




“Perceptions of the sugar-sweetened beverage tax amongst tertiary accounting students in South Africa: a comparative study”

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PERCEPTIONS OF THE SUGAR-SWEETENED BEVERAGE TAX AMONGST TERTIARY ACCOUNTING STUDENTS IN SOUTH AFRICA: A COMPARATIVE STUDY

Abstract

An excise tax on sugar-sweetened beverages to reduce excessive sugar consumption in South Africa came into effect on 1 April 2018. This study aimed to investigate perceptions of a limited sample of South Africans regarding the sugar-sweetened beverages tax based on certain economic factors, and whether participants perceived any likely benefit from the tax. These perceptions were compared with perceptions identified in selected foreign jurisdictions that have levied such a tax. A survey questionnaire was selected as the primary method of data collection. This questionnaire was administered to post-graduate Accounting students, aged twenty-one years and older, studying at three residential universities in South Africa. An extensive analysis of literature available on sugar-sweetened beverage taxes, both locally and internationally, was conducted. The two main constructs (construct 1: perception of the sugar-sweetened beverage tax and the price of sugar-sweetened beverages and construct 2: the social impact of the sugar-sweetened beverage tax) were analysed using descriptive statistics. This study found that there is a significant association between gender and perception that the sugary beverage levy will be beneficial to health, with female perceptions of the benefit of the sugary beverage levy being greater than that of males. The study found that perception of the sugar-sweetened beverage tax may depend on several factors, closely linked to individual beliefs and cultures, and thus different populations may have different perceptions of the tax. The findings about sugar-sweetened beverage consumption trends across gender, ethnicities and physical activity groups can help guide targeted strategies to reduce consumption.

Keywords

sugar-sweetened beverage tax, perceptions, South Africa, price, consumption, habit

JEL Classification

H2, H20, H71, I18

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СПРИЙНЯТТЯ ПОДАТКУ НА ЦУКРОМІСТКІ НАПОЇ СТУДЕНТАМИ УНІВЕРСИТЕТІВ НАПРЯМУ БУХГАЛТЕРСЬКОГО ОБЛІКУ В ПІВДЕННІЙ АФРИЦІ: ПОРІВНЯЛЬНЕ ДОСЛІДЖЕННЯ

Анотація

Акцизний податок на цукромісткі напої, метою якого було зменшення надмірного споживання цукру, у Південній Африці набув чинності 1 квітня 2018 року. Метою цього дослідження є вивчення сприйняття обмеженої вибірки південноафриканців щодо податку на напої із вмістом цукру на основі певних економічних факторів, а також того, чи відчули учасники якусь ймовірну вигоду від податку. Ці уявлення порівнювалися з уявленнями, визначеними в окремих іноземних юрисдикціях, які стягували такий податок. Основним методом збору даних обрано анкету, яку запропонували аспірантам-бухгалтерам трьох місцевих університетів Південної Африки віком від 21 року та старше. Було проведено широкий аналіз наявної літератури про податки на цукромісткі напої як на місцевому, так і на міжнародному рівні. За допомогою описової статистики проаналізовано дві основні моделі: модель 1 – сприйняття податку на цукромісткі напої та ціни на цукромісткі напої, модель 2 – соціальні наслідки податку на цукромісткі напої. Виявлено значний зв'язок між статтю та уявленнями про те, що збір на напої із вмістом цукру буде корисним для здоров'я, причому сприйняття жінками користі від збору на цукромісткі напої є вищим, ніж серед чоловіків. Показано, що сприйняття податку на цукромісткі напої може залежати від кількох факторів, тісно пов'язаних з індивідуальними віруваннями та культурами, тому різні групи населення можуть по-різному сприймати податок. Висновки про тенденції споживання цукромістких напоїв залежно від статі, етнічності та фізичної активності можуть допомогти в розробці стратегій зі зниження споживання.

Ключові слова

податок на цукромісткі напої, сприйняття, ПАР, ціна, споживання, звичка

Класифікація JEL

H2, H20, H71, I18

INTRODUCTION

Sugar-sweetened beverages have the potential not only to increase weight and the risk of Type Two (2) diabetes, but additionally may increase insulin resistance and inflammation (Malik, Schulze & Hu, 2006). A prospective cohort study carried out by Schernhammer, Hu, Giovannucci, Michaud, Colditz, Stampfer and Fuchs (2005) also indicated that the consumption of sweetened soft drinks may be linked with a greater risk of pancreatic cancer, predominantly in women with a high Body Mass Index or a low physical activity level and an underlying degree of insulin resistance. The consumption of soft drinks has also been linked to other health consequences, such as increased risk of dental caries due to the high sugar content and acidity, resulting in enamel erosion over time (Heller, Burt & Eklund, 2001).

The South African National Treasury (Republic of South Africa National Treasury, 2016) sheds light on the fact that global trends are increasingly focused on limiting the intake of sugars in the human diet to curb the burgeoning problems for governments arising out of the obesity epidemic. In South Africa, over the past 30 years, the problem of obesity has grown. This has resulted in the country being ranked the most obese in sub-Saharan Africa (Republic of South Africa National Treasury, 2016). Modern scientific evidence (World Health Organisation, 2015) has shown that adults who consume less sugar have a lower body weight and that increasing the amount of sugar in the diet is associated with a weight increase. Kengne (2017) explains that the South African Medical Research Council and various collaborating parties recently undertook a continental study, which revealed that the incidence of obesity and diabetes is proportionately higher in southern Africa and northern Africa, particularly in South Africa and Egypt. Kengne (2017) also reports that there has been a gradual increase in the prevalence of diabetes during the period 1980 to 2014.

