AWARENESS, ATTITUDE AND PHYSICAL ACTIVITY PATTERN AMONG REGULAR CONSUMERS OF SUGAR-SWEETENED BEVERAGES (SSBs) IN COLLEGE STUDENTS

PROJECT SUBMITTED

In partial fulfillment of requirement for the award of the degree of

B. Sc. NUTRITION AND DIETETICS

BY

AFYA SUDHARSHANAN, ANJALI S, NANDANA SAJEESH, PREEN JOB

(Register No: SB21ND001, SB21ND007, SB21ND030, SB21ND035)

DEPARTMENT OF CLINICAL NUTRITION AND DIETETICS

ST. TERESA'S COLLEGE (AUTONOMOUS)

ERNAKULAM

APRIL 2024

CERTIFIED AS BONAFIDE RESEARCH WORK

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APRIL 2024

CERTIFIED AS BONAFIDE RESEARCH WORK

29/04/24

Signature of Internal Examiner

29/4/24

Signature of External Examiner

DECLARATION

We hereby declare that the project entitled **"AWARENESS, ATTITUDE AND PHYSICAL ACTIVITY PATTERN AMONG REGULAR CONSUMERS OF SUGAR-SWEETENED BEVERAGES (SSBS) IN COLLEGE STUDENTS"** submitted in partial fulfilment of the requirement for the award of the degree of B. Sc. Nutrition and Dietetics is a record of original research work done by me under the supervision and guidance of **Ms. NAMITHA PRASTHEENA JOSEPH**, Assistant Professor, Department of Clinical Nutrition and Dietetics, Women's Study Centre, St. Teresa's College (Autonomous), Ernakulam and has not been submitted in part or full of any other degree/diploma/fellowship or the similar titles to any candidate of any other university.

Place: ERNAKULAM
Date: 29/04/2024

AFYA SUDHARSHANAN
ANJALI. S
NANDANA SAJEESH
PREEN JOB

CERTIFICATE

I hereby certify that the project entitled **"AWARENESS, ATTITUDE AND PHYSICAL ACTIVITY PATTERN AMONG REGULAR CONSUMERS OF SUGAR-SWEETENED BEVERAGES (SSBS) IN COLLEGE STUDENTS"** submitted in partial fulfillment of the requirement for the award of the degree of B. Sc. Nutrition and Dietetics is a record of original work done by **Ms. AFYA SUDHARSHANAN, Ms. ANJALI S, Ms. NANDANA SAJEESH, Ms. PREEN JOB** during the period of the study under my guidance and supervision.

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CHAPTER-I
INTRODUCTION

Sugar-sweetened beverages as defined by the Centre for Disease Control (CDC) are "any liquid that have been sweetened with any various forms of added sugars like brown sugar, corn sweetener, corn syrup, dextrose, fructose, glucose, high fructose corn syrup, honey, lactose, malt syrup, maltose, molasses, raw sugar, and sucrose." There is evidence to suggest that soft drink consumption is rising globally. Across the globe, adults consumed an average of 2.78 oz (248 grams) of sugar-sweetened beverages per week in 2018. Mexico had the greatest intakes among the 25 most populous countries in the world, followed by Ethiopia, the United States, and Nigeria. India, China, and Bangladesh (0.2 servings/week) had the lowest intakes. Out of 185 nations, 58 nations (31.4%) had a mean SSB intake of seven or more servings per week, accounting for 446 million adults or 8.9% of the global adult population (Malik & Hu, 2022).

Guidelines suggested by World Health Organization (WHO), recommends the maximum intake of added sugars for adults should be less than 10% of total daily energy intake. However, they also suggest, additional health benefits on further reductions of sugar intake to below 5% (about 25 grams or 6 teaspoons) of total daily energy. These recommendations are based on adverse health effects due to excessive sugar intake including obesity, type 2 diabetes, and dental problems evidenced by various studies. Recommendations suggested by American Heart Association (AHA) for added sugar intakes has even more tighter restrictions. They suggest that women should limit their added sugar intake to a maximum of 100 calories per day (about 6 teaspoons or 25 grams) and men should limit theirs to not exceeding 150 calories per day (about 9 teaspoons or 37.5 grams).

Studies show that people do not feel as full after consuming sugar-sweetened beverages as they do after eating solid food, therefore they do not usually eat fewer other meals to offset the excess calories they consume. Excess calories are a contributing factor to overweight and obesity because they are readily transformed into body fat and deposited in a variety of tissues. SSBs may lead to weight gain because of insufficient offset of liquid calorie intake during later meals, resulting in positive energy balance. Independently of weight gain, sugar-sweetened beverages (SSBs) can heighten the likelihood of Metabolic Syndrome (MetSyn), Type 2 Diabetes Mellitus (T2DM), and cardiovascular issues due to their significant impact on

elevating dietary glycemic load (GL) and containing a substantial fructose fraction. These factors contribute to the onset of insulin resistance, dysfunction of beta cells, inflammation, hypertension, accumulation of visceral fat, and the development of atherogenic dyslipidemia (Malik *et. al.,* 2010 and Kiya J *et. al.,* 2010). Metabolic syndrome incorporates a cluster of conditions such as obesity, high blood pressure, elevated blood sugar levels, and abnormal cholesterol levels, which unitedly increase the risk of cardiovascular disease, type 2 diabetes, and other chronic illnesses. The substantial sugar content found in SSBs not only fosters weight gain but also exacerbates insulin resistance, resulting in disruptions to both glucose and lipid metabolism, pivotal aspects of metabolic syndrome. Overconsumption is likely being caused by the rise in portion sizes of beverages with added sugar over the previous few decades. A study conducted by Bipasha et. al., (2017) in Bangladesh examined the consumption patterns of sugar-sweetened beverages among young people studying at a private university. The results showed that the consumption of sugar-sweetened beverages is becoming more common, and visits to campus cafeterias, neighborhood fast-food restaurants and local grocery stores, the most common sources of sugar-sweetened beverages, are increasing faster than ever. Sugar-sweetened beverages are particularly popular among the younger generation. Most students prefer sweet drinks. 95.4% of those with a high school diploma reported consuming sugary drinks regularly and 53.6% more than two days a week. The average daily caloric intake associated with sweetened beverages reported among college students was 560 kcal/day (4–5 servings/day for all sweetened beverages).

According to WHO, "Physical activity (PA) refers to all movement including during leisure time, for transport to get to and from places, or as part of a person's work. Both moderate- and vigorous-intensity physical activity improve health. Popular ways to be active include walking, cycling, wheeling, sports, active recreation, and play, and can be done at any level of skill and for enjoyment by everybody". Given the vital role that physical health plays in cognitive functioning, psychological well-being, and overall life satisfaction, research on the physical activity level of college students is crucial. Young adults undergo substantial lifestyle changes during their transition to college. They frequently deal with increased academic pressure, social pressure, and a change in individual responsibility, all of which can have a negative impact on the level of physical activity they engage in. The college years are crucial for beginning and maintaining regular physical activity since habits acquired during this time can also shape future behavior and health. In addition, it is harder to maintain appropriate levels of physical activity due to the rise in sedentary behaviors, which is mostly caused by spending

more time on electronic devices and engaging in online activities. It is critical to comprehend college students' patterns of physical activity while developing programs to encourage healthier lives and avert the long-term effects of physical inactivity.

For substantial health benefits, adults should engage in at least 150–300 minutes of moderate-intensity aerobic exercise, 75–150 minutes of vigorous-intensity aerobic exercise, or an equivalent mix of moderate- and vigorous-intensity activity throughout the week (WHO Guidelines on Physical Activity and Sedentary Behavior, 2020). It is important to comprehend the reported physical activity patterns in India and other countries. The Indian Council of Medical Research examined adult physical activity patterns throughout the country. The study discovered that, out of the 14,227 adults analyzed, 54.4% were not active, 31.9% were active, and 13.7% were extremely active. Given that the percentage of the population that is not active seems to be quite high, this trend is cause for concern (Anjana *et al.,* 2014). A similar study reported that compared to Indian adults (9.4%), there was a higher reported prevalence of physical inactivity (15.4%) among the medical students in Bangalore, India (Padmapriya *et. al.,* 2013). Unfortunately, between 30% and 50% of college students do not engage in enough PA to benefit from health advantages, hence the PA levels of current students are concerning. Researchers discovered no differences in PA by semester at the university, which is alarming because it shows that students' PA practices have not changed while in higher education (Keating *et al.,* 2005).

Engaging in regular physical activity provides a plethora of advantages for college students, extending far beyond mere physical health. Firstly, it serves as a potent stress reliever, crucial in an academic setting renowned for its demanding atmosphere. There existed a notable disparity in the exercise levels and mental well-being of college students. Higher levels of physical activity exhibited a positive association with the mental health status of students, indicating a direct correlation between physical activity and mental well-being (Ji, H., & Zheng, C., 2021). Exercise stimulates the release of endorphins (Goldfarb *et. al.,* 1998), nurturing a feeling of wellness and determination to cope with the challenges of academic workload and examinations. Moreover, engaging in regular physical activity improves cognitive abilities, enhancing memory, concentration, and overall academic achievement. A study by Redondo-Flórez et. al., (2022) revealed a significant correlation between academic performance and factors such as VO2 max (VO_2 max is the maximal rate of pulmonary oxygen uptake during the practice of a physical activity that requires sufficient muscle mass), diastolic blood pressure, and insomnia stemming from breathing issues, showing that the low academic

performance group had significantly higher diastolic blood pressure and insomnia levels, as well as significantly lower VO_2 max scores. Beyond the classroom, participation in sports or fitness activities fosters social connections, offering opportunities for networking and building friendships, which are invaluable during the college years. Additionally, regular exercise promotes better sleep patterns, crucial for cognitive function and emotional well-being. A study conducted by Rosenbaum et al. (2015) provides the first evidence that an exercise intervention is associated with reduced post-traumatic stress disorder (PTSD) and depressive symptoms, reduced waist circumference, and improved sleep quality. By prioritizing physical activity, college students not only invest in their present health but also lay the foundation for lifelong habits that promote overall well-being and success.

