



UNIVERSITY OF THE
WITWATERSRAND,
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**Access to non-sugar and sugar sweetened beverage:
Pricing and promotion in large and small retail stores in
Umlazi, KwaZulu Natal**

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A research report submitted to the School of Public Health in partial fulfilment of the requirement for the Degree of Master of Public Health, in the field of Social and Behaviour Change Communication.

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DECLARATION

I, Phumlani Khwela, certify that the following research is my original work, other than what is contained within acknowledgements and references. I am submitting this research report in partial fulfilment of the requirement for the completion of the degree of Master of Public Health in the field of Social and Behaviour Change Communication, at the University of the Witwatersrand. It has not been submitted before for any degree or examination at this university or any other. The University of the Witwatersrand Human Research and Ethics Committee approved this study (Clearance certificate Ref No: M180243).

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ABSTRACT

Background: Sugar is being renounced as the new tobacco by academics and health experts because it has been identified as a risk associated with obesity and developing other non-communicable diseases. South Africa was ranked 15th by WHO in terms of health risks of developing NCDs amongst 194 countries. Consumption of sugar sweetened beverages in particular is associated with weight gain and obesity. Health experts are concerned that health promotion strategies without regulatory policies may be insufficient to address levels of consumption in South Africa. Urbanization is increasing in the country with people moving to Black township areas, resulting in an increase in the emergence of retail shops and shopping malls. Therefore there is a focus on the retail environment in order to understand how it contributes to the consumers purchasing decisions between non-sugar and sugar sweetened beverages. The aim of the study was to assess how product shelf availability, pricing and promotion of sugar sweetened beverages versus non-sugar sweetened beverages differs in small and large retail shops in Umlazi, KwaZulu Natal.

Methodology: A descriptive and analytic cross-sectional study was conducted between 2018 and 2019. A census was conducted of all 61 retail shops (supermarkets and spaza shops) in the four sections of Umlazi. Consent for data collection was obtained from shop managers or owners. Data were captured by the researcher and research assistant using a data collection tool. Data were collected on retail shop size, selected pre-determined list of sugar sweetened beverages and non-sugar sweetened beverages available, price and promotion. Beverages were then categorized into the following categories; carbonated sugar sweetened beverages, carbonated non-sugar sweetened beverages, non-carbonated sugar sweetened beverages and non-carbonated non-sugar sweetened beverages. Data on the availability and price for different sizes of each of the selected products was also obtained. For continuous variables such as price per litre data were presented using means and standard deviations, while proportions were used to report on the availability and promotion which were categorical variables. A test of proportions was used to compare the availability and promotions in large and small shops while a ttest was used to compare prices for different beverage categories and sizes in large and small shops.

Results: The response rate for the study was 87% with 53 out of 61 shops consenting for data collection to take place. Of the 53 shops 32.1% were categorized as large and 64.2% were categorized as small. The main findings of this study indicate that from our selected pre-determined list of beverages a greater proportion of all beverages and different sizes were available in large shops compared to small shops. Carbonated sugar sweetened beverages had high proportion available in large and small shops whereas carbonated non-sugar sweetened beverages had high proportion available in large shop as compared to small shops (59.1% vs. 11.5%). Non-carbonated sugar sweetened beverages and non-sugar sweetened beverages were the least available beverages from the selected list of beverages in small shops as compared to large shops. The average price per litre for carbonated sugar sweetened beverages was noticeably cheaper in small shops as compared to large shops; similarly carbonated non-sugar sweetened beverages were also cheaper in small shops however carbonated non-sugar sweetened beverages were less represented in small shops as previously noted. The price for non-carbonated beverage categories was cheaper in large shops as compared to small shops. The average price per litre for selected carbonated sugar sweetened beverages becomes cheaper as the volume size increases in both large and small shops, indicating that it is cheaper to buy large volume sizes of carbonated sugar sweetened beverages than small volume sizes. Any promotional activities were frequently found to be disproportionately in favour of carbonated sugary beverages particularly in large shops where most of the any promotional activities were undertaken.

Conclusion: There is a mark difference in access to sugar sweetened beverages and non-sugar sweetened beverages through pricing and promotion in small versus large retail shops in a township in KwaZulu Natal. The small shops has less beverage options available than large shops. The small shops trade more of the cheap no-brand name sugar sweetened beverages as compared to large shops who had more options available; however large shops are not applying in-store promotional activities to promote healthier beverages choices. As South Africa progressively moves towards implementing the National Development Plan 2030, goal number four that aims to significantly reduce the prevalence of non-communicable chronic diseases. The researcher recommends a multi-disciplinary approach in order to raise awareness about the consequences of poor beverage choices at the point of sale and for public health policy makers to implement regulatory mechanisms which includes in-store retail environment.

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Nomenclatures

Added sugars: are sugars that are not naturally found in beverages or food products such as monosaccharide (glucose, fructose) and disaccharides (sucrose or table sugar), which are added to foods and drinks by the manufacturer, cook or consumer (Fitch and Keim, 2012)

Carbonated beverage: A liquid drink or beverage that has had carbon dioxide added to it under high pressure (Solanke et al., 2017)

Epidemiological Transition: shift from a high prevalence of infectious disease associated with malnutrition, food insecurity and poor sanitation, to the high prevalence of chronic disease associated with urbanisation in developing countries (Popkin and Mendez, 2006)

Free sugars: are monosaccharide and disaccharides added to foods and beverages by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates both natural and added (Fitch and Keim, 2012)

Nutrition Transition: the changes in dietary patterns and nutrient intakes when populations adopt modern lifestyles with a change from traditional foods to fat, sugar and refined foods during economic, social development and urbanization (Steyn and Mchiza, 2014)

Non-sugar-sweetened beverage: are all types of non-alcoholic sugar free beverages containing non-caloric artificial sweeteners (Popkin, 2012)

Sugar-sweetened beverage: are all types of non-alcoholic beverages containing free sugars and these include carbonated or non-carbonated soft drinks, fruit/vegetable juices and caloric sodas, liquid and powder concentrates, flavoured water, energy and sports drinks, ready-to-drink tea, ready-to-drink coffee, and flavoured milk drinks (Popkin, 2012)

Chapter 1: Introduction

This chapter looks at the literature looking specifically at access to sugar sweetened beverages (SSBs) and non-sugar sweetened beverages (non-SSBS) in retail stores. The chapter reviews the impact that these beverages have on weight gain and their contribution to specific health risks like obesity and diabetes. The chapter also looks at some of the measures that have been adopted to ameliorate the impact and demand of sugar sweetened beverages and the extent to which these efforts have been successful. A focus is drawn to the South African context challenges including the specific impact so far and the corresponding solutions being adopted.

For the purposes of this study, sugar-sweetened beverages (carbonated and non-carbonated) are defined as follows: caloric, sweetened soda; fruit drinks (including 100% fruit juices); sport drinks; and energy drinks, and beverages containing added sugars. Consumers of SSBs were defined as individuals who consumed >0 kcal of SSBs based on their Day-1 dietary intake assessment (Mathias et al., 2013).

1.1 Background

The increasing prevalence of non-communicable diseases has become the focus of many studies globally. World Health Organization reported that more than half of all deaths worldwide in 2005 were attributable to non-communicable diseases (NCDs), such as heart diseases, diabetes and cancers, totaling 35 million deaths, the number increased to 38 million deaths in 2014, and an estimated 85% of the deaths were reported in developing countries WHO (2014). In a systematic review of the evidence on burden of non-communicable diseases in Africa, Adeloje (2015) states that despite the increase in the awareness, the African continent will have the highest number of deaths due to non-communicable diseases by 2030. In 2014, the World Health Organization, reported that the incidence of cancer will increase by 75% globally over the next 20 years, and suggests that interventions which

focuses on prevention of obesity, smoking and alcohol intake will play a crucial role in mitigation of cancer incidence rates (WHO, 2014b).

The 2012 South African National Health and Nutrition Examination Survey (SANHANES) reported an obesity rate of 39.2% among females and 10.6% among males (Shisana et al., 2014). The increasing rate of urbanization in South Africa is associated with increased levels of obesity, and several studies have established a positive link between sugar consumption and the population's level of obesity (Crino et al., 2015). The findings from a study by Te Morenga et al. (2013) also showed a powerful link between the increased consumption of SSBs and increase in the body weight of adults. Several studies show that individuals with increased consumption of SSBs are associated with an increased risk of developing type 2 diabetes (Crino et al., 2015, Te Morenga et al., 2013, Sleddens et al., 2011, Hu and Malik, 2010).

International studies shows that sugar intake from sugar sweetened beverages largely includes added sugars such as sucrose and fructose which are of poor nutritional value and results in an increased total energy intake leading to weight gain and other associated life-style diseases (Hu and Malik, 2010, Gulati and Misra, 2014, Claro et al., 2012). Majority of the studies indicates that there is a difference between sugar intakes from healthier foods such as fruits, whole grains than sugar intake from SSBs (Leung et al., 2018, Hu and Malik, 2010, De Ruyter et al., 2012).

Sugar has been renounced as the new tobacco by various health experts, because it has been identified as a risk associated with developing NCDs (Shankar et al., 2013). There's growing evidence that shows that excess sugar intake has no health benefit for the human body, and therefore sugar should be classified as a toxic chemical substance, similar to how tobacco and alcohol are currently classified (Shankar et al., 2013, De Ruyter et al., 2012). A growing body of evidence indicates that consumption of sugar sweetened beverages (SSBs) is directly influenced by exposure to SSBs and that children and adolescents are the main targets for in-store promotional advertisement strategies (Koordeman et al., 2010, Gulati and Misra, 2014).

South Africa is experiencing a quadruple burden of disease and further compounded by the epidemiological transition from communicable disease to non-communicable diseases WHO

(2014). In South Africa closely related to the prevalence of NCDs is the recent change in dietary habits from the traditional foods, to more a 'western' diet that has high added refined sugars and saturated fats with low essential nutrients such as processed foods and sugar sweetened beverages (Micklesfield et al., 2013, Steyn and Mchiza, 2014). Amongst the 40 Sub-Saharan African (SSA) countries which were examined by Abrahams et al. (2011) to identify each country's stage of nutrition transition, South Africa received the highest score of six, which is the last phase of the nutrition transition. These findings confirm that South African's dietary habits have shifted away from the traditional plant-based foods that are high in essential nutrients, to a more western diet (Steyn and Mchiza, 2014). An exploratory study conducted in Soweto, showed an increase in preference for sugary beverage and chocolates amongst 13 to 17 year olds in Soweto due to the wide availability and accessibility of the fast foods and sugary drinks in commercial and informal outlets, which was greatly influenced by the lower prices of SSBs from informal vendors and spaza shops in low income groups (Yah, 2014).

