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RESEARCH ARTICLE

Does sugar taxation on sugar-sweetened beverages alter purchasing behaviour of South African consumers? Perspectives of dietitians and key industry role-players

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Background: The increasing prevalence of non-communicable diseases and obesity is associated with excessive consumption of sugar. To address this concern the taxation of sugar-sweetened beverages (SSBs), known as the Health Promotion Levy (HPL), was implemented in South Africa in April 2018.
Objectives: A study was undertaken to investigate perspectives of dietitians and key industry role-players (KIRs) on the HPL.
Design: This was a cross-sectional, descriptive study.
Setting: A national study was conducted in South Africa via a virtual platform.
Subjects: The participants were registered dietitians ($n = 138$) and key industry role-players (KIRs) ($n = 39$) who had expertise in nutrition, food science and/or sugar taxation legislation.
Outcome measured: Electronic surveys probed participants' awareness and opinions of the HPL, perceived SSB purchasing of consumers and barriers or facilitators for implementation of the HPL.
Results: Dietitians were positive regarding the HPL (75.8%; $n = 94/124$) but regarded the tax as too little to affect a reduction in obesity (71.8%, $n = 89/124$). They reported a 19.2% reduction in their perceived clients' daily purchasing of SSBs since implementation of the HPL.
The KIRs regarded the HPL as insufficient to influence consumers' purchasing behaviour (64.9%, $n = 24/37$). Consumers' habitual purchasing was deemed a barrier (83.8%, $n = 31/37$) and consumer education an enabling factor (76,9%, $n = 30/39$) to successful implementation.
Conclusion: Dietitians have a positive opinion on the HPL. They agree that the HPL alone will not influence the purchasing behaviour of consumers or reduce the prevalence of obesity. KIRs regard the HPL to be insufficient to affect consumers' purchasing behaviour. The HPL should form part of a multi-pronged approach to create a supportive environment to reduce sugar consumption. It is recommended that approaches should include fiscal measures, consumer education and controlled marketing of SSBs. Trained dietitians would be able to enhance the goal of the HPL to combat the obesity pandemic.

Keywords dietitians, health promotion levy, industry role-players, obesity, sugar-sweetened beverages

Introduction

The prevalence of overweight and obesity, one of the known modifiable risk factors for non-communicable diseases (NCDs), is reaching staggering statistics worldwide, claiming more lives every year.[1,2] This dire situation has been highlighted by the increased risk for obese individuals to suffer from severe complications as a consequence of Covid-19.[3] While the development of NCDs is linked to interactions of a variety of genetic, environmental and behavioural factors, increased consumption of free sugars in the form of sugar-sweetened beverages (SSBs) is associated with weight gain in both children and adults.[2,4] Consumption patterns of SSBs vary considerably by geographic location, gender, age and socioeconomic status but are higher in younger age groups, adult males and in middle-income countries.[2]

The global increase in the consumption of SSBs[2,4] could be due to environmental factors such as easy access to SSBs, advertising campaigns and low pricing as well as consumers being unaware of the association between obesity and SSB consumption.[2] The World Health Organization (WHO) strongly recommends reducing the intake of free sugars to less than 10% of total energy to address obesity prevalence.[4] If the Sustainable Development Goal of reducing premature NCD mortality by one-third by the year 2030[5] is to be met, drastic measures are required. Countries need comprehensive action plans that combine consumer education, fiscal measures and restriction of marketing of sugary products to children,[2,6,7] to reduce SSB purchases and encourage the purchase of healthier beverages.[8]

The adoption of a sugar taxation is a complex process that requires consideration of multiple stakeholders from various sectors such as politicians, the SSB industry, the consumer and public health experts.[9] Karim *et al*. urge that policy makers articulate a clear, evidence-based rationale for a SSB taxation policy, especially in low- and medium-income countries (LMICs). An absence of clear policy priorities and policy coherence between health and economic development could undermine acceptance and successful implementation of SSB tax.[10] Furthermore, research shows that nutrition interventions targeting specific food items such as SSBs could fail to motivate sustainable behaviour change and result in adverse compensatory behaviour, such as increased consumption of other energy-dense foods or beverages.[2] Nakhimovsky *et al*. warned that even though taxing SSBs could slow down

the increasing prevalence of obesity it may not lead to permanent weight reduction in populations.[11]

