illnesses

The mode for users (48,47%) shows agreement that taking a MVS every day would prevent common illnesses (Table 4-18).

Table 4-18: Using MVS to prevent common illnesses

Behavioural Belief: Taking a multivitamin supplement every day would prevent me from getting the cold, flu, or other common illnesses							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	1,75%	5,68%	20,96%	48,47%	23,14%	59,48%	3,86
	4	13	48	111	53	229	
Non-users	7,05%	16,67%	35,26%	30,77%	10,26%	40,52%	3,21
	11	26	55	48	16	156	
Total	3,90%	10,13%	26,75%	41,30%	17,92%	100,00%	3,59
	15	39	103	159	69	385	
Outcome Evaluation: Not getting the cold, flu, or other common illnesses is important to me							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,00%	0,87%	5,24%	44,98%	48,91%	59,48%	4,42
	0	2	12	103	112	229	
Non-users	1,28%	2,56%	10,90%	43,59%	41,67%	40,52%	4,22
	2	4	17	68	65	156	
Total	0,52%	1,56%	7,53%	44,42%	45,97%	100,00%	4,34
	2	6	29	171	177	385	
Attitude Score							
Users	Behavioural Belief (3,86) x Outcome Evaluation (4,42) =						17,06
Non-users	Behavioural Belief (3,21) x Outcome Evaluation (4,22) =						13,55

In contrast the mode for non-users (35,26%) shows neutrality. The mean score for users (3,86) and non-users (3,21) indicates a skew towards agree.

The majority of users (93,89%) and non-users (85,26%) agree or strongly agree that not getting common illnesses like the cold or flu is essential to them. Although the mean score for non-users (4,22) indicates a firm belief in the importance of not getting common illnesses, they are unlikely to believe as strongly that taking MVS every day would help prevent these illnesses (3,21). In contrast, the gap in the mean scores is smaller between the behavioural belief (3,86) and outcome evaluation (4,42) for users compared to non-users. This suggests that users are more inclined than non-users to believe that taking a MVS would prevent them from getting the cold, flu and other common illnesses.

The attitude score for users (17,06) indicates a moderate to strong positive attitude in favour of using MVS daily to prevent common illnesses. The attitude score for non-users (13,55) shows a weak to moderate positive attitude in favour of using MVS everyday to prevent common illnesses. According to the TPB, this positive attitude, in conjunction with subjective norms and perceived behavioural control, may have contributed to creating a behavioural intention to use MVS for both users and non-users. This finding supports a study by Conner *et al.* (2001) who reported that DS consumers were more confident that taking DS would prevent illness and protect their health. Similarly, a US study of pharmacy and nursing students revealed that both groups listed illness prevention as the top reason for taking DS (Maria *et al*., 2015). In addition, multiple additional research studies showed that DS users utilised supplements as a precaution against common illnesses (Aina & Ojedokun, 2014; Braun & Venter, 2008; Faherty & Hough, 2021; Lieberman *et al*., 2014; Pillay & Pillay, 2019; Steele & Senekel, 2005; Sharma, Adiga & Ashok, 2014).

The above findings show that the usage of MVS to prevent common illnesses is a factor that may influence the MVS use of both study user groups.

4.3.8.6 Using multivitamin supplements to fight fatigue and tiredness

The mode for users (48,03%) indicates agreement with the belief that taking a MVS daily would help fight fatigue and tiredness (Table 4-19).

Table 4-19: Using MVS to fight fatigue and tiredness

Behavioural Belief: Taking a multivitamin supplement every day would help me fight fatigue and tiredness							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,87%	6,55%	10,92%	48,03%	33,62%	59,48%	4,07
	2	15	25	110	77	229	
Non-users	8,33%	10,90%	35,90%	30,13%	14,74%	40,52%	3,32
	13	17	56	47	23	156	
Total	3,90%	8,31%	21,04%	40,78%	25,97%	100,00%	3,77
	15	32	81	157	100	385	
Outcome Evaluation: Fighting fatigue and tiredness is important to me							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,00%	0,87%	3,49%	42,36%	53,28%	59,48%	4,48
	0	2	8	97	122	229	
Non-users	1,92%	1,92%	7,69%	43,59%	44,87%	40,52%	4,28
	3	3	12	68	70	156	
Total	0,78%	1,30%	5,19%	42,86%	49,87%	100,00%	4,4
	3	5	20	165	192	385	
Attitude Score							
Users	Behavioural Belief (4,07) x Outcome Evaluation (4,48) =						18,23
Non-users	Behavioural Belief (3,32) x Outcome Evaluation (4,28) =						14,21

In contrast, the mode for non-users (35,90%) shows neutrality. The mean score for users (4,07) indicates a very slight skew towards strongly agree and the mean score for non-users (3,32) indicates a skew towards agree.

The majority of users (95,64%) and non-users (88,46%) agree or strongly agree that fighting fatigue and tiredness is important to them. Although the mean score for non-users (4,28) indicates a firm belief in the importance of fighting fatigue and tiredness, they are unlikely to believe as strongly that taking MVS every day would help fight fatigue and tiredness (3,32). In contrast, the gap in the mean scores is smaller between the behavioural belief (4,07) and outcome evaluation (4,48) for users compared to non-users; this indicates that users are more inclined than non-users to believe that taking a MVS would help them fight fatigue and tiredness.

The attitude score for users (18,23) indicates a moderate to strong positive attitude in favour of using MVS every day to fight fatigue and tiredness. The attitude score for non-users (14,21) shows a weak to moderate positive attitude in favour of using MVS every day to fight fatigue and tiredness. According to the TPB, this positive attitude, in conjunction with subjective norms and perceived behavioural control, may have contributed to creating a behavioural intention to use MVS for both users and non-

users. Aligned to this conclusion, the rationale for taking VS to improve energy levels was examined in a study involving multiple populations from around the world, and it was determined that the decreased fatigue levels observed by participants following the introduction of various supplements may have been due to deficiencies being addressed (Tardy *et al.*, 2020).

The findings above imply that using MVS to combat fatigue and tiredness may impact the MVS use of both study user groups.

4.3.8.7 Using multivitamin supplements to deal with stress

The mode for users (37,99%) indicates agreement with the belief that taking a MVS every day would help deal with stress better (Table 4-20).

Table 4-20: Using MVS to deal with stress

Behavioural Belief: Taking a multivitamin supplement every day would help me to deal with stress better							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,87%	10,48%	23,58%	37,99%	27,07%	59,48%	3,8
	2	24	54	87	62	229	
Non-users	10,90%	20,51%	37,82%	16,67%	14,10%	40,52%	3,03
	17	32	59	26	22	156	
Total	4,94%	14,55%	29,35%	29,35%	21,82%	100,00%	3,49
	19	56	113	113	84	385	
Outcome Evaluation: Dealing with stress in a better way is important to me							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,00%	1,31%	3,49%	46,29%	48,91%	59,48%	4,43
	0	3	8	106	112	229	
Non-users	3,21%	0,64%	5,77%	42,95%	47,44%	40,52%	4,31
	5	1	9	67	74	156	
Total	1,30%	1,04%	4,42%	44,94%	48,31%	100,00%	4,38
	5	4	17	173	186	385	
Attitude Score							
Users	Behavioural Belief (3,8) x Outcome Evaluation (4,43) =						16,83
Non-users	Behavioural Belief (3,03) x Outcome Evaluation (4,31) =						13,06

In contrast, the mode for non-users (37,82%) indicates that this user group neither agrees nor disagrees. The mean scores for users (3,8) and non-users (3,03) skew towards agree.

The majority of users (95,20 %) and non-users (90,39 %) agree or strongly agree that it is vital for them to cope with stress more effectively. Although the mean score for non-users suggests a significant belief

in the necessity of dealing with stress more effectively (4.31), they are less likely to feel that taking MVS daily will help them deal with stress more effectively (3,03). In contrast, the difference in mean scores between the behavioural belief (3,8) and outcome evaluation (4,43) is less for users than non-users, suggesting that users are more inclined than non-users to believe that taking a MVS would help them to deal with stress better.

The attitude score for users (16,83) indicates a moderate to a strong positive attitude in favour of using MVS daily to deal with stress better. The attitude score for non-users (13,06) shows a weak to moderate positive attitude in favour of using MVS to deal with stress better. According to the TPB, this positive attitude, in conjunction with subjective norms and perceived behavioural control, may have contributed to creating a behavioural intention to use MVS for both users and non-users. This finding is consistent with that of Braun and Venter (2005), who found that DS was used by participants to prevent stress. Furthermore, a third of medical students in Poland took DS to manage stress (Merwid-lad *et al*., 2022). Interestingly, the main reason cited by sporadic users of DS was dealing with stress (Steele & Senekal, 2005). Adults' changing lifestyles and stressful work schedules result in nutritional deficits, which are predicted to result in greater use of DS (Grand View Research, 2022).

The statistics presented above suggest that the usage of MVS to manage stress better could be a factor influencing the MVS use of both user groups within this study.

4.3.8.8 Using multivitamin supplements to help concentrate and stay mentally sharp

The mode for users (44,98%) indicates agreement with the belief that taking a MVS every day would help them to concentrate and stay mentally sharp (Table 4-21).

Table 4-21: Using MVS to help concentrate and stay mentally sharp

Behavioural Belief: Taking a multivitamin supplement every day would help me to concentrate and stay mentally sharp							
	SD	D	N	A	SA	Total	Mean
Users	0,44%	5,24%	16,16%	44,98%	33,19%	59,48%	4,05
	1	12	37	103	76	229	
Non-users	8,97%	11,54%	39,10%	26,28%	14,10%	40,52%	3,25
	14	18	61	41	22	156	
Total	3,90%	7,79%	25,45%	37,40%	25,45%	100,00%	3,73
	15	30	98	144	98	385	
Outcome Evaluation: Concentrating and staying mentally sharp is important to me							
	SD	D	N	A	SA	Total	Mean
Users	0,00%	0,87%	0,44%	39,74%	58,95%	59,48%	4,57
	0	2	1	91	135	229	
Non-users	1,28%	0,00%	2,56%	41,03%	55,13%	40,52%	4,49
	2	0	4	64	86	156	
Total	0,52%	0,52%	1,30%	40,26%	57,40%	100,00%	4,54
	2	2	5	155	221	385	
Attitude Score							
Users	Behavioural Belief (4,05) x Outcome Evaluation (4,57) =						18,51
Non-users	Behavioural Belief (3,25) x Outcome Evaluation (4,49) =						14,59

In contrast, the mode for non-users (39,10%) indicates neutrality. The mean score for users (4,05) shows a very slight skew towards strongly agree and the mean score for non-users (3,25) indicates a skew towards agree.

The majority of users (98,69%) and non-users (96,16%) agree or strongly agree that concentrating and staying mentally sharp is important to them. Although the mean score for non-users (4,49) indicates a firm belief in the importance of concentrating and staying mentally sharp, they are unlikely to believe as strongly that taking MVS every day would help them concentrate and stay mentally sharp (3,25). In contrast, the gap in the mean scores is smaller between the behavioural belief (4,05) and outcome evaluation (4,57) for users compared to non-users. This indicates that users are more inclined than non-users to believe that taking a MVS would help them to concentrate and stay mentally sharp.

The attitude score for users (18,51) indicates a moderate to strong positive attitude in favour of using MVS every day to concentrate and stay mentally sharp. The attitude score for non-users (14,59) indicates a weak to moderate positive attitude in favour of using MVS to concentrate and stay mentally

sharp. According to the TPB, this positive attitude, in conjunction with subjective norms and perceived behavioural control, may have contributed to creating a behavioural intention to use MVS for both users and non-users. In a study involving Saudi Arabian students, the main reasons for DS consumption were to to improve concentration. Similarly, Merwid-lad *et al*. (2022) found that DS was used to increase concentration, or alertness among Polish students. The study findings suggest that using MVS to help concentrate and stay mentally sharp may influence the MVS use of both user groups within this study.