The Department of Health has responded to the increasing levels of obesity and NCDs by developing a strategic plan for the prevention and control of NCDs for 2013–2018, and a National Strategy for the prevention and control of obesity 2015–2020 (Department: National Treasury, 2016). These strategies aim to reduce obesity prevalence by 10 per cent by 2020 and subsequently the National Treasury department (SA) released a policy paper on the proposal of 20% taxation on all sugar sweetened beverages in the country, as a cost effective strategy to address diet related disease, and to correct market failures by acting as a price signal that aims to influence consumer's purchasing decision (Department: National Treasury, 2016).

Supermarket environments influence consumers' choice of beverage through the type of beverage products that is readily accessible to the consumer (Feeley et al., 2012). Supermarkets are the main retailers of SSBs in South Africa (Tugendhaft et al., 2016, Ndlovu et al., 2018). Due to the increased focus on the negative effects of SSBs, South African government and other non-profit organizations have begun to focus on the retail environment to ensure that healthier beverage options are available and accessible in retail stores (Phillips et al., 2016, Butzlaff and Minos, 2016). The retail environment is recognized as one of the

important value chain links as it is where the manufacturers' products are made available to consumers, and where pricing and promotion of beverages takes place (Clemitson, 2016). Strategic promotion of SSBs such as discounts on sale price, special combos such as buy one get one free accounts for 30 percent to 40 percent of all supermarket sales (Clemitson, 2016). Understanding the types of beverages that are more accessible to the consumers through in-store marketing strategies in large shops versus small shops might provide more information that might help to begin to understand consumer's purchasing choice between sugary and non-sugary beverages.

1.2 Literature Review

1.2.1 Contribution SSBs to Obesity

There is growing evidence that the prevalence and ubiquity of sugar sweetened soft drinks causes weight gain and obesity (Bergen and Yeh, 2006). Following their own study, the authors even suggest that the increasing availability of the vending machines selling SSBs have contributed to the increasing obesity levels. Citing statistics from the US, Bergen and Yeh (2006) note how overweight, obesity and extreme obesity has increased by 65.1%, 30.4% and 4.9% respectively. The authors further cite how the consumption of sugar sweetened soft drinks has more than doubled over the past decade.

Mathias et al. (2013), basing their findings on a study involving small children found a direct link between increased consumption of sugar sweetened beverages and a higher calorie intake. Following a study involving children between the ages of 6 -13 years, the study found that the consumption of any amount of sugar sweetened beverages did not affect the quantity of solid foods that the children eat. Consequently, an uncontrolled and unmonitored consumption of sugar sweetened beverages adds to the calorie intake that the children already got from solid foods (Mathias et al., 2013). While the consumption of sugar sweetened beverages overall did not impact on the quantity of solid foods consumed, the study further observed that milk intake was lower on days when about 350 grams of sweetened drinks were consumed. Consumption of SSBs was also associated with lower intake of fruit and with

increased fast-food intake. The implications of these findings are that SSBs are primarily responsible for the higher caloric intakes in SSB consumers, and that SSB consumption is associated with the intake of a select number of food and beverage groups, some of which are often unhealthy.

Malik et al. (2006), puts into perspective the increasing risk of obesity by providing some statistics from the World Health Organization (WHO, 2005). The World Health Organization's projections indicate that globally in 2005 approximately 1.6 billion adults were overweight ($\text{BMI} \geq 25 \text{ kg/m}^2$) and at least 400 million were obese ($\text{BMI} \geq 30 \text{ kg/m}^2$), numbers which are projected to reach 2.3 billion and 700 million, by 2015. Using statistics from the US which has been consistent in its tracking of obesity, the World Health Organization estimate that the percentage of overweight and obese adults in the US increased from 47% and 15% respectively in the late 1970's to over 66% and 33% in 2005–2006, with the greatest proportion of the increase observed in Non-Hispanic black and Mexican–American women (Malik et al., 2006). The authors observe how temporal patterns in SSB intake across recent decades have shown a close parallel between the obesity epidemic and rising levels of SSB consumption (Malik et al., 2006).

Most studies, and notably Malik et al. (2006) make note of how sugar sweetened beverages contributes to increased calorie intake and overall obesity in high income settings. However, there have been a limited number of studies on how SSBs contribute to increased calorie intake and overall obesity in poor communities. Muckelbauer et al. (2009), notes that sugar sweetened beverages are usually energy-dense, but have relatively low micronutrient content. Therefore, sugar sweetened beverages consumption might have a diluting effect on micronutrient intake and total diet quality if SSBs substitutes nutrient-dense foods such as milk. Decreasing diet quality scores were found to increase disease risk and mortality rates in adulthood. Just as Mathias et al. (2013) observed, sugar based beverages consumption has been associated with decreasing intakes of milk in children and adults. Furthermore, studies have observed a positive correlation between an unhealthy beverage pattern, characterized by a high consumption of sweetened drinks, and an unhealthy food pattern in adults. Muckelbauer et al. (2009), overall conclusion was that the consumption of sugar based beverages was negatively associated with total diet quality in boys and girls. These findings

suggest that sugar based beverages consumption might decrease mean diet quality despite an adequate mean intake of most micronutrients.

De Ruyter et al. (2012), working on the conventional assumption that sugar sweetened beverages and their increased consumption are linked to overweight, because they contain calories which does not promote satiety, hence people can still go on to consume more food even after taking the drinks. The study sought to see the effect of replacing the sugar sweetened beverages with non-caloric beverages. The trial involved 641 normal weight children with two groups receiving sugar sweetened drinks and the others receiving sugar free, artificially sweetened drinks over an 18 months period. The study indicates that substituting high caloric sugar drinks with artificially sweetened sugar-free drinks led to significant weight loss and less body fat in health children. The authors further make the assertion that artificial sweeteners tend to alter children's taste buds, where children opt for sweetened food products and beverages due to activation of sweet taste receptors in the stomach, which could lead to weight gain in adult life in particular to those children with less physical activities. However, the findings by Gibson (2008) do not support this assertion, Gibson points out that in fact artificial sweeteners has been used to control caloric intake, thereby reducing weight gain. Alternatively, people who are at risk for gaining weight may turn to artificial sweeteners in an attempt to reduce caloric intake.

While most studies are of the opinion that sugar based beverages contributes to obesity, Gibson (2008) in a cross-sectional study involving multiple studies found that the contribution of sugar based beverages might be overstated. In his study, Gibson (2008) performed meta-analysis search for scholarly peer reviewed articles and found forty-four studies of which twenty-three were cross-sectional, seventeen were prospective studies and four randomized clinical trials in adults and children. A particular focus was placed on critically examining the methodology, results and presentation of the findings. Half of these studies reported a statistically significant association between consumption of beverages and weight gain or Body-Mass Index, and onset of obesity in at least one subgroup. However, because most of the studies focused on American subjects who consume a significant amount of processed and sugar dense diets, this compromises the overall conviction that sugar based beverages contribute to obesity. Most importantly, Gibson (2008) further notes that the

methodologies used in the studies do not disclose other lifestyle attributes of the subjects that might play a contributory role to overall weight gain other than fructose consumption alone.

After a review of the literature, Gibson (2008) comes to the conclusion that despite having a plethora of studies focusing on consumption of sugar sweetened beverages and its contributory factors to weight gain and onset of obesity, the lack of consistencies with study design, statistical testing and interpretation thereof makes it challenging to come up with a definite conclusion on the level of association between consumption of sugar sweetened beverages and weight gain. Gibson (2008), highlights that the possibility of publication bias towards positive studies as one of the weaknesses in the evidence base studies on contribution of SSBs to obesity. The general lack of power in sample size in most of the studies, unclearly defined conclusions on the findings add to the inconsistencies. The inconsistent evidence between subgroup and inadequate exploration of confounders or effect modifiers in analysis such as baseline BMI, ethnicity, physical inactivity, baseline diet, and misreporting also limits the credibility of the studies. Gibson (2008) further notes that weight and height is often self-reported by the participants in the surveys and is not measured. The narrow focus on sugar sweetened beverages with inadequate assessment of other dietary components coupled to a lack of standardized methods for dietary assessment further compounds on the credibility of the findings in the studies.

1.2.2 Contribution of SSB to health Problems

Some studies have identified a direct correlation between sugary beverages and non-alcoholic fatty liver disease (NAFLD) (Ouyang et al., 2008). While previous studies focused on increased energy (caloric) intake coupled with reduced physical activity as central mechanisms contributing to NAFLD, the authors have further suggestions and insights. The authors point out that not enough focus has been given to the effects of change in dietary habit and its contribution to NAFLD, seeing that there is an increase in consumption of added sugars such as fructose derived from sucrose and high fructose corn syrup (HFCS) which is an artificial sweetener added by beverage manufacturers that has led to an increase in total energy intake from 3.9% in 1977 to 9.2% in 2001.

Nguyen et al. (2009), evaluated the extent to which sugar-sweetened beverage consumption, a significant source of dietary fructose, is associated with higher serum uric acid levels and blood pressure in adolescents. For their study the researchers defined sugar-sweetened beverages to include sweetened tea and coffee, sports drinks, soda and fruit drinks. There were two significant findings in the study. Firstly, adolescents who drank more sugar-sweetened beverages tended to be older and male. Secondly, results indicate that increased sugar-sweetened beverage consumption is associated with higher serum uric acid levels and systolic blood pressure, which may lead to downstream adverse health outcomes (Nguyen et al., 2009).

According to a study by Nguyen et al. (2009) consumption sugary beverages is linked with increased risk for weight gain, type-2 diabetes and other metabolic syndrome. This is further reiterated by Hu and Malik (2010) where the authors reports that caloric soda drinks with high added sugars are the greatest contributors to weight gain in the United States, they further explain that this is thought to be as a result of incomplete satiety offered by sugary drinks leading to frequent excessive intake of soda drinks. Hu and Malik (2010) also state that sugar sweetened beverages are likely to increase the incidences of type-2 diabetes mellitus and cardiovascular disorders independently of obesity due to elevated blood sugar levels as a result of increased fructose metabolism, which may lead to increased insulin resistance due to impaired pancreatic cell functioning that may also lead to high blood pressure, as well as accumulation of visceral adiposity and atherogenic dyslipidemia.

Malhotra et al. (2015), make the argument that there has been some misinformation pushed through scientists on the relationship between sugar based beverages consumption, physical activity such as exercise and weight gain and obesity. The authors makes special reference to a UK's Academy of Medical Royal Colleges, which indicates that moderate exercise for 30 minutes a day for five days a week has the same effect as some of the drugs prescribed for chronic diseases. While the authors concede that there are some benefits in physical activities, these have little to no impact on weight loss. They make reference to the fact that while weight gain and obesity has significantly increased in the last thirty years largely due to a change in diets, the physical activities that people undertake on a day to day level have largely remained unchanged. The authors specifically point to the message that obesity is caused by physical inactivity. The authors further explains that while 'all calories count' as

pointed out by Coca Cola, it is where the calories come from that is crucial (Malhotra et al., 2015). Sugar calories promote fat storage and hunger. Fat calories induce fullness or ‘satiation’.