The SSB industry has considerable political power and could undermine the ultimate goal of flattening the obesity trajectory.[12] Health professionals play a crucial role in facilitating behaviour change and creating an enabling environment to support successful implementation of the SSB tax,[12] especially if they use their expertise to influence policy-makers and the media.[13] Globally dietitians are in support of sugar taxation[14–16] as part of a multi-sectoral collaboration to address the complex problem of obesity and reduce the risks of developing NCDs.[14,16] The National Department of Health's Strategy for the Prevention and Control of Obesity in South Africa (SA) highlights a multipronged approach to curb the obesity pandemic[14,17] and identified fiscal policies as being cost-effective and easy to implement on a wide scale.[18]

In response to the recommendation of the WHO for the implementation of an SSB tax[4,10,12,18] various modelling studies have suggested that a tax of 10% to 20% would be needed to reduce purchases and consumption of SSBs[12] for a decline in obesity, mortality rates and long-term health costs.[7] The South African government responded to this recommendation by implementing the Health Promotion Levy (HPL) in April 2018 at a rate of 11% with the explicit goal to address SA's obesity crisis. The HPL applies to beverages containing added sweeteners such as sucrose, high-fructose corn syrup (HFCS), or fruit-juice concentrates and was initially levied at 2.1 cents per gram of sugar in beverages in excess of 4 grams per 100 ml.[19]

Due to the paucity of data concerning the implementation and the effect of the HPL, the aim of this study was to investigate the awareness and understanding as well as the perceptions and opinions of South African dietitians and key industry role-players with regard to the effectiveness of taxation on SSBs. Perceived barriers and facilitators to the implementation of the taxation were also highlighted.

Methodology

Study design

A cross-sectional descriptive study was conducted during a three-week period in March/April 2019. As part of a larger study to gather information on consumer behaviour or purchases of SSBs since the HPL was implemented,[20] this part of the research focused on two groups of participants, namely registered dietitians and key industry role-players.

Study population and sampling

Dietitians registered with the Health Professions Council of SA (HPCSA) were recruited as they have close contact with their clients and could offer insightful opinions regarding consumer behaviour. Snowball sampling was used to obtain a feasible sample to increase the strength and validity of findings. Dietitians were recruited via the Association for Dietetics SA (ADSA), as well as the survey being posted on the 'Dietetics-Nutrition is a Profession' Facebook page. The link to the survey was also sent via email to the Dietetics Divisions of various universities and hospitals in SA, to be able to reach dietitians who do not belong to ADSA or Facebook. There were 3 576 dietitians registered with the HPCSA at the time of the study.[21] A sample size of $n = 138$ ensured a 95% confidence interval with a margin of error of 8%

Key industry role-players (KIRs) were recruited via purposive and snowball sampling from government, the public sector and academia. Channels used to identify KIRs with required expertise were the government departments of Health and Trade and Industry, ADSA, South African Association of Food Science and Technology (SAAFOST) and academic institutions. The unknown number of KIRs made it difficult to determine sample size. Due to time and logistical constraints 44 KIRs were identified and invited to participate.

Inclusion and exclusion criteria

Dietitians from both the public and private sectors were included if they were registered in SA. KIRs were included if they had expertise in nutrition, food science and/or sugar taxation legislation. Both groups of participants needed internet access. They were excluded if they participated in the pilot study or were not proficient in English.

Methods

The perspective of dietitians and KIRs on the implementation of the HPL were investigated by means of electronic surveys. Two independent surveys were compiled by the researchers based on the research objectives of the study, relevant legislation and current literature. The surveys were available in English and remained active for three weeks. Potential participants were informed about the study via email, which also included a request to inform any other industry role-players or dietitians they were aware of. A follow-up email included a link to the survey and an invitation to participate. Two reminder emails were sent out to increase the response rate.

The electronic surveys were developed using the SurveyMonkey® (https://www.surveymonkey.com/) online survey software and took 15–20 minutes to complete. Both surveys consisted of five sections and contained a series of closed-ended, multiple-choice, Likert-scale questions or yes/no answers. Participants provided consent by ticking a box, after which they could continue with the completion of the survey. The electronic survey for dietitians included a definition of SSBs; questions pertaining to demographic information; dietitians' awareness, understanding and perceptions of the HPL; their opinions on the HPL; and also their perception of the impact of the HPL on their clients' self-reported purchasing behaviour and consumption of SSBs.