4.3.8.9 Using multivitamin supplements and unpleasant side-effects

The scale weight for this question was reversed as follows, as this is a negative belief: Strongly disagree (SA) = 5, Disagree (D) = 4, Neither agree nor disagree (N) = 3, Agree (A) = 2, Strongly agree (SA) = 1. This was done to obtain more consistent scores across the main constructs of the study (i.e., behavioural beliefs, normative beliefs and control beliefs).as per the manual for constructing questionaires based on the TPB (Francis *et al*., 2004). This reversal should be borne in mind when interpreting the results below.

Table 4-22: Using MVS and unpleasant side-effects

Behavioural Belief: Taking a multivitamin supplement every day would cause unpleasant side-effects							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	18,34%	52,40%	18,78%	8,30%	2,18%	59,48%	3,76
	42	120	43	19	5	229	
Non-users	7,69%	21,79%	55,77%	8,97%	5,77%	40,52%	3,17
	12	34	87	14	9	156	
Total	14,03%	40,00%	33,77%	8,57%	3,64%	100,00%	3,52
	54	154	130	33	14	385	
Outcome Evaluation: Unpleasant side-effects are a concern for me							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	1,31%	7,86%	10,04%	43,23%	37,55%	59,48%	1,92
	3	18	23	99	86	229	
Non-users	7,69%	7,05%	5,77%	44,87%	34,62%	40,52%	2,08
	12	11	9	70	54	156	
Total	3,90%	7,53%	8,31%	43,90%	36,36%	100,00%	1,99
	15	29	32	169	140	385	
Attitude Score							
Users	Behavioural Belief (3,76) x Outcome Evaluation (1,92) =						7,22
Non-users	Behavioural Belief (3,17) x Outcome Evaluation (2,08) =						6,59

Most users (52,40%) disagree that taking a MVS every day would cause unpleasant side- effects. In contrast most non-users (55,77%) are neutral (Table 4-22). Although the mean score for users indicates a concern for unpleasant side-effects (1,92), they are unlikely to believe as strongly that taking MVS would cause unpleasant side effects (3,76). Similarly the mean score for non-users (2,08) indicates a concern for unpleasant side-effects; however, they tend to be more neutral (3,17) in their view that MVS causes unpleasant side-effects when compared to users.

The attitude score for users (7,22) and non-users (6,59) indicates a weak to moderate negative attitude towards the negative belief that consuming MVS every day would cause unpleasant side-effects. According to the TPB, this negative attitude may have, in combination with subjective norms and perceived behavioural control, led to the formation of a behavioural intention to use MVS for both user groups.

These findings align with the findings by Ghassan *et al.* (2022) who found that most respondents believed VS had no negative effects on their health. This is in contrast to a study by Pillay and Pillay (2019), who found that participants listed unfavourable side effects as a reason for not using DS.

4.3.9 Question 15: How much do you agree or disagree with each of the following statements? (Normative beliefs)

This question contained seven paired statements relating to the normative beliefs of MVS users and non-users. Subjective norm is a person's impression of society pressure to adopt a given behaviour, influenced by normative beliefs and compliance drive (Ajzen, 1991). Normative beliefs consider whether significant others would approve or disapprove of a behaviour while motivation to comply is an evaluation of how essential it is to gain approval from significant others (Ajzen, 1991). The subjective norm score for users and non-users of MVS is presented in a tabular format and interpreted using a range of 1-25: 1 = Strong negative social pressure, 4 = Moderate negative social pressure, 9 = Neutral, 16 = Moderate positive social pressure, 25 = Strong positive social pressure. A 5-point Likert scale was used for this question (i.e. Strongly disagree (SD) = 1, Disagree (D) = 2, Neither agree nor disagree (N) = 3, Agree (A) = 4, Strongly agree (SA) = 5).

4.3.9.1 The influence of family on the usage of multivitamin supplements

The mode for users (42,36%) and non-users (30,13%) indicates agreement that their family thinks they should take a MVS every day (Table 4-23). The mean score for users (3,38) shows a skew toward agree and the mean score for non-users (2,97) indicates a strong skew towards neither agree nor disagree.

45,85% of users agree to some extent (agree and strongly agree) that it is important to them what their family thinks about them taking MVS. In contrast 41,67% of non-users disagree to some extent (strongly disagree and disagree) on the importance of family thinking they should take MVS.

The subjective norm score for users (10,48) indicates a weak to moderate positive social pressure from family to use MVS. According to the TPB this positive social pressure from family, combined with attitudes towards consuming MVS and perceived behavioural control, may have led to the formation of a behavioural intention to use MVS. Similarly, according to research by Noor *et al.* (2014), family members were key reference groups for Malaysian college students regarding DS usage. Furthermore, Pawlak *et al*. (2005) indicated that influence from family regarding the use of MVS played an essential role in deciding whether or not to use MVS among African American females.

The subjective norm score for non-users (8,46) indicates a weak to moderate negative social pressure from family to use MVS. According to the TPB this negative social pressure from family, combined with attitudes towards consuming MVS and perceived behavioural control, may not have led to the formation of a behavioural intention to use MVS. The above findings suggest that social pressure from family may influence the MVS use of users.

Table 4-23: The influence of family on the usage of MVS

Normative Belief: My family (e.g., parents, siblings) thinks I should take a multivitamin supplement everyday							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	5,24%	17,90%	22,27%	42,36%	12,23%	59,48%	3,38
	12	41	51	97	28	229	
Non-users	13,46%	24,36%	23,08%	30,13%	8,97%	40,52%	2,97
	21	38	36	47	14	156	
Total	8,57%	20,52%	22,60%	37,40%	10,91%	100,00%	3,22
	33	79	87	144	42	385	
Motivation to Comply: It is important to me what my family thinks about me taking multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	12,23%	17,03%	24,89%	39,74%	6,11%	59,48%	3,1
	28	39	57	91	14	229	
Non-users	17,95%	23,72%	20,51%	31,41%	6,41%	40,52%	2,85
	28	37	32	49	10	156	
Total	14,55%	19,74%	23,12%	36,36%	6,23%	100,00%	3
	56	76	89	140	24	385	
Subjective Norm Score							
Users	Normative Belief (3,38) x Motivation to Comply (3,1) =						10,48
Non-users	Normative Belief (2,97) x Motivation to Comply (2,85) =						8,46

4.3.9.2 The influence of friends on the usage of multivitamin supplements

The mode for users (41,92%) and non-users (46,15%) indicates neutrality concerning friends being influential in using MVS. (Table 4-24). The mean score for users (3,38) indicates a skew toward agree and the mean score for non-users (2,92) indicates a skew towards neither agree nor disagree.

The majority of users (50,65%) and non-users (55,77%) disagree to some extent (strongly disagree and disagree) that it is important to them what their friends think about them taking MVS. Although 45,85% of MVS users either agree or strongly agree that their friends approve of them taking MVS, they place low importance on the influence of their friends (50,65%) in persuading them to use MVS.

Table 4-24: The influence of friends on the usage of MVS

Normative Belief: My friends approve of me taking a multivitamin supplement every day							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	3,49%	8,73%	41,92%	38,43%	7,42%	59,48%	3,38
	8	20	96	88	17	229	
Non-users	10,26%	18,59%	46,15%	18,59%	6,41%	40,52%	2,92
	16	29	72	29	10	156	
Total	6,23%	12,73%	43,64%	30,39%	7,01%	100,00%	3,19
	24	49	168	117	27	385	
Motivation to Comply: It is important to me what my friends think about me taking multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	16,59%	34,06%	27,51%	20,52%	1,31%	59,48%	2,56
	38	78	63	47	3	229	
Non-users	23,08%	32,69%	17,31%	25,00%	1,92%	40,52%	2,5
	36	51	27	39	3	156	
Total	19,22%	33,51%	23,38%	22,34%	1,56%	100,00%	2,54
	74	129	90	86	6	385	
Subjective Norm Score							
Users	Normative Belief (3,38) x Motivation to Comply (2,56) =						8,65
Non-users	Normative Belief (2,92) x Motivation to Comply (2,5) =						7,3

The subjective norm score for users (8,65) non-users (7,3) indicates a weak to moderate negative social pressure from friends to use MVS. According to the TPB this negative social pressure from friends, combined with attitudes towards consuming MVS and perceived behavioural control, may not have led to the formation of a behavioural intention to use MVS for both user groups.

In contrast to the above findings, research conducted among human immunodeficiency virus-positive African American women concluded that pressure from friends to use DS may influence females' decision to use it (Lino *et al*., 2014). This is reinforced by Faherty and Hough (2021), who discovered that the most significant social variable influencing DS use was recommendations from friends. In summary, the study's findings suggest that social pressure from friends may not influence the use of MVS among both user groups.

4.3.9.3 The influence of colleagues on the usage of multivitamin supplements

The mode for users (44,10%) and non-users (55,56%) shows neutrality in terms of colleagues influencing the use of MVS (Table 4-25).

Table 4-25: The influence of colleagues on the usage of MVS

Normative Belief: My colleagues approve of me taking a multivitamin supplement every day							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	4,37%	10,92%	44,10%	34,93%	5,68%	59,48%	3,27
	10	25	101	80	13	229	
Non-users	10,26%	12,82%	52,56%	22,44%	1,92%	40,52%	2,93
	16	20	82	35	3	156	
Total	6,75%	11,69%	47,53%	29,87%	4,16%	100,00%	3,13
	26	45	183	115	16	385	
Motivation to Comply: It is important to me what my colleagues think about me taking multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	20,96%	38,86%	22,71%	14,85%	2,62%	59,48%	2,39
	48	89	52	34	6	229	
Non-users	23,72%	36,54%	16,03%	20,51%	3,21%	40,52%	2,43
	37	57	25	32	5	156	
Total	22,08%	37,92%	20,00%	17,14%	2,86%	100,00%	2,41
	85	146	77	66	11	385	
Subjective Norm Score							
Users	Normative Belief (3,27) x Motivation to Comply (2,39) =						7,81
Non-users	Normative Belief (2,93) x Motivation to Comply (2,43) =						7,12

The mean score for users (3,27) indicates a skew toward agree and the mean score for non-users (2,93) indicates a skew towards neither agree nor disagree.

The majority of MVS users (59,82%) and non-users (60,26%) disagree or strongly disagree that it is significant what their coworkers think about them using MVS. Although 40,61% of MVS users either

agree or strongly agree that their colleagues approve of them using MVS, they attach minimal importance to the impact of their colleagues in influencing them to use MVS (59,82%).

The subjective norm score (7,81) for users and non-users (7,12) implies a weak to moderate negative social pressure to use MVS from peers. According to the TPB, this negative social pressure from peers, in conjunction with attitudes toward MVS use and perceived behavioural control, may not have resulted in creating a behavioural intention to use MVS within both user groups. In contrast, Housman *et al.* (2011) found that teammates significantly influenced respondents in their study to use DS. Furthermore, Duvengue (2015) discovered that coaches were the primary sources of supplement recommendations for under-16 rugby players in SA. This study's findings suggest that social pressure from colleagues may not influence the use of MVS among both user groups.

4.3.9.4 The influence of doctors on the usage of multivitamin supplements

The mode for users (46,72%) indicates agreement with the belief that their doctor wants them to take a MVS every day (Table 4-26).

