JOURNAL OF COMMUNITY SYSTEMS FOR HEALTH
2025, VOL. 2
https://doi.org/10.36368/jcsh.v2i2.1199

ORIGINAL RESEARCH

Sugar-sweetened beverages consumption among the Sámi in Sweden: prevalence and socioeconomic risk factors

Thein Myint Aung[1], Jon Petter Stoor[2], Lena Maria Nilsson[2], Miguel San Sebastián[2*]

[1]Department of Epidemiology and Global Health, Umeå University, Sweden.
[2]Department of Epidemiology and Global Health, Lávvuo-Research and education for Sámi health, Umeå University, Sweden.

***Corresponding author:** miguel.san.sebastian@umu.se

Received 6 May 2025 ; Accepted 20 October 2025 ; Published 5 November 2025

ABSTRACT

Introduction: The consumption of sugar-sweetened beverages (SSB) is a significant public health issue linked to various diseases like diabetes, obesity, and hypertension. SSB include flavored beverages with added sugars, and their high consumption is prevalent worldwide. Notably, there is limited research on SSB consumption within Indigenous communities, including the Sámi, the only Indigenous group in the European Union. The aim of this study was to estimate the prevalence of SSB consumption and identify associated risk factors among the Sámi population in Sweden.

Methods: The research utilized data from the SámiHET survey. A total of 3,658 Sámi aged 18 to 84 responded to the survey, which included questions on health outcomes, lifestyle behaviours, and socioeconomic data. SSB consumption was assessed by frequency of intake, and sociodemographic, socioeconomic, and sociocultural factors were analyzed to identify associated risk factors. Prevalence ratios and their 95% confidence intervals were estimated, using sampling weights to enhance generalizability.

Results: The study found that 29.5% of participants reported consuming SSB at least twice a week. Men and younger individuals displayed higher consumption patterns. Statistically significant associations were also observed with lower educational levels and belonging to mountain reindeer herding communities. However, economic stress and income levels were not found to have a statistical association with SSB consumption.

Conclusions: The research highlights a substantial consumption of SSB among the Sámi, similar to national levels but lower than other Indigenous groups globally. Factors like gender, age, education, and specific sociocultural contexts (e.g., belonging to a reindeer herding community) were significantly associated with SSB consumption. Culturally adapted public health interventions targeting youth and men and increasing health literacy among the entire Sámi population are recommended to promote better health but also to prevent future chronic diseases.

Keywords: Sámi, sugar, beverage, soft, Indigenous, socioeconomic.

Abstract in Español at the end of the article

INTRODUCTION

Consumption of sugar-sweetened beverages (SSB) is a major global public health concern due to its association with a variety of diseases such as diabetes type 2 [1], dental caries [2], metabolic syndrome [3], obesity [4,5], hypertension [6,7], and even mortality [8]. This has been recognized by the World Health Organization (WHO), which has called for a global effort to reduce the consumption of SSB to mitigate their adverse health

effects [9]. SSB, or soft drinks, are all beverages containing free sugars, i.e., carbonated or non-carbonated soft drinks, 100% fruit/vegetable juices and drinks, liquid and powder concentrates, flavored water, energy and sports drinks, ready-to-drink tea, ready-to-drink coffee, and flavored milk drinks [10]. WHO and several country-specific dietary guidelines recommend consuming <10% of daily energy from added sugars [11,12].

SSB consumption varies widely across the world, with an almost ten-fold difference between the highest and lowest regional intakes, with Latin America and the Caribbean being the region with the highest intake of SSB [13]. In 2019, 9% of people aged 15 years and older in the European Union drank sugar-sweetened soft drinks daily, and 6% drank such beverages 4-6 times per week, with daily consumption more common among men (12 versus 7%) and young people (14%) [14]. In addition to gender and age differences, there is an extensive literature on the substantial role of socioeconomic factors such as low income and education, urbanization, ethnicity and cultural norms, as well as advertising strategies targeted at vulnerable populations, in shaping dietary behaviours, particularly SSB consumption [15-17].

However, the literature on SSB consumption in Indigenous communities is limited, with most of these studies highlighting higher SSB consumption in Indigenous populations compared to national reference groups [18-20]. For example, half of Aboriginal and Torres Strait Islander people consumed SSB on the day before, compared to 34% of non-Indigenous people, according to the 2011-2012 Australian Health Survey [21]. In 2015, Indigenous people living off-reserve in Canada consumed significantly more SSB per person per day than other ethnic/racial groups [22]. Alaska Native adults are three times more likely to consume three or more sugary drinks per day than white adults in the continental United States [23].