Apart from the tick box and demographic information, the survey for KIRs investigated perceptions regarding the effectiveness of the HPL, opinions and perceptions of the HPL, as well as possible barriers and facilitators to the implementation of the HPL.

Validity

A panel of experts including dietitians and consumer scientists assessed content validity. Face validity of the dietitians' survey was assessed by five conveniently sampled registered dietitians from the private and public sector. Three academic dietitians assessed the face validity of the key role players' survey. They were asked to report any technical and logistical problems of the surveys.

Ethics and legal aspects

The study was approved by the Health Research Ethics Committee (HREC) at the Faculty of Medicine and Health Sciences, Stellenbosch University (N18/07/067). Participants gave informed consent by means of a 'click to assent' box included on the

first page of the survey. Surveys were filled out anonymously. A unique identifier code for each participant was used for data analysis only. Email addresses were kept confidential.

Data analysis

SurveyMonkey® updates responses automatically and data captured were exported to Microsoft® Excel® (Microsoft 365, Version 16.0.16529.20100; Microsoft Corp, Redmond, WA, USA). The Microsoft® Excel® (Microsoft 365, Version 16.0.16529.20100; Microsoft Corp, Redmond, WA, USA) spreadsheet was password protected. Statistica version 13 (https://www.statistica.com/en/) was used to analyse quantitative data. Summary statistics described the variables, frequency tables presented the distribution of nominal and ordinal variables, and histograms displayed ordinal and continuous variables. A p-value of ≤ 0.05 indicated statistical significance. Open-ended questions were analysed as qualitative data by reading and coding the responses to identify common themes.

Results

The 138 registered dietitians were mostly female (95.0%, $n = 131$), had a mean age of 33 years (SD ± 9.73) and were employed full time (80.4%, $n = 111$). The majority (44.2%, $n = 61$) worked in a clinical environment whereas only few dietitians (6.5%; $n = 9$) were employed by a manufacturer of SSBs (Table 1). Dietitians were geographically distributed throughout SA with most participants from the Western Cape and Gauteng (28.3%, $n = 39$ and 24.6%, $n = 34$ respectively). Less than half (43.5%, $n = 60$) of the clients counselled by dietitians were of a low socio-economic status. The majority of dietitians (73.2%; $n = 90$) counselled clients with NCDs. Some participants did not complete the full survey, explaining the variation in number of respondents.

Opinions of dietitians regarding the effectiveness of sugar taxation

Although dietitians (97.7%; $n = 127/130$) were aware of the HPL only 29 (22.3%) dietitians knew that SSBs in excess of 4 g sugar per 100 ml are taxed; 27 (20.8%) knew the amount of tax being levied. Half (46.80%, $n = 73/138$) of the dietitians understood that the HPL is an additional tax being levied on SSBs while 12 (7.70%) knew the HPL aims to reduce the NCD rates in SA. They had the perception that money obtained from the HPL would be utilised for the prevention (34.4%, $n = 44/128$) or treatment (5.5%, $n = 7/128$) of diabetes, heart disease, overweight and obesity, or spent on nutrition education (13.3%, $n = 17/128$). Other perceptions emerging from responses to open-ended questions indicated that the government would allocate funds as needed, for instance to the health sector or used to subsidise food, fruit and vegetables.

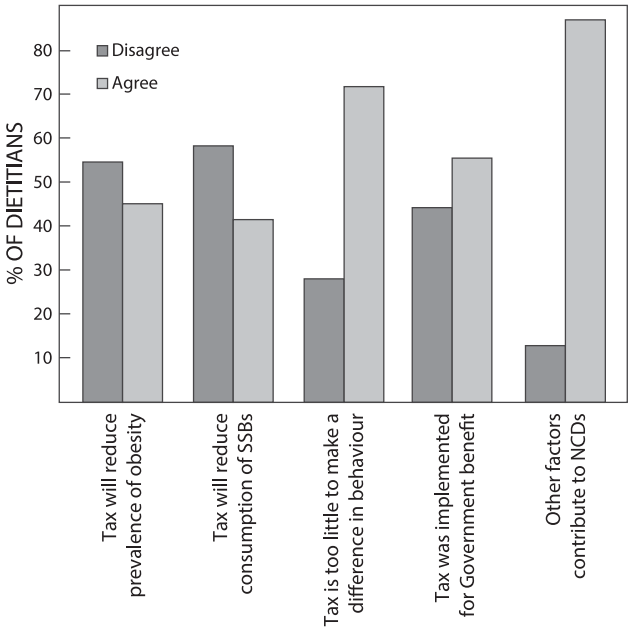

Figure 1: Dietitians' opinions regarding the effectiveness of sugar taxation.