Table 4-26: The influence of doctors on the usage of MVS

Normative Belief: My doctor wants me to take a multivitamin supplement every day							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	3,93%	12,23%	19,21%	46,72%	17,90%	59,48%	3,62
	9	28	44	107	41	229	
Non-users	22,44%	24,36%	25,64%	21,15%	6,41%	40,52%	2,65
	35	38	40	33	10	156	
Total	11,43%	17,14%	21,82%	36,36%	13,25%	100,00%	3,23
	44	66	84	140	51	385	
Motivation to Comply: It is important to me what my doctor thinks about me taking multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	3,49%	10,48%	11,79%	45,41%	28,82%	59,48%	3,86
	8	24	27	104	66	229	
Non-users	11,54%	8,33%	17,31%	40,38%	22,44%	40,52%	3,54
	18	13	27	63	35	156	
Total	6,75%	9,61%	14,03%	43,38%	26,23%	100,00%	3,73
	26	37	54	167	101	385	
Subjective Norm Score							
Users	Normative Belief (3,62) x Motivation to Comply (3,86) =						13,97
Non-users	Normative Belief (2,65) x Motivation to Comply (3,54) =						9,38

In contrast the mode for non-users (25,64%) indicates neither agree nor disagree. The mean score for users (3,62) indicates a skew toward agree and the mean score for non-users (2,65) indicates a skew towards neither agree nor disagree.

The data indicates that 64,62% of users agree or strongly agree that their doctor wants them to take a MVS every day. In contrast 46,80% of non-users strongly disagree or disagree. The majority of users (74,23%) and non-users (62,82%) agree or strongly agree that it is important to them what their doctor thinks about them taking MVS. This implies that even though non-users place high importance on MVS recommendations from their doctors, they tend not to receive these recommendations from their doctors.

The subjective norm score for users (13,97) indicates a weak to moderate positive social pressure from doctors to use MVS. The subjective norm score for non-users (9,38) indicates a neutral to weak positive social pressure from doctors to use MVS. According to the TPB, this positive social pressure from doctors may have, in combination with attitudes towards consuming MVS and perceived behavioural control, led to the formation of a behavioural intention to use MVS for both users and non-users. This finding confirms research conducted in the urban areas of Rajasthan, India, which showed that doctors were the most often cited source of knowledge about MVS (Saini & Hasan, 2020). In addition, the most often mentioned reason for using DS among Saudi Arabian health care attendants was guidance from health care professionals (Alsaleem *et al.*, 2021). Furthermore, according to Branum, Bailey, and Singer (2013), around 50% of pregnant and 40% of nursing women took DS on a health care professional's suggestion.

The outcomes of this research indicate that the social pressure exerted by physicians may affect the usage of MVS across both user categories, with a greater influence on users.

4.3.9.5 The influence of books/magazines on the usage of multivitamin supplements

The mode for users (29,26%) and non-users (38,46%) indicates neutrality on recommendations from their books/magazines to use MVS (Table 4-27). The mean score for users (2,89) and non-users (2,64) indicates a skew towards neither agree nor disagree.

Table 4.27 shows that 38,87% of users and 44,23% of non-users either strongly disagree or disagree that the books/magazines they read recommended MVS consumption. Similarly, 41,92% of users and 50,64% of non-users strongly disagree or disagree that it is important to them what a book/magazine says about taking MVS.

Table 4-27: The influence of books/magazines on the usage of MVS

Normative Belief: The book/magazine I read recommended I take a multivitamin supplement every day							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	9,61%	29,26%	29,26%	26,64%	5,24%	59,48%	2,89
	22	67	67	61	12	229	
Non-users	14,74%	29,49%	38,46%	11,54%	5,77%	40,52%	2,64
	23	46	60	18	9	156	
Total	11,69%	29,35%	32,99%	20,52%	5,45%	100,00%	2,79
	45	113	127	79	21	385	
Motivation to Comply: It is important to me what my book/magazine says about taking multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	9,61%	32,31%	32,75%	20,96%	4,37%	59,48%	2,78
	22	74	75	48	10	229	
Non-users	17,95%	32,69%	30,77%	14,10%	4,49%	40,52%	2,54
	28	51	48	22	7	156	
Total	12,99%	32,47%	31,95%	18,18%	4,42%	100,00%	2,69
	50	125	123	70	17	385	
Subjective Norm Score							
Users	Normative Belief (2,89) x Motivation to Comply (2,78) =						8,03
Non-users	Normative Belief (2,64) x Motivation to Comply (2,54) =						6,7

The subjective norm score for users (8,03) and non-users (6,7) indicates a weak to moderate negative social pressure from books/magazines to use MVS. According to the TPB, this negative social pressure from books/magazines, in combination with attitudes towards consuming MVS and perceived behavioural control, may not have led to the formation of a behavioural intention to use MVS.

In contrast, Conner *et al.* (2001) revealed that books and magazines significantly influenced female adult participants' decision to use DS. Furthermore, in a study by Braun and Venter (2008), the majority of respondents said that they obtained knowledge through books and magazine articles about DS.

The results of this study suggest that social pressure exerted by books and magazines may not be a factor influencing the adoption of MVS by any user category.

4.3.9.6 The influence of in-store sales staff on the usage of multivitamin supplements

The mode for users (36,68%) and non-users (35,26%) indicates disagreement with the belief that an in-store sales staff member recommended they take a MVS every day (Table 4-28).

Table 4-28: The influence of in-store sales staff on the usage of MVS

Normative Belief: An in-store sales staff member has recommended I take a multivitamin supplement every day							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	13,10%	36,68%	24,02%	22,27%	3,93%	59,48%	2,67
	30	84	55	51	9	229	
Non-users	21,79%	35,26%	25,64%	14,10%	3,21%	40,52%	2,42
	34	55	40	22	5	156	
Total	16,62%	36,10%	24,68%	18,96%	3,64%	100,00%	2,57
	64	139	95	73	14	385	
Motivation to Comply: It is important to me what in-store sales staff say about taking multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	16,59%	32,31%	21,83%	24,45%	4,80%	59,48%	2,69
	38	74	50	56	11	229	
Non-users	19,23%	28,21%	26,28%	20,51%	5,77%	40,52%	2,65
	30	44	41	32	9	156	
Total	17,66%	30,65%	23,64%	22,86%	5,19%	100,00%	2,67
	68	118	91	88	20	385	
Subjective Norm Score							
Users	Normative Belief (2,67) x Motivation to Comply (2,69) =						7,18
Non-users	Normative Belief (2,42) x Motivation to Comply (2,65) =						6,41

The mean score for users (2,67) and non-users (2,42) indicates a skew towards neither agree nor disagree. Table 4.28 shows that 49,78% of users and 57,05% of non-users either strongly disagree or disagree that MVS was recommended by in-store sales staff. Similarly, 48,90% of users and 47,44% of non-users either strongly disagree or disagree that it is important to them what in-store sales staff say about taking MVS.

The subjective norm score for users (7,18) and non-users (6,41) indicates a weak to moderate negative social pressure from in-store sales staff to use MVS. According to the TPB, this negative social pressure from in-store sales staff, in combination with attitudes towards consuming MVS and perceived behavioural control, may not have led to the formation of a behavioural intention to use MVS. In

contrast, about half of respondents in a study by Braun and Venter (2008) reported that health food store employees were sources of DS knowledge.

Social pressure applied by in-store sales employees may not be a factor influencing the adoption of MVS across both user groups, according to the findings of this study.

4.3.9.7 The influence of pharmacists on the usage of multivitamin supplements

According to Table 4-29, the mode for users (38,86%) indicates agreement with the belief that their pharmacist recommended they take a MVS every day.

Table 4-29: The influence of pharmacists on the usage of MVS

Normative Belief: A pharmacist has recommended I take a multivitamin supplement every day							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	9,61%	17,03%	26,64%	38,86%	7,86%	59,48%	3,18
	22	39	61	89	18	229	
Non-users	21,79%	32,05%	23,08%	19,23%	3,85%	40,52%	2,51
	34	50	36	30	6	156	
Total	14,55%	23,12%	25,19%	30,91%	6,23%	100,00%	2,91
	56	89	97	119	24	385	
Motivation to Comply: It is important to me what pharmacists say about taking multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	6,55%	12,23%	20,96%	47,60%	12,66%	59,48%	3,48
	15	28	48	109	29	229	
Non-users	12,18%	14,10%	23,08%	39,74%	10,90%	40,52%	3,23
	19	22	36	62	17	156	
Total	8,83%	12,99%	21,82%	44,42%	11,95%	100,00%	3,38
	34	50	84	171	46	385	
Subjective Norm Score							
Users	Normative Belief (3,18) x Motivation to Comply (3,48) =						11,07
Non-users	Normative Belief (2,51) x Motivation to Comply (3,23) =						8,11

In contrast, the mode for non-users (32,05%) indicates disagreement. The mean score for users (3,18) indicates a skew toward agree and the mean score for non-users (2,51) indicates a skew towards neither agree nor disagree.

Table 4.29 further indicates that 46,72% of users agree or strongly agree that a pharmacist has recommended taking an MVS. In contrast the majority of non-users (53,84%) strongly disagree or disagree. The majority of users (60,26%) and non-users (50,64%) agree or strongly agree that it is

important to them what their pharmacist says about taking MVS. This implies that even though non-users place high importance on MVS recommendations from pharmacists, they tend not to receive these recommendations from pharmacists.

The subjective norm score for users (11,07) shows a weak to moderate positive societal pressure to use MVS from pharmacists. According to the TPB, this positive social pressure from pharmacists, in conjunction with attitudes towards MVS use and perceived behavioral control, may have resulted in a behavioural intention to use MVS. Aligned with this finding, a comprehensive evaluation of 76 research studies revealed that expert guidance was the most important factor driving individuals to use DS (Teoh *et al*., 2019).

The subjective norm score for non-users (8,11) indicates a weak to moderate negative social pressure from pharmacists. According to the TPB, this negative social pressure from pharmacists, in combination with attitudes towards consuming MVS and perceived behavioural control, may not have led to the formation of a behavioural intention to use MVS.

The findings of this study imply that social pressure from pharmacists may have a positive impact on MVS users' adoption of MVS.

4.3.10 Question 16: How much do you agree or disagree with each of the following statements? (Control beliefs)

This question contained five paired statements relating to the control beliefs of MVS users and non-users. Perceived behavioural control represents an individual's thoughts of the ease or difficulty of performing the behaviour (Ajzen, 1991). The key ideas underpinning this notion are control beliefs, which entail the individual's judgments of resources versus obstacles to participating in the action. These beliefs are paired with the perceived power of each control element to facilitate/hinder the behaviour to form the overall perceived behavioural control (Ajzen, 1991). The perceived behavioural control score for users and non-users of MVS is presented in a tabular format and interpreted using a range of 1-25: 1 = Strong negative level of control, 4 = Moderate negative level of control, 9 = Neutral, 16 = Moderate positive level of control, 25 = Strong positive level of control. The 5-point Likert scale weights for this question were reversed for negative beliefs as follows, Strongly disagree (SD) = 5, Disagree (D) = 4, Neither agree nor disagree (N) = 3, Agree (A) = 2, Strongly agree (SA) = 1). This was done to obtain more consistent scores across the main constructs of the study (i.e., behavioural beliefs, normative beliefs and control beliefs) as per the manual for contructing questionaires based on the TPB by Francis *et al.* (2004). This reversal should be borne in mind when interpreting the results below.

4.3.10.1 Perceived behavioural control of remembering to take multivitamin supplements

The majority of users (65,07%) strongly disagree or disagree that it would be difficult to remember to take a MVS everyday (Table 4-30).