The South African National Treasury (Republic of South Africa National Treasury, 2016) announced plans during April 2017, to introduce an excise tax on sugar-sweetened beverages to reduce excessive sugar consumption (which came into effect on the 1st April, 2018). The Treasury outlined the scope of the tax by defining the products that will be subject to the tax as “beverages that contain added caloric sweeteners, such as sucrose, high-fructose corn syrup, or fruit-juice concentrates, which include but are not limited to: (i) soft drinks, (ii) fruit drinks, (iii) sports and energy drinks, (iv) vitamin water drinks, (v) sweetened iced tea, and (vi) lemonade, among others. Any beverage that contains only sugar naturally built into the structure of the ingredients (i.e. intrinsic sugars) will be excluded from the tax (e.g. unsweetened milk and milk products and 100% pure fruit juice)” (Republic of South Africa National Treasury, 2016, pp. 2-3).

Manyema, Veerman, Chola, Tugendhaft, Sartorius, Labadoarios and Hofman (2014) explain that the assumption made in research carried out in South Africa concerning the imposition of the sugar-sweetened beverages tax was that the demand for sugar-sweetened beverages is relatively price elastic. The finding by Manyema et al. (2014) was, however, subsequently found to be inconsistent with the study performed by Armstrong, Fourie and Rich (2016) and demand was, in fact, found to be inelastic. Theron, Rossouw and Fourie (2016) conclude that the predicted result of the findings by Armstrong et al. (2016) is that such a sugar tax will, in effect, translate into a minor impact on demand and will not, therefore, achieve its health objectives. If this is correct, only the revenue for the fiscus will be increased. As claimed by de Waal (2016), the proposed 20% tax on sugar-sweetened beverages will provide the government with an extra R7 bln each year, but the tax will fail to achieve its stated health objective. Theron et al. (2016) submit that, if demand is in fact inelastic, these taxes will be especially detrimental to the poor, who spend a significant amount on such beverages.

Sanchez-Romero, Penko, Coxson, Fernandez, Mason, Moran, Ávila-Burgos, Odden, Barquera and Bibbins-Domingo (2016, pp. 21) explain that in the experience of Mexico's Sugar-Sweetened Beverage Tax, “acceptance by the population is greatest when it understands that the tax is meant to improve its health and well-being”. Colchero, Molina, and Guerrero-Lopez (2017) concluded that, after the imposition of a sugar-sweetened beverage tax in Mexico, the purchases of sugar-sweetened beverages decreased while the purchases of water increased, and that the impact of these changes was more significant in lower-income and urban households.

Julia, Mejean, Vicari and Peneau (2015) explain that excise taxes may not have the anticipated effect, highlighting the need for further research. Their study claimed that the French public perception of the sugar-sweetened

beverage tax could be ascertained by determining the socio-demographic characteristics of supporters and opponents of the sugar-sweetened beverage tax in France, as socio-demographic factors will modulate their perceptions. Powell and Chaloupka (2009) claim that the success of the taxation of sugar-sweetened beverages is largely dependent on public perception of the actual purpose and possible impact of such taxes in meeting stated health objectives, that would then support its acceptance. Public acceptance of food taxes is greatly contingent on the intended objectives of the tax (Julia, Mejean, Vicari & Peneau, 2015).

1. LITERATURE REVIEW

An extensive literature review was conducted to analyse the imposition of sugar-sweetened beverage taxes in countries that have levied the tax. Previous studies have identified that sugar is considered to be highly addictive, so much so that it has been found that intense sweetness can surpass the cocaine reward, even in drug-sensitised and -addicted individuals (Lenoir, Serre, Cantin & Ahmed, 2007), leading to overeating and thus weight gain. The rise in the rates of obesity and obesity-related medical costs has resulted in countries around the world utilising food and beverage taxes as a means of curbing the obesity crisis. The chief contributing factor is the consumption of sugar from sugar-sweetened beverages, as liquid sugar is swiftly absorbed by the body, and sugar-sweetened beverages do not have nutritional value (Republic of South Africa National Treasury, 2017).

The contradictory findings in the field of a beverage tax are not conclusive enough to accurately predict the impact of such a tax on the beverage consumption. More research is necessary in this regard and thus this study aims to contribute to the existing research. Many countries have introduced a tax on sugar-sweetened beverages, each structured differently, in order to limit consumption of these products and thus prevent illnesses relating to excessive sugar consumption. These countries include Mexico, France, Denmark, and Iceland. Lowman (2016) reports that Iceland and Denmark withdrew the tax soon after implementation and that there is no clear evidence of a decrease in sugar use in either Mexico or France.

Table 1. Summary of impact of the sugar-sweetened beverage tax in other countries

Source: Own design.