1.2.3 The demand for non-sugary beverage vs. sugary beverages

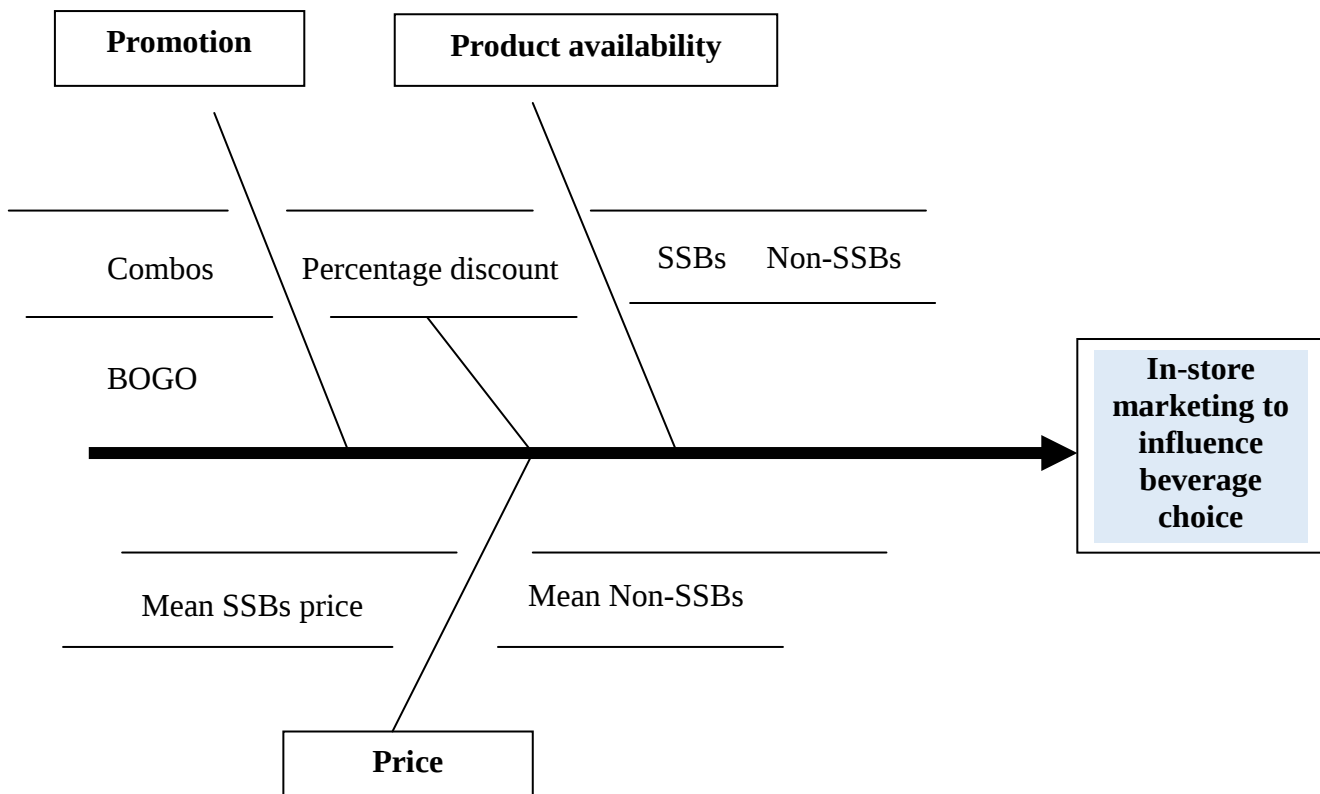


Figure 1: Conceptual model of in-store marketing strategies (Sharkey et al., 2012)

Figure 1 identifies the main in-store determinants that used to stimulate demand for SSB and non-SSB products. This is important because Sharkey et al. (2012) used the framework to illustrate how in-store beverage assortment by availability, price and promotion of specific brands can influence customer choices between sugary and non-sugary beverages in socioeconomically disadvantaged groups in Mexican American population. In South Africa, similar studies have used the framework to explore the role of in store marketing strategies used to stimulate consumer demand for SSB versus non-SSB products (Clemitson, 2016, Tlapana, 2017, Claasen et al., 2016)

1.2.4 Availability of non-sugary and sugary beverages

The retail environment in South Africa has contributed to the increase in obesity rate amongst different population groups due to increased availability of unhealthy beverage products, however there's contradicting evidence that suggests that the increase in access to large shops and larger shopping malls has decreased the probability of obesity in rural areas, due to the increase in variety of foods, and healthier options of non-sugary beverages available at the large retail stores (Lobstein and Leach, 2007, Pereira, 2014, Muzigaba, 2010). While other studies suggests that increased access to large retail stores has led to an increase in obesity in rural areas due to the abundant availability of unhealthy food and beverages at even lower cost in the large retail shops (Ni Mhurchu et al., 2013, Bodor et al., 2010). South Africans consumed 183 Coca-Cola products in 2002, per person per annum, which later increased to 260 products in 2012; thereby placing South Africa amongst the top ten consumers of Coca-Cola products globally (Pereira, 2014). The proportion of adults drinking SSBs in rural areas has more than doubled from 25% to 56% in women and from 33% to 63% in men between 2005 and 2010 due to the high increase in availability of sugar sweetened beverages in South Africa and rural townships (Pereira, 2014)

1.2.5 Price of non-sugary and sugary beverages

More research indicates that taste and price are the most important factors that influences consumers purchasing choices of beverages, and that health and nutritional packing content has least impact on beverage demands and purchasing choices (Silayoi and Speece, 2004, Bollard et al., 2016, Sadeghirad et al., 2016). The success of tobacco taxation in reducing smoking prevalence and related diseases has prompted public health experts to recommend taxation of SSBs as a means to promote healthier habits and reduce SSB consumption (Manyema et al., 2015). In 2013 and 2014, more than 12 US states and cities proposed SSB tax legislation, and in 2014, Berkeley, California, passed a 1cent per-ounce specific excise tax on the manufactures of SSBs, becoming the first United State city to implement such tax (Falbe et al., 2015). According to Falbe et al. (2015) excise taxes have direct effect on consumers than sales taxes due to increased shelf prices at the point of purchasing decision, however Nghiem et al., (2013) explains that any potential effects of excised tax depends on estimates of demand responsiveness to price, otherwise known as price elasticity. Stacey et al. (2017) defines price elasticity as a statistic defined according to the percentage change in

consumption derived from a one-percent change in price, therefore the degree to which excise tax can impact on SSB consumption hinges mostly on the “pass through rate,” which refers to the degree to which the tax is passed on to consumers through higher shelf prices (Thow et al., 2014).

International research on SSB excise taxes have found a pass-through rates ranging from 63% to over 300%, depending on beverage type, brand, and retailer, however other studies indicates that the demand for SSBs is elastic, therefore manufacturers or retailers may under-shift the tax by absorbing the costs or distributing the costs across non-taxed products such as food or diet soda, a term known as “strategic pricing” (Falbe et al., 2015). Under-shifting can cause lower than projected price increase post tax, which than undermines the public health benefit of excise tax (Falbe et al., 2015).

1.2.6 Promotion of non-sugary and sugary beverages

Glanz et al. (2012) reported that several in-store advertising strategies can be used to promote healthier beverage choices, such as increasing the availability of non-sugary beverages, and as well as price adjustment to enhance affordability of non-sugary beverages and applying prominent in-store promotion strategies targeted towards boosting the sales of non-sugary beverages which can include the use of coupons and combo specials to influence purchasing decisions. According to Glanz et al. (2012) however, the promotion of healthier beverages and food products does not create the same demand across the different types of beverages. The authors further state that in-store promotional manipulation strategies tend to create a stronger purchasing demand for unhealthier beverages such as sugar sweetened beverages. The authors concludes that it is therefore important for retailers to understand their unique position and ability to influence customer’s purchasing decision through use of in-store promotion strategies that should be targeted towards promoting a demand for healthier non-sugary beverages and food products

1.2.7 Possible solutions to curb increasing sugar consumption

Following a study in which they tracked the consumption patterns of students in a college setting, Bergen and Yeh (2006) came to the conclusion that careful labeling and promotional posters on areas where sugar-sweetened drinks are usually sold can reduce their consumption.

They believe these measures, which they term environmental changes, can contribute significantly to weight loss and maintenance of healthy body weight mass.

Shapiro et al. (2008), following a study on morbidly obese children came to the conclusion that some technology like SMS can assist in the monitoring and control of sugar intake. Working on the premise that overweight adolescents usually develop into obese adults, the study set to find some tools that can be used to control this amongst obese children. Some of the interventions that exist include reducing availability of sugar-sweetened beverages, decreasing television and computer screen time, limiting the time spent playing video games, increasing fruit and vegetable intake, decreasing dietary fat and increasing physical activity. The authors also point out that other interventions include self-monitoring of weight, monitoring expenditure on sugary diets and monitoring of sugar intake can all contribute towards long term weight control.

Van der Horst et al. (2007) and Sleddens et al. (2011) further supports the findings of Shapiro et al. (2008), which advocate that reducing screen time among children and adolescents might have a positive effect in reducing incidents of obesity. This was after the authors found a positive relationship between the screen time available to children and the quantity of sugary beverages they consumed. Also associated with the impact of screen time were parenting styles and habits of the children and parents. The study underlines the importance of the home environment in the prevention of excessive weight gain in adolescents. Because parents provide the child's main contextual environment for television viewing and playing on the computer, they can be viewed as key players and central agents of change in the prevention of increased caloric intake from SSBs and subsequent weight gain (Shapiro et al., 2008).

According to Blecher (2015) one of the methods used to control the consumption of sugar sweetened beverages and foods includes 'sugar tax' which is meant to increase the prices of sweetened beverages to generally discourage their consumption. This follows similar taxes on tobacco related products like cigarettes which decreased the rate and levels of smoking and also generally decreased smoking related diseases (Blecher, 2015). Falbe et al. (2015), sought to assess the impact of these taxes that were introduced in 2013 and 2014 across several states in the US. Although there was significant pass through rate to the consumer resulting in an increase in prices, the authors did not find any significant evidence that this decreases the consumption of sugar sweetened beverages. Additionally, they also noticed that

some stores, despite the tax did not raise the price immediately due to limited knowledge of the tax or because of regional distribution which means retail chains had a uniform price across states all which contributed to limited the effectiveness of the tax.