RELEVANCE OF THE STUDY

College students represent a population at key developmental period of life where lifestyle habits are often established and can have long-lasting effects on health outcomes. They often face unique challenges in maintaining healthy lifestyles due to academic pressures, limited time, and easy access to unhealthy food and beverage options on campus. Understanding the relationship between sugar-sweetened beverage consumption and physical activity patterns among college students is crucial due to its consequences on overall health and well-being. By investigating this relationship, the study aims to illuminate on how the intake of sugar-sweetened beverages, may impact physical activity levels among college students. This perception is essential as excessive consumption of sugar-sweetened beverages has been linked to various adverse health outcomes, including obesity, type 2 diabetes, and cardiovascular diseases. Moreover, as college campuses are environments where dietary choices and physical activity opportunities are abundant, this study holds real-world consequences for designing interventions and policies to encourage healthier behaviours and create supportive environments beneficial to well-being.

AIM

The present study entitled **"Awareness, Attitude and Physical Activity Pattern Among Regular Consumers of Sugar-Sweetened Beverages (SSBs) in College Students"** aimed to investigate the awareness and attitude towards SSBs, prevalence and pattern of physical activity among regular consumers of sugar sweetened beverages within a college student population.

OBJECTIVES

The specific objectives of the present study were envisaged as follows:

- To determine the sociodemographic characteristics of the subjects.
- To assess the anthropometric measurements of the subjects.
- To analyze the Sugar Sweetened Beverage (SSB) consumption pattern among the subjects.
- To investigate the attitude and awareness of the subjects about sugar sweetened beverages.
- To ascertain the prevalence of physical activity among regular consumers of SSBs.
- To examine the physical activity pattern among the subjects.

CHAPTER – II
REVIEW OF LITERATURE

The review pertaining to the present study entitled **"Awareness, Attitude and Physical Activity Pattern Among Regular Consumers of Sugar-Sweetened Beverages (SSBs) in College Students"** is discussed under the following headings

2.1 Attitude and Awareness about Sugar Sweetened Beverages (SSBs)

2.2 Reasons for SSB consumption

2.3 Consumption pattern of SSB among college students

2.4 Prevalence and pattern of physical activity (PA) among college students

2.1 ATTITUDE AND AWARENESS ABOUT SUGAR SWEETENED BEVERAGES (SSBs)

A study conducted by Fadupin et al., (2015) assessed the knowledge, attitude and consumption pattern of alcohol and SSBs among the undergraduate students. A pretested, self-administered questionnaire was used to obtain information from 376 undergraduate students from the University of Ibadan, on the socio-demographic characteristic, knowledge, attitude and consumption pattern of the students regarding the negative social and health implications of excessive consumption of alcohol and SSBs. Large proportion (86.7%) had adequate knowledge of the health implications of excessive consumption of SSBs. Majority (83.5%) had a negative attitude towards the intake of SSBs. 32.5% considered regular consumption of SSBs as dangerous to health. A significant relationship was also observed between frequent consumption of SSBs by the respondents and being overweight ($P<0.05$). Knowledge of the undergraduate students on the social and health implication of excessive consumption of alcohol and sugar sweetened beverages was adequate.

Madiba et al. (2017) conducted a cross sectional study among undergraduate dental and oral hygiene students (n = 344) registered in 2015 at a South African dental university. A self-administered questionnaire was used to draw out the necessary information. The study concluded that 70% of respondents had an acceptable level of knowledge on the types of SSBs and possible health conditions if consumed excessively. Almost half (46%) had a positive attitude toward the consumption of SSBs. Clinical students had a significantly higher level of

knowledge compared to nonclinical students ($P = 0.03$). Participants consumed an average of six teaspoons (±9.5) of sugar from SSBs daily. Those with poor knowledge and attitude consumed significantly more SSBs ($P < 0.01$) than those with higher levels of knowledge and attitude. Males were significantly more obese and overweight than females ($P < 0.01$). There was no association between the amount of sugar consumed from SSBs and the BMI.

Saroja and Priya (2020) conducted a study using simple random sampling method in Tirunelveli District. The sample consists of randomly selected 300 college students. The investigators found that i) there is significant difference between male and female, nuclear and joint family in their awareness on the detrimental effects of soft drinks consumption ii) there is no significant difference between rural and urban, social media users and social media non-users in their awareness on the detrimental effects of soft drinks consumption iii) there is no significant association between college students in their awareness on the detrimental effects of soft drinks consumption with reference to the following background variables such as father's educational qualification and mother's educational qualification.

Park et al., (2023) conducted a cross-sectional study using 2021 Youth Styles Survey data. 831 US adolescents in the age group of 12–17 years were included in Youth Styles Survey. Among which 51.1% were males and 48.9% were females. 75.4% adolescents identified that SSB intake is related to cavities, 74.6% identified SSB is related to weight gain and 69.7% of the adolescent's identified association between SSB and diabetes; however, fewer adolescents identified high blood pressure (31.7%), high cholesterol (25.8%), heart disease (24.6%), and some cancers (18.0%) as related to drinking SSBs.

2.2 REASONS FOR SUGAR SWEETENED BEVERAGES CONSUMPTION

Khandelwal and Salazar (2020) conducted a qualitative study to evaluate the sugary beverage consumption habits of Latin American students and understand the social determinants that lead to this consumption behaviour in order to design health communication campaigns more effective. This study examines the putative reasons behind high sugar-sweetened beverage (SSB) consumption among Hispanic college students in the Texas Panhandle region. Fifteen Latin American students were interviewed through an innovative social media-based online interview protocol. According to later analyses, sugary drink consumption among the target group was caused by peer pressure and socialization, as well as the absence of packaged drinking water at social events, targeted advertising, and poor lifestyle choices. This study recommends designing Public Service Announcements tailored to Latino

youth to increase awareness of the long-term health risks that can result from high consumption of sugar-sweetened beverages. Additionally, the positive health benefits of drinking water should be emphasized and Latin American parents should avoid glorifying sugary drinks and limit their consumption of sugary drinks in front of their children. Further research should aim to design educational messages, using theoretical support, to test how Latino youth respond to them.

Al-Hanawi et al. (2022) conducted a study on "Determinants of Sugar-Sweetened Beverage Consumption Among the Saudi Adults: Findings from a Nationally Representative Survey". The fifth largest consumer of calories from sugar-sweetened beverages (SSB) in the world is Saudi Arabia. However, there is a lack of knowledge to understand the factors that potentially influence the consumption of sugar-sweetened beverages in Saudi Arabia. This study aimed to examine the determinants of sugary drinks in Saudi Arabia. Participants in this study were from the 2013 Saudi Health Interview Survey (SHIS), recruited from all regions of Saudi Arabia. Data from a total of 10,118 respondents aged 15 years and older were used in this study. Two binary outcome variables were used to determine our study, which was weekly SSB consumption (no amount or no quantity) and daily SSB consumption (not both daily and weekly. After adjusting for survey weights, multivariable logistic regression models were applied to evaluate the association between SSB consumption and study variables. 71% of the respondents reported that they consume SSB at least once a week. A higher probability of consuming sugar-sweetened beverages (SSBs) was observed among men, the 25–34 age group, those with less income (<3,000 SR), those who smoke currently, those who frequently eat fast food, and those who watch television for longer periods of time (≥4 h). Consuming vegetables on a daily basis decreased the chance of consuming sugar-sweetened beverages by almost 33%. In Saudi Arabia, 3 out of 4 people aged 15 and over consume sugary drinks at least once a week. A better understanding of the relationship between SSB consumption and demographic, socioeconomic, and behavioral factors is needed to reduce SSB consumption. This study provides important population-based evidence to inform public health efforts to adopt effective strategies to reduce sugar-sweetened beverage consumption in Saudi Arabia. There is a need for interventions targeting education about the adverse health effects associated with the consumption of sugar-sweetened beverages.

Subramanian et al. (2023) conducted a study on "Determinants of Sugar-Sweetened Beverage Consumption Among Adults in Perambalur District of India". This study aimed to determine the prevalence of sugar-sweetened beverage consumption among adults in

the Perambalur region of Tamil Nadu, India and the factors influencing it. We surveyed 1,007 people in a cross-sectional design from June to November 2022.They included residents 18 years of age or younger who were under 80 years of age. Using convenience sampling, they collected responses from the public across the urban and rural practice areas of a teaching medical college in Perambalur district, India. We conducted face-to-face interviews to collect data on sugar-sweetened beverage consumption. We measured the frequency and duration of sugary beverage consumption, while also taking into account the context in which they consumed sugary drinks. We examined the factors that play a role in SSB consumption and asked questions about participants' knowledge of SSB ingredients, their side effects, and their cumulative toll. In addition to examining the effects of sugar-sweetened beverage consumption, the study also explored the possibility of reducing or completely stopping sugar-sweetened beverage consumption. The prevalence of SSB use in the current study population was 96.3%. Half of the population has drunk sugary drinks, between 100 and 200 ml, for more than 10 years. Taste and peer pressure were the main reasons facilitating sugary drinks, while media had only a small impact. Most of the population (69%) has started consuming sugary drinks, mainly on holidays and celebrations. About one-fifth of the population experiences negative consequences after drinking sugary drinks, while only half of the population knows the content of sugary drinks. Similarly, only 50% of the population is aware of the long-term harmful effects of sugary drinks. Nearly 16.7% of the population has tried to stop using sugary drinks. Being overweight, belonging to a high socioeconomic class, and living in a rural area are risk factors associated with consuming sugary drinks. There is a need to educate the public about the short- and long-term negative effects of consuming sugary drinks. Governmental and non-governmental organizations must work together to create mass communication about behaviour change.

Ortega-Avila (2019) conducted a study on “Individual, social and environmental determinants of sugar-sweetened beverages intake in Mexico”. This study aims to identify high sugar-sweetened beverage consumers in Mexico and assess individual, social, and microenvironmental predictors of sugar-sweetened beverage consumption. Data and methods used are:1) A secondary quantitative analysis of a representative sample of the Mexican population was conducted to assess the demographic/socioeconomic characteristics of different types of alcoholic beverage consumers. 2) An online questionnaire was given to a sample of Mexican adolescents to assess the role of personal, social, and microenvironmental factors that influence sugar-sweetened beverage consumption. 3) Qualitative interviews were conducted

with adolescents to obtain detailed information about SSB consumption at home and outside, as well as their perceptions of SSB taxation. Compared to other groups, Mexican adolescents were more likely to be heavy consumers of SSB. The online survey indicates that habit strength, preferences, availability at home and at school are important predictors of SSB consumption among adolescents. Qualitative interview revealed that preferences, health beliefs of certain SSBs, the importance of accompanying meals with SSBs, and family norms drove availability promote SSB consumption. Some other factors that promote SSB consumption are availability of SSB at school, social relationships and activities, and proximity to shops/convenience stores. Teenagers were largely unaware of the tax and believed it would not affect their consumption of sugary drinks, mainly due to low price increases, taste preferences, and their "addiction" to sugary drinks. Adolescents are the largest consumers of SSBs in Mexico, and various physical, social, and individual environmental factors are associated with their SSB consumption and need to be addressed in future interventions.