Country	Brief description of impact of the tax
Mexico	In January 2014, Mexico imposed a tax on sugar-sweetened beverages levied at the rate of 1 peso per litre. The South African National Treasury (Republic of South Africa National Treasury, 2016) refers to the Mexican sugar-sweetened beverage tax as an example of what a comparable tax in South Africa will achieve. The policy paper (Republic of South Africa National Treasury, 2016) emphasises that the introduction of the tax was followed by a reduction in sales of taxed products in 2014 by 6%, and 8 and 11.1% in 2015 and the first half of 2016, respectively (Rivera, 2016). The conclusions were that the tax was not only reducing demand in the short term but will also help to further decrease the demand for sugar-sweetened beverage drinks over time. Further, Colchero, Guerrero-López, Molina, and Rivera (2016) found that the sugar-sweetened beverage tax reduced purchases of taxed beverages and increased purchases of untaxed beverages during the first year of implementation of the tax in Mexico and was effective in reducing sales of sugar-sweetened beverages and increasing sales of plain water both in the first (2014) and second (2015) year, after the implementation of the tax.
France	France introduced a soda tax in 2012 to discourage the consumption of sugar-sweetened drinks. Urbach (2016) notes that despite the tax being introduced to promote healthy behaviour, the motive behind the implementation of the tax was unclear, as the French government was facing having to introduce strict measures to prevent a debt crisis when the tax generated millions of euros in additional tax revenue.
Denmark and Iceland	In 2014 the Danish government abolished its tax on soft drinks. Urbach (2016) and Riemann (n.d.) state that this was due to the fact that approximately 10% of tax revenue generated was utilised for administrative costs, the tax contributed to cross-border shopping in Germany, approximately 1300 job losses occurred, and the tax was regressive in its impact, with low-income households bearing the brunt of the tax rather than wealthier households. Riemann (n.d.) states further that 80% of Danes did not change their shopping habits. Iceland abolished its tax on sugar-sweetened beverages and sugary goods in 2015, as a result of the government citing that this was vital to benefit households and simplify the tax system. Urbach (2016) explains that recently numerous countries have considered introducing taxes on sugar-sweetened beverages and foods considered unhealthy but have abandoned the idea following public debate, including the difficulty of implementing the taxes and the risk of job losses.

South Africa is following the trend by implementing the tax on sugar-sweetened beverages, which it imposed in 1993 and subsequently abolished in 2002 (Republic of South Africa National Treasury, 2016). National Treasury claims that the aim of the sugar-sweetened beverage tax is not to increase revenue for the fiscus but rather to overcome obesity. According to Urbach (2016), however, this rationale is not convincing for the following reasons. The experience in Mexico illustrates that a sugar-sweetened beverage tax can succeed in raising additional tax revenue, especially as demand for sugar-sweetened beverages is often so inelastic that people will continue buy-

ing them even if the price goes up. If, however, consumers decide against buying higher-priced sugar-sweetened beverages, they can always buy other untaxed sugary products, which means their sugar consumption will not decrease and obesity will not be reduced. Urbach (2016) concludes that South Africa cannot afford another tax that disproportionately affects lower income households.

Many opponents of the sugar-sweetened beverage tax believe that it is regressive in nature, as lower income people suffer more from the higher prices than higher income people, which is thought to bring greater inequality among the social classes. The Republic of South Africa National Treasury (2016), however, state that when the goal of the tax is to promote better beverage consumption choices, regressivity is lessened when the low-income group reduces their purchases of the unhealthy item. This will result in potentially improving health outcomes and reducing pressure on state resources in the future.

Several factors are associated with sugar-sweetened beverage consumption and each of these are discussed in developing a theoretical framework to be used to test the perceptions of the sugar-sweetened beverage tax in South Africa. The relationship between the factors discussed below and sugar-sweetened beverage consumption was identified by synthesising, analysing and comparing the results from prior research. The aim of a study by Scully, Morley, Niven, Crawford, Pratt and Wakefield (2017), for example, was to examine the associations between high consumption of soft drinks and selected demographic characteristics, weight status and health behaviours among Australian adolescents. Adolescents' perceptions of the availability, convenience and value for money of soft drinks were also explored. In the questionnaire developed for the purpose of the present study, all the identified factors are addressed by specific items. These factors were then translated into the model to be used for the present research.

2. AIMS

The South African National Treasury (Republic of South Africa National Treasury, 2016) explains that the aim of the sugar-sweetened beverage tax in South Africa is to alter the behaviour of consumers and achieve health benefits by varying the relative price of healthy, as compared to less healthy, products. Julia, Méjean, Vicari and Péneau (2015), Powell and Chaloupka (2009) and numerous other studies have proved that perception of a tax, drives behaviour (in response to the tax). Several factors are associated with sugar-sweetened beverage consumption and each of these are discussed in developing a theoretical framework to be used to test the perceptions of the sugar-sweetened beverage tax in South Africa.

The present study therefore aimed to determine the perceptions of postgraduate accounting students who would be affected by the sugar-sweetened beverage tax in South Africa based on certain economic factors, for example, the demand for such products, the ability to easily reduce consumption should these products become less affordable, whether participants perceive any likely benefit from such a tax, and whether socio-demographic factors pertaining to the participants reveal differing perceptions. The aim of this study is to specifically explore their attitudes, behaviours and perceptions. The study is designed to outline the key factors relating to sugar-sweetened beverage consumption and obtain an understanding of how these factors will impact perceptions of a sugar-sweetened beverage tax. This research will contribute to the existing body of knowledge and the understanding of the driving forces behind sugar-sweetened beverage consumption, whilst providing additional evidence and context to perceptions of the sugar-sweetened beverage tax in South Africa.

3. METHODS

This is an exploratory study among university students in South Africa, designed to obtain their perceptions of the sugar-sweetened beverage tax. This study is referred to as cross-sectional because the information that is gathered represents what is going on at only one point in time (Olsen & George, 2004, p. 7).