In a related study to that of Falbe et al. (2015), Blecher (2015) also examined the impact of various taxes on sugary drinks to see if they had the same effect they had on tobacco products. The author, while using the South African case makes the argument that excise taxation of sugary drinks, may be able to bring about positive health benefits. The authors make reference to uniform specific tax that was aimed at nicotine producing manufactures which has subsequently led to significant decline in cigarette smokers. This strategy has yielded positive outcomes within the alcohol beverage industry, where use of tax on alcohol containing beverages has reduced per capita volume of alcohol beverages consumed. This was achieved by incentivizing manufacturers in order for them to produce and market lower concentration of alcohol on beers and other alcohol containing beverages (Blecher, 2015). According to Blecher (2015), a similar approach to tobacco and alcohol taxation can be applied to sugar beverages, to influence the production and supply side and not just to focus on the demand side only. The author also explains that by applying tax to sugary drinks according to the quantity of caloric sweeteners rather than the volume size of beverage, the manufacturers and suppliers will be encouraged to produce and market lower or zero calories of non-sugary beverages. Blecher (2015), further postulate that lowering the calorie content of beverages could have extraordinary public health effects since it would influence the entire population who consume them.

Avery et al. (2014), in a systematic review of three data bases for trials between 2000 and 2013 which sought to have successful results to reduce sugar sweetened beverages consumption. To ensure the validity of the findings, the authors also set some parameters including the following: (a) which aimed to reduce the consumption of SSBs in >100 children aged 2–18 years, (b) studies reporting changes in body fatness, (c) studies ≥ 6 months in duration, and (d) intervention control trials were included. The evidence suggests that school-based education programmes focusing on reducing sugar sweetened beverages consumption, but including follow-up modules, offer opportunities for implementing effective, sustainable interventions. Peer support and changing the school environment (e.g.

providing water or replacement drinks) to support educational programmes could improve their effectiveness.

Hawkes et al. (2013), in their study suggest the implementation of the Nourishing framework which is an approach aimed at preventing obesity and non-communicable diseases globally. The Nourishing framework by WCRF International is a broad framework that provides a guide for a comprehensive policy package. It broadly provides recommendations that are flexible for a comprehensive response, in order for policymakers to be able to implement policy decisions that are context specific for their target populations. The framework also provides a guide for systematic reporting, categorization and monitoring of policy implementation decisions globally for improved interpretation and communication of evidence for policy to policy-makers.

1.2.8 Problem statement

There is a recent increase in the body of evidence which suggests that the increase in consumption of sugar sweetened beverage is associated with the in-store environment and the products that they offer, that ultimately leads to an increase in NCDs, morbidity and mortality in those individual with increased consumption (Koordeman et al., 2010, Hawkes, 2009). Research suggests that South Africans living in poor communities tend to have poorer diets since there are fewer healthier options available, and as a result black South Africans tend to suffer the most from lack of healthier food options, and have higher daily sugar intake (Boyd, 2014, Rajan, 2014). Socio-economic inequities are still prevalent in South Africa and this is demonstrated by the macro-and micronutrient consumption choices available to communities and as well as the poor communities nutritional status in South Africa (Boyd, 2014, Rajan, 2014).

Urbanization is increasing in majority of black township areas (Bourne et al., 2002). The increase in the emergence of shopping malls and improved transport system has made shopping centres to become more accessible and people no longer have to walk long distances to get to shops (Clemison, 2016). A study by Transition, Health and Urbanisation in South Africa (THUSA) showed, that urbanisation has a negative impact on dietary patterns of the South African people, due to increased income and increased exposure to processed food leading to individual being more susceptible to coronary artery diseases, and sustained high cholesterol levels in both men and women (Vorster et al., 2005). This is a point of

concern for South Africa, which is already ranked 15th by WHO in terms of risks factors to NCD amongst 194 countries (WHO, 2015).

1.2.9 Justification

South Africa was ranked 15th by WHO in terms of health risks to NCDs amongst 194 countries (WHO, 2015). Globally, SSBs consumption accounts for almost 184,000 deaths per annum (WHO, 2015). The new guidelines by WHO recommends that children as well as adult consume not more than 10 % of their over-all energy consumption as free sugars, and recommends a further reduction of five percent, which is about 25 g or 6 teaspoons of sugar for better health outcomes (WHO, 2015). From Figure 2 below it can be seen that for example a can of Fanta Grape contains 44.1 g of sugar which is equivalent to about 9 teaspoons of sugar compared to healthier option of Valpre still water which contains 0g of sugar.

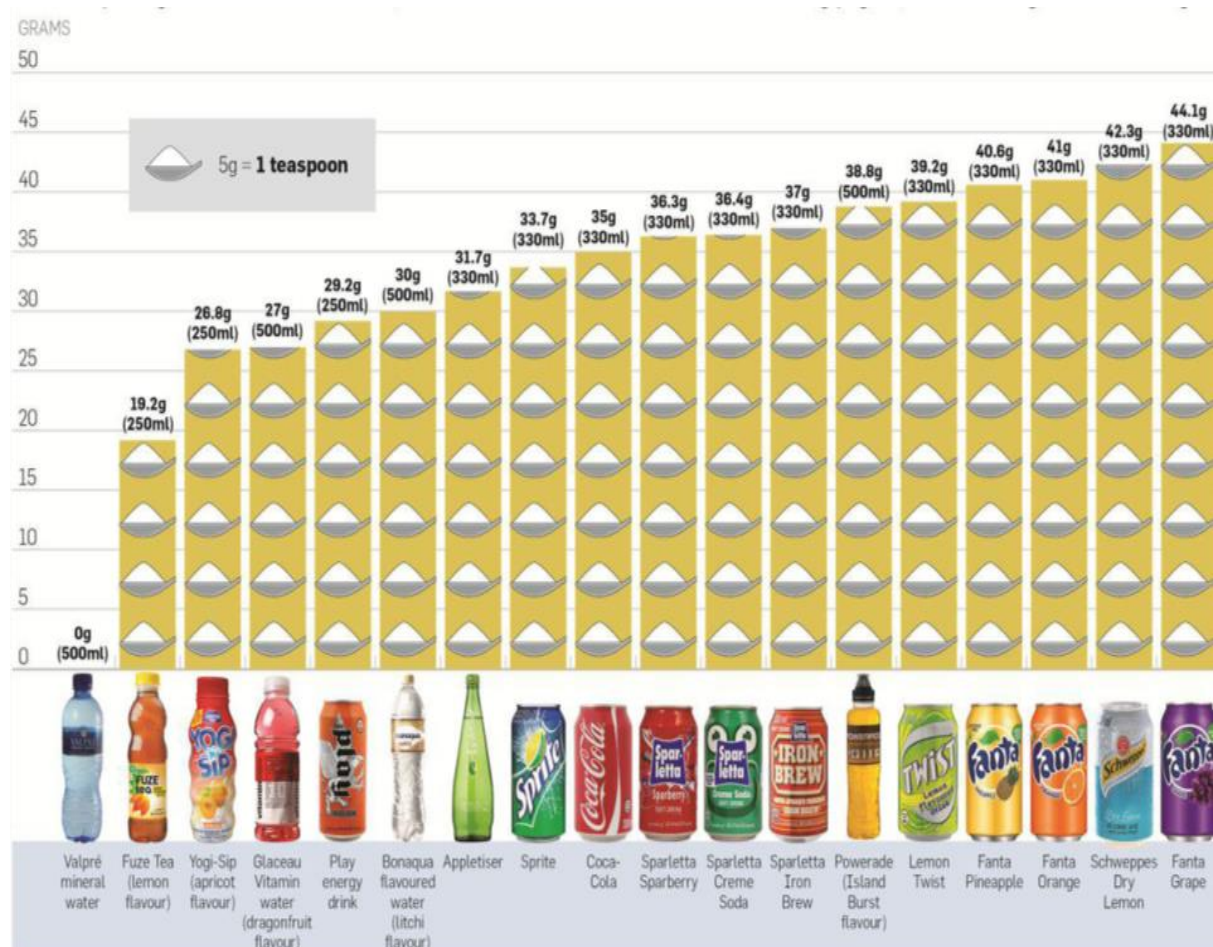


Figure 2: SSBs sugar content (Carte Blanche. 2016).

The increase access to SSBs has negative effects on individual's health outcomes, even more so for the poor communities, since it has been shown to be related to socioeconomic status and the physical store environments (Mchiza et al., 2014). Retail stores facilitate access to SSBs by exploiting individuals' psychological, social, and economic vulnerabilities through promotional materials and product placement (Mchiza et al., 2014).

Majority of the research indicates that healthier foods are more likely to be found in high income communities while unhealthy food options such as SSBs, processed foods are widely available in lower-income communities, however, most of the available evidence comes from high-income countries, and it is less understood whether such associations hold true in lower and middle-income countries (Sharkey et al., 2012). Recent studies have also shown that the emergence of large shopping malls in and around the African townships in the recent years has had a profound effect on dietary habits of individuals in those communities, due to greater concentration of grocery stores, supermarkets and street vendors (Clemitson, 2016), however there is a gap in literature about the availability, pricing and promotion of SSBs and non-SSBs in both small and large shops in South African townships.

To answer a range of these questions about the retail food environment, and how the SSBs and non-SBBs are made available through retail pricing and promotion, a context specific beverage in-store observational survey tool needs to be developed, in order to achieve the goal of the study and assess the reliability, and construct validity of the retail food store in order to develop retail interventions which aim to support communities towards healthy dietary behaviours, and provide more needed information about the retail food environment and the role they play in influencing access to non-sugary and sugary beverages in the small and large shops in Umlazi (Mchiza et al., 2014).

Therefore to try and curb the high prevalence of NCD's in South Africa particularly in black townships; the focus has to shift more to the retail environment in order to understand how it contributes to the consumer's purchasing decision between non-sugar and sugar sweetened beverages, and better understand effects of product shelf availability, pricing and promotion of SSBs versus non-SSBs in small and large retail shops.

1.3 Aim and objectives

The aim of this study was to determine and compare the availability, price and promotion of sugar sweetened beverages versus non-sugar sweetened beverages in small and large retail stores in Umlazi, Durban, 2018

Specific Objectives:

- To determine the availability of sugary versus non-sugary beverages in small and large shops in Umlazi in 2018.
- To describe and compare the prices of sugary and non-sugary beverages in small and large shops in Umlazi in 2018.
- To describe and compare the promotion of sugary and non-sugary beverages in small and large shops in Umlazi in 2018.

CHAPTER 2: Methodology

2.1 Study Design

The study used a cross-sectional design. It is both descriptive and analytic in nature. The cross-sectional design allowed for data on retail shop size and selected SSBs and non-SSBs availability, price and promotion to be collected simultaneously. Data collection took place during the period August 2018 to April 2019 and comparative analysis was performed between large and small shops to answer the objectives.