Table 4-30: Perceived behavioural control of remembering to take MVS

Control Belief: It would be difficult for me to remember to take a multivitamin supplement every day							
	SD	D	N	A	SA	Total	Mean
Users	13,54%	51,53%	13,54%	19,21%	2,18%	59,48%	3,55
	31	118	31	44	5	229	
Non-users	7,05%	34,62%	14,10%	29,49%	14,74%	40,52%	2,9
	11	54	22	46	23	156	
Total	10,91%	44,68%	13,77%	23,38%	7,27%	100,00%	3,29
	42	172	53	90	28	385	
Perceived Power to Influence Behaviour: Remembering to take multivitamin supplements would make taking them more difficult							
	SD	D	N	A	SA	Total	Mean
Users	11,79%	48,91%	15,28%	22,27%	1,75%	59,48%	3,47
	27	112	35	51	4	229	
Non-users	6,41%	26,92%	24,36%	35,26%	7,05%	40,52%	2,9
	10	42	38	55	11	156	
Total	9,61%	40,00%	18,96%	27,53%	3,90%	100,00%	3,24
	37	154	73	106	15	385	
Perceived Behavioural Control Score							
Users	Control Belief (3,55) x Power to Influence (3,47) =						12,32
Non-users	Control Belief (2,9) x Power to Influence (2,9) =						8,41

In contrast 41,67% of non-users strongly disagree or disagree. The majority of users (60,70%) strongly disagree or disagree that remembering to take MVS would make taking them more difficult. On the other hand 33,33% of non-users strongly disagree or disagree.

The perceived behavioural control score for users (12,32) indicates a weak to moderate level of positive control. This means that remembering to take MVS every day is slightly easy for users. According to the TPB, this positive control, in combination with attitudes towards consuming MVS and subjective norms, may not have led to the formation of a behavioural intention to use MVS or usage of MVS itself.

The perceived behavioural control score for non-users (8,41) indicates a weak to moderate level of negative control. This means that remembering to take MVS every day is slightly difficult for non-users. According to the TPB, this negative control, in combination with attitudes towards consuming

MVS and subjective norms, may not have led to the formation of a behavioural intention to use MVS or usage of MVS itself.

These findings are aligned with Faherty and Hough's (2021) study of DS. In their study 30,4% of non-users ascribed their non-use to difficulties in developing the habit of taking VS frequently. Notably, fewer than 1% of users admitted they only took DS as they remembered.

4.3.10.2 Perceived behavioural control of multivitamin supplements affordability

Table 4-31 shows that the majority of users (66,81%) and 48,72% of non-users either agree or strongly agree that they can afford to buy MVS. The scale weight for this belief was not reversed as it constitutes a positive belief. This was done to obtain more consistent scores across the main constructs of the study (i.e., behavioural beliefs, normative beliefs and control beliefs), as per the manual for contructing questionaires based on the TPB by Francis *et al*. (2004). This non-reversal should be borne in mind when interpreting the results below.

Table 4-31: Perceived behavioral control of MVS affordability

Control Belief: I can afford buying multivitamin supplements							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	0,87%	12,23%	20,09%	56,33%	10,48%	59,48%	3,63
	2	28	46	129	24	229	
Non-users	5,77%	25,64%	19,87%	35,26%	13,46%	40,52%	3,25
	9	40	31	55	21	156	
Total	2,86%	17,66%	20,00%	47,79%	11,69%	100,00%	3,48
	11	68	77	184	45	385	
Perceived Power to Influence Behaviour: The cost of multivitamin supplements would prevent me from taking them							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	4,80%	27,51%	15,28%	39,74%	12,66%	59,48%	2,72
	11	63	35	91	29	229	
Non-users	7,69%	14,74%	16,67%	37,18%	23,72%	40,52%	2,46
	12	23	26	58	37	156	
Total	5,97%	22,34%	15,84%	38,70%	17,14%	100,00%	2,61
	23	86	61	149	66	385	
Perceived Behavioural Control Score							
Users	Control Belief (3,63) x Power to Influence (2,72) =						9,87
Non-users	Control Belief (3,25) x Power to Influence (2,46) =						8

Interestingly, the majority of users (52,40%) and non-users (60,90%) either agree or strongly agree that the cost of MVS would prevent them from taking it.

The perceived behavioural control score for users (9.87) implies a moderate to weak degree of positive control. This means that being able to afford and purchase MVS is slightly easy for users. According to the TPB, this positive control, in conjunction with attitudes about MVS use and subjective norms, may have contributed to creating a behavioural intention to use MVS and, ultimately, usage within this sample group. This finding is consistent with Pawlak *et al.* (2008), who used the TPB to examine the determinants of MVS usage amongst Caucasian female university students. They found that attitudes, subjective norms, and behavioural control all affected behavioural intention to adopt MVS. However, only a single control belief regarding being able to afford MVS significantly affected behavioural intent.

The perceived behavioural control score for non-users (8) indicates a weak to moderate level of negative control. This means that being able to afford and purchase MVS is slightly difficult for non-users. According to the TPB, this negative control, in combination with attitudes towards consuming MVS and subjective norms, may not have led to the formation of a behavioural intention to use MVS or usage of MVS itself. Aligned to this finding, Pillay and Pillay (2019) found that students at the University of KwaZulu-Natal listed cost and DS being a waste of money as reasons for not utilising DS.

4.3.10.3 Perceived behavioural control of knowledge of multivitamin supplements

Table 4-32: Perceived behavioural control of knowledge of MVS

Control Belief: I don't have enough knowledge about multivitamins							
	SD	D	N	A	SA	Total	Mean
Users	8,30%	38,43%	22,71%	25,33%	5,24%	59,48%	3,19
	19	88	52	58	12	229	
Non-users	8,33%	16,67%	20,51%	35,90%	18,59%	40,52%	2,6
	13	26	32	56	29	156	
Total	8,31%	29,61%	21,82%	29,61%	10,65%	100,00%	2,95
	32	114	84	114	41	385	
Perceived Power to Influence Behaviour: Not having enough knowledge about multivitamins would prevent me from taking them							
	SD	D	N	A	SA	Total	Mean
Users	3,93%	17,90%	13,54%	52,40%	12,23%	59,48%	2,49
	9	41	31	120	28	229	
Non-users	10,90%	12,18%	14,10%	46,15%	16,67%	40,52%	2,54
	17	19	22	72	26	156	
Total	6,75%	15,58%	13,77%	49,87%	14,03%	100,00%	2,51
	26	60	53	192	54	385	
Perceived Behavioural Control Score							
Users	Control Belief (3,19) x Power to Influence (2,49) =						7,94
Non-users	Control Belief (2,6) x Power to Influence (2,54) =						6,6

As demonstrated in Table 4-32, 46,73% of users either strongly disagree or disagree that they do not know enough about MVS.

The majority of users (64,63%) and non-users (62,82%) either agree or strongly agree that not having enough knowledge about MVS would prevent usage.

The perceived behavioural control score for users (7,94) and non-users (6,6) indicates a weak to moderate level of negative control. This means that taking MVS without having enough knowledge is slightly difficult for both users and non-users. According to the TPB, this negative control may have, in combination with attitudes towards consuming MVS and subjective norms, not led to the formation of a behavioural intention to use MVS and ultimately usage for both user groups. This finding is supported by Merwid-lad *et al*. (2022), who found that respondents cited insufficient knowledge as one of the main reasons for not using DS. Similarly, Barnes *et al.* (2016), revealed that DS users believe DS are beneficial but are unaware of the specific advantages or risks associated with their usage.

Furthermore, non-users of DS examined by Faherty and Hough (2021) stated that they lack confidence in selecting a DS for themselves.

4.3.10.4 Perceived behavioural control of brand availability of multivitamin supplements

Most users (50,21%) agree or strongly agree that some MVS brands are not readily available (Table 4-33). In contrast the majority of non-users (53,21%) neither agree nor disagree. The mean score for users (2,66) and non-users (2,69) indicates a skew towards neither agree nor disagree. Interestingly, 43,67% of users and 41,67% of non-users either agree or strongly agree that the non-availability of their preferred MVS brand will prevent them from taking MVS.

The perceived behavioural control score for users (7,77) and non-users (7,51) indicates a weak to moderate level of negative control. This means that being able to use MVS without the availability of a preferred brand is slightly difficult for users and non-users. According to the TPB this negative control in combination with attitudes towards consuming MVS and subjective norms may not have led to the formation of a behavioural intention to use MVS and ultimately usage for both user groups.

Table 4-33: Perceived behavioural control of brand availability

Control Belief: Some multivitamin supplement brands are not readily available							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	3,06%	14,41%	32,31%	45,41%	4,80%	59,48%	2,66
	7	33	74	104	11	229	
Non-users	3,21%	6,41%	53,21%	30,13%	7,05%	40,52%	2,69
	5	10	83	47	11	156	
Total	3,12%	11,17%	40,78%	39,22%	5,71%	100,00%	2,67
	12	43	157	151	22	385	
Perceived Power to Influence Behaviour: Non-availability of my preferred multivitamin supplement brand will prevent me from taking them							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	4,80%	34,50%	17,03%	35,37%	8,30%	59,48%	2,92
	11	79	39	81	19	229	
Non-users	5,13%	20,51%	32,69%	32,05%	9,62%	40,52%	2,79
	8	32	51	50	15	156	
Total	4,94%	28,83%	23,38%	34,03%	8,83%	100,00%	2,87
	19	111	90	131	34	385	
Perceived Behavioural Control Score							
Users	Control Belief (2,66) x Power to Influence (2,92) =						7,77
Non-users	Control Belief (2,69) x Power to Influence (2,79) =						7,51

4.3.10.5 Perceived behavioral control of swallowing multivitamin supplements

Most users (53,28%) strongly disagree or disagree that MVS are difficult to swallow (Table 4-34). In contrast, most non-users (50,00%) are neutral.

Interestingly, 47,59% of users agree or strongly agree that not being able to swallow MVS easily would prevent them from taking it. In contrast, 42,95% of non-users either strongly disagree or disagree.

The perceived behavioural control score for users (9,9) and non-users (9,61) indicates a weak to moderate level of positive control. This means that the perceived ability to swallow MVS is slightly easy for users and non-users. According to the TPB, this positive control, in combination with attitudes towards consuming MVS and subjective norms, may have led to the formation of a behavioural intention to use MVS and ultimately usage for both groups of the sample.

Table 4-34: Perceived behavioural control of swallowing MVS

Control Belief: Multivitamin supplements are difficult to swallow							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	8,30%	44,98%	27,07%	16,16%	3,49%	59,48%	3,38
	19	103	62	37	8	229	
Non-users	5,77%	22,44%	50,00%	16,03%	5,77%	40,52%	3,06
	9	35	78	25	9	156	
Total	7,27%	35,84%	36,36%	16,10%	4,42%	100,00%	3,25
	28	138	140	62	17	385	
Perceived Power to Influence Behaviour: Not being able to swallow multivitamin supplements easily would prevent me from using them							
	SD	**D**	**N**	**A**	**SA**	**Total**	**Mean**
Users	9,17%	29,69%	13,54%	40,17%	7,42%	59,48%	2,93
	21	68	31	92	17	229	
Non-users	17,95%	25,00%	16,03%	35,26%	5,77%	40,52%	3,14
	28	39	25	55	9	156	
Total	12,73%	27,79%	14,55%	38,18%	6,75%	100,00%	3,02
	49	107	56	147	26	385	
Perceived Behavioural Control Score							
Users	Control Belief (3,38) x Power to Influence (2,93) =						9,9
Non-users	Control Belief (3,06) x Power to Influence (3,14) =						9,61

4.3.11 Question 17: How much do you agree or disagree with each of the following statements? (Psychographics)

This question contained seven statements relating to preferred type of MVS of users and non-users concerning their psychographics. A 5-point Likert scale was used for this question (i.e. Strongly disagree (SD) = 1, Disagree (D) = 2, Neither agree nor disagree (N) = 3, Agree (A) = 4, Strongly agree (SA) = 5).

4.3.11.1 Store branded multivitamin supplements are not good quality e.g., Clicks, Dis-Chem

The mode for users (43,23%) and non-users (54,49%) indicates a neutral stance regarding whether store-branded MVS are of good quality (Table 4-35). The mean score for users (2,7) and non-users (2,62) indicates a skew towards neither agree nor disagree. Likely, the n=99 users within the user sample had not tried store-branded MVS before. The extent of disagreement (strongly disagree and disagree) of users (41,92%) and non-users (35,26%) may indicate that both user groups have a strong belief that store-branded MVS might be good quality products or at least not bad quality.