The research involved a combination of quantitative and qualitative techniques, based on a paper-based questionnaire that included both closed- and open-ended questions, with a total of 46 questions. Common examples of

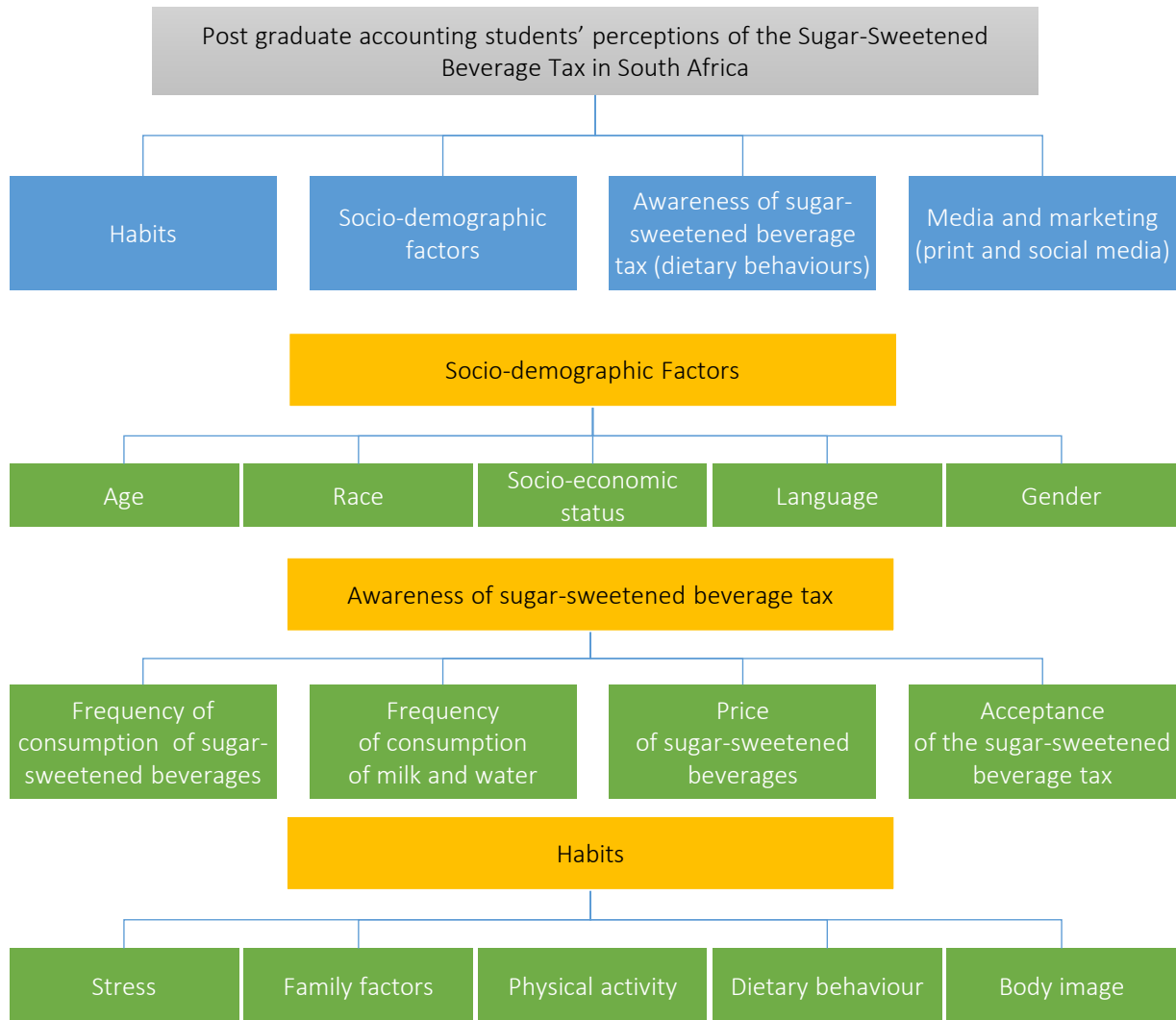


Figure 1. Research Model: Factors influencing a postgraduate students’ perceptions of the Sugar-Sweetened Beverage Tax in South Africa

sugar-sweetened beverages were also provided on the final page of the questionnaire. Respondents may have been guarded and unwilling to respond fully and honestly, due to not wanting to admit to abusing sugar-sweetened beverages, or denying that they are obese, or that the reason is sugar. An appropriate methodology was thus to make use of an anonymous survey questionnaire.

Figure 1 provides a diagrammatical overview of factors influencing perception of the sugar-sweetened beverage tax. The key factors identified from the literature review are depicted, together with individual research constructs.

The multifactorial factors affecting consumption of sugar-sweetened beverages are dependent on various sociodemographic factors, all of which, have been shown to be key factors to consider. Taking these factors into account, a theoretical framework was developed, against which perceptions were tested.

The purpose of the study was not to generalise the findings of the research to the entire South African population, but to obtain an understanding of public perceptions of the tax on sugar-sweetened beverages. The target population for the survey was post-graduate Bachelor of Commerce Accounting and Postgraduate Diploma in Accounting students, aged twenty-one years and older, studying at the University of KwaZulu-Natal, the University of Zululand and the University of Fort Hare. Time, budget and distance were identified as constraints, resulting in the research being limited to these three universities.

Table 2. Summary of the theoretical framework

Source: Own design.