2.2 Study setting

The study was conducted in Umlazi V, D, U and M section, which is a township located approximately 17 kilometers south-west of Durban's Central Business District in KwaZulu-Natal (Kubone, 2012). Umlazi is known as the largest township in KwaZulu Natal and is densely populated by the Black African people, with a population size of approximately 750 000 people (Kubone, 2012). The Mangosuthu Highway road forms the primary access that links to the secondary roads leading to primary retail outlets in all 26 sections or nine precinct areas comprising of Sections A to Z and an addition of Sections AA, BB and CC. The focus area in the study was the retail stores in Umlazi V, D, U and M section, which is selected because of its mix of residential and commercial setting and feasibility for data collection due to the size of the study setting.

2.3 Study population

The study population was the retail stores selling selected list of SSBs and non-SSBs in Umlazi during the time of the study. Retail stores included chain supermarkets, small shops such as convenience stores and spaza shops. Fast food stores and hawkers selling SSBs and non-SSBs from vans, portable fridges or at street corners were excluded from the study.

2.4 Sampling Procedure

A census was conducted on all 61 retail shops (supermarkets and spaza shops) in the four sections of Umlazi and an informed consent process was carried out. Only the stores where permission was granted were eligible to participate in the study.

2.5 Data collection

The primary data was collected by the principal investigator and one field worker who were trained on data collection before starting fieldwork. An in-store retail observational tool was developed based on previously available tools, and then tested. The permission for inclusion of the participating stores in the study was obtained from the store manager in large shops and from the store owners in the small shops. Data were collected on a pre-determined list of SSBs and non-SSBs available in the retail stores. The list was based on the selected Euromonitor of top selling SSBs and non-SSBs in South Africa. Data was collected on availability, price, and promotion of each category of selected beverages in each retail store. A data coding (capturing sheet) was developed in Excel, which was used to capture the data from the retail stores (see Appendix A). The in-store data collection tool was used to record the visible prices from price tags; while beverages without visible prices were purchased and the price was recorded from the receipts. There were no shop names collected to ensure confidentiality.

2.6 Measurement and transformation of variables

The main independent variable of interest was size of the retail store. Retail stores with two check-out points or less were categorized as a small shop/spaza shops, and retail stores with three or more pay points were categorized as large or big shops.

There were three outcome/dependent variables of interest. These were availability, price and promotion of a predetermined list of SSBs and non-SSBs. Data on availability (of all different sizes), price and promotion were collected for the following and later categorized as follows: carbonated SSBs (these included, Coca Cola, Sprite, Stoney Ginger beer, Sparletta, Coo-ee, flavoured water and Red bull caffeine), and carbonated non-SSBs (which included, Coke light, Coke zero, Sprite zero, Stoney zero, Red bull sugar free, Tab caffeine free). Other categorizations included are non-carbonated SSBs (which included, Vitamin water, Clover Tropika juice, Clover 60% fruit juice, Liquifruit, Halls, Oros, Energade, Appletizer), non-carbonated non-SSBs (unflavoured milk and still water). Data were collected for the following sizes of each beverage such as 250ml, 300ml, 330ml, 350ml, 355ml, 440ml, 473ml, 500ml, 1, 750ml, 1litre, 1,25litre, 1.5litre, 2litre, 2.25litre and 5litre ; these were post coded into four categories of sizes: small single serving (for all sizes of containers below and

excluding 400 ml), small multiple serving (for all serving sizes from 400ml and up to but excluding 800ml), and large single serving (for all dimensions including 800ml and up to but excluding 1.2 litre) and large multiple serving (for beverage categories including 1.2 litre and above).

Price data were collected for all listed beverages. Price data was converted into a price per litre so that different sizes could be compared. The prices were converted to price/litre to enable comparisons during analysis as different types of beverages are often available in different size containers; this greatly improved the presentation of the results and the explanatory power of the findings.

Promotion data was collected for both SSBs and non-SSBs beverages according to sizes. The promotion included categories such buy one get one free (BOGO), Combo sales, where a special price is offered for buying a particular beverage brand together with some other product of sale such a pie, chips or chocolate, percentage discount, coupons sale and other promotions which included other forms of promotions such as at the door advisement etc.

2.7 Pre-testing the Data Collection Procedure and Tool

The study included a pre-testing phase to determine any errors in the data collection tool and challenges which could potentially hinder actual fieldwork and to allow for adjustments prior to implementation of the study. The pre-test was first conducted in Hillbrow, Johannesburg, prior to change of the study and was repeated in Bluff, eThekwin, as there was a similar commercial environment to the final study. Bluff has several spaza shops and a mix of large retail stores which provided better understanding on how to improve data collection tool. Subsequently all different sizes which were predetermined before developing the data collection tool and pre-testing were included.

Table 1: Data transformation for analysis by objective

Objectives	Variables	Transformation
To determine the availability of non-SSBs versus SSBs in small and large shops in Umlazi in 2018.	Type of beverages available categorized as carbonated SSBs, carbonated non-SSBs, non-carbonated SSBs, non-carbonated non-SSBs	The type of beverage category available was coded in a nominal categorical scale e.g. carbonated SSB YES/NO, this allowed for descriptive analysis in form of frequency tables to describe the mode using test of proportions
To describe and compare the prices of non-SSBs and SSBs in small and large shops Umlazi in 2018.	Price per litre for each category of beverages and for each size.	The price per liter was obtained by collapsing all the individual beverage prices and different sizes into four categories in order to calculate the mean price for each beverage category and standard deviation. A ttest was performed to compare the price of beverages in small and large shops
To describe and compare the promotion of non-sugary and SSBs in small and large shops in Umlazi in 2018.	Any promotion vs. none Type of promotion such as Buy One Get One free (BOGO), discounts	Coded in nominal categorical scale such as discount offered YES/NO, Special offers YES/NO, this allowed for descriptive analysis in form of frequency tables to describe the mode using test of proportions

2.8 Data management and analysis

The data collected was captured using Excel and exported to the STATA version 15.0. Data checking and cleaning was performed on STATA then data was then transformed for analysis and descriptive statistics were calculated. The analysis focused on comparing the outcomes/dependent variables (availability, price and promotion) by retail stores sizes using a test of proportions (Girdler-Brown and Dzikiti, 2018). Descriptive statistics was used to summarize numerical variable such as mean price and standard deviation, while proportions were used to measure categorical variables. The number of drinks in each category was calculated by multiplying the number of the selected brands available in each shop by the number of shops which sold a particular brand. For categorical variables such as availability and promotions cross tabulations were used in assessing the distribution and associated relationships using test of equal proportions method which was the appropriate tests for

evaluating the statistical significance of relationships established for categorical variables. As such, the test of proportions and the associated p-values were used to describe the nature and strength of the relationships displayed in the tables from a statistical point of view. A Student's two-sample t-test was used for analyzing statistical differences in average prices of SSBs and non-SSBs in large and small shops which was an appropriate test for evaluating the statistical significance difference in mean/average price estimate. This type of test was considered the most appropriate because it assumes that the prices of beverages in large and small shops were independent of each other and that the data for both large and small shops was normally distributed.

2.9. Ethics

Ethics approval was obtained from the University of the Witwatersrand's Human Research Ethics Committee (HREC) Ref No: M180243. The study did not include human subjects and all the data collected was in the public domain. Permission to collect data using an in-store data collection tool was obtained from the store managers or owners, the stores where permission was not granted were excluded from participating in the study.

CHAPTER 3: Results

3.1 Introduction

This section discusses the results of analysis of the selected list of sugary and non-sugary beverages. The results present findings on large and small shops in the Umlazi Suburban area. Fifty-three retail outlets were visited and data was collected on 23 sugary and non-sugary beverages. As described in the Methodology Chapter 2, beverages were categorized into: carbonated SSBs, carbonated non-SSBs, non-carbonated SSBs, and non-carbonated non-SSBs. Analysis presented in the Results Chapter compare the availability, price and promotion of each category of beverage in large and small shops .

3.2 Characteristic of the shops

3.2.1. Shop size

Table 2 shows the distribution of the 53 shops in V, D, M and U sections of the greater Umlazi Township by size. A total of 61 shops were counted, eight of the shops refused to take part in the survey (6 small shops and 2 large shops). The response rate was therefore 87%. Of the retail outlets that were included in the survey, 17 (32.1%) were categorized as large shops, while 34 (64.2%) were small shops, and the remaining 3.8 % (n=2) had missing values for size and could not be classified.

Table 2: Description of retail shops in the greater Umlazi Township (V, D, M and U Section) by size

Retail shop	Frequency (n)	Percentage (%)
Large	17	32.1
Small	34	64.2
Size data missing	2	3.8

3.2.2 Beverage category and Sizes/Volume

Table 2 shows the distribution of the selected beverage categories and the distribution of the sizes/volume observed. Over one-third (38.3% of the beverages observed) were carbonated non-SSBs. A similar proportion were carbonated SSBs (33.7%). Non-carbonated SSBs made up 18.2% of beverages observed and non-carbonated non-SSBs 9.8% of beverages observed.

Large multiple serving size was available for 35.0% of the selected beverages. Small single serving sizes were found for 32.1% of the selected beverages, and large single serving size was found for 25.2% of the selected beverages. Small multiple servings were found for 7.7% of the samples observed.

Table 3: Description of beverages and brand sizes

Characteristic	Frequency (n)	Percentage (%)
Beverage category		
Carbonated SSBs	1229	33.7
Carbonated non-SSBs	1344	38.3
Non-Carbonated SSBs	662	18.2
Non-Carbonated non-SSBs	358	9.8
Sizes/Volume		
<i>small single serving</i>	1170	32.1
<i>large single serving</i>	918	25.2
<i>small multiple serving</i>	282	7.7
<i>large multiple serving</i>	1275	35.0

3.3: Overall availability of selected beverage categories in small and large shops

A comparison of selected beverage category availability by large and small retail shops was assessed. Table4 shows overall availability of selected beverage categories by size of retail shops.

Large shops had 80.0% of the selected carbonated SSBs while small shops had 35.5%. Carbonated non-SSBs were available at 59.1% of large shops compared to 11.5% of small

shops. A greater proportion of the selected non-carbonated SSBs were available in large shops compared to small (94.0% vs. 22.7%). A similar pattern was observed for non-carbonated non-SSBs, where 99.2% of the selected products were available in large shops compared to 17% in small shops.

Table 4: Overall availability of beverage categories in small and large shops

Beverage category Availability	Small shops n (%)	Large shops n (%)	P value
Carbonated SSBs	757 (35.5)	424 (80.0)	<0.01
Carbonated non-SSBs	853 (11.5)	491 (59.1)	<0.01
Non-Carbonated SSBs	414(22.7)	217 (94.0)	<0.01
Non-Carbonated non-SSBs	224(17.0)	118 (99.2)	<0.01

3.4 Availability of selected beverages in different categories by size

Table 5 shows the availability of selected beverage categories by volume size. Large multiple serving were available for 30.8% of selected carbonated SSBs. Small single servings, and large single servings had similar availability (27.2% of the samples observed) among selected carbonated SSBs. Small multiple servings were available for 14.9% of selected carbonated SSBs.