Table 4-35: Store-branded MVS

Store branded multivitamins are not good quality e.g. Clicks, Dis-Chem							
	SD	D	N	A	SA	Total	Mean
Users	6,99%	34,93%	43,23%	10,92%	3,93%	59,48%	2,7
	16	80	99	25	9	229	
Non-users	16,67%	18,59%	54,49%	7,05%	3,21%	40,52%	2,62
	26	29	85	11	5	156	
Total	10,91%	28,31%	47,79%	9,35%	3,64%	100,00%	2,66
	42	109	184	36	14	385	

4.3.11.2 I want the best, most advanced multivitamin – even if it costs more than other brands

The mode for users (30,57%) indicates that they want the best, most advanced MVS even if it costs more than other brands (Table 4-36).

Table 4-36: Advanced MVS

I want the best, most advanced multivitamin – even if it costs more than other brands							
	SD	D	N	A	SA	Total	Mean
Users	4,80%	21,83%	30,13%	30,57%	12,66%	59,48%	3,24
	11	50	69	70	29	229	
Non-users	9,62%	30,77%	33,33%	18,59%	7,69%	40,52%	2,84
	15	48	52	29	12	156	
Total	6,75%	25,45%	31,43%	25,71%	10,65%	100,00%	3,08
	26	98	121	99	41	385	

In contrast the mode for non-users (33,33%) indicates neutrality. The mean score for users (3,24) skews toward agree. On the other hand, the mean score for non-users (2,84) skews towards neither agree nor disagree. These findings indicate that non-users in the sample may be more price-sensitive to MVS usage than users. This is further reiterated by the level of agreement (agree and strongly agree) of users (43,23%) versus non-users (26,28%). MVS users are more likely to pay a higher price for an advanced MVS than non-users. Aligned to this finding, Pillay and Pillay (2019) found that students at the University of KwaZulu-Natal listed cost and DS being a waste of money as reasons for not utilising DS.

4.3.11.3 I want a good, all-around multivitamin that is good value for money

The mode for users (47,16%) indicates strongly agree and the mode for non-users (39,74%) indicates agree (Table 4-37).

Table 4-37: MVS and value for money all-round MVS

I want a good, all-around multivitamin that is good value for money							
	SD	D	N	A	SA	Total	Mean
Users	2,18%	1,31%	6,99%	42,36%	47,16%	59,48%	4,31
	5	3	16	97	108	229	
Non-users	3,21%	7,69%	14,10%	39,74%	35,26%	40,52%	3,96
	5	12	22	62	55	156	
Total	2,60%	3,90%	9,87%	41,30%	42,34%	100,00%	4,17
	10	15	38	159	163	385	

The mean score for users (4,31) skews towards strongly agree and the mean score for non-users (3,96) skews towards agree. The level of agreement (agree and strongly agree) for both users (89,52%) and non-users (75,00%) indicates that both these groups prefer a good quality MVS that is good value for

money. Similarly, Pawlak *et al.* (2008) found that being able to afford MVS significantly affected behavioural intent in a study utilising the TPB.

4.3.11.4 I want an inexpensive multivitamin – even if it does not contain the full range of ingredients found in other brands

The mode for users (48,91%) indicates disagreement. In contrast the mode for non-users (32,69%) neither agreed nor disagree (Table 4-38).

Table 4-38: Inexpensive MVS

I want an inexpensive multivitamin – even if it does not contain the full range of ingredients found in other brands							
	SD	D	N	A	SA	Total	Mean
Users	12,23%	48,91%	15,72%	18,78%	4,37%	59,48%	2,54
	28	112	36	43	10	229	
Non-users	15,38%	25,64%	32,69%	14,10%	12,18%	40,52%	2,82
	24	40	51	22	19	156	
Total	13,51%	39,48%	22,60%	16,88%	7,53%	100,00%	2,65
	52	152	87	65	29	385	

The mean score for users (2,54) and non-users (2,82) skews towards neither agree nor disagree. The level of disagreement (strongly disagree or disagree) of users (61,14%) may indicate that this user group may not be willing to compromise the quality of their MVS over price. On the other hand, non-users (41,02%) are split between disagreeing to some extent (strongly disagree or disagree) on choosing price over quality and being unsure (32,69%).

4.3.11.5 I want a multivitamin that is personalised to my gender - has adjusted nutrient levels for men/women

The mode for users (52,40%) and non-users (34,62%) indicates agreement with wanting a MVS personalised to gender (Table 4-39).

Table 4-39: MVS personalised to gender

I want a multivitamin that is personalised to my gender - has adjusted nutrient levels for men/women							
	SD	D	N	A	SA	Total	Mean
Users	0,87%	4,37%	15,72%	52,40%	26,64%	59,48%	4
	2	10	36	120	61	229	
Non-users	7,05%	15,38%	23,08%	34,62%	19,87%	40,52%	3,45
	11	24	36	54	31	156	
Total	3,38%	8,83%	18,70%	45,19%	23,90%	100,00%	3,77
	13	34	72	174	92	385	

The mean score for users (4) signifies agreement; on the other hand, the mean score for non-users (3,45) skews towards agreeing. The level of agreement (agree and strongly agree) for users (79,04%) and non-users (54,49%) suggests that both user groups prefer a MVS tailored to their gender. However, the preference is higher among users. Interestingly, Steele and Senekal (2005) revealed that males were more likely to indicate convenience as a reason for taking DS while females cited dietary factors such as poor diet and ensuring enough intake of nutrients as reasons for taking DS. In a study by Kim *et al*. (2011), female participants utilised DS for well-being and energy improvement.

In addition, Pawlak *et al*. (2008) noted that the strongest effect on behavioural intention was the belief that MVS will enhance participants' feelings and appearance. These results corroborate those of Rofail *et al.* (2011), who indicated that women aged 17-25 cited body image and physical appearance as important motivations for MVS usage.

4.3.11.6 I want a multivitamin that is personalised to my lifestyle needs e.g., pregnant, active

The majority of users (52,84%) and non-users (51,28%) agree on a preference for a MVS tailored to their lifestyle (Table 4-40).

Table 4-40: MVS and lifestyle needs

I want a multivitamin that is personalised to my lifestyle needs e.g. active							
	SD	D	N	A	SA	Total	Mean
Users	1,31%	3,93%	16,16%	52,84%	25,76%	59,48%	3,98
	3	9	37	121	59	229	
Non-users	5,77%	7,05%	19,23%	51,28%	16,67%	40,52%	3,66
	9	11	30	80	26	156	
Total	3,12%	5,19%	17,40%	52,21%	22,08%	100,00%	3,85
	12	20	67	201	85	385	

The mean score for users (3,98) and non-users (3,66) skews towards agree. Furthermore, the level of agreement (agree and strongly agree) of users (78,60%) and non-users (67,95%) indicate that both these groups have a high preference for MVS that target their specific lifestyle or stage in their life. According to Aronsson *et al.* (2016) and Morin *et al.* (2002), being pregnant for the first time and planning a pregnancy were independent predictors of DS intake in moms. Picciano and McGuire (2009) also claimed that 50% of pregnant and breastfeeding women in North America use some type of DS.

4.3.11.7 The form of a multivitamin – tablet, liquid or chewable tablet - is more important to me than the brand I buy

The mode for users (42,36%) indicates disagreement. On the other hand, the mode for non-users (40,38%) indicates neutrality (Table 4-41).

Table 4-41: MVS form versus brand

The form of a multivitamin – tablet, liquid or chewable tablet - is more important to me than the brand I buy							
	SD	D	N	A	SA	Total	Mean
Users	14,41%	42,36%	19,65%	20,52%	3,06%	59,48%	2,55
	33	97	45	47	7	229	
Non-users	7,69%	31,41%	40,38%	16,03%	4,49%	40,52%	2,78
	12	49	63	25	7	156	
Total	11,69%	37,92%	28,05%	18,70%	3,64%	100,00%	2,65
	45	146	108	72	14	385	

A summary of the factors influencing MVS usage in the study is presented in Table 4-42 for MVS users, and in Table 4-43 for MVS non-users.

The factors influencing MVS use indicate variations amongst users and non-users of MVS. Table 4-42 for users and Table 4-43 for non-users show the attitude, subjective norm and perceived behavioural (i.e. TPB) scores in descending order, as well as a summary of the three additional factors in the study's conceptual framework.

Table 4-42: Factors influencing the usage of MVS among MVS users

Users	
Behavioural belief	**Attitude score**
Using MVS to improve health	19,37
Using MVS to obtain nutrients	18,9
Using MVS to help concentrate and stay mentally sharp	18,51
Using MVS to fight fatigue and tiredness	18,23
Using MVS to look and feel good	18
Using MVS to obtain extra energy	17,86
Using MVS to prevent common illnesses	17,06
Using MVS to deal with stress	16,83
Using MVS and unpleasant side-effects	7,22
Normative belief	**Subjective norm score**
The influence of doctors on the usage of MVS	13,97
The influence of pharmacists on the usage of MVS	11,07
The influence of family on the usage of MVS	10,48
The influence of friends on the usage of MVS	8,65
The influence of books/magazines on the usage of MVS	8,03
The influence of colleagues on the usage of MVS	7,81
The influence of in-store sales staff on the usage of MVS	7,18
Control belief	**Perceived behavioural control score**
Remembering to take MVS	12,32
Difficulty in swallowing MVS	9,9
Affordability of MVS	9,87
Knowledge of MVS	7,94
Availability of preferred MVS brand	7,77
Health-related lifestyle	
The majority of users were non-smokers (72,05%), non-drinkers (54,15%), exercised at least once a week (58,1%), described their diets as healthy to some extent (57,20%) and were satisfied with their eating habits to some extent (50,65%).	
Perceived health status	
The majority of users (72,04%) described their overall health as either good, very good or excellent.	
Health value	
Most users (84,72%) either agreed or strongly agreed that health was the most important aspect of their life and were more likely to place their health above other aspects of their life. Furthermore, users were likely to place high importance on good health as a measure of their happiness and were unlikely to prioritise different aspects of their life above good health. Overall, users in this study placed a high value on health.	

Table 4-43: Factors influencing the usage of MVS among MVS non-users

Non-users	
Behavioural belief	**Attitude score**
Using MVS to improve health	15,37
Using MVS to obtain nutrients	14,96
Using MVS to help concentrate and stay mentally sharp	14,59
Using MVS to look and feel good	14,29
Using MVS to fight fatigue and tiredness	14,21
Using MVS to prevent common illnesses	13,55
Using MVS to obtain extra energy	13,5
Using MVS to deal with stress	13,06
Using MVS and unpleasant side-effects	6,59
Normative belief	**Subjective norm score**
The influence of doctors on the usage of MVS	9,38
The influence of family on the usage of MVS	8,46
The influence of pharmacists on the usage of MVS	8,11
The influence of friends on the usage of MVS	7,3
The influence of colleagues on the usage of MVS	7,12
The influence of books/magazines on the usage of MVS	6,7
The influence of in-store sales staff on the usage of MVS	6,41
Control belief	**Perceived behavioural control score**
Difficulty in swallowing MVS	9,61
Remembering to take MVS	8,41
Affordability of MVS	8
Availability of preferred MVS brand	7,51
Knowledge of MVS	6,6
Health-related lifestyle	
The majority of non-users were non-smokers (69,87%), 50% were non-drinkers, 46,79% exercised at least once a week, 46,16% described their diets as healthy to some extent and 47,44% were satisfied with their eating habits to some extent.	
Perceived health status	
The majority of users (69,23%) described their overall health as either good, very good or excellent.	
Health value	
Most non-users (84,62%) either agreed or strongly agreed that health was the most important aspect of their life and were more likely to place their health above other aspects of their life. Furthermore, non-users were likely to place high importance on good health as a measure of their happiness and were unlikely to prioritise different aspects of their life above good health. Overall, non-users in this study placed a high value on health.	