Research Model	Research Constructs	Brief description of constructs
Sociodemographic factors	<ul style="list-style-type: none"> • Age • race • language • gender • socio-economic status. 	Previous research on the consumption of sugar-sweetened beverages has indicated that intake in adults and children has been linked with obesity, diabetes, and several demographics such as race, gender, age, and socioeconomic background (Rehm, Matte, Van Wye, Young & Frieden, 2008).
Media and marketing	Print and social media	Brownbill (2015) claims that sugar-sweetened beverage companies, restaurants and retailers advertise sugar-sweetened beverages using radio and television, print media, in-store displays and social media, all of which captures the attention of young adults.
Awareness of the sugar-sweetened beverage tax	<ul style="list-style-type: none"> • Frequency of consumption of sugar-sweetened beverages versus frequency of consumption of water and milk; • price; • acceptance of the sugar-sweetened beverage tax. 	Pivotal factors, as identified by Julia, Méjean, Vicari and Péneau (2015), such as acceptance of the tax, perceptions of its economic impact and its impending health impact, as well as the consumption of sugar-sweetened beverages is investigated. Further, attitudes about price modification, knowledge of the tax and its scope will also be explored.
Habits	Dietary behaviour	Lavin and Timpon (2013) define habit behaviours as those which are often repetitive, involuntary and can be difficult to control. Mechanisms for coping with stress, family influence and regularity of physical activity have all been identified as habits which affect perceptions of the sugar-sweetened beverage tax.

The decision to use students as the units of analysis was based on the difficulty in gaining access to consumers of the sugar-sweetened beverages, and the assumption that postgraduate students are also consumers who will make their consumption decisions based on economic and socio-demographic factors. It was also assumed that the demographic profile of the students of the three universities is likely to be broadly representative of the demographics of the South African population. The methodology can be applied in different age groups, however, a separate questionnaire should be developed for each age group.

A purposive, non-probability, convenience sampling technique was used. Kothari (2004, p. 17) explains that "...purposive sampling is considered desirable when the universe happens to be small and a known characteristic of it is to be studied intensively. Also, there are conditions under which sample designs other than random sampling may be considered better for reasons like convenience and low costs". The deliberate sampling method therefore was considered the most logical and feasible manner by which to identify the target population and units of analysis for this study.

Data was collected during the 2018 calendar year. Accounting lecturers at the universities concerned were requested to administer the questionnaires in class, to ensure a good response rate. A total of 325 questionnaires were distributed to postgraduate accounting students across three universities. All 325 questionnaires were returned, however, 22 were excluded and were not considered for analysis due to missing responses (incomplete) and obvious errors, which resulted in 303 viable (completed) responses. This resulted in 93% of the questionnaires being subject to analysis (303 valid responses / 325 = 93%). As the research involves both non-inferential quantitative and qualitative techniques, without the intention of generalising the findings, this is considered an adequate number of participants.

The socio-demographic profile of the respondents was subdivided into various characteristics based on age, gender, home language, race, level of income, and type of residence. The sample consisted of 303 university students, ranging in age from 21 to 35 years, with the majority of the respondents (92%) between the ages of 21 to 25 years.

The questionnaire consisted of questions adapted from factors identified in the literature review and designed to test each variable, based on relevant previous studies on sugar-sweetened beverage consumption. The questionnaire included an introductory letter and an informed consent form, which declared that survey participation is voluntary, and that the responses will be kept anonymous. Participants were required to agree to these terms before commencing with the questionnaire.

The first part of the questionnaire dealt with establishing the demographic and income profile of the target group. Section two of the questionnaire tested each construct from the framework developed in Table 2. A five-point Likert-type scale with anchors on "strongly agree" and "strongly disagree" was used.

With the aim of establishing whether respondents would experience any difficulties in interpreting and completing the questionnaire, a pilot study was conducted. The questionnaire was critically evaluated and pre-tested by academics at various institutions across the country. All suggested amendments were considered and effected, if deemed appropriate. Feedback indicated that the survey was easily understood in that the questionnaire language was clear and unambiguous, produced reasonable answers and was ethically appropriate. This ensured the quality and accuracy of the research design. The questionnaire was designed to test the following variables:

- demographic variables;
- health;
- physical activity;
- perceived stress response;
- beverage consumption.

This study was subject to various ethical considerations applying to research involving human beings, and the procedures followed included; obtaining ethical clearance from Rhodes University Department of Accounting Ethics Sub-Committee, Rhodes University - Human Subjects Ethical Standards Committee, and the gatekeeper consent of the appropriate persons from the Universities of KwaZulu-Natal, Zululand and Fort Hare; and ensuring that all the ethical requirements of research involving human participants were adhered to. No ethical considerations arose in relation to the documents used in the research as all the documents used are publicly available.

The data from the completed questionnaires was checked, coded and entered into SAS Enterprise Guide 7.1 to analyse the data, and SPSS 25 Statistical Software was used for the factor analysis. The data was analysed using descriptive statistics for the closed-ended questions and thematic analysis for the open-ended responses. The descriptive statistical analysis involved the computation of frequency distributions (counts and percentages) of the responses to the questionnaire. Measures of central tendency, including means, standard deviations, and range were conducted on all variables of interest. Analysis of variance were used to compare group means. Chi-square analyses were used to examine differences in proportions, as appropriate. To examine group differences, analysis of variance (ANOVA) and independent t-tests were conducted and $p < 0.05$ was established as the level of significance.

Reliability and validity tests of the instrument used were carried out. Mean scores and Cronbach's alpha were used to test the reliability of the instrument, while factor analysis was used to ascertain its validity. A reliability and internal consistency test on the multiple item constructs was carried out on the data. The Cronbach's alpha (α) reliability coefficient was used to test the reliability of the items for the various constructs. The Cronbach's alpha is a reliability measure coefficient that reflects how well items in a set are positively correlated to one another. To analyse the validity of each of the constructs (i.e. the theoretical model), factor analysis was applied using SPSS 25.