Small single serving sizes were available for 37.9% of the selected carbonated non-SSBs. Large multiple serving sizes were available for 31.0%, and large single servings for 17.2% of the selected carbonated non-SSBs. Small multiple serving samples were available for 13.8% of the selected carbonated non-SSBs

Large multiple serving were available for 35.7% of selected non-carbonated SSBs, whereas large single servings were available for 28.6%, and small single servings for 21.4% of

selected non-carbonated SSBs. On the other hand, small multiple serving are the least represented non-carbonated SSBs available for 14.3% of selected beverages

Large single serving were available for 37.5% of selected non-carbonated non-SSBs. Followed by both small multiple servings and by large multiple servings that were both equally available for 25.0% of selected beverages. While small single serving samples were the least available for 12.5% of selected non-carbonated non-SSBs.

Table 5: Overall availability of beverage categories per volume size

Beverage category Availability	N	%
Carbonated SSBs		
· <i>small single serving</i>	416	27.2
· <i>large single serving</i>	416	27.2
· <i>small multiple serving</i>	228	14.9
· <i>large multiple serving</i>	472	30.8
Carbonated non-SSBs		
· <i>small single serving</i>	572	37.9
· <i>large single serving</i>	260	17.2
· <i>small multiple serving</i>	208	13.8
· <i>large multiple serving</i>	468	31.0
Non-Carbonated SSBs		
· <i>small single serving</i>	156	21.4
· <i>large single serving</i>	208	28.6
· <i>small multiple serving</i>	104	14.3
· <i>large multiple serving</i>	260	35.7
Non-Carbonated non-SSBs		
· <i>small single serving</i>	52	12.5
· <i>large single serving</i>	156	37.5
· <i>small multiple serving</i>	104	25.0
· <i>large multiple serving</i>	104	25.0

3.5 Availability of beverage sizes in large and small retail shops

Large shops were statistically significantly more likely to have all beverage sizes available in all selected beverage categories with the p-value < 0.01 (Table 6). A greater proportion of selected carbonated SSB and carbonated non-SSBs were available in large shops compared to small shops. Large shops were more likely to have all sizes available. However, the opposite was the case for selected non-carbonated SSBs where a greater proportion of small shops had small single servings and small multiple serving sizes available than large shops. This was

also the case for selected non-carbonated non-SSBs where the small single serving and large single servings were more available at small shops compared to large shops.

Table 6: Availability of beverage sizes in large and small shops

Beverage category Availability	Small shops n (%)	Large shops n (%)	P value
Carbonated SSBs			
· <i>small single serving</i>	256 (19.5)	136 (84.6)	<0.01
· <i>large single serving</i>	193 (17.1)	100 (82.0)	<0.01
· <i>small multiple serving</i>	100 (25.0)	50 (75.0)	<0.01
· <i>large multiple serving</i>	308 (60.4)	188 (75.5)	<0.01
Carbonated non-SSBs			
· <i>small single serving</i>	350 (2.6)	185 (56.8)	<0.01
· <i>large single serving</i>	159 (9.4)	85 (74.1)	<0.01
· <i>small multiple serving</i>	52 (0.0)	68 (10.3)	<0.01
· <i>large multiple serving</i>	292 (25.3)	153 (75.2)	<0.01
Non-Carbonated SSBs			
· <i>small single serving</i>	96 (34.4)	50 (10.0)	<0.01
· <i>large single serving</i>	126 (23.0)	66 (93.9)	<0.01
· <i>small multiple serving</i>	64 (28.1)	34 (10.0)	<0.01
· <i>large multiple serving</i>	128 (10.9)	67 (86.6)	<0.01
Non-Carbonated non-SSBs			
· <i>small single serving</i>	32 (43.8)	17 (10.0)	<0.01
· <i>large single serving</i>	96 (10.8)	49 (10.0)	<0.01
· <i>small multiple serving</i>	32 (1.3)	18 (94.4)	<0.01
· <i>large multiple serving</i>	64 (1.6)	34 (10.0)	<0.01

3.6 Price per litre of the beverages in small and large shops

Table 7 shows the mean prices for selected beverages with the standard deviation. Non-carbonated SSBs had the highest mean price per litre (mean price=R27.00, SD=8.10 in small shops and R26.10 (SD=8.80in large shops) but there was no statistically significant difference in the mean price per litre between large and small shops for this beverage category ($p<0.40$). Carbonated SSBs had a mean price of R17.20 (SD=13.50) in small shops which was lower than in large shops with mean price R22.10 and SD=15.40. Carbonated non-SSBs had the lowest reported price per litre and were statistically significantly cheaper at small shops (mean price=R14.00, SD=8.10) compared to large shops (mean price=R20.70, SD=13.30). Carbonated SSBs and carbonated non-SSBs were statistically significantly more expensive per litre at large shops while non-carbonated SSBs and non-carbonated non-SSBs had a higher price per litre at small shops than in large shops ($p<0.01$).

Table 7: Price per litre of the beverages in small and large shops

Beverage category Price(price per litre)	Small shops Mean (SD)	Large shops Mean (SD)	p-value
Carbonated SSBs	269 17.20(13.50)	339 22.10(15.40)	<0.01
Carbonated non-SSBs	98 14.00(8.10)	290 20.70(13.30)	<0.01
Non-Carbonated SSBs	94 27.00(8.10)	204 26.10(8.80)	0.40
Non-Carbonated non-SSBs	38 24.00(7.10)	117 16.70(5.20)	<0.01

3.7 Price per litre of different sizes of beverages

Table 8 shows the prices per litre for beverages by category and size in small retail shops and in big retail shops. There was a statistically significant difference in the mean price per litre for small single servings carbonated SSBs. Small shops charged a higher price per litre of R41.00 (SD=12.60) compared to R36.40 (SD=13.90) in large shops. There was no statistically significant difference in the price for large single servings. Both the large multiple serving and small multiple serving carbonated SSBs were a statistically significantly cheaper in large shops compared to small shops.

For carbonated non-SSBs there was no statistically significant difference in the mean price per litre between small and large shops for small single servings or large single servings. Large multiple servings were statistically significantly cheaper in large shops (R7.90, SD=0.90) compared to small shops with mean price of R9.60, (SD=0.80). By contrast small multiple serving were cheaper in small shops (R9.90; SD=0.90) compared to large shops where the mean price per litre was R12.50, (SD =0.50).

For non-carbonated SSBs there was no statistically significant difference in the mean price per litre between small and large shops for majority of the beverage size categories. While not statistically significant, there was a marginal finding for small multiple serving (p=0.06).

There was statistically significant difference in the mean price per litre between large and small shops for non-carbonated non-SSBs. Interestingly the opposite was observed for non-carbonated non-SSB when compared with non-carbonated SSBs where large shops charged less than small shops. One exception was small multiple servings where there was no difference in the price between large and small shops for non-carbonated non-SSBs ($p=0.10$), while there was a marginal finding for small multiple serving for non-carbonated SSBs ($p=0.06$).

Table 8: Price per litre of the beverages in small and large shops

Beverage category Price	Small shops Mean (SD)	Large shops Mean (SD)	p-value
Carbonated SSBs			
· <i>small single serving</i>	41.0 (12.6)	36.4 (13.9)	0.047
· <i>large single serving</i>	22.5 (4.4)	25.5 (9.5)	0.089
· <i>small multiple serving</i>	9.0 (2.7)	8.6 (1.6)	<0.01
· <i>large multiple serving</i>	9.3 (2.3)	8.1 (1.4)	<0.01
Carbonated Non-SSBs			
· <i>small single serving</i>	31.3 (4.0)	32.7 (11.7)	0.72
· <i>large single serving</i>	25.5 (2.4)	24.8 (5.4)	0.64
· <i>small multiple serving</i>	9.9 (0.9)	12.5 (0.5)	<0.01
· <i>large multiple serving</i>	9.6 (0.8)	7.9 (0.9)	<0.01
Non-Carbonated SSBs			
· <i>small single serving</i>	37.0 (2.6)	38.7 (3.7)	0.03
· <i>large single serving</i>	23.0 (2.1)	26.7 (3.4)	<0.01
· <i>small multiple serving</i>	23.3 (1.7)	22.2 (2.0)	0.06
· <i>large multiple serving</i>	16.5 (2.8)	16.9 (4.1)	0.73
Non-Carbonated non-SSBs			
· <i>small single serving</i>	32.3 (2.4)	25.7 (3.0)	<0.01
· <i>large single serving</i>	20.3 (3.1)	17.1 (2.5)	<0.01
· <i>small multiple serving</i>	15.5 (0.6)	17.3 (2.0)	0.10
· <i>large multiple serving</i>	13.5 (-)*	11.2 (2.7)	-

* There was only one observation in this category and size therefore p value could not be calculated.

3.8 Any promotional advertising in small and large shops

A comparison between large and small shops and promotional advertising activities found that large shops had 55.8% of any promotional activities while small shop had 44.4% (Table 9). A greater proportion of promotional activities occurred in large shops compared to small shops ($p\text{-value} < 0.01$).

Table 9: Any promotional advertising by shop size

Promotional advertising	Small shops n (%)	Large shops n (%)	P Value
Any promotion	269 (44.2)	339 (55.8)	<0.01

3.9 Overall promotional advertising activities for selected beverage categories

Table 10 shows different promotional advertising activities of the selected beverages. More than three-quarters of selected non-carbonated SSBs had discounts (81.8 %). Just under three-quarters (73.5%) of carbonated non-SSBs had discounts, and half of the non-carbonated non-SSBs had discounts. Less than a third (30.7%) of carbonated SSBs had discounts. Non-carbonated non-SSBs had only one promotion. Carbonated SSBs had combo specials while non-carbonated non-SSBs did not have any combo specials. Only Carbonated SSBs and carbonated non-SSBs had Buy One Get One Free (BOGO) promotions.

Table 10 Promotional advertising per beverage category

Beverage category Promotion	PROMOTIONS					
	BOGO	Buy 3 for R50	Combos	Coupons	Other promotion	% Discount
Carbonated SSBs	4 (4.5)	2 (2.3)	30 (34.1)	11 (12.5)	14 (15.9)	27 (30.7)
Carbonated Non-SSBs	2 (2.9)	0 (0.0)	9 (13.2)	2 (2.9)	5 (7.4)	50 (73.5)
Non-Carbonated SSBs	0 (0.00)	0 (0.0)	4 (12.1)	1 (3.0)	1 (3.0)	27 (81.8)
Non-Carbonated non-SSBs	0 (0.00)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	1 (50.0)

3.9.1 Promotional advertising of the selected beverages in small and large shops

Promotional advertising activities for selected beverages observed in small shops as compared to large shops are presented in Table 11. There was statistically significant difference in any promotional activities for all beverage categories observed in large and small shops with the p-value < 0.01 with the exception of non-carbonated non-SSBs which were not statistically significant (p-value = 0.42). There was marginal difference in the type of beverage categories that were being promoted in small shops, whereas amongst the large shops there were greater proportions of promotional activities directed towards carbonated SSB and carbonated non-SSBs for the selected beverages and to a lesser extent the non-carbonated SSBs.