4.4 Conclusion

This chapter focused on the presentation, interpretation and discussion of results following the key dimensions of the study. MVS users had lifestyle characteristics associated with health. Both user groups placed a high value on health; however, non-users tended to have a slightly higher perceived health status than users. Overall, users had stronger behavioural beliefs than non-users; however, both user groups showed positive attitude scores toward MVS consumption. Doctors were the only subjective norm to exert positive social pressure on users and non-users to consume MVS. All users' perceived behavioural control scores were favourable except for MVS knowledge and preferred brand availability. All non-users' perceived behavioural control scores were negative, except for MVS being hard to swallow, which was positive. Non-users were more price-sensitive when picking an advanced MVS than users. Both user groups preferred a gender-and lifestyle-specific MVS. Non-users were more ambivalent towards their preferred MVS brand than users. The next chapter presents the study's conclusions, including limitations and recommendations for marketers and future studies.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The recommendations and findings of the study are outlined in this chapter. These findings and suggestions are based on the factors affecting MVS utilisation in the greater Durban area. Chapter 2 evaluated literature and theories relevant to the study, Chapter 3 defined and supported the technique used to achieve the research objectives, and Chapter 4 reported the important findings from the data analysis. The study's ramifications, suggestions, contributions, and limits are all examined in this last chapter, along with the relationship between the study's findings and research goals.

5.2 Findings in relation to research objectives

The eight study goals were satisfied in this investigation. The sections that follow highlight the connection between the conclusion and the goals.

5.2.1 Objective 1: To explore the health-related lifestyle characteristics of multivitamin supplement users and non-users in the greater Durban area

The majority of users and non-users were non-smokers and non-drinkers in this study. In line with this finding, Block, Sinha, and Gridley (1994) found that DS users were likelier to smoke and drink less.

Non-users were more likely to never exercise compared to users and were less likely to exercise 3-4 times a week and daily when compared to users. Aligned with these findings, Al-Johani *et al*. (2020) revealed a statistically significant association between DS usage and regular physical activity. Similarly, Bailey *et al*. (2013) and Mullie *et al.* (2011) found that DS users were more inclined than non-users to exercise regularly.

On average, users tended to be slightly more satisfied with their eating habits when compared to non-users. In contrast to this finding, Duvenage, Meltzer and Chantler (2015) found that almost half of the respondents in the sample thought that their diets were inadequate. Users were more likely to describe their diets as somewhat healthy or very healthy when compared to non-users. Similarly, Tully (2014), revealed that MVS users had better diets than non-users. Furthermore, a study by Merwid-lad *et al*. (2022) revealed that the majority of DS users described their diet as being somewhat healthy or healthy. Overall, the study findings were consistent with the findings of Foote *et al*. (2003), Ishihara *et al.* (2003) and Slesinski *et al*. (1996), who found that the lifestyle characteristics of DS users are associated with health.

5.2.2 Objective 2: To determine the perceived health status of multivitamin supplement users and non-users in the greater Durban area

When asked to report on their overall health, the mode indicated that both groups perceived their health to be good; however, non-users were more likely to describe their overall health as excellent compared to users, and less likely to state that their overall health was poor when compared to users. Overall, the mean scores indicated that non-users tended to have a slightly higher perceived health status than users, suggesting that users' lower perceived health status may encourage them to use MVS. This finding is consistent with Steele and Senekal's (2005) finding that frequent supplement users rated their health as fair or worse than non-users.

5.2.3 Objective 3: To determine the value placed on health by multivitamin supplement users and non-users in the greater Durban area

Most users and non-users either agreed or strongly agreed that health was the most important aspect of their life and were more likely to place their health above other aspects. Furthermore, both user groups were likely to place high importance on good health as a measure of their happiness and were unlikely to prioritise different aspects of their life above good health. Overall, users and non-users in this study placed a high value on health. Similarly, a study conducted by Pajor *et al.* (2017) among Dutch adults found no significant differences between DS users and non-users regarding health value. In contrast, other studies have shown that DS users are more health-concerned than non-users (Block, Sinha & Gridley, 1994; Kirk *et al*., 1999). Furthermore, Conner *et al.* (2001) found evidence that individuals who place a high value on their own health are more inclined to take DS by way of precaution.

5.2.4 Objective 4: To explore the behavioural beliefs toward multivitamin supplement consumption among users and non-users of multivitamin supplements in the greater Durban area

All the mean scores of positive behavioural beliefs for users in the study skewed towards strongly agree, apart from the belief that consuming a MVS every day would help to look and feel good which had a mean of 4. On the other hand, all the mean scores of positive behavioural beliefs for non-users skewed towards agree. Furthermore, all the attitude scores for users showed a moderate to strong positive attitude about using MVS for each behavioural belief and outcome evaluation in the questionnaire. On the other hand, all the attitude scores for non-users showed a weak to moderate positive attitude. Using MVS to promote health was the most significant behavioural belief towards utilising MVS for both user categories. This finding aligns with several other studies where the main purpose of buying DS was to improve overall health (Chiba *et al*., 2017; Garcia-Cazarin *et al*., 2014; Kofoed *et al*., 2015; Pajor *et al*., 2017, Pillay and Pillay (2019).

Users and non-users had the second-highest attitude score for the behavioural belief that MVS would help get nutrients missing from the diet. This finding is consistent with past studies in which DS users were shown to utilise DS to compensate for dietary deficiencies (Aina & Ojedokun, 2014; Braun & Venter, 2008; Dickinson *et al.*, 2014; Hamulka *et al*., 2020; Merwid-lad *et al.,* 2022; Saini & Hasan, 2020; Steele & Senekal, 2005; Zezelj *et al*., 2020). Furthemore, Pawlak *et al.* (2008) found that replenishing missing nutrients with MVS was one of only two attitudes influencing the desire to use MVS. The lowest positive attitude score for users and non-users was for the belief that using MVS would help to deal with stress better. This finding is consistent with that of Braun and Venter (2005), who found that DS was used by participants to prevent stress. Furthermore, medical students in Poland took DS to manage stress (Merwid-lad *et al*., 2022). Interestingly, the main reason cited by sporadic users of DS was dealing with stress (Steele & Senekal, 2005).

5.2.5 Objective 5: To explore the normative beliefs toward multivitamin supplement consumption among users and non-users of multivitamin supplements in the greater Durban area

All the mean scores of normative beliefs for users in the study skewed towards agreeing, apart from the recommendation to use MVS from books/magazines and the recommendation to use MVS from an in-store sales staff which skewed towards neutrality. On the other hand, the mean scores of normative beliefs for non-users in the study skewed towards neutrality. Furthermore, all the subjective norm scores for users show a weak to moderate negative social pressure to use MVS, apart from doctors, pharmacists and family which showed a weak to moderate positive social pressure. On the other hand, the subjective norm scores for non-users showed a weak to moderate negative social pressure to use MVS apart from doctors, which showed a weak to moderate positive social pressure. This finding confirms the research conducted in urban areas of Rajasthan, India, which showed that doctors were the most often cited source of knowledge about MVS (Saini & Hasan, 2020). In addition, the most frequently-mentioned reason for using DS among Saudi Arabian health care attendants was guidance from health care professionals (Alsaleem *et al.*, 2021).

5.2.6 Objective 6: To explore the control beliefs toward MVS consumption among users and non-users of MVS in the greater Durban area

All the mean scores of negative control beliefs for users in the study skewed towards disagree, apart from the control belief that some MVS brands are not readily available which skewed towards neutrality. On the other hand, all the mean scores of negative control beliefs for non-users in the study skewed towards neutrality, apart from the control belief that MVS were difficult to swallow, which skewed slightly to disagree. Furthermore, all the perceived behavioural control scores for users indicated a weak to moderate level of positive control, apart from knowledge of MVS and availability

of preferred brands, which showed a weak to moderate level of negative control. This finding is supported by Merwid-lad *et al*. (2022), who found that respondents cited insufficient knowledge as one of the main reasons for not using DS.

On the other hand, all the perceived behavioural control scores for non-users showed a weak to moderate level of negative control, apart from MVS being too difficult to swallow, which showed a weak to moderate level of positive control.

5.2.7 Objective 7: To explore the type of multivitamin supplement preferred among users and non-users of multivitamin supplements in the greater Durban area

MVS users were more likely to pay a higher price for an advanced MVS than non-users. Similarly, Pillay and Pillay (2019) found that respondents listed cost and DS being a waste of money as reasons for not utilising DS. Both user groups preferred a good quality MVS that was good value for money. Aligned to this finding, Pawlak *et al.* (2008) found that being able to afford MVS significantly affected behavioural intent in a study utilising the TPB. In the current study, users indicated they were unwilling to compromise on the quality of their MVS over price. In contrast, non-users were split between disagreeing on wanting an inexpensive MVS with fewer ingredients (compared to other brands) and being unsure.

Both user groups preferred a MVS tailored to their specific lifestyle and gender, although the preference was higher among users. Interestingly, Steele and Senekal (2005) noted that males were more likely to indicate convenience as a reason for taking DS, while females cited dietary factors such as poor diet and ensuring enough intake of nutrients as reasons for taking DS. In addition, Pawlak *et al*. (2008) noted that the strongest effect on behavioural intention was the belief that MVS would enhance participants' feelings and appearance.

Users tended to be brand conscious, preferring brand over the form of their MVS. Non-users, on the other hand, were more neutral. Overall, users and non-users strongly believed that store-branded MVS might be good quality products or at least not bad quality.

5.2.8 Objective 8: To explore the marketing implications of the factors influencing multivitamin supplement usage in the greater Durban area

The study uncovered numerous implications for marketing, which are explained in further detail in section 5.3.1. An integrated marketing communications strategy targeting potential MVS users should include the most important benefits of MVS (as identified in the study), which include minimising the risks of a poor diet by helping to obtain missing nutrients, improving and maintaining good health and assisting with concentration and staying mentally sharp. MVS non-users exercised less frequently than users. Therefore, marketers should highlight that MVS can provide extra energy and help fight fatigue

and tiredness which will assist in exercising more regularly. These marketing campaigns should be framed in the context of doctors, pharmacists or close family as reference categories and highlight intended use, affordability, availability and quality as inherent themes. Marketers can customise these campaigns for MVS products tailored to lifestyle and gender.

5.3 Recommendations for marketers and future researchers

The stakeholders in the healthcare and pharmaceutical industries will find this study's contribution to the body of knowledge on health and pharmaceutical marketing useful. Therefore, the following recommendations are given for researchers and marketing practitioners.

5.3.1 Recommendations for marketers

Based on the findings of this study, marketers should consider the health and lifestyle, behavioural, normative and control beliefs of MVS users and non-users to help inform product development and marketing communication.

5.3.1.1 Health-related lifestyle, perceived health status and value placed on health: Implications for marketing

Non-users in the study were less satisfied with their eating habits and described their diets as less healthy than users. Marketers should bridge this gap by tailoring their advertising campaigns to focus on the risks of a poor diet and how MVS can minimise this risk. Overall, MVS non-users exercised less than users; therefore, marketing campaigns should emphasis how MVS can provide extra energy and help fight fatigue and tiredness to assist in exercising more regularly. Non-users had a higher perceived health status when compared to users. Marketers should therefore focus on how MVS will help to maintain good health in advertising campaigns in order to target new users of MVS. In addition, advertising campaigns should focus on the importance of health in the grand scheme of life and how MVS use can support this, as both user groups place a high value on health.