In principle, dietitians were positive (75.8%; $n = 94/124$) towards the HPL although the majority (87.1%; $n = 108/124$) agreed that the implementation of a sugar tax alone will not make a difference because multiple factors contribute to NCDs and obesity. They believed the HPL of 11% was too little to have an impact on the purchasing behaviour of consumers (71.8%, $n = 89/124$). Findings on dietitians' opinions regarding the effectiveness of sugar taxation are presented in Figure 1.

Themes emerging from responses to an open-ended question probing dietitians' opinion on the impact of the HPL varied. Some dietitians felt a need for expanding the HPL: 'I believe it should be rolled out to other luxury food items', while

Table 1: Demographic information of participants

Dietitians ($n = 138$)	Attribute	n (%)	Key industry role-players ($n = 39$)	Attribute	n (%)
Gender	Female	131 (95.0)	Gender	Female	28 (71.8)
	Male	7 (5.0)		Male	11 (28.2%)
Age (years)	20–29	62 (44.9)	Age (years)	20–29	5 (12.8)
	30–39	45 (32.6)		30–39	11 (28.2)
	40–49	21 (15.2)		40–49	17 (43.6)
	< 50	10 (7.3)		< 50	6 (15.4)
Work area*	Private practice	46 (33.3)	Area of expertise*	Nutrition	8 (20.5)
	Community nutrition	30 (21.7)		Legislation	11 (28.2)
	Clinical (hospital)	61 (44.2)		Industry	17 (43.6)
	Foodservice management	7 (5.1)		Consultant	9 (23.1)
	Industry	9 (6.5)		Product development	11 (28.2)
	Academia	23 (13.7)		Academia	8 (20.5)
	Other	7 (5.1)		Other	1 (2.6)

*Participants could choose > 1 option.

another remarked: 'It will indirectly increase the intake of artificial sweeteners'. They emphasised that 'the government should commit to educating the consumer about healthy eating in the media'. Possible job losses were a concern, as 'beverage companies will retrench some of their staff because the rate at which beverages are purchased will be decreased'.

Of the dietitians who consulted with clients ($n = 90$), few dietitians (14.4%, $n = 13/90$) confirmed that clients consumed fewer SSBs due to the HPL. They indicated a perceived decrease of 19.2% in the daily purchasing of SSBs since the implementation of the HPL, from 57.8% ($n = 52/90$) to 46.7% ($n = 42/90$). Monthly self-reported purchases of clients increased from 1.11% ($n = 1/90$) to 6.7% ($n = 6/90$) (Figure 2).

Several dietitians were under the impression that their clients were consuming alternative drinks such as sugar-free beverages ($n = 28$), water ($n = 20$), fruit juice ($n = 9$) or tea/coffee ($n = 6$). Dietitians agreed and strongly agreed (23.9%, 21/88) that their clients have been purchasing other sugar-containing food items as a substitute for SSBs since the implementation of the HPL.

Reasons offered to explain why clients would consume fewer SSBs included weight-loss purposes, SSBs viewed as unhealthy, personal health reasons ($n = 18$ each) and high cost of SSBs ($n = 9$) Of the 78 dietitians who offered reasons as to why clients were not changing their consumption behaviour of SSBs, 46.2% ($n = 36/78$) indicated that clients enjoyed the taste, did not regard SSBs as unhealthy (20.5%, $n = 16/78$) or could afford SSBs (17.9%, $n = 14/78$).

One-third (34.44%, $n = 31/90$) of the dietitians confirmed using the HPL as a motivational tool to encourage reduced consumption of SSBs. Other legislative measures used for client education were teaching clients to read the nutritional information table with an emphasis on total sugar content ($n = 75$) and glycaemic carbohydrates ($n = 39$) and how to understand endorsement logos ($n = 22$).