Table 11: Any promotional advertising of beverages in small and large shops

Beverage category Promotion	Small shops Any promotional activities	Large shops Any promotional activities	P-Value
Carbonated SSBs	16 (2.6)	72 (11.8)	<0.01
Carbonated Non-SSBs	2 (0.5)	66 (17.0)	<0.01
Non-Carbonated SSBs	4 (1.3)	29 (9.6)	<0.01
Non-Carbonated non-SSBs	00	2 (1.3)	0.42

CHAPTER 4: Discussion

4.1 Introduction

The aim of this study was to understand how the availability, price and promotion of selected sugar sweetened beverages versus non-sugar sweetened beverages differed in small and big shops in Umlazi, Durban. Chapter one presented the large amount of research undertaken found that healthier food options are more likely to be found in high income communities whereas unhealthy food options such as sugary beverages, processed foods were widely available in lower-income communities. A gap in literature was identified about the availability, pricing and promotion of SSBs and non-SSBs in both small and large shops in African townships. The current study adds some insights to begin to fill the gap. Limitations of the study are discussed as part of the conclusions of the chapter

4.2 Availability of selected non-sugary and sugary beverages in large and small shops stores

Carbonated SSBs and non-SSBs were available in all sizes at both large and small shops. Large shops had a wider selection of the brands included in the study than small shops and a greater range of sizes. Large shops were not easily accessible by majority of the people residing in the outer skirts of V, D, U and M sections where they were mainly located in Umlazi Township, which then limits the purchasing decisions of consumers who may then need to shop at small shops which were more easily accessible in Umlazi as compared to large shops. Evidence from several studies suggests that the increase in access to non-sugary beverages via large shops has decreased the probability of obesity in rural areas, due to the increase in variety of foods, and healthier options of beverages (Brimblecombe et al., 2013, Lobstein et al., 2007, Pereira, 2014, Tsolekile et al., 2014). While to an extent this could be true, our finding in the results chapter highlights that there were fewer large shops in Umlazi than small shops which predominately traded carbonated SSBs, which could limit access to healthier beverage options, especially for those without access to transport.

The lack of ease of access to non-sugary beverages demonstrates how supermarket environments could influence consumers' choice of beverage purchases through the type of beverage products that are readily accessible to the consumer (Claasen et al., 2016, Brimblecombe et al., 2013).

In summary, the supply of selected sugary beverages was high in both small shops and large shops, but there was a greater range of beverages and sizes in large shops.

4.3 Availability of selected beverages categories by size in small and large shops

Sugary beverages were available in different volume sizes across both large and small shops; however the small shops had statistically significantly fewer sizes in most beverage categories than the large shops. The small shops mainly had more stock of small single serving than the large shops for all selected beverages; this could be due to small fridge and storage capacity of small shops than large shops, which further limits the buying decision of consumers at the point of sale in the small shops. This is important because Sharkey et al. (2012) identified that beverage assortment, both by variety and brand size is an important concept for in-store marketing strategies that impacts on the choices between sugary and non-sugary beverages, therefore the lack of access to different brand sizes limits the choices of consumers with different needs of beverage sizes in small shops.

4.4 Price of non-sugary and sugary beverages in small and large shops

There is increasing evidence that shows that price elasticity has an influence in the choice consumers makes between sugary and non-sugary beverages (Falbe et al., 2015). Our findings in the results chapter shows that sugary beverages were traded in both large and small shops whereas the selected brands of non-sugary beverages were more available in large shops. The price for the selected non-carbonated beverages was cheaper in large shops as compared to small shops. The price difference was more meaningful for non-carbonated non-SSBs which were cheaper in large shops. This was important to note because non-carbonated non-SSBs which includes beverages such as unflavoured milk, and pure water are the healthier options which can be substituted for sugary beverages according to Shapiro et al. (2008), furthermore this is important to establish because price is one of the important factors for consumers in terms of both planned and impulse purchasing decision on the choice of beverage product (Muruganantham and Bhakat, 2013). Our findings shows that the average price for selected carbonated SSBs was cheaper in small shops compared to large shops, which Muruganantham and Bhakat (2013) suggests that this lower price elasticity for sugary beverages could potentially increase the obesity rates since consumer's choice has been shown to be influenced by price of beverage. This is a concern because a study by Shapiro et al. (2008) on morbidly obese children, indicated that reducing availability of sugar-sweetened beverages and increasing physical activity especially amongst young adolescents is vitally

important to prevent them from growing into obese adults, this is concerning because small shops have cheaper sugary beverages and as previously noted that price is an important factor when it comes to beverage choices, compounded by the fact that these shops are easily accessible to children who at home spend more time watching television and playing video games than doing any physical activities which contributes towards teenage weight gain and adulthood obesity. A study conducted by Stacey et al. (2017) which aimed at providing estimates of price and expenditure elasticities for various categories of soft drinks also showed that carbonated sugary beverages have the highest expenditure among the various categories of beverages. This is a point of concern because as previously noted that small shops had cheaper prices of carbonated SSBs, as such the authors suggest that implementation of the proposed taxation of these sugary beverages may lead to a significant reduction in consumption carbonated sugary beverages and this could potentially reduce the onset of obesity in South Africa (Stacey et al., 2017). This is further supported by similar study in Mexico conducted in middle to low socio-economic setting, where taxation of sugary beverages was associated with fewer purchases of taxed sugary beverages and more purchases of untaxed sugar free beverages (Singhal and Joshi, 2016). Cheaper prices of carbonated sugary beverages observed in the small shops could be thought to be as a result of spaza shops which generally stocked more of cheaper no-name brand beverages (Coo-ee, and Flavoured water) compared to large shops that had different popular brands such as Coca-Cola, Sprite and Red Bull caffeine.

The average price per litre for the selected beverage categories and different volume sizes becomes cheaper as the volume size increases in both large and small shops, in other words across all selected beverage categories, it is more expensive to buy small single serving and large single serving as compared to buying small multiples serving and large multiples serving in both small and large shops, however more noticeably was that this phenomena applied more to the selected carbonated sugary beverages and non-carbonated sugary beverages and less to carbonated non-sugary beverages and non-carbonated non-sugary beverages. This invariably means it is cheaper to buy larger volume sizes of sugary beverages than it is to buy smaller volumes, which could lead to increase consumption of sugary beverages and potentially could lead to increase obesity in Umlazi. This could potentially be ameliorated by the suggestions given by Blecher (2015), where he explains that taxation of sugary drinks according to the quantity of caloric sweeteners rather than by volume size

could potentially encouraged manufactures and suppliers to market and supply lower or zero calorie of non-sugary beverages as opposed to sugary beverages so as to positively influence access by making these healthier beverages cheaper in both small and large shops.

The sample of retail shops showed that non-sugary beverages were expensive on average, with the average prices much higher by as much as R3/litre when comparison for the same categories volumes is made between large and small shops. This might reflect as well the differences in procurement options available for both retail shops, or it might be the possibility of profit maximization possible to each group of retail shops.

4.5 Promotion of selected non-sugary and sugary beverages

Large shops in this study had more promotions than small shops. Any promotional activities were frequently found to be disproportionately in favour of carbonated sugary beverages as against carbonated non-SSBS, non-carbonated SSBs and non-carbonated non-SSBs beverages. Among the large shops, carbonated SSBs were predominately being promoted of all the selected beverages observed, using a diverse range of promotional activities, the use of marketing and promotional activities declines steadily as observation moves from carbonated SSBs, to carbonated non-SSBs, non-carbonated SSBs and non-SSBs. This is important because evidence shows that the impact of in-store promotional activities has the ability to strongly encourage brand loyalty, and could potentially influence brand preference for the consumers at the point of purchase (Sharkey et al., 2012).

Percentage discounts was the most common approach of promotional activity. Percentage discount was mostly towards non-carbonated SSBs and carbonated non-SSBS, this was interesting to note because it was previously also noted that in large shops, carbonated non-SSBS were cheaper on average than carbonated sugary beverages. This finding shows that the large shops over the surveyed area in Umlazi were promoting more carbonated non-SSBs and therefore it is cheaper for consumers to buy carbonated non-sugary beverages than it is to buy carbonated sugary beverages in large shop, this was contrary to the small shops although there was less promotional activities among the small shops where promotions were more directed towards carbonated SSBs than carbonated non-SSBs hence in small shops it was cheaper to buy sugary beverages. These finding are important because Muruganantham and Bhakat (2013), suggests that in-store promotional activities such as price discounts are

common strategies that are used by retailers in efforts to influence consumer's choice of beverage in order to promote sales of a particular brand type which means if these strategies are used to promote sales of unhealthy beverages option, it could potentially lead to increase consumption of sugary beverages and increased obesity rate in township where they are predominately small shops.

4.6 Limitations

The results of the study need to be interpreted in the light of several limitations. Due to the plethora of different beverages and volume sizes, 23 beverage brands of interest with their corresponding sizes were purposively included in this study rather than capturing all available brands in each category. The results therefore reflect only findings for the measured brands rather than overall availability of all brands. This limits the external validity or generalizability of the study.

There may have been inconsistencies in how the researcher and the research assistant collected data. It is possible that some brands and sizes available in the retail stores under study could have been missed and thus not captured. It is unlikely that this would have occurred in any systematic way so if errors occurred they are likely to be random.

Barriers to accessing retail stores in instances where there was resistance from the shop owners and managers who did not permit recording of in-store beverages contributed to the limitations in the study. However, the response rate was high with researchers being able to collect data from 87% of shops in the area.

Another limitation was that data collection was at a point in time and factors such as stock out, or seasonal promotions could not be considered. Also the study was not designed to determine whether availability was based on demand which could have led retailers to stock a particular brand over the other.

Since the study was a census of all retail stores in the surveyed area of Umlazi, the results could be applicable to other similar Townships.