2.3 CONSUMPTION PATTERN OF SUGAR-SWEETENED BEVERAGES AMONG COLLEGE STUDENTS

A cross-sectional study done by Bipasha et al. (2017) on "Sugar-Sweetened Beverages Consumption among University Students of Bangladesh" was to examine the preference, prevalence, and consumption patterns of sugar-sweetened beverages among Bangladesh university students. The main objective of this study was to assess the patterns of sugary drink intake on a daily and weekly basis among young adults enrolled in universities. A sample of 150 undergraduates participated (83.4% males, 15.9% females). This study examined the days of the week when people consume sugar-sweetened beverages and the characteristics that are linked to that consumption. The results demonstrated that consumption of sugar-sweetened beverages is rising. The majority of college students favored sugar-filled drinks. Significant amounts of sugar-sweetened beverage intake were reported by undergraduates, with 53.6% reporting usage more than twice a week and 95.4% indicating frequent consumption. College students who reported using sugar-filled beverages reported an average daily calorie intake of 560 kcal/d (4 to 5 servings/d across the combined categories of sugar-filled beverages). Male students reported consuming sugar-filled beverages regularly at a rate of 85.4% compared to 14.5% for female students. Undergraduates self-report consuming a lot of sugar-sweetened beverages, which probably adds up to a lot of non-nutritive calories and could cause weight gain. Encouraging public awareness efforts, nutritional standards, and

targeted health education programs could be implemented to address university students' bad drinking habits and enhance their health.

The primary goal of a study conducted by West et al. (2006) was to analyse the intake of SSB among college students. A total of 265 undergraduates (66% female, 46% minority) volunteered, out of the total number of requests. In the previous month, 95% of students reported consuming sugar-sweetened beverages, and 65% reported doing so every day. The likelihood of men reporting daily intake was higher than women's (74% vs. 61%, p 0.035). The most popular sugar-sweetened beverage was soda. With 91% of black undergraduates reporting consumption of sugar-sweetened fruit drinks in the previous month and 50% reporting daily consumption, black undergraduates reported a higher intake of sugared beverages than white undergraduates (p 0.02). The study concluded that concerns regarding the likelihood that consuming significant amounts of energy from beverages sweetened with sugar could lead to weight gain and the rising rate of obesity among children and adolescents should extend to undergraduate populations.

A study conducted by Cheah & Chua (2023), concluded that regular soft drink (52.3%) was the most often drunk SSB among the participants weekly (≤6 times per week), while sugar-sweetened coffee or tea (39.8%) was the most frequently consumed SSB daily (at least once daily). The age range for inclusion was university students living in Malaysia, capable of understanding English, and between the ages of 18 and 26. 176 young adults, ages 18 to 26, participated in this cross-sectional study and answered a self-administered questionnaire. The questionnaire asked questions about SSBs' demographics and KAP statistics. To compare categorical variables, a chi-square test was performed and descriptive statistics were described. Most of the university students (90.6%) had a favorable attitude toward SSB intake overall, there were gaps in their understanding (51.7%) and practice (80.7%).

The purpose of the study done by Cheng and Lau (2022) was to assess the pattern of SSB intake as well as the degree of knowledge, attitude, and behaviors (KAP) related to SSB intake among university students in Malaysia during COVID-19. In all, 100 college students participated in this investigation. The SSB intake pattern and KAP were ascertained by self-administered questionnaires. SPSS was utilized for data analysis. Milk, tea, and coffee were the most commonly drank SSB, while energetic drinks were the least popular. The students' average daily consumption of sugar from SSB was 59.14 ± 51.28 g/day, or twelve

teaspoons of sugar. Practice is the only component that multiple linear regression showed to be substantially correlated with the use of sugar-sweetened beverages (adjusted R2= 0.137, F= 3.614, p=0.003). Higher practice score students typically drink less sugar-sweetened beverages (SSB). The study concluded that reducing sugar-sweetened beverages (SSBs) and maintaining a balanced diet during the COVID-19 pandemic are key implementation strategies.

Gedi and Tasyikan's (2022) study set out to evaluate Somali students' knowledge, attitudes, and consumption habits of sugar-sweetened beverages (SSBs), as well as associated sociodemographic and lifestyle characteristics. The present study involved a cross-sectional analysis of Somali students residing in Turkey who were at least eighteen years of age. The students were chosen from an existing panel of Somali students collected from the Somali Student Organization in Turkey. The study involved 325 participants, with a mean age of 24.1 ± 3.2 years, and 60% males and 40% females. Of the respondents, 82.1 percent were originally from Somalia, and 33.2% were faculty members in medical schools. The grams of sugar in each beverage and the servings per liter of sugar-sweetened drinks (SSBs) consumed by the students were measured. About 30% of the individuals reported consuming SSBs daily. The students estimated that they ate 2.2+1.07 servings of SSBs daily on average. This finding was higher than the global means of consumption of 0.58 servings/day – 0.80 servings/day and 0.59 servings/day in upper and lower-middle-income countries, respectively.

The study done by Cheah et al. (2023) aimed to examine the prevalence and type of Sugar-sweetened Beverages (SSB) consumption among students at a public university in Sarawak. This cross-sectional study was carried out at a public university in Malaysia with undergraduate students. Data on socio-demographics, SSB consumption, family and personal history of diabetes, and knowledge of SSB intake were gathered through the use of questionnaires. Measurements for anthropometry were also obtained during the survey. 208 respondents in all took part in the research. Eighty-six percent of the respondents (83.6%) drank SSB at least once a day, and 72.1% of them did so more than three times a week. Coffee, flavored milk, and 3-in-1 sachet drinks were the top three SSB categories in terms of consumption (53.4 to 76.0%). When compared to Chinese respondents, Malay and other ethnic groups (Bumiputra Sarawak, Bumiputra Sabah, Indian, and other ethnic groups) reported considerably higher daily intake of SSB (≥1 time). The article concluded that understanding the pattern of SSB consumption among young adults is important to establish an effective intervention strategy. The findings highlighted the need for targeted interventions aimed at

different ethnicities because of their dietary consumption patterns in a multicultural society like Malaysia.

2.4 PREVALENCD AND PATTERN OF PHYSICAL ACTIVITY AMONG COLLEGE STUDENTS

Jalloun and Surrati (2020) conducted a cross-sectional study through random sampling method at the Madinah main branch of Taibah University, KSA to evaluate the patterns of physical activity among female college students. A total of 658 female college students participated. To evaluate patterns of physical activity, the Arabic version of the International Physical Activity Questionnaire (IPAQ) was shortened. More information was gathered about the body mass index (BMI), visceral fat level (VFL), body fat percentage (BF%), and skeletal muscle percentage (SM%). In total, 44.9% of the students engaged in moderate-intense physical activity and 37.5% of them in vigorous-intensity physical exercise. There was a strong inverse relationship found between BMI and BF% and both vigorous and moderate physical exercise. Students who engaged in vigorous physical activity for at least 75 minutes per week for BMI (aOR = 0.559, 95% CI 0.318–0.687) and BF% (aOR = 0.389, 95% CI 0.044–0.507) and moderate physical activity for at least 150 minutes per week for BMI (aOR = 0.580, 95% CI 0.205–0.812) and BF% (aOR = 0.320, 95% CI 0.124–0.402) seemed to have stronger associations. The findings indicated the need for strategies to raise awareness among female students to be physically active in order to promote healthy lifestyles and significant health benefits, even though both vigorous and moderate physical activity appeared to affect BMI and BF% among college students who performed physical activity.

Clemente et al., (2016) conducted an observational cross-sectional study to determine (a) if Portuguese university students met the public health recommendations for physical activity and (b) how gender and day of the week affected the students' daily PA levels. In this observational cross-sectional study, 126 healthy Portuguese university students between the ages of 18 and 23 participated (73 of them were women). The ActiGraph wGT3X-BT accelerometer was worn by the participants for seven days in a row. The amount of time spent inactive, walking, and engaging in light, moderate, and intense physical activity were all tracked. The physical activity variables were significantly impacted by gender (p-value = 0.001; $\eta 2 = 0.038$; minimum effect) and day of the week (p-value = 0.001; $\eta 2 = 0.174$; minimum effect), according to the results of the two-way MANOVA. Male students were found to walk more steps (65.14%) and engage in light activities (3.11%) less frequently during

the week than they did on weekends, and to spend more time engaging in moderate (136.67%) and strenuous (171.29%) activities. According to the descriptive analysis, female students engaged in more strenuous (124.16%) and moderate (125.70%) activities and walked more steps (51.18%) on weekdays than on weekends ($p < 0.05$). On weekdays and weekends, female students did not walk the recommended 10,000 steps per day on average. During the week, only male students were able to implement this proposal. In conclusion, the study revealed that university students frequently spend their weekends sitting down, especially throughout the weekend. In order to encourage physical activity in this population, new approaches that emphasize modifying sedentary behaviour must be used.

Padmapriya et al., (2013) conducted a study with 264 medical students as samples coming in the age group of 18-22 years who were studying MBBS. The goal was to investigate the patterns and prevalence of physical exercise among young adults. The students were interviewed using the official English long version of the International Physical Activity Questionnaire (IPAQ), with the ratio of males to women (116:143). In each of the four living domains—work, transportation, household and gardening, and leisure time—the overall amount of physical activity was calculated and reported as metabolic equivalent hours per week (MET-hour/week). Of the pupils, 41.3% shown high levels of physical activity, whereas 43.2% and 15.4% demonstrated moderate and low levels, respectively. While 80.7% (n=209) displayed activities connected to transportation, 84.6% (n=219) were involved in work-related activities. 67.2% of students reported engaging in leisure-time activities, while 63.7 percent (n=165) of persons reported engaging in physical activity related to gardening and housework. 7.06 hours a day were spent sitting down on average. The sample as a whole had a median total physical activity of 39.13 MET/hour/week, of which 18.10 was related to work, 4.40 to transportation, 2.60 to household and gardening, and 4 to leisure activities. A notable gender disparity was noted, with women engaging in less physical exercise.