Results for key industry stakeholders

Thirty-nine KIRs completed the survey, of whom 71.8% ($n = 28$) were female, their mean age was 43 years (SD ± 10.42) and all had tertiary qualifications. Twenty-seven (69.2%) KIRs have been involved with selected aspects related to the sugar tax legislation such as development (25.6%, $n = 10$) or the implementation and evaluation thereof (both 33.3% ($n = 13$). This study sample was diverse with regard to their areas of expertise, which included legislation and product development (28.2%, $n = 11$ each) and industry (43.6%, $n = 17$) (Table 1).

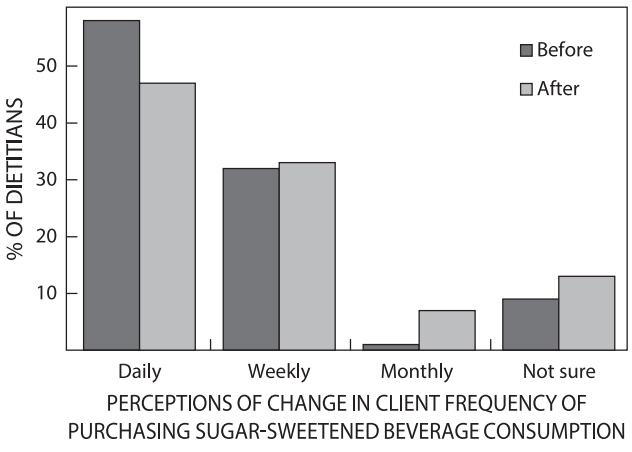

Figure 2: Perceptions of dietitians ($n = 90$) as to how clients' frequency of purchasing sugar-sweetened beverages changed due to the Health Promotion Levy.

Opinions of key industry role-players regarding the effectiveness of the HPL

While most KIRs (79.5%, $n = 31/37$) agreed that the food industry understood the government's rationale to implement the HPL they also held the opinion that consumers were not aware of (69.2%, $n = 27/37$), nor understood (89.7%, $n = 35/37$) the sugar taxation legislation. There was consensus that consumers need to reduce the consumption of added sugar (94.6%, $n = 35/37$) because 'various studies show a high intake of added sugars in SA, which has been linked to the rise in NCDs'. Half of the KIRs (54.1%, $n = 20/37$) believed that the HPL will not lead to a healthier population and a lower incidence of NCDs. There was a statistically significant difference (Fisher's exact test) between KIRs who had nutrition expertise and those who did not, and the perceived value of the HPL ($p = 0.01$). Those with nutrition expertise were of the opinion that it will be more valuable.

Two-thirds (64.9%, $n = 24/37$) of the KIRs believed that the proposed tax rate of 11% was not high enough to have a significant impact on the purchasing behaviour of SSBs, as 'people purchase products because they taste good. [The] current tax rate will have little or no effect on consumption.' When asked which intervention would be helpful to reduce obesity and improve the health of the general population, 87.2% ($n = 34/37$) KIRs indicated that creating a healthier school environment would be beneficial (Table 2).

KIRs (81.1%, $n = 30/37$) agreed that fiscal policy interventions can be successfully implemented by offering incentives for the production and manufacture of healthy foods and 89.2% ($n = 33/37$) thought the HPL will lead to the formulation of products lower in added sugar. They held the opinion that the industry would be proactive to accommodate the HPL by reformulating existing products (76.9%, $n = 30/39$), changing packaging sizes (64.1%, $n = 25/39$), using stronger marketing initiatives for zero sugar alternatives (59.0%, $n = 23/39$) or formulating new products (56.4%, $n = 22/39$). Only 10.8% ($n = 4/37$) were not concerned that the taxation might have a negative impact on job security in SA.