Research on SSB and the Sámi people, the only Indigenous population in the European Union, is essentially non-existent. The Sámi traditional homelands are known as Sápmi, an area that currently includes the northern parts of Norway, Sweden, Finland, and the Kola Peninsula in Russia. Sámi demography is largely unknown due to the lack of ethnicity data in the national registers of the Nordic countries. Estimates of the Sámi population range from 80,000 to 100,000, with about 20,000 to 40,000 living in Sweden. Historically hunters and gatherers, the Sámi switched to reindeer husbandry in the 17th century, with approximately 4,600 currently engaged in this practice in Sweden [24]. Sweden's reindeer-herding region is organized into 51 Sámi reindeer-herding villages. Of these, 33 are mountain villages where herding involves long-distance migrations between summer and winter grazing lands. The remaining ten are forest villages, where herding is more localized and takes place within wooded areas. Eight villages are designated as concession, operating under special permits issued by the County Administrative Board (Länsstyrelsen). Unlike other herding villages, concession villages include both Sámi and non-Sámi residents, though only Sámi individuals are legally allowed to carry out reindeer herding in these villages [25].

Recent literature on Sámi health and lifestyle behaviors in Sweden is limited [26,27]. While a similar risk consumption of SSB has been reported among the Sámi compared to the Swedish population [28], information on potential risk factors for hazardous SSB consumption among the Sámi is lacking.

The aim of this study was to estimate the prevalence of SSB consumption and identify associated risk factors among the Sámi population in Sweden.

METHODS

Study participants

The present study used data from the SámiHET (Sámi Health on Equal Terms) survey, a population-based health study conducted among the Sámi population in Sweden. Since ethnicity is not recorded in the Swedish population registry, the survey used three administrative registries-the Sámi Electoral Register (SER), the Reindeer Mark Register (RMR), and the "Labor Statistics Based on Administrative Sources"-to create a Sámi sampling frame.

A total of 9,249 eligible persons aged 18 to 84 were identified and all were invited to participate, being able to answer the questionnaire through a web- or paper-format. Data collection took place from February to May 2021, and 3,779 individuals responded to the survey, resulting in a participation rate of 40.9%. Of these, 121 individuals were excluded from the analysis as they did not clearly self-identify as Sámi in the questionnaire (ticking a box to signal Sámi self-identification). Thus, the final analytical sample consisted of 3,658 individuals.

To allow comparability, the SámiHET questionnaire was based on the same questions as the national HET survey. However, it included Sámi-specific sections with questions on access to healthcare, exposure to violence, discrimination and racism, and Sámi identity and language. The data collection procedures were similar to those used for the national HET survey, and Statistics Sweden oversaw the data collection process and the different register linkages in both surveys. More detailed information on the study design and data collection can be found elsewhere [29].

Variables

The SámiHET questionnaire consisted of 81 questions on self-reported health outcomes, lifestyle behaviors, access to health care, and experiences of violence and discrimination. In addition, demographic and socioeconomic data (sex/gender, age, marital status, education and income) were extracted from Swedish registers using personal identification numbers.

SSB consumption was defined by the following question: "How often do you drink soda, juice, or other sweetened beverages?" with five possible responses:

four or more times per week, 2-3 times per week, 1 time per week, less than 1 time per week, or never. Individuals who reported consuming SSB two or more times per week were classified as frequent consumers of SSB; this is the cut-off used by the Public Health Agency of Sweden [30].

The potential risk factors associated with a high SSB consumption were grouped into sociodemographic, socioeconomic, and sociocultural factors. These variables were selected based on the literature [31,32], guided by the social determinants of health framework [33], and based on the availability of data in the survey.

Five variables were included as sociodemographic factors: i) sex, divided into men and women); ii) age, categorized into: 18-29, 30-44, 45-64 and 65-84 years old; iii) civil status, with three categories: married or cohabitating, divorced/widower, and unmarried; iv) living arrangements, defined as either living with others or alone; and v) region of residence, classified as Norrbotten, Västerbotten, Jämtland-Härjedalen and other regions. This classification was made because the majority of Sámi people live in these three regions, which form part of Sápmi, the traditional Sámi homeland. Three variables were considered as socioeconomic factors: education, which was divided into low (<10 years), medium (10–12 years), high (12+ years); and individual disposable income, defined as the amount available for consumption or savings after taxes and all positive and negative transfers have been made; the income was divided into five quintiles (with quintile 1 being the richest). Difficulties making ends meet (economic stress) was captured by the question: "During the last 12 months, have you ever had difficulty in managing the regular expenses for food, rent, bills, etc.?" with 'no', 'yes, once' and 'yes, more than once' as possible options. Due to the low frequency in the latter category, the last two answers were combined in the regression analysis.

To capture socio-cultural factors, two further variables were used: whether the participants self-reported to be part of a Sámi reindeer herding community (such as mountain, forest, concession or none) and if they were fluent in a Sámi language.