5.3.1.2 Behavioural beliefs: Implications for marketing

MVS non-users tended to lean towards agreement on all behavioural beliefs and overall had a weak to moderate positive attitude in favour of using MVS. It is clear from the research that MVS non-users may have the intention to consume MVS in terms of the TPB. Marketers should therefore adjust their communication in order to convert the behavioural intentions of MVS non-users into usage. Marketing aimed at adult MVS usage should include focus on the benefits of MVS to improve health, help in obtaining nutrients missing from the diet and assist with concentration and staying mentally sharp. These three beliefs received the highest attitude scores for both users and non-users and can be considered drivers of MVS consumption for both user groups. Focusing on these benefits in marketing campaigns could help to grow the MVS sub-category in SA by gaining new customers.

5.3.1.3 Normative beliefs: Implications for marketing

Positive social pressure from doctors is an important factor in the consumption of MVS for both user groups. Marketers should take advantage of the high motivation to comply with doctors revealed by non-users, as recommendations to use MVS from doctors was lacking for non-users. Marketers must ensure MVS sales representatives adequately target general practitioners and provide doctors with the required product knowledge. Research has shown that healthcare professionals felt their knowledge of VS from the university degree level was insufficient when advising patients (Stanojevic-Ristic *et al*., 2017). Sales representatives can provide free MVS samples to doctors to distribute to patients who may need them. This will assist in bringing new users into the MVS sub-category, as this study revealed that non-users of MVS were price-sensitive and may be hesitant to try MVS due to the cost versus benefit factor.

In addition, the second-highest subjective norm score for users and third-highest for non-users was for pharmacists. Marketers should target pharmacists at local and national pharmacy stores and chains. Offering product information (leaflets) and free samples to pharmacists (to offer to patients) may assist in bringing current non-users into the category. In addition, the placement of posters and advertising on digital screens within pharmacies can further assist. Messages on the posters and digital screens can direct shoppers to the pharmacist, who can provide further information on the product. The primary merchandising space for MVS can be the pharmacy's over-the-counter section during the advertising campaigns. Furthermore, in-store sales staff working in the MVS aisle of health stores and pharmacies should be trained to direct customers to the responsible pharmacist within the pharmacy or health store.

Interestingly the influence of family ranked in second place for non-users and third for users. Marketing messages that use close family members as a reference group may have a positive impact on non-user adults' perceptions of the advantages of MVS usage.

5.3.1.4 Control beliefs: Implications for marketing

The negative level of control for non-users included remembering to take MVS, affordability of MVS, knowledge of MVS and availability of preferred brands. Two of these negative control beliefs were also revealed for users in the study: knowledge of MVS and availability of preferred brands.

Marketers should educate existing and potential customers on the benefits of MVS. This can be achieved through educational campaigns via television or radio shows, as well as social media campaigns via Facebook and Instagram. Facebook and Instagram are justified starting points for these campaigns as these are two of SAs largest social media platforms with 27 million and 10 million users respectively (Ornico, 2022). Additionally, these educational campaigns should preferably incorporate recommendations from doctors, as this is an important social influencer for both user groups in the study.

In terms of availability, marketers must ensure that their brands are readily available both online and at store level, as this is a concern for both user groups. Subscription and delivery options can be tailored to each customer, ensuring they are not disappointed when the pharmacy or store runs out of their preferred brand.

Regarding affordability, MVS manufacturers could develop cost-effective MVS in smaller pack sizes for marketers to offer to new users. In addition, marketers can approach government to subsidise cost-effective MVS for doctors and nurses to prescribe (to patients who need it) at public hospitals and clinics, if this is not already done.

MVS businesses can develop and market various formats of MVS for those customers who find it difficult to remember to take MVS. For example, gummy format MVS can be snacked on while at work and powdered versions can be sprinkled on cereals or used in a morning shake. These formats can assist consumers in remembering to take their MVS everyday as it will fit into their existing routines.

5.3.1.5 Type of multivitamin supplements preferred: Implications for marketing

This study indicated that non-users of MVS are price sensitive and prefer an all-round MVS that is good value for money. Marketers should market MVS bulk value packs emphasising the well-rounded list of vitamins and minerals that will appeal to the general consumer irrespective of demographics.

The study also indicated that both users and non-users preferred an MVS tailored to their gender, as well as a MVS tailored to their lifestyle needs. MVS manufacturers could design and offer specific MVS with adjusted nutrient levels for males and females. Instead of consumers purchasing a MVS exclusively for gender or an active lifestyle, this can be combined into one MVS such as an MVS targeting active females. Marketers need to ensure that a broad category of MVS is affectively marketed to each market segment. For example, an MVS targeted toward active males or females can be framed in the context of an active person or athlete as a reference category. This may create positive influences on the benefits of MVS consumption for active consumers. MVS can be promoted at gyms or sports events across the country. Sponsorship of sports events with free samples for participants may also aid in bringing new users to the category. Similarly, MVS targeted towards pregnant females should be framed in the context of a pregnant women emphasising the essential vitamins and minerals needed for pregnant women.

Users and non-users strongly believed that store-branded MVS might be good quality products or at least not bad quality. Marketers of store branded MVS should emphasise the high quality and low cost of their brands in marketing campaigns. This could possible bring new MVS users into the category, as MVS non-users are price sensitive.

5.3.2 Recommendations to future researchers

This study was conducted in the greater Durban area of KwaZulu-Natal. Future researchers can extend the study to the entire province of KwaZulu-Natal, other provinces, or other cities within SA.

Past research has indicated that demographic characteristics such as gender (Algaeed *et al*., 2019; Alsaleem *et al*., 2021; Awad and Al-Shaye, 2014; Azizi *et al*., 2010; El Khoury, Ramadan, and Zeeni, 2015; Spencer *et al*., 2006), age and education level (Aronsson, *et al*., 2013; Gahche *et al.,* 2017; Jun *et al.,* 2020) may influence the use of DS. Further research can be conducted via a quota sample to ascertain whether these demographic characteristics influence the use of MVS in SA. In addition, demographic characteristics such as race and marital status can be explored in relation to MVS usage. Studies by Pawlak *et al*., 2005 and Pawlak *et al.*, 2008 revealed differences in beliefs toward MVS amongst African-American and Caucasian college students.

This study did not include sporadic or lapsed users of MVS. Past research indicates that sporadic users may have different reasons for using MVS (Steele & Senekal, 2005). Future research could include these user groups to determine their beliefs concerning MVS use.

5.4 Limitations of the study

This study was subject to some limitations. First, due to budget and time constraints a non-probability convenience sample was used. Therefore, the findings could not be generalised to the entire population. Second, due to the COVID-19 pandemic, shopping malls were hesitant to grant gatekeeper permission to the researcher, even though contact-based research was permissible under the restrictions that applied at the time. Hence the study was limited to those shopping malls in the greater Durban area that provided gatekeeper permission. Finally, this study may have been influenced by self-report bias since it relied on respondents' own accounts.

5.5 Contributions of the study

Based on the researcher's knowledge, this study was the first investigation of the usage of MVS by consumers in SA's general population. Other South African research studies examined the larger category of DS among the student population (Pillay & Pillay, 2019; Steele & Senekal, 2005), health food store customers (Braun & Venter, 2008) and under-16 rugby players (Duvenage, Meltzer & Chantler, 2015). This study therefore addressed this gap by exploring the factors influencing the usage of MVS in the general population and the implications for marketing. The research findings will potentially aid retailers, marketers and manufacturers of MVS by contributing to overall brand strategy optimisation, including positioning and communication, to generate brand growth. The findings could also contribute to current government policies on nutrition.

5.6 Conclusion

This study aimed to explore the underlying beliefs towards MVS usage among users and non-users of MVS. The purpose was to gain insights into the drivers and barriers of MVS consumption to suggest appropriate marketing insights that can be adopted to grow the category. This final chapter summarised the main findings in relation to the study's eight research objectives. The study's contributions and constraints were acknowledged, and suggestions were provided for future researchers and marketers.

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APPENDIX A: QUESTIONNAIRE

Section A: Demographics

1. Do you currently live in the greater Durban area? The greater Durban area includes Central Durban and surrounding suburbs in Durban North, South, and West.

	Close
Yes	No
1	2

2. Age Group

Under 18	18 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 or older
Close	1	2	3	4	5	6

3. Gender

Male	Female
1	2

4. Race

Black	White	Indian	Coloured	Other
1	2	3	4	5

5. Marital Status

Single	Married
1	2

6. Highest Education Obtained

Matric	Diploma	Degree	Postgraduate Degree	Other
1	2	3	4	5

Section B: Health and Lifestyle

7. Do you currently take a multivitamin supplement? A multivitamin supplement is a preparation intended to serve as a dietary supplement with vitamins and dietary minerals. Such preparations are available in the form of tablets, capsules, pastilles, powders, liquids, or injectable formulations.

Yes	No
1	2

8. How often do you smoke?

Never	Occasionally	1-2 times per week	3-4 times per week	5-6 times per week	Daily
1	2	3	4	5	6

9. How often do you consume alcohol?

Never	Occasionally	1-2 times per week	3-4 times per week	5-6 times per week	Daily
1	2	3	4	5	6

10. How often do you exercise?

Never	Occasionally	1-2 times per week	3-4 times per week	5-6 times per week	Daily
1	2	3	4	5	6

11. Which of the following words best describes your overall health?

Poor	Fair	Good	Very Good	Excellent
1	2	3	4	5

12. How satisfied are you with your eating habits?

Very unsatisfied	Somewhat unsatisfied	Neither satisfied nor unsatisfied	Somewhat satisfied	Very satisfied
1	2	3	4	5

13. Which of the following words best describes how healthy your diet is?

Very unhealthy	Somewhat unhealthy	Neither healthy nor unhealthy	Somewhat healthy	Very healthy
1	2	3	4	5

14. How much do you AGREE OR DISAGREE with each of the following statements?

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
14.1 If you don't have your health you don't have anything	1	2	3	4	5
14.2 There are many things I care about more than my health	1	2	3	4	5
14.3 Good health is only of minor importance in a happy life	1	2	3	4	5
14.4 There are only a few things more important than good health	1	2	3	4	5

Section C: Behavioural Beliefs

15. How much do you AGREE OR DISAGREE with each of the following statements?

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
15.1. Taking a multivitamin supplement everyday would improve my health	1	2	3	4	5
15.2. Being healthy is important to me	1	2	3	4	5
15.3. Taking a multivitamin supplement everyday would help me to get nutrients I do not get in my diet	1	2	3	4	5
15.4. Getting all the nutrients I need is important to me	1	2	3	4	5
15.5. Taking a multivitamin supplement everyday would give me extra energy	1	2	3	4	5
15.6. Getting extra energy is important to me	1	2	3	4	5
15.7. Taking a multivitamin supplement everyday would help me look and feel good.	1	2	3	4	5
15.8. Looking and feeling good is important to me	1	2	3	4	5
15.9. Taking a multivitamin supplement everyday would prevent me from getting the cold, flu, or other common illnesses	1	2	3	4	5
15.10. Not getting the cold, flu, or other common illnesses is important to me	1	2	3	4	5
15.11. Taking a multivitamin supplement everyday would help me fight fatigue and tiredness	1	2	3	4	5
15.12. Fighting fatigue and tiredness is important to me	1	2	3	4	5
15.13. Taking a multivitamin supplement everyday would help me to deal with stress better	1	2	3	4	5
15.14. Dealing with stress in a better way is important to me	1	2	3	4	5
15.15. Taking a multivitamin supplement everyday would help me to concentrate and stay mentally sharp	1	2	3	4	5
15.16. Concentrating and staying mentally sharp is important to me	1	2	3	4	5
15.17. Taking a multivitamin supplement everyday would cause unpleasant side-effects	1	2	3	4	5
15.18. Unpleasant side-effects are a concern for me	1	2	3	4	5