CHAPTER 5: Conclusion and recommendations

5.1 Conclusion

Obesity is a major public health concern in South Africa. Recent evidence has emphasized that excess consumption of sugar-sweetened beverages (SSBs) is important for weight gain. There is insufficient information about the factors that influence SSB consumption in South Africa particularly in the lower income communities such as Townships. The results of this study provide important information that can be used to plan for health interventions that will begin to address retail environments in the Townships. This information provides insight and understanding of how retailers could potentially influence consumer's choice of beverage options at point of purchase. Research shows that increasing the number of large shops in these areas will ameliorate the obesity rate as a result of increase in access to healthier beverage options offered by large shops (Lobstein et al., 2007, Pereira, 2014, Tsolekile et al., 2014, Brimblecombe et al., 2013), however the impact of in-store promotional activities linked to price discount of sugary beverages is also important since it has been shown that price discounts can facilitate brand preference at points of purchase (Muruganantham and Bhakat, 2013).

The findings of this study show that the small shops had less beverage options available than large shop for all different sizes. The small shops traded more of the cheap no-brand name sugar sweetened beverages as compared to large shops which had more options available; however large shops were not using in-store marketing strategies to promote non-sugary beverages. As concerns are increasing about the health risks associated with excess sugary beverages consumption, health experts and policy makers have begun to explore health interventions that are linked to in-store retail environments. This is in an attempt to assist consumers to make healthier beverage choices while growing consumer demand that is socially responsible with health benefits for people in living in Township areas.

This study provides useful information that will begin to fill the gap about the different retail environments in Umlazi Township and how they might influence consumer's choice at point of purchase.

5.2 Recommendations

The National Development Plan 2030, goal number four aims to significantly reduce the prevalence of non-communicable chronic diseases and promote health and wellness for all South Africans. The researcher recommends a multi-disciplinary approach to raise awareness about the consequences of poor beverage choices and use of regulatory mechanism which includes in-store retail environment interventions that encourages consumers to make healthier beverage choices.

5.2.1 Retail store managers and public policy maker recommendations

The finding of our study has implications and informs both retail store managers and public policy maker in terms of the in-store retail environment and how it can be utilized to aid in achieving goal number four of the National Development Plan 2030 which aims to create an enabling environment that supports availability and accessibility to healthy food choices for all South African people of all races. In order to help achieve this goal, small and large shop owners and managers need to play an important role in making sure that healthier beverage options are widely available in both small and large shops, and specifically the small spaza shops which are easily accessible to most people living in township areas. The owners of small shops also need to take into cognizant the volume sizes of the beverages that are readily accessible to consumers because different consumers have different satiety needs when it comes to beverage consumption. The small shop owners would need to engage with the manufactures in order to get bigger fridges for storage so that indeed they are able to stock variety of beverages with different sizes with particular focus on non-sugary beverages. The owners and managers of large shop needs to be encouraged towards better utilization of in-store spaces so that non-sugary beverages are easily accessible inside the large shops as it has been shown through literature that impulse purchasing counts for more sales in beverage consumers (Muruganantham and Bhakat, 2013).

Government policy makers must come up with interventions that supports small business owners through preferential procurement policy frameworks that is pro-small business owners such that it is made easier for small business to procure healthier beverage products. Policy makers will need to look at ways that will increase accessibility of large shops to the majority of the people through reliable mode of transport. Equitable access to large shops in

the Township areas will increase availability and accessibility of healthier beverage choices to people in Township areas since there's growing research that indicates that large shops offer healthier beverage products. However a joint collaborative effort is needed from government policy makers and all other industry role players to ensure competitive fairness that supports small retailers to trade and promote healthier non-sugary beverages.

Taking action that aims at reducing the prevalence of non-communicable chronic diseases and promote health and wellness is well articulated in the South African National Development Plan 2030. The South African population experiences a high burden of diseases in form of malnutrition, and high rates of obesity and NCDs which retail environment can help alleviate by means of price discount on healthy non-sugary beverages. Literature has shown that price elasticity has an influence in the choice consumers make between sugary and non-sugary beverages (Falbe et al., 2015). Our findings have shown that the average price for carbonated sugary beverages is cheaper and widely available in small shops and non-carbonated non-sugary beverages are widely available in large shops. This suggests that more fiscal measures, such as excise taxes are needed to assist in promotion of healthy beverage choices particularly in small shops.

This study presents several managerial implications for store owners in large shops where greater proportion of in-store promotions were undertaken. Any promotional activities were frequently found to be disproportionately in favour of carbonated sugary beverages in large shops, therefore store manager need to apply more variations to their in-store lay-out plans which will increase healthy beverage display and apply promotional strategies that will contribute to healthy behavioral change in individual's beverage choices.

Store managers in both small and large shops have a role to play in increasing consumer's health awareness through the type of beverage products that are promoted. Promoting beverages with more health benefits will therefore be more appealing to consumers with high health awareness (e.g., unflavoured milk, pure still water, and vitamin drinks).

Finally, given the recent economical constraints, and the burden of obesity and chronic NCDs in the health system, public policy makers in South African should seek to adopt WHO's guidelines on sugar consumption and formulate context specific guidelines for healthy substitutes of SSBs such as pure water and move towards implementation of in-store environment regulatory policies

5.3 Further Research

This thesis has several implications for future research around availability, pricing and promotion of SSBs and non-SSBs in retail stores in South Africa. More research is required in order to validate the findings presented in this thesis. For instance, in order to validate the results, future researchers need to compile a census of beverages in all different sizes that are available in all retail shops and longitudinal data analysis are required which will then make it possible to assess changes in the profile of in-store retail environment over time. Future researcher will need to develop a validated data capturing tool in the form of checklists that can assist data capturing and future analysis of in-store retail environment.

The density and distance to small versus shops need to be considered for future research as it was indicated in the discussion chapter that spatial accessibility to big shops influences accessibility of non-SSBs. There is limited local research that has reported on this objectively in association with access to SSBs and non-SSBs as influenced by spatial planning in Townships, therefore this could presents a viable opportunity for future research.

This report mainly focuses on the selected list of beverages in retail stores under the surveyed area, only limited inferences can be made with regards to consumption of SSBs and non-SSBs. Additional research is needed to determine the association between the high rates of exposure to SSBs versus non-SSB and consumption thereof.

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Appendix A: Data Collection Tool

Retail name	Retail location	Date	category	Brand	size	availability	Price	Promotion (%) discount	Promotion (coupons)	Promotion (BOGO)	Other Promotions	Shelf_Commercial placement (e.g. paypoint)	Fridge_Commercial placement (e.g. paypoint)2	Shelf_Verical Placement: TOP, EYE, MID, BOTTOM	Fridge_Verical Placement: TOP, EYE, MID, BOTTOM2	Shelf_Block Placement	Fridge_Block Placement2	Other placement
			soft drinks	Coca-Cola	330ml													
			soft drinks	Coca-Cola	2l+ 250ml													
			soft drinks	Coca-Cola Zero	330ml													
			soft drinks	Coca-Cola Zero	2l+ 250ml													
			soft drinks	Coke Light	330ml													
			soft drinks	Coke Light	2l+ 250ml													
			soft drinks	Sparletta	330ml													
			soft drinks	Sparletta	2l+ 250ml													
			soft drinks	Sprite	330ml													
			soft drinks	sprite	2l+ 250ml													
			soft drinks	Sprite Zero	330ml													
			soft drinks	Sprite Zero	2l+ 250ml													
			soft drinks	Fanta	330ml													
			soft drinks	fanta	2l+ 250ml													
			soft drinks	stoney	330ml													
			soft drinks	Stoney	2l+ 250ml													
			soft drinks	Coo-ee	330ml													
			soft drinks	Coo-ee	2l													
			soft drinks	Twizza	330ml													
			soft drinks	Twizza	2l													
			soft drinks	Iron Brew	330ml													
			soft drinks	Iron Brew	2l													
			soft drinks	Schweppes	330ml													
			soft drinks	Schweppes	2l+ 250ml													
			soft drinks	Twist- Granadilla	330ml													
			soft drinks	Twist- Granadilla	2l+ 250ml													
			soft drinks	Appetizer	330ml													
			soft drinks	Appetizer	2l													
			soft drinks	Pepsi	330ml													
			soft drinks	Pepsi	2l													
			concentrates	Brookes	1l													
			concentrates	Brookes	5l													
			concentrates	Oros	1l													
			concentrates	Oros	5l													
			concentrates	Halls	1l													
			concentrates	Halls	5l													
			sport & energy drinks	Energade	330ml													
			sport & energy drinks	Energade	500ml													
			sport & energy drinks	Powerade	330ml													
			sport & energy drinks	Powerade	500ml													
			sport & energy drinks	Red Bull	330ml													
			sport & energy drinks	Red Bull	500ml													
			bottled water	Valpre	330ml													

APPENDIX B: ETHICS APPROVAL



HUMAN RESEARCH ETHICS
COMMITTEE (MEDICAL)

Ref: W-CP-180702-1 (previously M180243)

02 July 2018

TO WHOM IT MAY CONCERN:

Waiver: This certifies that the following research does not require clearance from the Human Research Ethics Committee (Medical).

Investigator: Dr Phumlani Khwela (student no 1369710)
Supervisors: Nicola Chrisofides and Nicholas Stacey
Faculty: Health Sciences
School: Public Health
Project title: Access to non-sugar and sugar sweetened beverage: pricing, promotion, and placement in large and small retail stores
Reason: Marketing research – study will focus on understanding how access to non-sugar and sugar sweetened beverage differs between large and small retail stores.

Professor Clement Penny

Chair: Human Research Ethics Committee (Medical)

A handwritten signature in black ink, appearing to read "C. Penny".

Copy – HREC (Medical) Secretariat: Zanele Ndlovu, Rhulani Mkansi, Iain Burns,
Mapula Maila



Research Office Secretariat: Faculty of Health Sciences, Philip Tobias Building, 3rd Floor, Office 301, 29 Princess of Wales Terrace, Parktown, 2193 Tel +27 (0)11-717-1252/1234/2656/2700 Private Bag 3, Wits 2050, email: zanele.ndlovu@wits.ac.za Office email: hrec-medical-research@wits.ac.za Website: www.wits.ac.za

APPENDIX C: Permission to conduct research at the stores

Permission to conduct research

To: Store Manager

Shop: _____

Manager/owner: _____

From: The Investigator

Wits School of Public Health

Dr Phumlani Khwela

Date: _____

Re: Permission to conduct research at _____

Dear Store manager

I, Dr Phumlani Khwela, a master's student at the School of Public health (University of the Witwatersrand) would like to ask for permission to collect data for my masters research report title: ***Access to non-sugar and sugar sweetened beverage: pricing, promotion, and placement in large and small retail stores.***

The purpose of my research is to gather knowledge about access to SSBs through promotional materials and product placement and to further understand the current options of non-sugary and SSBs that are available in the larger and smaller retail stores.

I have received approval from the Human Research Ethics Committee at University of the Witwatersrand (M180243), dated _____. The shops will not be identified by name but will only be categorized as larger and smaller shops.

Supported/Not supported by

Store Manager (Signature)

Date