Data analysis

First, the frequencies and percentages of the independent variables and the outcome of the study sample, that is a high consumption of SSB, were calculated. Then, the magnitude of the association between the study outcome and the independent variables was summarized with the prevalence ratio (PR) using the 95% confidence interval (95% CI) for inferential purposes. Variables that were statistically significant in the bivariable models were included in the multivariable (adjusted) models using a Poisson distribution. Sampling weights were used in all analyses to account for differences in selection probabilities and to improve the generalizability of the results to the invited Sámi population.

The variance inflation factor (VIF) was used to assess multicollinearity among the independent variables, but no collinearity was found (VIF<5).

Ethics

The purpose of the study and the consequences of participating in it were explained in the letter of invitation, which was available in Swedish as well as in the North, Lule and South Sámi languages. Participants were also asked to give informed consent before the study began. The research was approved by the Swedish Ethical Review Authority (reference number 2020-04803, Ö 70-2020/3.1) and adhered to the ethical guidelines for Sámi health research [34]. The data collection was conducted on behalf of the Sámi Parliament in Sweden (Sametinget). The final results of the survey, including those from this study, have been presented to the Sametinget.

RESULTS

Characteristics of participants

Table 1 shows the characteristics of the sample and the prevalence of SSB consumption. More women (50.8%) than men participated, with the 45-64 age group (37.74%) being the largest, followed by the 65-84 age group (26.1%). Almost half (46.3%) of the population was unmarried and one fifth lived alone. The majority of participants lived in Norrbotten (48.9%), followed by Västerbotten (23.1%), while the fewest lived in Jämtland-Härjedalen (7.3%).

Almost two thirds of the participants (61.8%) had a medium level of education, the average annual income was 266,135 SEK and 14% of the participants reported having difficulties making ends meet. More than half of the participants (56.9%) did not belong to a reindeer herding community, while about one third (30.9%) belonged to a mountain community. In addition, 23% of the participants reported being fluent in the Sámi language.

Prevalence of SSB consumption

Overall, 29.5% of the participants reported high consumption of SSB. Men (34.8%) reported higher consumption than women (24.3%). High consumption patterns were observed in the youngest age group (52.7%), among unmarried individuals (37.0%), those living with others (30.5%), those living in Jämtland-Härjedalen (32.6%), those with low education (36.9%), the poorest group (37.2%), those with difficulties making ends meet (35.4%), those belonging to a mountain reindeer herding community (36.6%) and those speaking Sámi (31.9%).

Table 1. Frequency and percentages of the characteristics of the participants and SSB consumption among the Sámi population, Sweden (n=3,658).

Characteristics	N (%)	High SSB consumption (%)
		N = 1071 (29.5%)
Sociodemographic factors		
Sex		
Men	1798 (49.2%)	621 (34.8%)
Women	1860 (50.9%)	450 (24.3%)
Age		
65–84	954 (26.1%)	177 (18.8%)
45–64	1381 (37.7%)	337 (24.5%)
30–44	861 (23.5%)	314 (36.6%)
18–29	463 (12.7%)	243 (52.7%)
Civil status		
Married	1377 (37.7%)	338 (24.7%)
Divorced/Widow(er)	586 (16.0%)	111 (19,0%)
Unmarried	1695 (46.3%)	623 (37.0%)
Living arrangement		
With others	2882 (78.8%)	872 (30.5%)
Alone	776 (21.2%)	199 (25.7%)
Region		
Norrbotten	1789 (48.9%)	571 (32.0%)
Västerbotten	845 (23.1%)	240 (28.6%)
Jämtland-Härjedalen	268 (7.3%)	86 (32.6%)
Other	756 (20.7%)	174 (23.1%)
Socioeconomic factors		
Education		
High	865 (23.7%)	198 (23.0%)
Medium	2258 (61.8%)	677 (30.2%)
Low	529 (14.5%)	193 (36.9%)
Income		
Richest	710(19.4%)	187 (26.5%)
Richer	716(19.6%)	212(29.8%)
Middle	722 (19.8%)	200 (27.8%)
Poorer	718 (19.6%)	181 (25.3%)
Poorest	790 (21.6%)	292 (37.2%)
Mean income (sd)1	266,135 (245,456.8)	-
Economic stress		
No	3121 (85.8%)	887 (28.5%)
Yes	515 (14.2%)	182 (35.5%)
Sociocultural factors		
Reindeer herding community		
None	2051 (56.9%)	516 (25.2%)
Mountain	1112 (30.9%)	405 (36.6%)
Forest	390 (10.8%)	130 (33.3%)
Concession	50 (1.4%)	14 (27.5%)
Sámi Language		
Yes	815 (22.9%)	259 (31.9%)
No	2741 (77.1%)	793 (28.9%)

1 sd=standard deviation

Factors associated with high SSB consumption

In the crude analysis (Table 2), all variables except Sámi language proficiency were statistically significantly associated with a high SSB consumption. After adjusting for all variables except language, a higher proportion of men consumed more (aPR: 1.51, 95% CI: 1.35-1.68) than women, and the youngest age group (18-29 years) was 2.54 times (95% CI: 2.09-3.08) more likely to consume more than the oldest age group.