Montasser et al., (2011) conducted a nested cross-sectional study in Mansoura University, Egypt to draw attention to the pattern of intense physical activity among first-year college students and assess the relationships between body mass index, perceived barriers, support systems, and sociodemographic characteristics. 500 first-year students in all were chosen using a systematic random selection. In addition to other questions, participants answered the International Physical Activity Questionnaire in its abbreviated form. According to the study, students engaged in 9.8% (N=49) of intense exercise compared to 90.2% (N=451)

of light and moderate activity. Body-related barriers, such as shyness from others while exercise (6.9% versus 0.0%) and shyness from one's appearance in public (14.6% versus 4.1%), were substantially more prevalent among those reporting mild and moderate activities. Another factor that was cited as a barrier was not having the necessary equipment (31.0 versus 16.3% for those performing mild to moderate and strenuous, respectively). When compared to the more sedentary students, a significantly higher percentage of those engaging in vigorous activity reported the influence of support factors like perceived health benefits (53.1% versus 33.7%), encouragement from others (53.1% versus 30.4%), and participation from others (51.0% versus 23.9%). While the majority of both groups reported spending less than four hours a day in front of a computer, the proportion of those who only reported mild to moderate engagement was much higher (88.0% versus 63.3%). The majority of the obstacles that were analysed were more common in individuals who reported mild to moderate activities, whereas those who reported strong activity had higher levels of support factors. These findings emphasize the significance of social norms, the environment, and intrapersonal elements in shaping the behaviour pattern of first-year Egyptian university students.

Indriani and Aisyiyah (2020) conducted a cross-sectional study at Faculty of Health Science, X University, Yogyakarta. A total of 112 students was enrolled in this study. The characteristics of the students, their sedentary behaviour, and their physical activity were the study's variables. The purpose of this study was to gather data on Yogyakarta health science students' patterns of physical activity. The Global Physical Activity Questionnaire (GPAQ) form was used to collect the data, which was then divided into three categories: low activity (<600 METs), medium activity (600-3000 METs), and high activity (>3000 METs). There was a descriptive analysis of the data. Low PA activity was present in 61 students (54.4%) overall. With METs and a low duration per minute per week (Mean= 49.51; SD= 298.90), males were more active than females (Mean= 186.56; SD= 220.57). Age, gender, and sedentary behaviour all showed a statistically significant positive connection. Sedentary behaviour and age and gender are positively correlated. In this way, a conducive atmosphere for managing non-communicable illnesses and mental well-being is established.

CHAPTER-III

METHODOLOGY

The methodology adopted for the present study entitled **"Awareness, Attitude and Physical Activity Pattern Among Regular Consumers of Sugar-Sweetened Beverages (SSBs) in College Students"** is discussed under the following headings:

3.1 Selection of Area

3.2 Selection of Subjects

3.3 Selection of Tool

3.4 Collection of Data

- **3.4.1 General Profile**
- **3.4.2 Anthropometry Measurements**
  - **3.4.2.1 Measurement of Height**
  - **3.4.2.2 Measurement of Weight**
  - **3.4.2.3 Body Mass Index**
- **3.4.3 Sugar Sweetened Beverages Consumption Pattern**
- **3.4.4 Physical Activity Pattern**
- **3.4.5 Awareness & Attitude about SSB and its Consumption**

3.5 Analysis and Interpretation of Data

3.1 SELECTION OF AREA

The present study was carried out in the colleges in Kochi. Kochi was selected as it is a metropolitan city where there can be high chances of consumption of sugar-sweetened beverages among the college students.

3.2 SELECTION OF SUBJECTS

Several studies reported that consumption of sugar sweetened beverages where higher

among college students (Bawadi *et al.,* 2019; Ahmad *et al.,* 2019 & Bipasha *et al.,* 2017). Therefore, a sample size of 100 college students aged between 18-25 years, who consume sugar sweetened beverages on a regular basis were selected for the study from various educational institution through purposive sampling method. The criteria for inclusion involved subjects who consume SSBs either once, twice or thrice on a daily basis or once, twice or thrice on weekly basis.

Purposive sampling method was employed mainly to meet the criteria of regular SSB consumption. Purposive sampling technique is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research (Rai et al., 2004)

3.3 SELECTION OF TOOL

The tool selected for the study was an interview schedule. An interview schedule is a proforma containing a set of questions which is generally filled out by the research worker, who can interpret questions when necessary (Kothari, 2004). Therefore, in the present study, a well-structured interview schedule was formulated with details including general profile, anthropometric measurements, sugar sweetened beverage consumption, physical activity, awareness & attitude about SSB consumption of the respondents. The interview schedule used for the present study is given in appendix-I.

3.4 COLLECTION OF DATA

The data was collected by personally interviewing 100 college students studying in various colleges in Kochi. The details collected from the subjects were:

3.4.1 General Profile

The general profile included basic information about the subjects like name, age, gender and residential information.

3.4.2 Anthropometry Measurements

Anthropometric measurements were taken to assess the nutritional status of the subjects. Anthropometric measurements like height and weight of subjects were recorded and used to calculate BMI.

3.4.2.1 Measurement of Height

Height of the respondents were measured using a measuring tape and ruler. The subjects were asked to remove their shoes and was made to stand against a wall with the head, shoulders and buttocks touching the wall and feet flat on the floor. A ruler was placed little above the head and was lowered till it touches the head of the subjects and a point is marked with a pencil. Now, using the measuring tape, the length is measured and recorded. The height was recorded in cm.

Plate-1: Measuring height of the subjects

3.4.2.2 Measurement of Weight

Weight of the respondents were measured using weighing machine. The respondents were instructed remove their shoes and any heavy clothing to ensure precise measurement. Respondents were then asked stand still on the weighing machine. The weight was recorded in kg.

3.4.2.3 Body Mass Index (BMI)

Body mass index is the method of utilizing an adult's height and weight to broadly place them into underweight, normal weight, overweight and obese categories (Zierle-Ghosh & Jan, 2023). The BMI was calculated from the recorded height and weight of the subjects using the formula:

$$BMI = \text{Weight (kgs)} / \text{Height } (m^2)$$

3.4.3 Sugar sweetened beverages consumption pattern

This section recorded information on frequency of SSB consumption (daily, weekly, or monthly) and the type of SSB consumed in order to determine the pattern of SSB consumption.

3.4.4 Physical Activity Pattern

This section gathered information regarding the type, frequency and duration of exercise. The attitude of the subjects on physical activity was also analyzed.

3.4.5 Awareness & attitude about SSB and its consumption

The last section asked about the respondent's attitude and awareness about SSB and its consumption. Their preferences, awareness about sugar content and health effects were also analyzed. This section helps to get a better understanding of the individual's attitude and awareness about SSB and its consumptions.

3.5 ANALYSIS AND INTERPRETATION OF DATA

The data collected from the subjects were analyzed, tabulated and interpreted. Percentage analysis, mean and standard deviation was used to analyze the data.

CHAPTER-IV
RESULTS AND DISCUSSION

The results pertaining to the present study entitled **"Awareness, Attitude and Physical Activity Pattern Among Regular Consumers of Sugar-Sweetened Beverages (SSBs) in College Students"** are presented under the following headings:

4.1 Socio-demographic Characteristics of the Subjects

4.2 Anthropometric Measurements of the Subjects

4.3 Attitude and Awareness of the Subjects towards SSBs

4.4 SSB Consumption Pattern of the Subjects

4.5 Physical Activity Pattern of the Subjects

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SUBJECTS

The socio-demographic characteristics give basic information on the age, gender and residential information of the selected subjects. The socio-demographic characteristics of the selected subjects are presented in table-1.

Table-1: Socio-demographic Characteristics

Characteristics	Frequency (n)	Percentage (%)
Age		
18-20	52	52
21-25	48	48
Gender		
Male	61	61
Female	39	39
Residential information		
Home	70	70
Off campus housing	17	17
College hostel	13	13

College students between the age group of 18-25 years were selected for the study. Out of 100 students, majority (52%) of them were in the age group of 18-20 whereas 48% of

students were in the age group of 21-25. It was found that majority (61%) of the subjects selected were males and 39% were females. This result is in line with the findings of Bawadi et al., (2019). They investigated the consumption of SSBs among Jordanian college students, which showed higher SSB consumption among male students than female students.

The samples were selected from the various colleges in Kochi. Majority of the sample selected, that is, 70% of the students resided in their home whereas only 13% was staying in college hostels and remaining 17% resided outside campus. Similar findings on residential information were reported in a study conducted by Bawadi et al., (2019).

4.2 ANTHROPOMETRIC MEASUREMENTS OF THE SUBJECTS

Anthropometry studies the measurements of the human body totally or partially. The anthropometric measures are useful to understand the nutritional status of the subjects. The anthropometric measurements like height and weight of the subjects were recorded and was then used to calculate the Body Mass Index. The anthropometric measurements of the subjects are presented in table-2.

Table-2: Anthropometric Measurements of the College students

Anthropometric parameters	Mean	SD
Height (cm)	166.83	8.90
Weight (kg)	62.15	15.37
BMI (kg/m^2)	22.12	4.49

From the above table, it is clear that the mean height of the subjects was 166.83 cm with a standard deviation of 8.90 cm. The mean and standard deviation calculated for weight was 62.15 kg and 15.37 kg respectively. This indicates that the mean height and weight of the college students were within the normal range which is typical for young adults between the ages of 18 to 25 years.

The calculated mean BMI of the subjects were 22.12 kg/m^2 which indicates that the college students have a healthy nutritional status, according to the World Health Organization's BMI classification. However, it is important to note that the standard deviation of 4.49 kg/m^2 reveals variation in BMI within the subjects and indicates that some subjects may fall outside the normal range.