Data was gathered relating to the demographic characteristics of the respondents and the two main constructs (construct 1: perception of the sugar-sweetened beverage tax and the price of sugar-sweetened beverages; and construct 2: the social impact of the sugar-sweetened beverage tax), which was then analysed using descriptive statistics. Questions relating to respondents' sugar consumption habits, the frequency and quantity of consumption of sugar-sweetened- and non-sugar-sweetened beverages, and childhood behaviours were also explored.

4. RESULTS

4.1. Perception of the sugar-sweetened beverage tax and the price of sugar-sweetened beverages

Table 3 displays the mean score of 14 items used to measure the perception of respondents of the sugary beverage levy and the price of sugar-sweetened beverages. The mean score of 3.42 for all 14 items indicates a positive perception of the sugary beverages levy and the price of sugar-sweetened beverages. The statement: "imposing a tax on sugar-sweetened beverages will increase prices" received the highest positive perception of this construct

(mean=4.43), followed by the statement: “a tax should be levied on sugar-sweetened beverages only if the prices of other healthy foods and beverages decrease” (mean=3.92). The lowest mean score of 2.80 was for the statement “the reports that I see and read in the media about sugar and sugar-sweetened beverages discourage me from drinking sugar-sweetened beverages”.

Generally, the respondents have a positive perception towards this construct, understand the sugary beverage levy (mean=3.49) as well as the health benefit that will be derived from the levy (mean=2.91). The respondents have a positive perception of purchasing healthier beverages if the price of sugar-sweetened beverages went up by 20% (mean=3.17). Respondents also have a strong positive perception of developing a habit of drinking healthier beverages if they are cheaper than sugar-sweetened beverages (mean=3.66).

Table 3. Mean score of 14 items used to measure the perception of respondents of the sugary beverage levy and the price of sugar-sweetened beverages

Source: Own design.

Statements (perception and price)	Mean	Standard deviation	Min	Max
I understand the sugary beverages levy (n= 303)	3.49	1.11	1	5
The sugary beverages levy will be beneficial to my health (n= 303)	2.91	1.26	1	5
A tax should be levied on sugar-sweetened beverages (n= 303)	3.07	1.31	1	5
A tax should be levied on sugar-sweetened beverages only if the money is used to improve the health-care system (n= 303)	3.87	1.22	1	5
A tax should be levied on sugar-sweetened beverages only if the prices of other healthy foods and beverages decrease (n= 302)	3.92	1.17	1	5
Imposing a tax on sugar-sweetened beverages will increase prices (n= 303)	4.43	0.88	1	5
A tax on sugar-sweetened beverages would be unfair because poor people would still pay the same amount as the rich (n= 300)	3.79	1.16	1	5
Having a tax on sugar-sweetened beverages will improve the health of the population (n= 303)	3.24	1.24	1	5
Clear labelling of sugar content makes me less likely to buy sugar-sweetened beverages (n= 303)	2.88	1.35	1	5
The reports that I see and read in the media about sugar and sugar-sweetened beverages discourage me from drinking sugar-sweetened beverages (n= 303)	2.80	1.2	1	5
Advertising and marketing of sugar-sweetened beverage brands make me want to buy these products (n= 303)	3.04	1.24	1	5
I would purchase fewer sugar-sweetened beverages if the price went up by 20% (n= 303)	3.51	1.29	1	5
I would purchase healthier beverages if the price of sugar-sweetened beverages went up by 20% (n= 303)	3.17	1.18	1	5
I could develop a habit of drinking healthier beverages if they are cheaper than sugar-sweetened beverages (n= 303)	3.66	1.31	1	5
Mean score for all 14 items	3.42	–	–	–

Note: **Question 33: “As sugar-sweetened beverages were relatively cheap prior to the imposition of the tax, I have developed a habit of drinking these beverages” was moved to “habits” (questions 12 -19) for statistical grouping purposes.

4.2. Social impact of the sugar-sweetened beverage tax

Table 4 displays the mean score of 11 items used to measure the social impact of the sugar-sweetened beverage tax. This construct had a mean of 3.66 indicating respondents believe that the sugar-sweetened beverage tax has a positive social impact. All items received a mean score above 3.0. The highest mean score for the social impact statements was: “childhood obesity is a serious problem” (mean=4.28), which was closely followed by the statement: “childhood obesity is a problem for society” (mean=4.26). The statement with the lowest mean score was that the “the tax on sugar-sweetened beverages will result in producers of sugar-sweetened beverages leaving South Africa” (mean=3.07).

Respondents believe that “the consumption of sugar-sweetened beverages contributes to the obesity rate in South Africa” (mean=3.99). Respondents believe that one of the positive social impacts is that “the sugary beverages levy will be effective in lowering obesity” (mean=3.2). The respondents were positive about the fact that “prominent calorie labels should be placed on sugar-sweetened beverages” (mean=3.96). This correlates with a study by Gollust, Barry and Niederdeppe (2014) where 65% of the respondents had the highest support for calorie labelling.

Respondents strongly believe that there will be a positive social impact if “television and radio stations provide free airtime for public service announcements on healthy eating and exercise” (mean=3.92).

Table 4. Mean score of 11 items used to measure the social impact of the Sugar-Sweetened Beverage Tax

Source: Own design.