Regarding socioeconomic factors, individuals with low (aPR: 1.19, 95% CI: 1.06-1.37) and medium (aPR: 1.37, 95% CI: 1.13-1.66) education were more likely to consume higher amounts of SSB compared to those with high education. Finally, regarding socio-cultural factors, only participants belonging to mountain reindeer herding communities had a 19% higher likelihood of a high SSB consumption compared to non-members of reindeer herding communities (aPR: 1.19, 95% CI: 1.05-1.34).

Table 2. Bivariable and multi-variable analysis of the determinants of a high SSB consumption among the Sámi population, Sweden (n=3,658), SámiHET 2021.

Variables	Crude PR (95% CI)	Adjusted PR (95% CI)
Socio-demographic factors		
Sex		
Women	1	1
Men	1.43 (1.29-1.60)	1.51 (1.35-1.68)
Age		
65 - 84	1	1
45-64	1.31 (1.11 – 1.54)	1.39 (1.17-1.64)
30-44	1.95 (1.66 – 2.30)	2.06 (1.71-2.48)
18-29	2.81 (2.38 – 3.31)	2.54 (2.09-3.08)
Civil status		
Married	1	1
Divorced/Widow(er)	0.77 (0.63 – 0.94)	0.94 (0.76-1.16)
Unmarried	1.50 (1.34 – 1.68)	1.10 (0.96-1.26)
Living status		
With others	1	1
Alone	0.84 (0.73 – 0.98)	0.89 (0.79-0.997)
Region		
Other	1	1
Norrbotten	1.39 (1.19-1.62)	1.16 (0.99-1-35)
Västerbotten	1.24 (1.04-1.48)	1.09 (0.91-1.29)
Jämtland-Härjedalen	1.41 (1.12-1.78)	1.05 (0.84-1.32)
Socio-economic factors		
Educational level		
High education	1	1
Medium education	1.31 (1.14 – 1.50)	1.19 (1.06-1.37)
Lower education	1.61 (1.35 – 1.91)	1.37 (1.13-1.66)
Individual income		
Richest	1	1
Richer	1.13 (0.94-1.34)	1.11 (0.93-1.32)
Middle	1.05 (0.88-1.26)	1.10 (0.92-1.32)
Poorer	0.96 (0.79-1.15)	1.02 (0.84-1.24)
Poorest	1.40 (1.19-1.65)	1.17 (0.97-1.40)
Economic stress		
No	1	1
Yes	1.24 (1.08-1.44)	1.04 (0.89-1.20)
Socio-cultural factors		
Reindeer herding community		
None	1	1
Mountain	1.45 (1.29-1.63)	1.19 (1.05-1.34)
Forest	1.32 (1.11-1.57)	1.09 (0.92-1.29)
Concession	1.09 (0.68-1.77)	0.99 (0.60-1.63
Sámi language		
Yes	1	
No	0.91(0.80-1.03)	

DISCUSSION

This study found that 29.5% of the Sámi population in Sweden consumed two or more SSB drinks per week. This finding differs from international patterns in two main ways. First, SSB consumption appears to be lower among the Sámi than among other Indigenous populations. For example, a study from Australia found that approximately 24% of Aboriginal and Torres Strait Islander adults aged 15 years and older consumed SSB daily [35] (9.5% in our study), while Alaska Native children and adults living in Interior Alaska consume high amounts of SSB, including energy drinks, and inadequate amounts of water [36]. Second, the prevalence of SSB consumption among the Sámi was similar to that found in the total Swedish population (28.6%) [28], which tends to be higher in other countries [20]. When comparing these figures, it is important to consider the different historical, cultural, social and economic contexts experienced by different Indigenous populations that influence these consumption patterns [37,38].

In this study, women were less likely to consume SSB than men. This finding is consistent with studies in Indigenous populations in Australia [39], but also in non-Indigenous populations from Sweden and internationally [28, 40, 41]. This has been explained by higher health literacy among women [42], which makes them more likely to avoid high-calorie beverages in order to maintain or achieve a healthy weight. Similarly, the finding that younger age groups are more likely to consume SSB has been observed in several studies in both Indigenous and non-Indigenous populations [32,43]. Aggressive marketing by beverage companies targeting youth and easy and cheap accessibility are known important factors explaining the higher consumption in this age group [44-46].