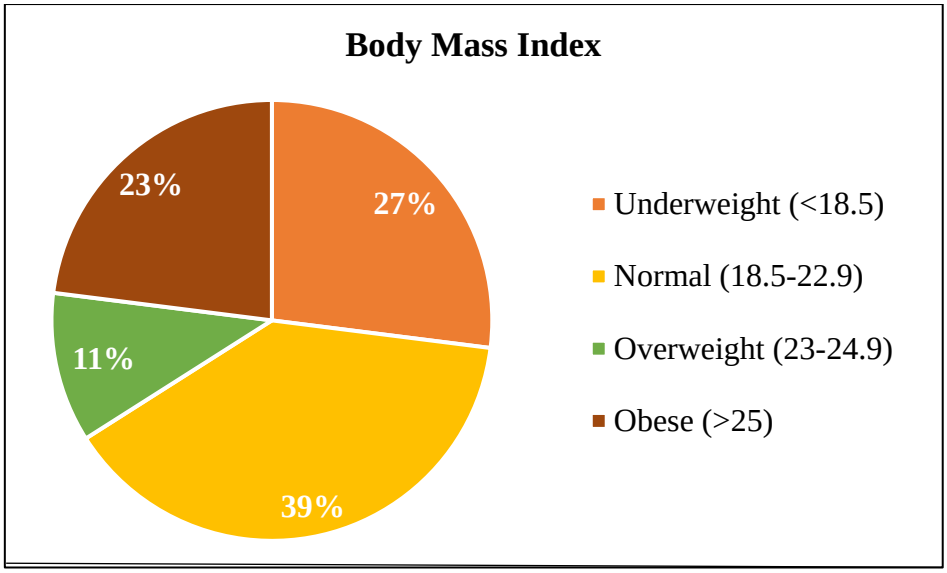


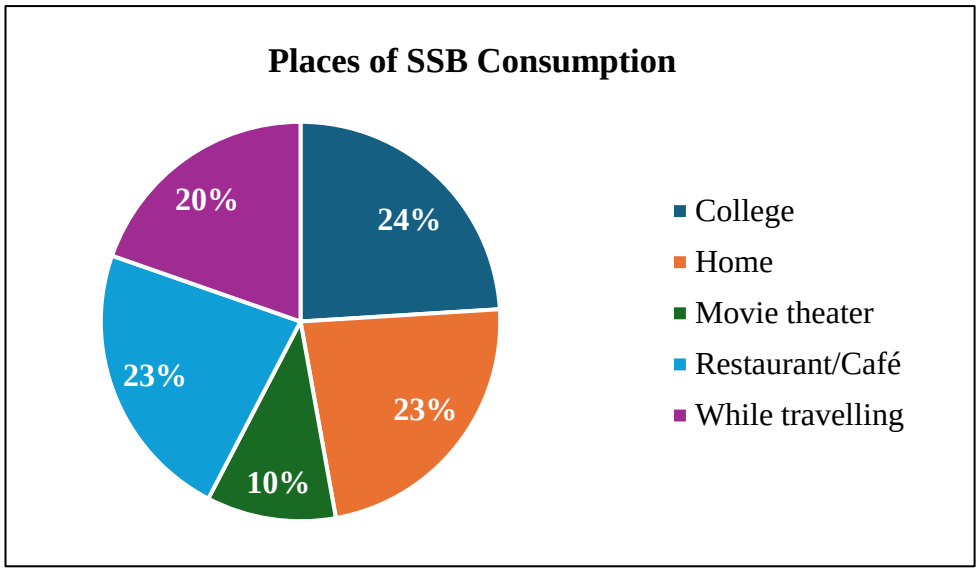
Figure 1: BMI of the College Students

The Body mass index was calculated by using height and weight measurements of the respondents. It was found that majority (39%) of the subjects belong normal category despite consuming SSBs on a regular basis. About 27% of the subjects were underweight which can be due to various factors like excessive stress, poor dietary habits and limited access to nutrient dense meals.

It was also noted that 11% of the subjects were overweight and 23% of them were obese which highlights the prevalence of overweight and obesity among college students consuming SSBs regularly. This finding points out that consumption of SSBs may increases the risk of weight gain, obesity and health related complications like diabetes mellitus and cardiovascular diseases among college students. The study conducted by Bawadi et al., (2019) showed similar results, that is, out of 967 respondents, majority (63%) belonging to normal BMI category, 21% was belonging to overweight category and 7% to obese category.

4.3 ATTITUDE AND AWARENESS OF THE SUBJECTS TOWARDS SSBs

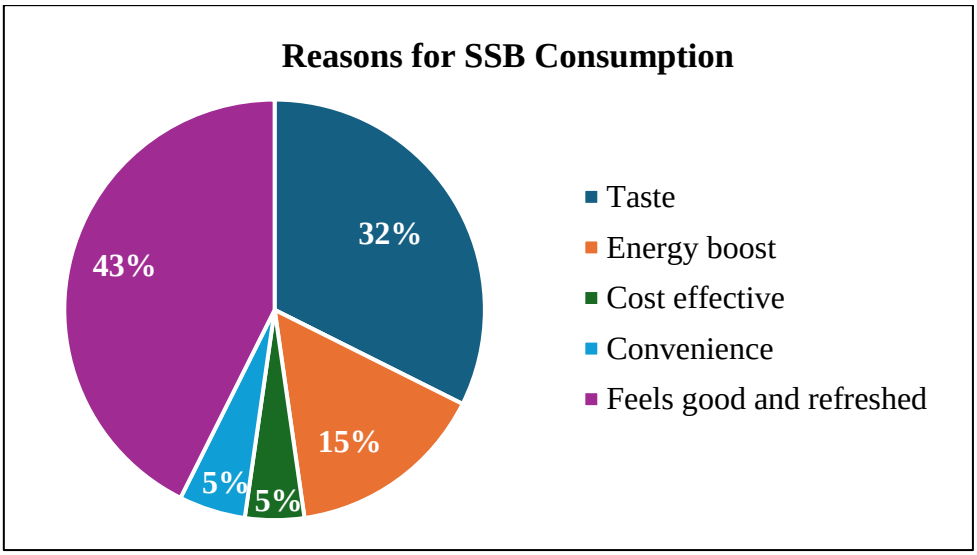
Attitude and awareness relating to SSB consumption play a vital role in understanding and addressing the prevalence of their consumption. Attitudes represent individual's feelings and evaluations towards SSBs, influenced by various factors such as taste preferences, convenience, cost effective, low cost etc. Awareness, on the other hand, relates to individual's knowledge and understanding of the health implications associated with SSB consumption.



*Multiple responses

Figure 2: Places of SSB Consumption

From the above figure, it was clear that 24% of respondents consumed SSB in college while 23% of them reported home and restaurants/cafe to be their favorite spot of SSB consumption. It was also found that 20% of the respondents consumed SSB while travelling and only 10% reported consuming SSB in movie theatre.



*Multiple responses

Figure 3: Reasons for SSB Consumption among College Students

From the above figure, it was observed that majority (43%) of the respondents consumed SSB because they felt good and refreshed after having it. About 32% of the respondent's reported taste was the reason for their SSB consumption. For 15% of the

respondents the energy boost they were getting after having SSB was the reason behind SSB consumption while 5% of the respondents consumed SSB because they considered it as cost effective and for another 5% convenience was the reason for SSB consumption.

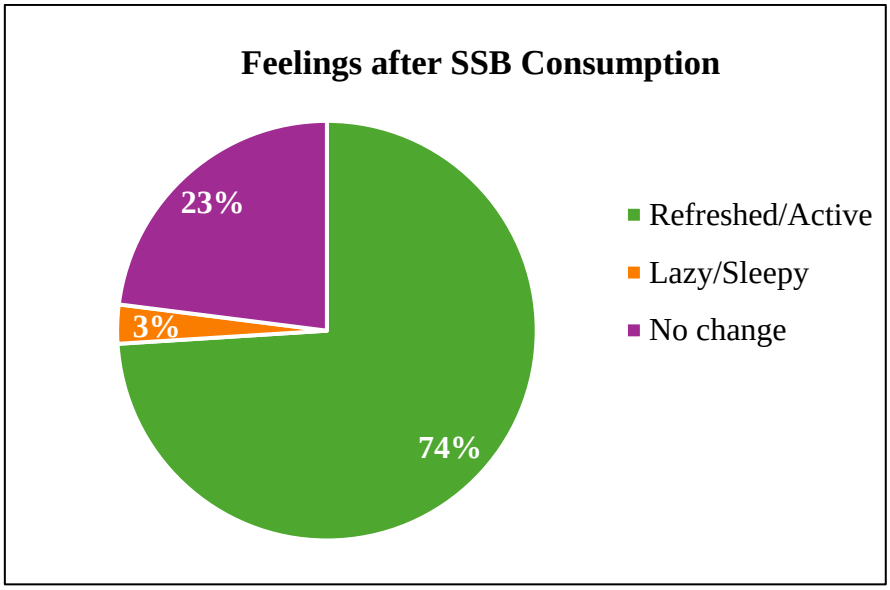


Figure 4: Feelings of Respondents after SSB Consumption

From the above figure it was clear that majority (74%) of the respondents felt refreshed/active after having SSB. 23% of the respondents felt no change after having SSB and 5 % of respondents felt lazy/sleepy following their SSB consumption.

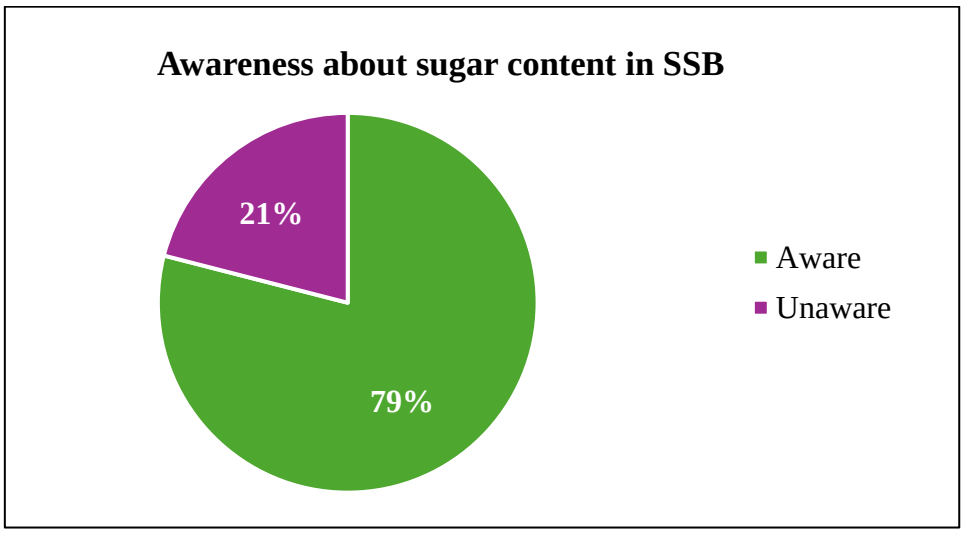


Figure 5: Awareness of respondents regarding Sugar Content in SSB

From the above figure, it was found that majority (79%) of the respondents were aware about the high sugar content in SSB and remaining 21% of the respondents were not aware

about the sugar content in SSB.