Statements (Social impact)	Mean	Standard deviation	Min	Max
Childhood obesity is a problem for society (n= 303)	4.26	0.92	1	5
Childhood obesity is a serious problem (n= 303)	4.28	0.93	1	5
The consumption of sugar-sweetened beverages contributes to the obesity rate in South Africa (n= 303)	3.99	0.98	1	5
The sugary beverages levy will be effective in lowering obesity rates (n= 303)	3.20	1.12	1	5
The sugary beverages levy is a practical approach to limiting sugar intake (n= 303)	3.18	1.18	1	5
A tax should be levied on sugar-sweetened beverages only if the money is used to improve pre-school programs or build parks, libraries or recreation centres (n= 303)	3.80	0.99	1	5
Schools should be prohibited from selling sugar-sweetened beverages on school property (n=303)	3.28	1.17	1	5
The tax on sugar-sweetened beverages will result in producers of sugar-sweetened beverages leaving South Africa (n= 303)	3.07	1.08	1	5
The tax on sugar-sweetened beverages will result in a loss of jobs (n= 303)	3.27	1.03	1	5
Prominent calorie labels should be placed on sugar-sweetened beverages (n= 303)	3.96	0.86	1	5
Television and radio stations should provide free airtime for public service announcements on healthy eating and exercise (n= 302)	3.92	1.02	1	5
Mean score for all 11 items	3.66	–	–	–

Qualitative data analysis of the responses to the final open-ended question regarding the sugary beverages levy and its implementation, was applied to gain an understanding of the respondents’ knowledge and perception of the tax. Responses were collated and summarised under various themes, to reveal common responses, statements, perceptions or thoughts of the respondents.

It was evident that many of the respondents, although in favour of the tax, were concerned about the disparity created between the wealthy and poor as a result of the tax (participants with lower education tended to agree more with the French study by Julia, Méjean, Vicari and Peneau (2015)), the possible maladministration of the funds collected, the fact that demand for sugar-sweetened beverages appeared not to be price-sensitive and that most citizens would benefit more from being educated on the negative effects of sugar.

These findings correlate with those in a qualitative study of adolescent views of sugar-sweetened beverage taxes in Michigan by Krukowski, Conley, Sterling and Rainville (2016). Krukowski et al. (2016) found that students identified that the advantage of a sugar-sweetened beverage tax was greater revenue for the government and decreased consumption of these beverages. The students, however, understood that habit could make decreasing consumption of sugar-sweetened beverages particularly difficult.

The study by Krukowski et al. (2016) also found that adolescents were of the view that due to the addictive nature of sugar-sweetened beverage consumption, demand was not price sensitive. Respondents also identified various educational strategies that could be implemented at school level to reduce consumption of sugar-sweetened beverages. Additionally, they identified knowledge and awareness campaigns of the detrimental effects of high sugar consumption by the government, could aid in the successful implementation of the tax.

5. DISCUSSION

This study highlights and profiles perceptions of the sugary beverages levy among post-graduate accountancy university students across two provinces in South Africa. University students experience various social and environmental changes. These changes involve increased independence in daily living and decision-making in all domains, including health (Gillen & Lefkowitz, 2011).

In the French study by Julia, Méjean, Vicari, and Péneau (2015), 50% of the study sample was supportive of the tax and 57.7% perceived it as helpful in improving population health. The present study indicated that there is a significant association between gender and the perception that the sugary beverage levy will be beneficial to health. Female perceptions (64%) of the benefit of the sugary beverage levy were higher than that of males. In contrast to the French study, though, only 34% of all respondents in the present study perceived the sugar-sweetened beverage as being beneficial in terms of health effects.

Generally, the respondents have a positive perception of the sugary beverages levy, understand the sugary beverage levy, as well as the health benefits that will be derived from the levy. In the study by Gollust, Barry and Niederdeppe (2014), however, only 21% of the public supported sugar-sweetened beverage taxes, while 36% support was garnered from a nationally representative survey conducted in 2009–2010 by Rivard, Smith, McCann and Hyland (2012). Rivard et al. (2012) found that those with some college or higher education were more likely to support a sugar-sweetened beverage tax than those with less education. This was evident in the present study as well.

The present study found that 71.80% of respondents supported the tax on sugar-sweetened beverages if the revenue generated was used to improve the health care system, which correlates to the findings in the French study by Julia, Méjean, Vicari and Peneau (2015). Rudd (2013) found that question wording proved to be a critically important factor shaping public support on this issue, with those questions that unequivocally linked tax revenue generated from sugar-sweetened beverage taxes to health improvement programs eliciting more support.

70% of respondents in the present study supported the imposition of a sugar-sweetened beverage tax if the price of healthy foods decreased. The study by Battram, Piché, Beynon, Kurtz and He (2016) found a similar policy-level strategy suggested by children to limit consumption of sugar-sweetened beverages. The Battram et al. (2016) results were supported in the present study, where the mean of the statement relating to support for the sugar-sweetened beverage tax if the revenue it generated was used for health-care system improvement resulted in a mean of 3.87, while a mean of 3.92 was reflected in relation to the statement dealing with support of the tax if there was a corresponding decrease in the prices of other healthy food and beverage options.

A noteworthy finding emerging from this study is that it did reveal statistically significant different means between male (mean=3.99) and female (mean=2.70) consumption of sugar-sweetened beverages. These results indicated that female respondents drink fewer sugar-sweetened beverages than the male respondents. The study by Hoffman (2013), however, contrasted with the present study's results and previous literature (Edward, 2016), as it did not support gender differences in sugar-sweetened beverage consumption. It should be noted that due to the tertiary institutions chosen, the largest race group was Black African.