Educational level, but not economic factors, influenced the likelihood of SSB consumption in this study. Similar findings have been reported in other non-Indigenous studies from different contexts. For example, the Fenland study from the United Kingdom, conducted in 2017, showed that lower education was associated with higher SSB consumption [47]. In the United States, another study conducted among adults in New York also found that those with less education were more likely to consume SSB than those with a college degree [31]. A cross-sectional survey of dietary habits among Norwegian adults found that people with higher levels of education were more likely to consume water, wine and beer, while those with lower levels of education were more likely to consume SSB [48]. A combination of factors, including lower health literacy and limited access to information about the adverse health effects of such beverages among the less educated, have been proposed as possible explanations. In addition, economic and environmental factors may play a role, with lower income areas, often associated with lower levels of education, having greater availability of cheaper sugary drinks compared to healthier, often more expensive alternatives [49]. Research also suggests that marketing strategies for sugary drinks often target lower socioeconomic groups, which may influence consumption patterns. In addition, individuals with lower levels of education may experience more significant life stressors, leading to choices that prioritize immediate gratification or convenience, such as the consumption of readily available and affordable sugary drinks [50].

Although both mountain (36.6%) and forest (33.3%) reindeer herding Sámi reported higher SSB consumption compared to the non-reindeer herding Sámi (25.2%), the aPR was only significant for Sámi belonging to mountain communities. More research is needed but the hypothesis should include coping strategies for demanding and dangerous working conditions, as well as concerns about existential threats to their lifestyle. Income and financial difficulties were not associated with SSB consumption in our study. It is interesting to note that although income or economic level has been found to be significantly associated with SSB consumption in other similar studies [30, 51-52], there are other studies, where income did not play such a clear role [53,54].

Methodological considerations

The study was based on a large sample of Sámi people. However, it is important to be aware that the actual Sámi population in Sweden is larger than that covered by the three registers used in the SámiHET survey. While the participation rate was moderate, the application of sample weights based on the sampling frame means the results are generalisable to the invited population of Sámi in Sweden. The fact that several demographic and socioeconomic variables (gender, age, education, income) were collected from the national registers further strengthens the accuracy and reliability of the data.

As the outcome was self-reported, it may have been subject to recall bias, with participants potentially misremembering their actual consumption levels. The way the question about SSB was phrased could lead to different interpretations, which could contribute to response bias. In addition, social desirability bias may have led some individuals to underreport their soda consumption based on social norms or perceptions. The lack of information on the amount consumed per occasion should also be considered a limitation. However, it is not possible to assess the extent of these biases.

The study was also limited in the number of variables included as potential risk factors (such as taste preferences, and household availability of SSB), which may have underestimated some of the associations found. Finally, the study was conducted during the COVID-19 pandemic, which could have influenced this population's SSB consumption patterns.

Conclusion

This study has found that almost one-third of the Sámi population consumed SSB at least twice a week. Among them, men, younger people, those with low education and those belonging to mountain reindeer husbandry communities reported higher consumption. Although the prevalence was similar to that of the Swedish population, culturally adapted public health interventions targeting youth and men and increasing health literacy among the entire Sámi population are recommended to promote better health but also to prevent future chronic diseases.

DECLARATIONS

AI utilization

Artificial intelligence (AI) tools were used to improve the clarity and grammar of the manuscript. The authors reviewed and approved all content.

Competing interests

The authors declare no competing interests.

Funding
This research was partly funded by the Public Health Agency of Sweden (01401-2021.2.3.2) and the Umeå Medical Faculty Strategic Funding (FS 216-339-20).

Author contributions
JPAS and MSS co-designed the original SámiHET study and collected the data. MSS and JPAS formulated the research question. ATM analysed the data and drafted the manuscript. MSS, JPAS and LMN contributed to the interpretation of the findings and commented on the draft article. All authors approved the final version of the article. JPAS and LMN are Sámi health researchers.

Data availability
Data cannot be shared publicly because of the sensitive nature. Data are available from Umeå University (contact via the correspondent author) for researchers who meet the criteria for access to confidential data.

Acknowledgements
We are grateful to the participants in the SámiHET and to the authorities supporting the data collection and analysis: the Sámi Parliament (Sametinget) in Sweden and the Public Health Agency of Sweden, respectively.

ORCIDs
Jon Petter Stoor 0000-0002-1580-8307
Lena Maria Nilsson 0000-0002-2354-7258
Miguel San Sebastián 0000-0001-7234-3510

ABSTRACT IN SPANISH

Consumo de bebidas azucaradas entre los Indígenas Sámi de Suecia: prevalencia y factores de riesgo socioeconómicos