Barriers and facilitators to the implementation of the sugar taxation

Barriers

KIRs (83.8%, $n = 31/37$) felt that consumers' habitual purchasing behaviour creates a barrier to successful implementation of the

Table 2: Interventions to reduce sugar consumption as suggested by key industry role-players ($n = 34$)

Possible interventions	n	%
Focus on healthier school environment	34	87.2
More education campaigns via media	31	79.5
Creating an enabling environment that supports the availability and accessibility of healthy food choice in various settings	31	79.5
Increased physical activity of the population	30	76.9
Responsible marketing and advertising	26	66.7
More training for teachers who teach nutrition modules at schools	25	64.1

Table 3: Barriers to the successful implementation of the sugar tax legislation for consumers identified by key industry role-players' ($n = 37$)

Statement	Agree	Disagree
Consumers will just buy a different beverage	19 (51.4)	18 (48.6)
Consumers feel they want a choice and decide which products they want to buy	36 (97.3)	1 (2.7)
Consumers will have a negative attitude towards the taxation	29 (78.4)	8 (21.6)
Consumers feeling the government is taking their money	32 (86.5)	5 (13.5)
Habitual purchasing	31 (83.8)	6 (16.2)

HPL (Table 3). One KIR explained: '[Consumers would react] similar to how they reacted to the plastic bag pricings. At first you will see a drop in consumption, and then consumers will get used to the new prices and consumption will flatten out again.' KIRs agreed that consumers want to have the freedom to choose which products to buy (97.3%, $n = 36/37$) and that consumers would just purchase other products high in sugar in response to the price increase of SSBs (64.8%, $n = 24/37$) (Table 3).

Three -quarters of KIRs (74.4%, $n = 29/37$) thought consumers harboured negative feelings towards the HPL. They verbalised their own negative feelings towards the HPL by expressing their concern that the revenue generated through sugar taxation would be utilised by the government and that 'the money will be lost due to corruption'. They indicated in an open-ended question that the revenue should be utilised 'towards prevention and treatment of NCDs'. However, some of them were not confident that this will come to fruition because 'it will go into the general pot as government is so desperate for revenue, [it is] unlikely that nutrition education will benefit in practice'.

Facilitating factors to the successful implementation of the sugar tax legislation

The main enabling factor to enhance the successful implementation of the HPL selected by the KIRs was education of the consumer (76.9%, $n = 30/39$). Two-thirds (64.1%, $n = 25/39$) recognised the focus of the HPL on the health benefits for the general population as an enabling factor. Less than half of the KIRs regarded educating the food industry as beneficial or that the compulsory legislation itself will facilitate consumer behaviour change (46.2%, $n = 18/39$ and 41.0%, $n = 16/39$ respectively).

Discussion

There have been no studies investigating the opinions of SA healthcare professionals and KIRs regarding the feasibility and impact of the HPL. Findings from this study highlights various aspects of creating a supportive environment to facilitate a change in consumers' purchasing behaviour of SSBs and contribute to achieving the goal of a significant reduction in obesity rates in SA. Results showed that registered dietitians have a low awareness of the HPL. Dietitians as well as KIRs held the perception that the HPL is not adequate to have a sustainable impact on lowering NCDs and obesity, especially because the HPL is not well understood by consumers.

Opinions of dietitians and KIRs regarding the effectiveness of sugar taxation

Overall, dietitians involved in this study were positive (76%) towards the HPL, probably because they realised that drastic measures are required to support consumers in reducing their sugar intake without requiring a conscious effort on their part, as described in current literature.[7] However, both groups of participants commented on consumers' right to freedom of choice. The changes in purchasing behaviour reported by dietitians could be the result of consumers' decision to consume SSBs less frequently for health reasons. While policy-makers regard taxation as an appropriate and cost-effective intervention to protect the consumer from the increasing burden of obesity,[12,17,22] it could be regarded as intrusive.[18] Furthermore, the HPL may be regarded as inappropriate by consumers who are not at risk of developing obesity or NCDs.[18] Consumers' resistance to changing their purchasing behaviour could be ascribed to sugar addiction,[23] which is only one of the multiple and complex factors that influence consumers' choices.[24]

In accordance with the results of this study, there is consensus amongst researchers that sugar taxation as a single strategy is insufficient to combat the rising prevalence of NCDs and obesity.[2] ADSA articulated in the Position Statement on the Taxation of Sugar-Sweetened Beverages in SA that the HPL must be viewed as 'only one piece of the puzzle to address the complex problem of obesity in SA'.[14] Even though taxation of SSBs is widely regarded as a cost-effective intervention to reduce SSB consumption for the purpose of obesity prevention in the long run,[11,12] integrated intervention strategies requiring multi-sectoral engagement are needed.[2,13] Unfortunately, negative consequences of nutrition interventions targeting specific food items may undermine the intent of the HPL, especially if consumers are not educated.[2] Feelings of stigmatisation may be experienced amongst overweight consumers.[2] Furthermore, the same obesogenic factors that had been contributing to the increase in SSB consumption over the past decades are still in play. Some of these factors include easy access to SSBs as well as increases in unit and serving sizes.[2]