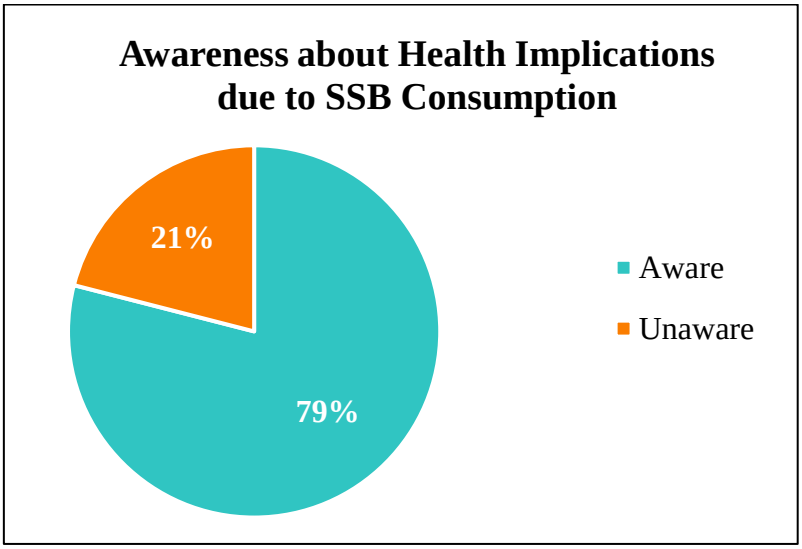


Figure 6: Awareness about Health Implications due to SSB Consumption among College Students

From the above figure, it was clear that majority (79%) of the respondents were aware about the health implications due to regular SSB consumption and only 21% of the respondents were found to be unaware about the negative effects of SSB. Similar results were reported by Madiba et al. (2017) in their study where majority (70%) of respondents had an acceptable level of knowledge on the types of SSBs and possible health conditions if SSBs consumed excessively.

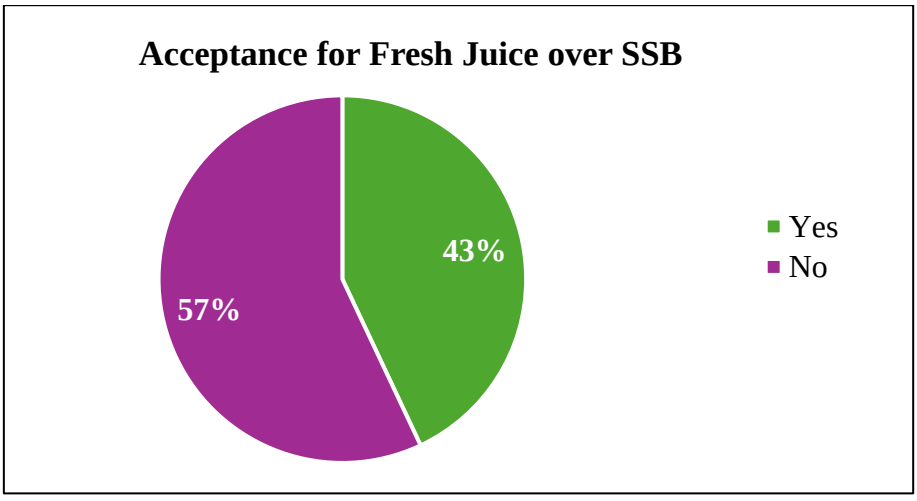


Figure 7: Acceptance for Fresh Juice over SSB among College Students

From the above figure, it was observed that majority (57%) of the respondents were

willing to replace fresh juices over SSB and about 43% of the respondents had a negative acceptance towards replacing SSB with fresh juice.

The increased preference for fresh juice over SSBs indicates that the college students are becoming more aware about the adverse health effects related to SSB consumption, such as weight gain, insulin resistance and increased risk of chronic diseases.

4.4 SSB CONSUMPTION PATTERN OF THE SUBJECTS

SSB consumption pattern refers to the typical frequency under which college students consume sugar-sweetened beverages. SSB consumption pattern can reveal how often (daily, weekly) students typically consume these beverages. Understanding these patterns helps in identifying potential health risks associated with excessive sugar intake and in developing target interventions to promote healthier beverage choices among the college demographic.

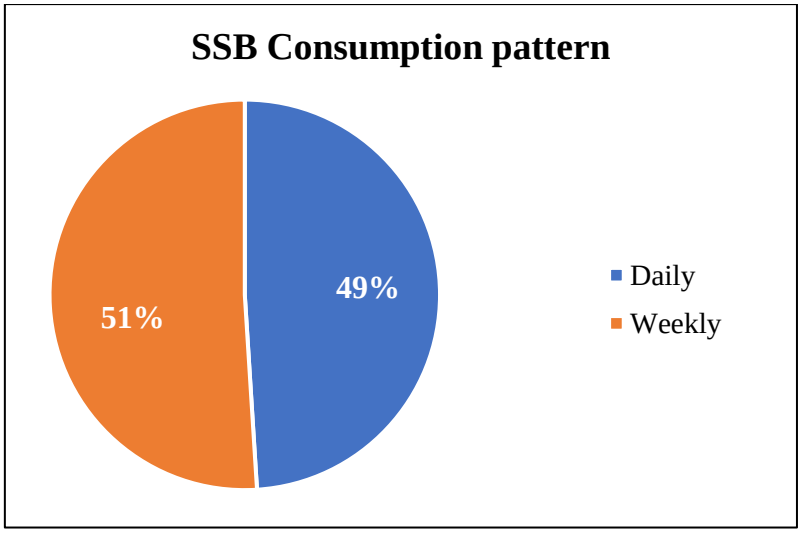


Figure 8: SSB Consumption Pattern of the College Students

From the above figure, it is clear that the consumption of sugar-sweetened beverages was higher among college students. Out of 100 subjects, 49% of the students consumed SSB on a daily basis and 51% on a weekly basis. The study conducted by West et al., (2006) revealed that around half of the black undergraduates (50%) reported daily intake of SSB which is similar to our findings of the present study.

Table-3: Frequency of SSB Consumption per Day

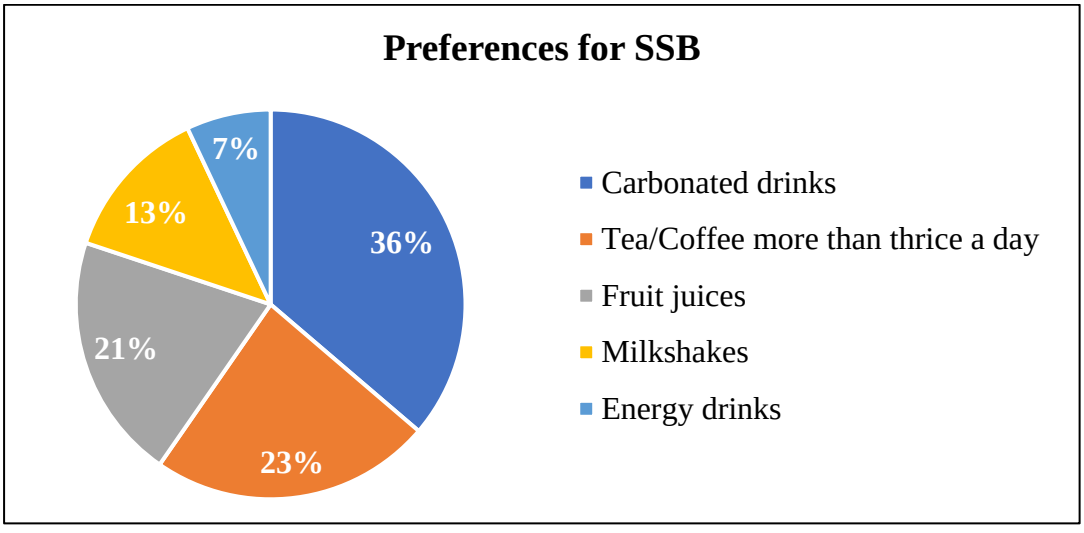
No. of times per day	Frequency (n)	Percentage (%)
Once	16	32.7
Twice	13	26.5
Thrice	20	40.8

Out of 49 students who consume SSBs regularly, majority (40.8%) of the students consume SSB three times per day. About 26.5% of the students reported to consume SSB twice per day and only 32.7% of them consumed SSBs once in a day.

Table-4: Frequency of SSB Consumption per Week

No. of times per week	Frequency (n)	Percentage (%)
Once	8	15.7
Twice	22	43.1
Thrice	21	41.2

Out of 51 students who consume SSBs weekly, majority (43.1%) of the students reported consuming SSBs twice in a week while 41.2% of them stated having SSBs thrice a week. Only 15.7% of students consumed SSBs once in a week.



*Multiple responses

Figure 9: SSB Preference among College Students

From the above figure, it was clear that among all the sugar-sweetened beverages,

carbonated drinks (36 %) were the most preferred SSB among college students followed by Tea/Coffee (23 %) which is consumed more than thrice a day, fruit juices (21 %), milkshakes (13 %) and energy drinks (7 %). According to the study conducted by Cheah and Chua (2023), sugar-sweetened tea or coffee (45.5%) was the second most consumed drink among college students which is similar to the results of the present study.

4.5 PHYSICAL ACTIVITY PATTERN OF SUBJECTS

According to World Health Organisation, physical activity is any bodily movement produced by skeletal muscles that requires energy expenditure.