Introducción: El consumo de bebidas azucaradas (BA) representa un importante problema de salud pública, asociado a diversas enfermedades como la diabetes, la obesidad y la hipertensión. Las BA incluyen bebidas saborizadas con azúcares añadidos, cuyo consumo elevado es común en todo el mundo. Sin embargo, existe una limitada investigación sobre el consumo de BA en comunidades Indígenas, incluido el pueblo Sámi, el único grupo indígena reconocido dentro de la Unión Europea. El objetivo de este estudio fue estimar la prevalencia del consumo de BA e identificar los factores de riesgo asociados entre la población Sámi en Suecia.
Métodos: La investigación utilizó datos de la encuesta SámiHET. Un total de 3,658 personas Sámi, de entre 18 y 84 años, respondieron el cuestionario, que incluía preguntas sobre resultados de salud, comportamientos relacionados con el estilo de vida y datos socioeconómicos. El consumo de BA se evaluó mediante la frecuencia de ingesta, y se analizaron factores sociodemográficos, socioeconómicos y socioculturales para identificar los factores de riesgo asociados. Se estimaron razones de prevalencia y sus intervalos de confianza del 95%, aplicando ponderaciones muestrales para mejorar la generalización de los resultados.
Resultados: El estudio encontró que el 29,5% de los participantes reportó consumir BA al menos dos veces por semana. Los hombres y las personas más jóvenes mostraron patrones de consumo más elevados. También se observaron asociaciones estadísticamente significativas con niveles educativos más bajos y con la pertenencia a comunidades de pastoreo de renos de montaña. Sin embargo, no se encontraron asociaciones estadísticas entre el consumo de BA y factores como el nivel de ingresos o el estrés económico.
Conclusiones: La investigación pone de relieve un consumo considerable de BA entre la población Sámi, similar al promedio nacional, pero inferior al observado en otros pueblos Indígenas a nivel mundial. Factores como el género, la edad, el nivel educativo y los contextos socioculturales específicos (por ejemplo, el pertenecer a una comunidad de pastoreo de renos) se asociaron significativamente con el consumo de BA. Se recomienda implementar intervenciones de salud pública culturalmente adaptadas, dirigidas especialmente a jóvenes y hombres, así como promover la alfabetización en salud en toda la población Sámi, con el fin de fomentar hábitos más saludables y prevenir futuras enfermedades crónicas.

Palabras clave: Sámi, azúcar, bebida, refresco, Indígena, socioeconómico.

REFERENCES

[1] Greenwood DC, Threapleton DE, Evans CEL, Cleghorn CL, Nykjaer C, Woodhead C, et al. Association between sugar-sweetened and artificially sweetened soft drinks and type 2 diabetes: systematic review and dose–response meta-analysis of prospective studies. Br J Nutr. 2014 Sep 14;112(5):725–34.

[2] Valenzuela MJ, Waterhouse B, Aggarwal VR, Bloor K, Doran T. Effect of sugar-sweetened beverages on oral health: a systematic review and meta-analysis. Eur J Public Health. 2021;31(1):122–9.

[3] Malik VS, Popkin BM, Bray GA, Després JP, Willett WC, Hu FB. Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis. Diabetes Care. 2010;33(11):2477–83.

[4] Basu S, McKee M, Galea G, Stuckler D. Relationship of soft drink consumption to global overweight, obesity, and diabetes: a cross-national analysis of 75 countries. Am J Public Health. 2013 Nov;103(11):2071–7.

[5] Ruanpeng D, Thongprayoon C, Cheungpasitporn W, Harindhanavudhi T. Sugar and artificially sweetened beverages linked to obesity: a systematic review and meta-analysis. QJM Mon J Assoc Physicians. 2017 Aug 1;110(8):513–20.

[6] Hernández-López R, Canto-Osorio F, Vidaña-Pérez D, Torres-Ibarra L, Rivera-Paredez B, Gallegos-Carrillo K, et al. Soft drink and non-caloric soft drink intake and their association with blood pressure: the Health Workers Cohort Study. Nutr J. 2022 Jun 7.

[7] Kim Y, Je Y. Prospective association of sugar-sweetened and artificially sweetened beverage intake with risk of hypertension. Arch Cardiovasc Dis. 2016 Apr;109(4):242–53.

[8] Narain A, Kwok CS, Mamas MA. Soft drinks and sweetened beverages and the risk of cardiovascular disease and mortality: a systematic review and meta-analysis. Int J Clin Pract. 2016 Oct;70(10):791–805.

[9] WHO urges global action to curtail consumption and health impacts of sugary drinks. [cited 2023 Apr 29]. Available from: https://www.who.int/news/item/11-10-2016-who-urges-global-action-to-curtail-consumption-and-health-impacts-of-sugary-drinks.

[10] Ooi JY, Wolfenden L, Sutherland R, Nathan N, Oldmeadow C, Mclaughlin M, et al. A systematic review of the recent consumption levels of sugar-sweetened beverages in children and adolescents from the World Health Organization regions with high dietary–related burden of disease. Asia Pac J Public Health. 2022;34(1):11–24.

[11] World Health Organization. Sugar intake for adults and children guideline. Geneva: WHO; 2015.

[12] Fogelholm M. Common nutrition and health issues: Nordic nutrition recommendations. In: Nutritional and Health Aspects of Food in Nordic Countries. Elsevier; 2018. p. 197–210.