The present study found that there is a statistically significant association between gender and the consumption of water, and on average, females were found to have a higher water consumption than males. The number of males and females, however, who consume the recommended daily water intake of 8 cups daily is more or less similar. In contrast, Hoffman (2013) unexpectedly demonstrated that, compared to females, males consumed more water daily. The present study revealed that females, nearly three times the number of males, reported higher sugar-sweetened beverage consumption during stressful periods. This finding supports the study by Hoffman (2013) where it was found that there was little association between stress and sugar-sweetened beverage intake amongst males.

Efforts to reduce sugar-sweetened beverage consumption are needed for university students. Little research on sugar-sweetened beverage intake has examined consumption patterns of sugar-sweetened beverages by young adults, despite the vulnerabilities of this population to weight gain. It is important to recognise the contribution of sugar-sweetened beverages to excess calories and sugars that may lead to weight gain and resulting health co-morbidities. Reducing sugar-sweetened beverage intake, increasing physical activity, addressing perceptions of body image, and controlling stress may be a targeted means to impact the weight status of university students. Hoffman (2013) found that to promote the health of young adults, nutrition, physical activity, and stress management must be addressed, in addition to sugar-sweetened beverage consumption.

Policies, for example, beverage taxes, regulating food advertising, nutrition labelling and interventions targeting adults may be effective in modifying consumer behaviour within the home, including sugar-sweetened beverage consumption by children. Regulating soft drink advertising, in particular, may play a role.

It is submitted that increasing the cost of the sugar-sweetened beverage levy may limit sugar-sweetened beverage consumption, and the profits generated from taxes on sugar-sweetened beverages can be used to fund other nutrition-based programs. International evidence suggests that when taxes are used in conjunction with investments in nutrition programs, dietary behaviours relating to sugar-sweetened beverage consumption can be successfully modified.

Other researchers may expand the findings of this research by testing these findings for other areas, among other population groups and using varying statistical analyses.

The findings about sugar-sweetened beverage consumption trends across gender, ethnicities and physical activity groups can help guide targeted strategies to reduce sugar-sweetened beverage consumption.

This study is subject to several limitations. First, the cross-sectional design reduces the ability to draw causal conclusions as it is difficult to gauge long-term patterns and implications. Secondly, the population was drawn from a specific setting and the resulting sample for this study was a convenience sample consisting of post-graduate accounting students. Individuals included in the study were young (approximately in the same age group) and with higher educational levels (all tertiary level students). Further, due to the tertiary institutions chosen, the largest race group was Black African. The study thus probably overestimates the level of acceptance of the tax, since age, education, level of income and race were found to be significant determinants of support for the tax (Julia, Méjean, Vicari & Péneau, 2015).

All measures were self-reported, which can involve inaccurate reporting. The tax perception questionnaire was administered four to five months after the implementation of the tax in South Africa, which may yield different results, if conducted at a later date.

CONCLUSION

This study provides insight into sugar-sweetened beverage consumption trends in two provinces in South Africa, among young adults. South Africa is a country of diverse cultures and backgrounds. The study found that perception of the sugar-sweetened beverage tax may depend on several factors, closely linked to individual beliefs and cultures, and thus different populations may have different perceptions of the tax. Gender, certain racial minorities and the lack of physical activity can potentially be related to greater sugar-sweetened beverage consumption.

Based on the study performed, it is submitted that information regarding the potential effectiveness of sugar-sweetened beverage taxes in reducing consumption and generating revenue for childhood obesity programmes, can be disseminated to the public. The relationship between obesity and sugar-sweetened beverages must be explained to enhance the public's understanding of the effect of sugar-sweetened beverages on health outcomes. Fiscal interventions such as subsidies on healthy beverage choices may also be beneficial.

Another issue to consider is that reducing the price of healthy food effectively gives consumers more money to spend, and they may choose to purchase both healthier and unhealthier foods. It is not sufficient to demonstrate that lowering the price of healthy foods increases consumption of those healthy foods. Food policy analysts need to consider food choices in order to understand what effect taxes and subsidies will have on diet. College students are at a developmental stage in which they are establishing healthy habits that are likely to endure and represent a very promising target audience for focused behavioural interventions directed at reducing sugar-sweetened beverage consumption.

To determine the success or failure of the sugar-sweetened beverage tax, monitoring of the subsequent effects on public health will be required. Further, it will be important to note how industry reacts, as companies may absorb the tax rather than pass it down to consumers, which could potentially result in very little to no change in consumer behaviour.

In recent times, several countries have deliberated introducing sugar-sweetened beverage taxes but have vetoed the idea following public debate. The Treasury emphasises that the introduction of the tax in Mexico was followed by a decline in purchases of the taxed products. Overall, the Mexican sugar-sweetened beverage tax raised additional tax revenue without considerably reducing consumption, or having any quantifiable influence on obesity at all, indicating that demand for sugar-sweetened beverages may often be very inelastic. However, similar to the “sin taxes” directed at tobacco and alcohol, a sugar-sweetened beverage tax remains a solution that is worth considering as, even if it does not reduce consumption as much as anticipated, it will generate more tax revenues which could be spent on healthcare (as a result of overweight related illnesses) or subsidising healthy foods, and such pricing strategies may actually be an effective stimulant of healthier food choices.

AUTHORS CONTRIBUTIONS

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