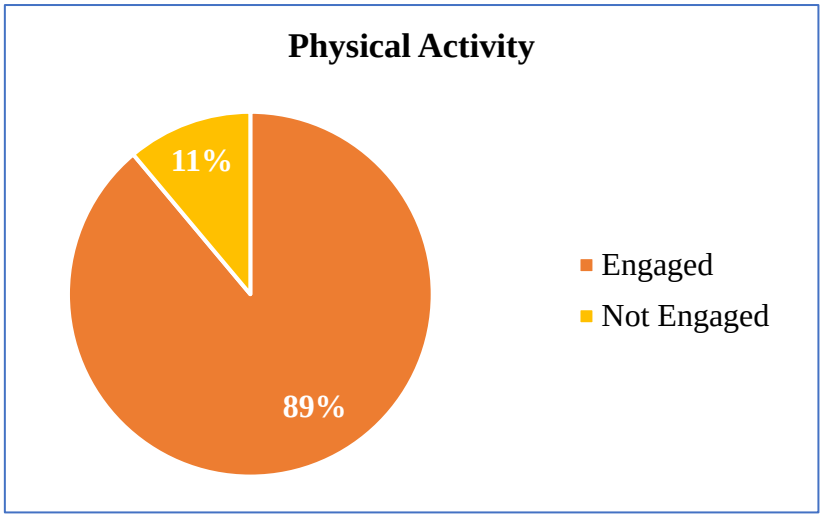


Figure 10: Physical Activity

It was noted that out of 100 samples, majority (89%) of the respondents engaged in physical activity and only 11% weren't engaged in any kind of physical activity.

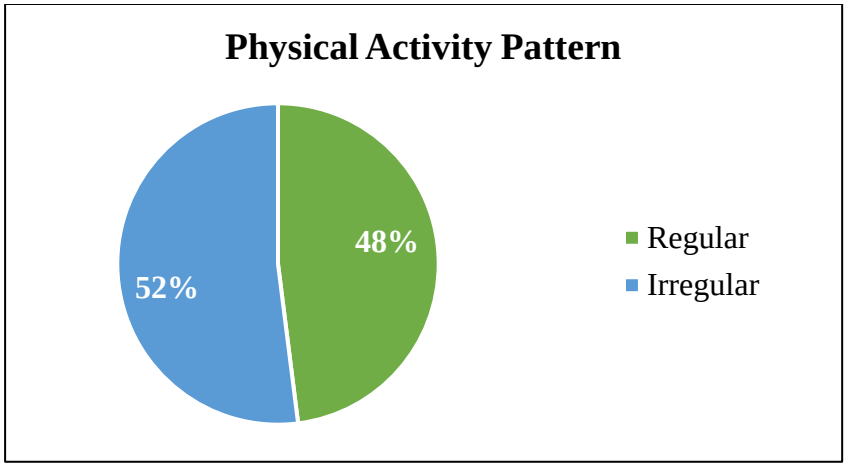


Figure 11: Physical Activity Pattern

Out of the 89% respondents who engaged in exercise, majority (52%) of them reported exercising irregularly while 48% of them reported exercising regularly.

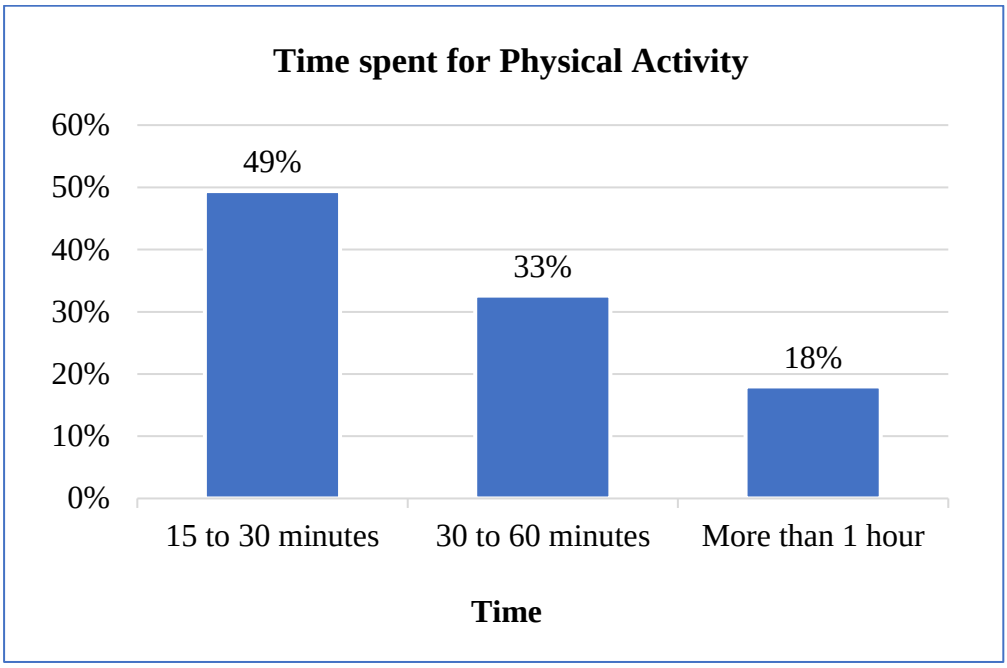


Figure 12: Time spent for Physical Activity

According to the data collected, the above graph displays the time spent in a day by the respondents for doing physical activity. As shown majority (49%) of the respondents spent 15-30 minutes for physical activity in a day while 33% of them spent 30-60 minutes in a day. It was found that only 18% of the respondents spent more than 1 hour in a day for physical activities. It indicates that there is only a little proportion who does physical activity for more than 1 hour.

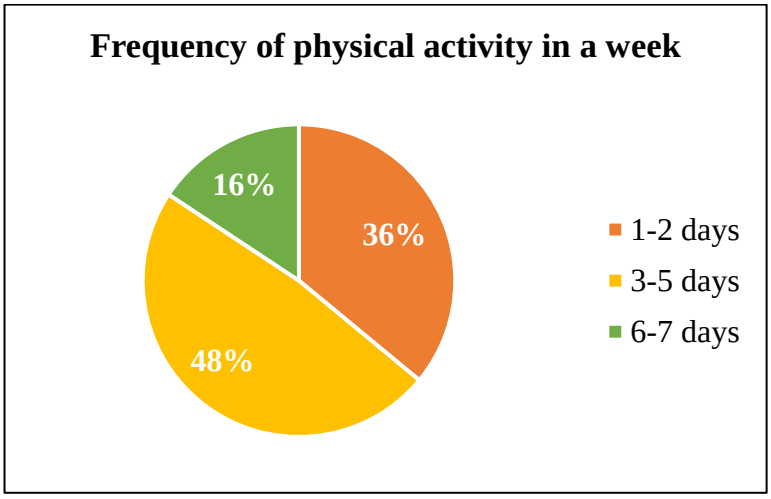


Figure 13: Frequency of physical activity in a week

It was found out that majority (48%) of the respondents engaged in physical activities for 3-5 days in a week whereas 36% of them engaged in physical activities for 1-2 days in a week and only 16% engaged in physical activities for 6-7 days in a week. The finding revealed that a very less proportion of people engaged in physical activity for almost every day.

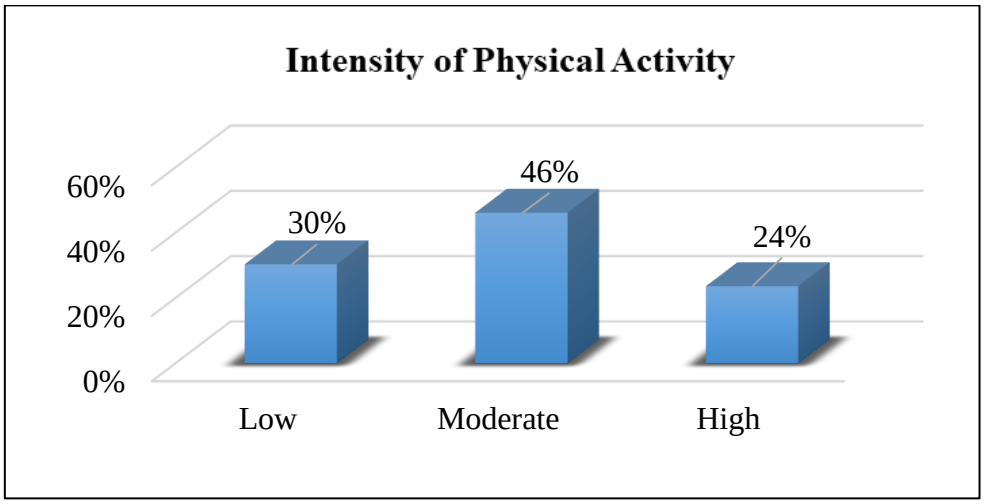


Figure 14: Intensity of Physical Activity

The figure depicts the kind of physical activity engaged by the respondents. Intensity of physical activity was classified as low, moderate and high. Low intensity physical activities denote leisure walk; moderate intensity physical activities comprise of brisk walking, light jogging etc. and high intensity physical activities includes running and intense workouts. From the above figure, it was found that majority (46%) of the respondents involved in moderate physical activities. About 30% of the respondents were involved in low intensity physical activities and remaining 24% engaged in high intensity physical activity.

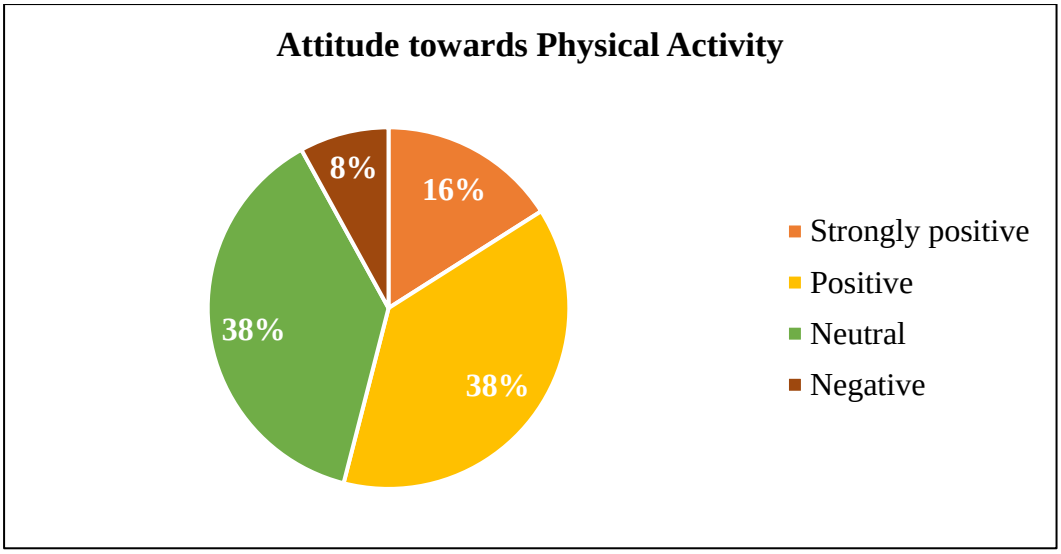


Figure 15: Attitude of Respondents towards Physical Activity

The above figure displays the respondent's attitude towards engagement in physical activity. Five options were provided to choose - strongly positive, positive, neutral, negative and strongly negative. The results showed that 16% of the respondents had strongly positive opinion and 38% of them had a positive opinion while another 38% reported neutral opinion It was also noticed that only 8% of the people had a negative opinion towards physical activity. None of them had a strongly negative opinion on the same. This indicates majority of them had a positive attitude towards physical activity.