[13] Singh GM, Micha R, Khatibzadeh S, Shi P, Lim S, Andrews KG, et al. Global, regional, and national consumption of sugar-sweetened beverages, fruit juices, and milk: a systematic assessment of beverage intake in 187 countries. PloS One. 2015;10(8):e0124845.

[14] Eurostat. How often do you drink sugar-sweetened soft drinks? Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210727-1.

[15] Dai J, Soto MJ, Dunn CG, Bleich SN. Trends and patterns in sugar-sweetened beverage consumption among children and adults by race and/or ethnicity, 2003–2018. Public Health Nutr. 2021;24(9):2405–10.

[16] Purohit BM, Dawar A, Bansal K, Nilima, Malhotra S, Mathur VP, et al. Sugar-sweetened beverage consumption and socioeconomic status: A systematic review and meta-analysis. Nutr Health. 2023;29(3):465–77.

[17] Madsen KA, Falbe J, Olgin G, Ibarra-Castro A, Rojas N. Purchasing patterns in low-income neighbourhoods: implications for studying sugar-sweetened beverage taxes. Public Health Nutr. 2019;22(10):1807–14.

[18] Lee A, Rainow S, Tregenza J, Tregenza L, Balmer L, Bryce S, et al. Nutrition in remote aboriginal communities: lessons from Mai Wiru and the Anangu Pitjantjatjara Yankunytjatjara lands. Aust N Z J Public Health. 2016;40:S81–8.

[19] Australian National Preventive Health Agency. Obesity: Sugar-Sweetened Beverages, Obesity and Health. Camberra: Australian National Preventive Health Agency; 2014.

[20] Cartwright J, Netzel ME, Sultanbawa Y, Wright OR. Seeking Sweetness: A systematic scoping review of factors influencing sugar-sweetened beverage consumption in remote Indigenous communities worldwide. Beverages. 2023;9(1):11.

[21] Australian Bureau of Statistics. Australian Aboriginal and Torres Strait Islander Health Survey: First Results, Australia, 2012–13. Canberra: Australia Bureau of Statistics, 2013.

[22] Jones AC, Kirkpatrick SI, Hammond D. Beverage consumption and energy intake among Canadians: analyses of 2004 and 2015 national dietary intake data. Nutr J. 2019;18:1–14.

[23] Alaska Department of Health and Social Services. Alaska obesity facts report 2014. Anchorage, AK: Section of Chronic Disease Prevention and Health Promotion, Division of Public Health, Alaska Department of Health and Social Services; 2014.

[24] Samiskt informationscentrum. Antalet samer i Sápmi 2019. Available from: http://www.samer.se/samernai siffror.

[25] Nordregio. Sámi reindeer herding villages and herding areas in Sweden. Available from: https://nordregio.org/maps/sami-reindeer-herding-villages-and-herding-areas-in-sweden/.

[26] Storm Mienna C, Axelsson P. Somatic health in the Indigenous Sami population - a systematic review. Int J Circumpolar Health. 2019 Jan 1;78(1):1638195.

[27] San Sebastián M, Stoor JP. The self-reported health of the Sámi in Sweden: the SámiHET study. Eur J Public Health. 2023;33(3):366-371.

[28] Public Health Agency of Sweden. Hur mår samerna i Sverige? Resultat från en kartläggning av hälsa och levnadsförhållanden i den samiska befolkningen. Stockholm: Public Health Agency of Sweden; 2022.

[29] Stoor JPA, San Sebastián M. A population-based study on health and living conditions among Sámi in Sweden: the SámiHET study. Int J Circumpolar Health. 2022 Dec 31;81(1):2076383.

[30] Folkhälsomyndigheten, Nationella folkhälsoenkäten - Hälsa på lika villkor. Nationella folkhälsoenkäten-Hälsa på lika villkor-Folkhälsomyndigheten (folkhalsomyndigheten.se). 2021.

[31] Rehm CD, Matte TD, Van Wye G, Young C, Frieden TR. Demographic and behavioral factors associated with daily sugar-sweetened soda consumption in New York city adults. J Urban Health. 2008 May;85(3):375–85.

[32] Miller C, Wakefield M, Braunack-Mayer A, Roder D, O'Dea K, Ettridge K, et al. Who drinks sugar sweetened beverages and juice? An Australian population study of behaviour, awareness and attitudes. BMC Obes. 2019;6:1–12.

[33] World Health Organization. A conceptual framework for action on the social determinants of health. Available from: https://apps.who. int/iris/handle/10665/44489.

[34] Kvernmo S SBK Broderstad A, Rossvoll M, Eliassen BM, Stoor J. Proposal for ethical guidelines for Sámi health research and research on Sámi human biological material. Kárášjohka/Karasjok, Norway; 2018.

[35] National Aboriginal and Torres Strait Islander Health Survey, 2018-19 financial year | Australian Bureau of Statistics. 2019. Available from: https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/national-aboriginal-and-torres-strait-islander-health-survey/latest-release.