The literature suggest that price increases of SSBs are associated with decreasing SSB sales,[2] especially in lower socioeconomic groups.[18,25–27] Earlier studies recommended a rate of 10% to 20% tax to effect a meaningful impact on the purchasing and consumption of SSBs and reduction of obesity.[2,11,12,18,28] ADSA expressed its concern that an 11% the tax rate might not reduce consumption of SSBs to the level required to slow the increasing obesity rate.[14] Similarly, most KIRs and dietitians in this study believed the HPL of 11% was too little to influence purchasing behaviour of consumers. Results from a recent study conducted during 2016 to 2021 found a 23% decrease in the volume of SSBs consumed since the implementation of the HPL at 11%.[26] Although tax levels higher than 20% are deemed more likely to have a positive impact on health behaviour and outcomes, the level of taxation is difficult to compare because currencies, the level of competition and purchasing power differ.[18]

Most participants in this study held the opinion that the revenue raised through the HPL should be earmarked for the treatment and prevention of NCDs and for health promotion. However, they had a cynical outlook and believed that the money obtained will be absorbed by the government for general purposes. This is not unique to SA as several countries (France, Denmark, Finland, Hungary, Mexico and several Pacific countries) have employed health-related food taxes in response

to general budget deficits.[9] The HPL would garner more consumer support if health taxes were earmarked for health spending[28] and if there was transparency regarding the distribution of funds allocated to health promotion activities as initially indicated by choosing the title 'Health Promotion Levy'.[9] Importantly, it is crucial to closely monitor utilisation of revenue from the HPL in terms of the resources invested, the process and the results obtained.[7] Further research is required to validate and/or adapt the HPL according to the results.[2]

Findings from this study underscore the importance of an enabling environment that supports the availability and accessibility of healthy food choices in various settings as a vital cornerstone of the effectiveness of the HPL. To achieve this, a multi-pronged strategy and cooperation amongst stakeholders is crucial to facilitate an environment in which consumers make healthy choices, for instance the combination of education, effective food labelling and banning of marketing SSBs to children.[2,7,14] Apart from increasing the price of SSBs, examples of other successful interventions to reduce SSB consumption have been described in the literature and include the availability of water and bottled unflavoured water at schools and at home,[2,7,12] and promotion of healthier beverages in supermarkets as well as on children's menus.[2] If not well coordinated, SSB taxation could have adverse outcomes if children who attend schools where the availability of SSBs is reduced were to consume more SSBs outside school.[2] KIRs expressed similar views, with the majority saying that interventions should focus on promoting a healthier school environment.[30]

At the time of promulgating the HPL, SA was already experiencing a 26.5% unemployment rate.[31,32] Participants' perception that the HPL might have a negative impact on job security in SA corresponds with the arguments SSB manufacturers used during the policy-making process.[10,33] SSB manufacturers argued that, especially in an LMIC,[13] the potential harm caused by the SSB tax could be disproportionately higher for small sugarcane growers, informal traders and small businesses,[10] more so than for large multi-national companies (MNCs) that are able to redeploy employers.[10,33] After two years of implementing a sugar tax there was a decline in employment in the beverage industry in California[34] and San Francisco[35] but it did not impact negatively on net employment, due to new job opportunities in the non-beverage industry. However, a report on the 'Economic Impact of the Health Promotion Levy on the Sugar Market Industry' found high numbers of job losses one year after introduction of the HPL in SA.[36] At this stage it is difficult to quantify the true impact of the HPL on job security due to the impact Covid-19 and ensuing lockdowns had on the South African economy.[37]

Dietitians reported a perceived decrease in the daily purchasing of SSBs by their clients in favour of mainly sugar-free beverages and water since the implementation of the HPL. Some dietitians were concerned that SSBs were substituted with other sugar-containing food items. This corresponds with research showing that nutrition interventions targeting specific foods or beverages may lead to adverse compensatory behaviour, such as increased consumption of alternative but similarly unhealthy foods and beverages.[2,26]