Section D: Normative Beliefs

16. How much do you AGREE OR DISAGREE with each of the following statements?

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
16.1. My family (e.g., parents, siblings) thinks I should take a multivitamin supplement everyday	1	2	3	4	5
16.2. It is important to me what my family thinks about me taking multivitamin supplements	1	2	3	4	5
16.3. My friends approve of me taking a multivitamin supplement everyday	1	2	3	4	5
16.4. It is important to me what my friends think about me taking multivitamin supplements	1	2	3	4	5
16.5. My colleagues approve of me taking a multivitamin supplement everyday	1	2	3	4	5
16.6. It is important to me what my colleagues think about me taking multivitamin supplements	1	2	3	4	5
16.7. My doctor wants me to take a multivitamin supplement everyday	1	2	3	4	5
16.8. It is important to me what my doctor thinks about me taking multivitamin supplements	1	2	3	4	5
16.9. The book/magazine I read recommended I take a multivitamin supplement everyday	1	2	3	4	5
16.10. It is important to me what my book/magazine says about taking multivitamin supplements	1	2	3	4	5
16.11. An in-store sales staff member has recommended I take a multivitamin supplement everyday	1	2	3	4	5
16.12. It is important to me what in-store sales staff say about taking multivitamin supplements	1	2	3	4	5
16.13. A pharmacist has recommended I take a multivitamin supplement everyday	1	2	3	4	5
16.14. It is important to me what pharmacists say about taking multivitamin supplements	1	2	3	4	5

Section E: Control Beliefs

17. How much do you AGREE OR DISAGREE with each of the following statements?

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
17.1. It would be difficult for me to remember to take a multivitamin supplement everyday	1	2	3	4	5
17.2. Remembering to take multivitamin supplements would make taking them more difficult	1	2	3	4	5
17.3. I can afford buying multivitamin supplements	1	2	3	4	5
17.4. The cost of multivitamin supplements would prevent me from taking them	1	2	3	4	5
17.5. I don't have enough knowledge about multivitamins	1	2	3	4	5
17.6. Not having enough knowledge about multivitamins would prevent me from taking them	1	2	3	4	5
17.7. Some multivitamin supplement brands are not readily available	1	2	3	4	5
17.8. Non-availability of my preferred multivitamin supplement brand will prevent me from taking them	1	2	3	4	5
17.9. Multivitamin supplements are difficult to swallow	1	2	3	4	5
17.10. Not being able to swallow multivitamin supplements easily would prevent me from using them	1	2	3	4	5

Section F: Psychographics

18. How much do you AGREE OR DISAGREE with each of the following statements?

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
18.1. Store branded multivitamins are not good quality e.g., Clicks, Dis-Chem	1	2	3	4	5
18.2. I want the best, most advanced multivitamin – even if it costs more than other brands	1	2	3	4	5
18.3. I want a good, all-round multivitamin that is good value for money	1	2	3	4	5
18.4. I want an inexpensive multivitamin – even if it does not contain the full range of ingredients found in other brands	1	2	3	4	5
18.5. I want a multivitamin that is personalised to my gender - has adjusted nutrient levels for men/women	1	2	3	4	5
18.6. I want a multivitamin that is personalised to my lifestyle needs e.g., pregnancy, active	1	2	3	4	5
18.7. The form of a multivitamin – tablet, liquid, or chewable tablet - is more important to me than the brand I buy	1	2	3	4	5

End of Questionnaire

APPENDIX B: INFORMED CONSENT LETTER

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL

For research with human participants

Information Sheet and Consent to Participate in Research

Date:

Greetings,

My name is Mohamed Suleman (Cell no: 0670156333; Email: 204508862@stu.ukzn.ac.za) and I am a M Com (Marketing) student in the School of Management, Information Technology and Governance, at the University of KwaZulu-Natal. My supervisor is Dr A Arbee (Email: arbee@ukzn.ac.za).

You are invited to consider participating in a research project entitled, Factors Influencing the use of Multivitamin Supplements: Implications for Marketing. The aim of the study is to understand the factors that promote as well as prevent multivitamin supplement consumption amongst users and non-users of multivitamin supplements. The study is expected to include 385 respondents who are 18 years of age and above. If you choose to participate and remain in the study, you will be asked to complete a questionnaire, which should take you 10-15 minutes to complete.

Through your participation, I hope to understand the beliefs that users and non-users have toward multivitamin supplements and their attitudes toward health. The results of this survey are intended to contribute to filling the knowledge gap on the factors that influence the usage of multivitamin supplements. This study will help government, retailers, marketers, and manufacturers of multivitamin supplements to devise effective strategies to increase multivitamin supplement use. The study will not involve any risks and/or discomforts.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSSREC/00003892/2022).

In the event of any problems or concerns/questions you may contact the researcher at (Cell no: 0670156333; Email: 204508862@stu.ukzn.ac.za) or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

RESEARCH OFFICE, WESTVILLE CAMPUS

GOVAN MBEKI BUILDING

Private Bag X 54001
Durban 4000
KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequence. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance and your responses will not be used for any purposes outside of this study.

All data, both electronic and hard copy, will be securely stored during the study and archived for 5 years. After this time, all data will be destroyed.

If you have any questions or concerns about participating in the study, please contact me or my research supervisor at the numbers listed above.

Sincerely

Mohamed Suleman

CONSENT TO PARTICIPATE

I (_____) have been informed about the study entitled Factors Influencing the use of Multivitamin Supplements: Implications for Marketing by Mohamed Suleman (Cell no: 0670156333; Email: 204508862@stu.ukzn.ac.za).

I understand the purpose and procedures of the study.

I have been given an opportunity to ask questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at Cell no: 0670156333; Email: 204508862@stu.ukzn.ac.za.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

RESEARCH OFFICE, WESTVILLE CAMPUS

GOVAN MBEKI BUILDING

Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 - Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

_____ _____

Signature of Participant **Date**

_____ _____

Signature of Witness **Date**

(Where applicable)

_____ _____

Signature of Translator **Date**

(Where applicable)

APPENDIX C: ETHICAL CLEARANCE APPROVAL LETTER

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

08 May 2022

Mohamed Yaseen Ahmed Suleman (204508862)
School Of Man Info Tech & Gov
Westville Campus

Dear MY Ahmed Suleman,

Protocol reference number: HSSREC/00003892/2022
Project title: Factors influencing the usage of multivitamin supplements in the greater Durban area: Implications for marketing
Degree: Masters

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 25 February 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 08 May 2023.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)

/dd

APPENDIX D: GATEKEEPER PERMISSIONS

The Pavilion Shopping Centre, Jack Martens Drive, Westville | P.O. Box 111, Pavilion,3611
Tell: +27(31) 275 9800 | Email: enquiries@thepav.co.za | www.thepav.co.za
Proudly owned and managed by Pareto Limited

The Pavilion Shopping Centre
Jack Martens Drive
Westville
3611,

10 February 2022,

Dear Mohamed Ahmed Suleman,

Kindly note The Pavilion Shopping Centre has approved the below mentioned Research to take place within the **Centre**.

Permission has been granted to Mr Mohamed Ahmed Suleman (UKZN Student NO: 204508862) to conduct research to approach consumers that shop at The Pavilion and to identify factors influencing the usage of multivitamin supplements in the greater Durban area: Implications for marketing.

Please contact me if you have any further queries.

Kind Regards,

The Pavilion Fraud Hotline: 0800 333 615 or SMS "FRAUD" to 33000 for a call back
FOR MORE INFO VISIT
www.thepav.co.za

EXCELLERATE

JHI

Excellerate Real Estate Services (Pty) Ltd t/a JHI
Reg. No. 2007/021131/07
VAT No. 4710256407

Chatsworth Centre
17 Joyhurst Street, Chatsworth
P.O. Box 56721, Chatsworth, 4030

Tel +27 31 403 5451
www.excellerateihi.com

11 February 2022

Mr Mohamed Ahmed Suleman

Via email: 204508862@stu.ukzn.ac.za

To Whom it May Concern,

RE: PERMISSION TO CONDUCT MALL INTERCEPT INTERVIEW AT CHATSWORTH CENTRE

We refer to the above matter and confirm that we are the Managing Agent of Chatsworth Centre situated at 17 Joyhurst Street, Westcliff, Chatsworth, 4092 as appointed by the Owner, herein referred to as Sanlam Life Insurance Limited, and as such we are duly authorised to address this communication to you.

We confirm that permission is granted to Mr Suleman with student number 204508862 to conduct interviews at Chatsworth Centre on dates and/or times to be pre-agreed upon with Mustard Seed Relationship Marketing.

Should you require any further information, please don't hesitate to contact me.

Yours faithfully,

Raveshin Veerasamy
Portfolio Manager
Excellerate JHI

SUBMITTED ELECTRONICALLY THEREFORE UNSIGNED

Tel: +27 31 403 5451

Email: Raveshin.Veerasamy@excelleratejhi.com

EXCELLERATE **JHI**

Excellerate Real Estate Services (Pty) Ltd t/a JHI
Reg. No. 2007/021131/07
VAT No. 4710256407

The Crescent Shopping Centre
1-3 Sunset Crescent
Umhlanga Ridge, 4319
P .O Box 25462, Gateway, 4320

Tel +27(0) 31 566 2887
www.excelleratejhi.com

10 February 2022

Dear Mr Mohamed Ahmed Suleman
Student Number: 204508862

RE THE CRESCENT – CONDUCT OF SURVEY

Kindly be advised that you have been granted permission to conduct your survey at The Crescent Shopping Centre at Umhlanga Ridge.

Once you have confirmed the dates, kindly advise Centre Management via email on kalpana.ramsamy@excelleratejhi.com, in order for a memo to be distributed to the Centre Tenants and security.

Kindly retain your permission letter and the UKZN Masters research study letter during 5 day interview process.

Should you require any information, please don't hesitate to contact me.

Yours faithfully

[redacted]

Kalpana Ramsamy
Marketing Manager
031 5662887

Mohamed Ahmed Suleman (204508862)

From: Adele Ephraim <Adele.Ephraim@excelleratejhi.com>
Sent: Thursday, 10 February 2022 14:59
To: Mohamed Ahmed Suleman (204508862)
Cc: Lara Gracie; Samantha Thango
Subject: RE: UKZN: Masters Research Study

Dear Mohamed

I am well thank you and I trust that you are too

We will be happy to accommodate you at the Mall, preferably early on in March 2022 only.

Please can you contact us when you have earmarked your dates so that we can inform the necessary parties concerned before you commence.

@Samantha Thango – please note and assist.

Have a lovely afternoon.

Kind regards,

Adele Ephraim | Marketing Manager
Excellerate Real Estate Services (Pty) Ltd t/a JHI
Cornubia Mall, Cnr Flanders & Tacoma Drive Blackburn Estate, Mount Edgecombe,
T: 0845585550 | M: 084 558 5550
Adele.Ephraim@excelleratejhi.com | www.excelleratejhi.com

Mohamed Ahmed Suleman (204508862)

From: Cindene Sheasby <csheasby@growthpoint.co.za>
Sent: Thursday, 17 February 2022 08:31
To: Mohamed Ahmed Suleman (204508862)
Subject: FW: UKZN: Masters Research Study

Dear Mohamed

Permission is granted for this survey to take place at City View Mall.

Please advise when you would like to proceed with this?

Thank you

Cindene Sheasby
Retail Sector

GROWTHPOINT PROPERTIES
Tel: +27 87 350 7681
Fax: +27 86 686 5049
Mobile: +27 83 559 9073
La Lucia Mall, 90 William Campbell Drive, La Lucia, Durban North, KwaZulu-Natal, 4051
P.O. Box 1330, La Lucia, KwaZulu-Natal, 4330, South Africa
csheasby@growthpoint.co.za
www.growthpoint.co.za

GROWTHPOINT *space to thrive*