CHAPTER-V
SUMMARY AND CONCLUSION

The purpose of the present study entitled **"Awareness, Attitude, and Physical Activity Pattern Among Regular Consumers of Sugar-Sweetened Beverages (SSBs) in College Students"** was to determine the awareness and attitude towards SSBs, prevalence and pattern of physical activity among college students who regularly consumed SSBs.

Around 100 regular SSB consumers between the ages of 18 and 25 were chosen for the study through purposive sampling technique from various educational institutions. An interview schedule was administered to gather information from the selected subjects on general profile, anthropometric measurements, sugar sweetened beverage consumption, physical activity, awareness and attitude about SSB consumption. The collected data was further analyzed using percentage analysis, mean and standard deviation techniques for interpretation.

The important points of the study are summarized below:

- The socio-demographic profile indicated that:
  - Majority (52%) of the selected samples were found to be between 18-20 years old whereas, 48% of the students were between the ages of 21-25. It was found that majority (61%) of the students were males while 39% were females.
  - Regrading residential information, majority (70%) of the respondents were residing in their home, about 17% of the respondents were residing out of the campus, and only 13% of the respondents were residing in college hostels.
- The anthropometric measurements revealed that:
  - The mean height obtained was 166.83 cm with standard deviation of 8.90 cm.
  - The mean and standard deviation calculated for weight was 62.15 kg and 15.37 kg respectively.
  - Finally, the mean value obtained for BMI was 22.12 Kg/m^2 with a standard deviation of 4.49 Kg/m^2.

- It was found that majority of the students (39%) were found to be in the normal BMI category. About 23% of the students were obese and 27% were underweight. The remaining 11% were seen to be in the overweight category.

➢ The awareness and attitude of the subjects towards SSBs indicated that:

- Majority (74%) of the respondents had a positive attitude towards SSB as they felt refreshed or active after consuming sugar sweetened beverages.
- During the analysis of reason for sugar-sweetened beverage consumption, it was found that 43% of respondents consumed SSBs for the feeling of refreshment and satisfaction it provided. Taste was cited as the reason for SSB consumption by 32% of the respondents. Additionally, 15% reported consuming SSBs for the energy boost they offered, cost-effectiveness was a factor for 5% of respondents, while convenience was the reason for another 5% of SSB consumption.
- Regarding the convenient place for SSB consumption, the data revealed that 24% of respondents consumed sugar-sweetened beverages (SSBs) during their college activities. Home was identified as the preferred location for SSB consumption by 23% of respondents, while an equal percentage (23%) consumed SSBs in restaurants or cafes. A minority of respondents (10%) reported consuming SSBs while traveling.
- In terms of awareness about sugar-sweetened beverages, a large majority (79%) of respondents were knowledgeable about the high sugar content in SSBs, whereas 21% were not. Similarly, the majority (79%) of respondents were aware of the health implications associated with regular SSB consumption, while only 21% were unaware of the negative effects of SSBs.
- The majority (57%) of respondents expressed willingness to substitute fresh juices for SSBs, while approximately 43% exhibited resistance to replacing SSBs with fresh juice.

➢ The sugar sweetened beverages consumption pattern points out that:

- It was found that 49% of the respondents ingested SSB daily. Of the 49% of daily consumers, those who reported consuming SSB more than thrice a day were 40.8 %. Those who reported twice a day and once a day were found to be 26.5 % and 32.7 % respectively.

- The weekly consumers of SSB were found to be 51%. Among them, those who ingested SSB more than thrice a week were found to be 41.2 %, 43.1 % twice a week, and 15.7% once a week.
- The most consumed SSB was carbonated drinks (36 %) followed by tea/coffee more than thrice a day (23 %), fruit juices (21 %), milkshakes (13 %), and energy drinks (7 %).

➢ The physical activity pattern of the subjects revealed that:

- It was found out that 89% of the people engaged in some kind of physical activity and the remaining 11% didn't engage in any kind of physical activity.
- Out of 89%, majority (52%) of them did exercise irregularly and 48% of them did exercise on a regular basis.
- The amount of time spent in a day for doing physical activity, it was found out that majority (49%) of the respondents spent 15-30 minutes in a day, 33% of the people spent 30-60 minutes in a day and remaining 18% of the people spent more than 1 hour in a day.
- When looking into the number of days they did physical activity in a week, it was found out that, majority (48%) of the respondents used to engage in physical activities for 3-5 days in a week, 36% used to engage in physical activity for 1-2 days in a week and remaining 16% for 6-7 days in a week.
- Most of the people that is 46% were involved in moderately intense physical activity which includes brisk walking & light jogging, 30% of the people were involved in low intensity physical activity and remaining 24% of the people were engaged in high intensity physical activity.
- The attitude towards physical activity showed that 16% of the respondents had strongly positive opinion, 38% had positive opinion and an another 38% had a neutral opinion while 8% of the people had a negative opinion towards physical activity. None of them had a strongly negative opinion on the same.

CONCLUSION

From the present study it can be concluded that majority of the selected participants were aged between 18 and 20 years old. Additionally, most respondents resided in their homes. Anthropometric measurements indicated most students fell into the normal weight category. Regarding SSB consumption habits, nearly half of frequent consumers reported daily intake, while the rest were weekly consumers. Carbonated drinks were the most consumed SSB. In terms of attitude and awareness towards SSBs, most of the respondents had a positive attitude towards SSBs, often feeling refreshed or active after consumption. When analysing reasons for SSB consumption, the study found that majority of respondents consumed SSBs for refreshment and satisfaction. As for convenient locations for SSB consumption, the majority reported consuming SSBs during their college activities. When it came to SSB awareness, the majority of respondents knew about the high sugar content and the potential health risks of consuming SSB frequently. although a small percentage of pupils were unaware. Additionally, majority were aware of the negative effects of SSBs, leaving only a few students unaware. Furthermore, more than half of respondents expressed willingness to substitute fresh juices for SSBs. It was observed that the majority of participants engaged in some form of physical activity, with nearly half of the students exercising irregularly and the rest spending more than one hour per day on exercise. Additionally, a reasonable number of participants engaged in physical activities for 3-5 days per week, with the majority participating in moderately intense activities such as brisk walking and light jogging.

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APPENDIX-I

QUESTIONNAIRE TO ELICIT INFORMATION ON "AWARENESS, ATTITUDE AND PHYSICAL ACTIVITY PATTERN AMONG REGULAR CONSUMERS OF SUGAR-SWEETENED BEVERAGES (SSBS) IN COLLEGE STUDENTS"

I) Sociodemographic Details

1. Name:
2. Age:
3. Gender:
4. Residential Information:

a) Home ☐ b) College Hostel ☐ c) Off Campus Housing ☐

II) Anthropometric Measurements

1. Height: 2. Weight: 3. BMI:

III) SSB Consumption Pattern

1. Do you consume SSB? (Soft drinks, flavoured mineral water and juice drinks, fruit and vegetable-based drink with added sugar, milk shake, sports drinks, electrolyte drinks, sweetened tea or coffee)

a) Yes ☐ b) No ☐

2. If yes, how often do you consume SSB?

a) Daily ☐ b) Weekly ☐ c) Monthly ☐

3. If daily, how many times do you consume SSB?

a) Once ☐ b) Twice ☐ c) Thrice or above ☐

4. If weekly, how many times do you consume SSB?

a) Once ☐ b) Twice ☐ c) Thrice or above ☐

5. If monthly, how many times do you consume SSB?

a) Once ☐ b) Twice ☐ c) Thrice or above ☐

6.Which type of SSB do you prefer?

a) Carbonated drinks (7 up, Sprite, Coco cola, Pepsi, Miranda etc.)

b) Fruit juices (Frooti, Tropicana, Appy fizz, Slice etc.)

c) Milkshakes (Cavin's Milky mist, Milma etc.)

d) Energy drinks (Monster, Red bull etc.)

Others, specify_____

IV) Physical Activity Pattern

1. Do you engage in physical activity? (brisk walking, running, swimming, dancing, yoga, stretches, cycling, aerobics, jumping rope, workouts etc.)

a) Yes ☐ b) No ☐

2. If yes, how often do you engage in physical activity?

a) Regularly ☐ b) Irregularly ☐

3. How much time do you spend for physical activity?

a) 15-30 minutes ☐ b) 30-60 minutes ☐ c) More than one hour ☐

4. How many days a week you spend for physical activity?

a) 1-2 days ☐ b) 3-5 days ☐ c) 6-7 days ☐

5. How would you describe the intensity of your usual physical activity?

a) Low (e.g., leisurely walking) ☐

b) Moderate (e.g., brisk walking, light jogging) ☐

c) High (e.g., running, intense workouts) ☐

6. How would you rate your overall attitude towards engaging in physical activity?

a) Strongly negative ☐ d) Positive ☐

b) Negative ☐ e) Strongly positive ☐

c) Neutral ☐

V) Attitude and Awareness about SSB

1. Why do you prefer SSB?

a) Taste ☐ d) Convenience ☐

b) Energy boost ☐ e) Feels good and refreshed ☐

c) Cost affective ☐

f) Others, specify_____

2. Where do you prefer to consume SSB?

a) College ☐ d) Restaurant /Café ☐

b) Home ☐ e) While traveling ☐

c) Movie Theatre ☐

Others, specify _____

3. How do you feel after consuming SSB?

a) Refreshed/active ☐ b) Lazy/sleepy ☐ c) No change ☐

4. Are you aware of the sugar content in the beverages you consume?

a) Yes ☐ b) No ☐

5. Are you aware of the health impacts of SSBs?

a) Yes ☐ b) No ☐

6. Would you rather prefer SSB over fresh juices?

a) Yes ☐ b) No ☐

7.Do you think there's a relation between your SSB consumption and physical activity?

a) Yes ☐ b) No ☐ c) No opinion ☐