Barriers and facilitators to the implementation of the HPL

The apparent uncertainty of dietitians and KIRs regarding the goal and implementation of the HPL as well as the utilisation of revenue could be regarded as a barrier against successful health promotion strategies. The majority of participants in this study were unsure how the revenue generated through the HPL would be utilised. Their perception was that the revenue gained from the HPL seems to benefit the government rather than health matters. ADSA advocates that the financial revenue should be used to fund the Department of Health's Strategy for the Prevention and Control of Obesity in SA.[14] Even though the South African Taxation of SSB Policy Paper set the target of reducing sugar intake by 10% by 2020,[29] the HPL failed to explicitly earmark revenues for health promotion or educational programmes.[18] Various studies from the UK, Israel and the United States show mistrust in governments' use of funding.[12,18] It is crucial to develop policies with clear priorities explaining how the income generated from fiscal measures would be utilised, especially in LMICs.[10] This will minimise mistrust and garner cooperation from stakeholders.[10,12,13,28] Furthermore, the use of local and context-specific evidence is crucial, especially in LMICs.[10]

The finding that 70% of KIRs believed consumers were unaware of the sugar taxation legislation can be regarded as a barrier to reaching the goals of the HPL, leading them to believe that education would be an effective method to inform consumers. Research shows that the publicity surrounding the SSB tax may contribute to consumer awareness,[9,38] as health literacy improved following the introduction of the public health product tax.[18] A recent South African study found a 16% reduction in SSB purchases in the period between announcement and implementation of the HPL.[25]

While the success of educational interventions to improve consumers' nutritional knowledge shows a mixed effect,[7] it still needs to be a priority for all South Africans[14] as health promotion provides an opportunity to educate consumers regarding the goal of the sugar taxation.[7,40] Educational measures place a lot of responsibility on consumers to make the final choice concerning their diet.[7] Effective food labelling would help consumers differentiate between healthy and unhealthy options.[39] Labels that are easy to understand, such as traffic-light labels, and labels that rate the healthfulness of beverages with stars or numbers have proved to be successful measures to help consumers to drink fewer SSBs.[2] Educational interventions provided by dietitians need to form part of an overarching public health strategy.[7] To optimise the effectiveness of the HPL, dietitians should ensure that they focus their education concerning the disadvantages of a high sugar consumption on population groups known to be most responsive to educational interventions. These generally include younger age groups, namely children and adolescents,[2,7] males[2] and consumers of a low education and income level who experience barriers to the reading and interpretation of labels.[25,40] The opinion that a higher intake of artificial sweeteners might be seen is also noteworthy. A recent systematic review and meta-analysis conducted by the WHO found that replacing sugar with artificial sweeteners might result in reduction in bodyweight and cardiometabolic risk factors in the short term but may have a long-term negative impact on health outcomes, such as an increased risk of type 2 diabetes, cardiovascular disease and mortality. Therefore guidelines on the intake of artificial sweeteners should form part of nutrition education campaigns.[41] The question remains: how can the industry and health professionals better support the consumer?

Limitations

Due to the use of purposive and snowball sampling, the results cannot be generalised to all role-players in the South African industry. Surveys were administered online, therefore no probing or clarification of queries were possible. At the time of data collection, the HPL has been implemented for only one year. The uncertainty regarding utilisation of the HPL could potentially have resulted in participant bias. Responses reflected perceptions of dietitians regarding their clients' self-reported purchasing and consumption of SSBs, which might not be a true indication of consumers' actual practices. The uneven distribution in gender is in line with the general demographic profile of the dietetic profession. It could have been insightful to also include questions to test the knowledge and not only the awareness of study participants regarding the HPL.

Conclusion

The South African population faces an increasing prevalence of NCDs, and obesity is one of the modifiable factors that need to be curbed. Sugar taxation is deemed a cost-effective measure to discourage consumption of SSBs, which led to the implementation of the HPL as one strategy to reduce the increasing prevalence of overweight and NCDs. Participants felt positive towards the HPL but were concerned that 11% was insufficient to achieve the desired effect and felt the levy should be increased to make a significant difference in consumers' purchasing behaviour. Revenue generated through the HPL should be earmarked for health promotion and prevention and treatment of obesity and NCDs to garner consumers' trust and facilitate change. More should be done to educate consumers and create a supportive environment to improve the overall health and nutritional status of the South African population.

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