[36] Elwan D, Schweinitz P de, Wojcicki JM. Beverage consumption in an Alaska Native village: a mixed-methods study of behaviour, attitudes and access. Int J Circumpolar Health. 2016;75(1):29905.

[37] King M, Smith A, Gracey M. Indigenous health part 2: the underlying causes of the health gap. The lancet. 2009;374(9683):76–85.

[38] Anderson I, Robson B, Connolly M, Al-Yaman F, Bjertness E, King A, et al. Indigenous and tribal peoples' health (The Lancet–Lowitja Institute Global Collaboration): a population study. The Lancet. 2016;388(10040):131–57.

[39] Australian Bureau of Statistics. In: Australian health survey: nutrition first results - foods and nutrients, 2011-12. Canberra: Australian Bureau of Statistics; 2014.

[40] Rao G, Kirley K, Weiss-Coleman R, Inman JJ, Bauer V, Zhou Y, et al. Consumption patterns of sugar-sweetened carbonated beverages among children and adolescents. Curr Cardiovasc Risk Rep. 2015;9:1–19.

[41] Tasevska N, DeLia D, Lorts C, Yedidia M, Ohri-Vachaspati P. Determinants of sugar-sweetened beverage consumption among low-income children: are there differences by race/ethnicity, age, and sex? J Acad Nutr Diet. 2017;117(12):1900–20.

[42] Wardle J, Haase AM, Steptoe A, Nillapun M, Jonwutiwes K, Bellisle F. Gender differences in food choice: the contribution of health beliefs and dieting. Ann Behav Med Publ Soc Behav Med. 2004 Apr;27(2):107–16.

[43] Bersamin A, Herron J, Nash S, Maier J, Luick B. Characterizing beverage patterns among Alaska Natives living in rural, remote communities: The CANHR study. 2011;

[44] Sadeghirad B, Duhaney T, Motaghipisheh S, Campbell NR, Johnston BC. Influence of unhealthy food and beverage marketing on children's dietary intake and preference: a systematic review and meta analysis of randomized trials. Obes Rev. 2016;17(10):945–59.

[45] Potvin Kent M, Pauzé E, Roy E, de Billy N, Czoli C. Children and adolescents' exposure to food and beverage marketing in social media apps. Pediatr Obes. 2019;14(6):e12508.

[46] Bankole E, Harris N, Rutherford S, Wiseman N. A systematic review of the adolescent directed marketing strategies of transnational fast food companies in low and middle income countries. Obes Sci Pract. 2023;9(6):670–80.

[47] Barrett P, Imamura F, Brage S, Griffin SJ, Wareham NJ, Forouhi NG. Socio-demographic, lifestyle and behavioural factors associated with consumption of sweetened beverages among adults in Cambridgeshire, UK –the Fenland Study. Public Health Nutr. 2017;20(15):2766–77.

[48] Paulsen MM, Myhre JB, Andersen LF. Beverage consumption patterns among Norwegian adults. Nutrients. 2016 Sep 13;8(9):561.

[49] Jensen JD, Bere E, De Bourdeaudhuij I, Jan N, Maes L, Manios Y, et al. Micro-level economic factors and incentives in Children's energy balance related behaviours-findings from the ENERGY European cross-section questionnaire survey. Int J Behav Nutr Phys Act. 2012;9:1–12.

[50] Khandelwal P, Salazar LR. Exploring the social determinants of drinking sugary beverages leading to chronic illness among latina/o populations. Hisp Health Care Int. 2020;18(2):64–70.

[51] Al-Hanawi MK, Ahmed MU, Alshareef N, Qattan AMN, Pulok MH. Determinants of sugar-sweetened beverage consumption among the Saudi adults: findings from a nationally representative survey. Front Nutr. 2022 Mar 22;9:744116.

[52] Barrett P, Imamura F, Brage S, Griffin SJ, Wareham NJ, Forouhi NG. Sociodemographic, lifestyle and behavioural factors associated with consumption of sweetened beverages among adults in Cambridgeshire, UK: the Fenland Study. Public Health Nutr. 2017 Oct;20(15):2766–77.

[53] Bolt-Evensen K, Vik FN, Stea TH, Klepp KI, Bere E. Consumption of sugar-sweetened beverages and artificially sweetened beverages from childhood to adulthood in relation to socioeconomic status–15 years follow-up in Norway. Int J Behav Nutr Phys Act. 2018;15:1–9.

[54] Warren C, Hobin E, Manuel DG, Anderson LN, Hammond D, Jessri M, et al. Socioeconomic position and consumption of sugary drinks, sugar-sweetened beverages and 100 percent juice among Canadians: a cross-sectional analysis of the 2015 Canadian Community Health Survey–Nutrition. Can J Public Health. 2022;113(3):341–62.