

Describing Beverage Intake and Factors Related to Beverage Intake Among College Students

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Abstract

Background: More than 66% of American adults are overweight or obese. Sugar sweetened beverages (SSB) are a primary source of added sugars and calories and may promote weight gain.

Methods: This study was approved by the Institutional Review Board. College students provided informed consent prior to completing an electronic survey. The survey included questions to determine participants' demographics, self-reported height, weight, physical activity level, total beverage intake, health perceptions, and factors affecting health and beverage choices. Beverage kcals and intake were determined using the validated *BEVQ15 Beverage Questionnaire*.

Results: Participants (N=103) were 19.6+/-1.9 years of age with a mean BMI of 23.3+/-3.7. Almost 70% (n=48) of participants had a healthy BMI, ~25% (n=17) were overweight, 6% (n=4) were obese, ~81% (n=83) reported that they were lightly to very active, while only 5% (n=5) reported that they were sedentary. Average daily calories from beverages were 180.8+/-156.2 kcals and ranged from 0-795 kcals/day. Among the respondents who completed the entire *BevQ15* (n=75), 33% (n=26) consumed < 100 kcals/day, 47% (n=35) consumed 100-<300 kcals/day, and 19% (n=14) consumed ≥kcals/day. Participants with a normal BMI consumed 191 beverage kcals/day, overweight participants consumed 204 beverage kcals/day and obese participants consumed 69 beverage kcals/day. There was no significant correlation between BMI and beverage kcal intake. The top three factors contributing to beverage choices were taste, quenching thirst, and health reported by 54% (n=55), 46% (n=47) and 44% (n=45), respectively.

Conclusion: No significant correlations were detected between BMI and beverage kcals/day. Obese participants consumed fewer beverage kcals/day than healthy and overweight participants. This lower beverage kcal contribution may be a method used to lose weight. Although calories were less frequently cited as a primary factor that determined beverage choices, participants who chose beverages for health reasons were more likely to consider calories when deciding what to drink.

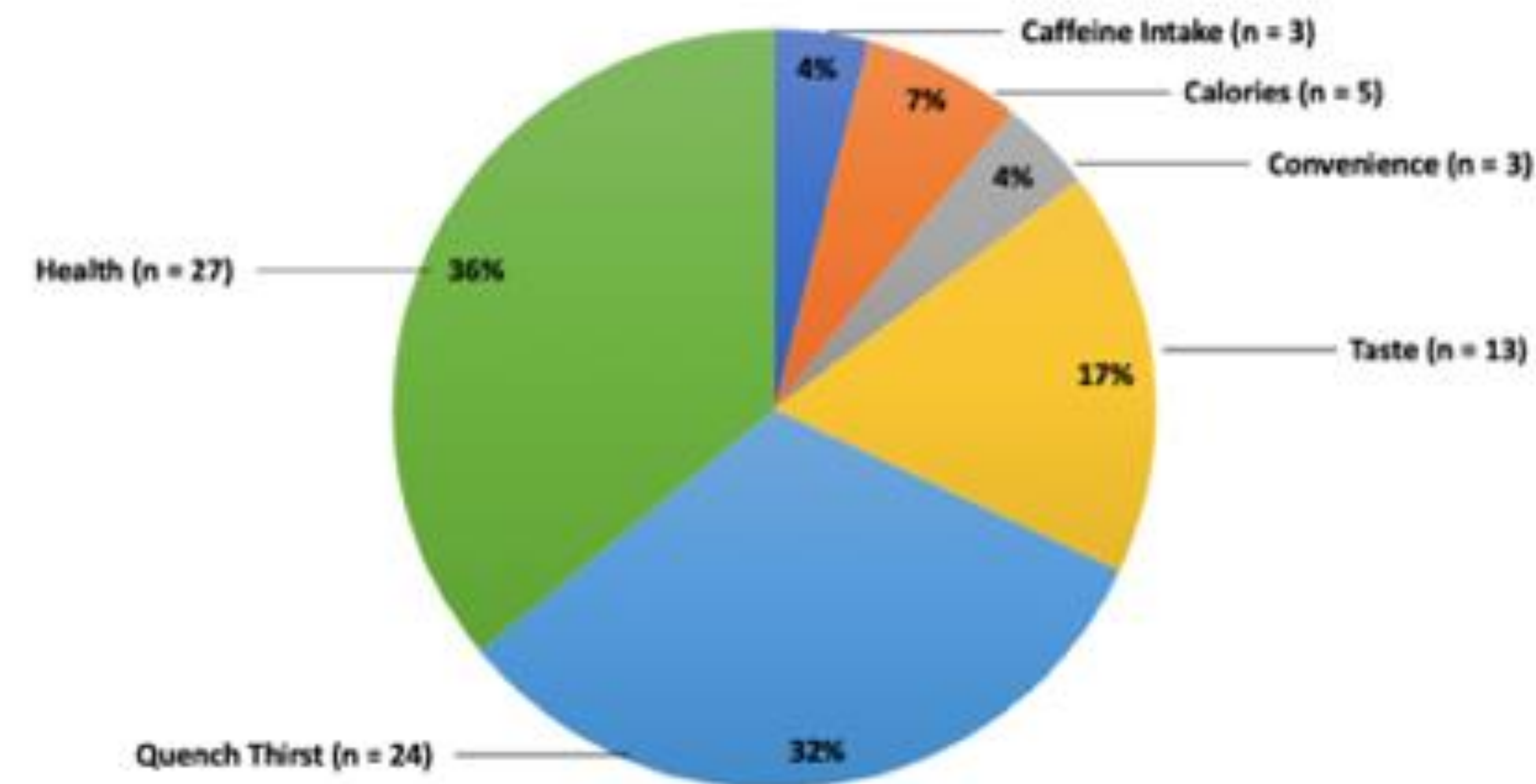
Purpose

- Describe beverage consumption of participants.
- Discuss factors that influence overall beverage choices of participants.
- Identify correlations between participants' beverage intake, Body Mass Index (BMI), and overall subjective health status.

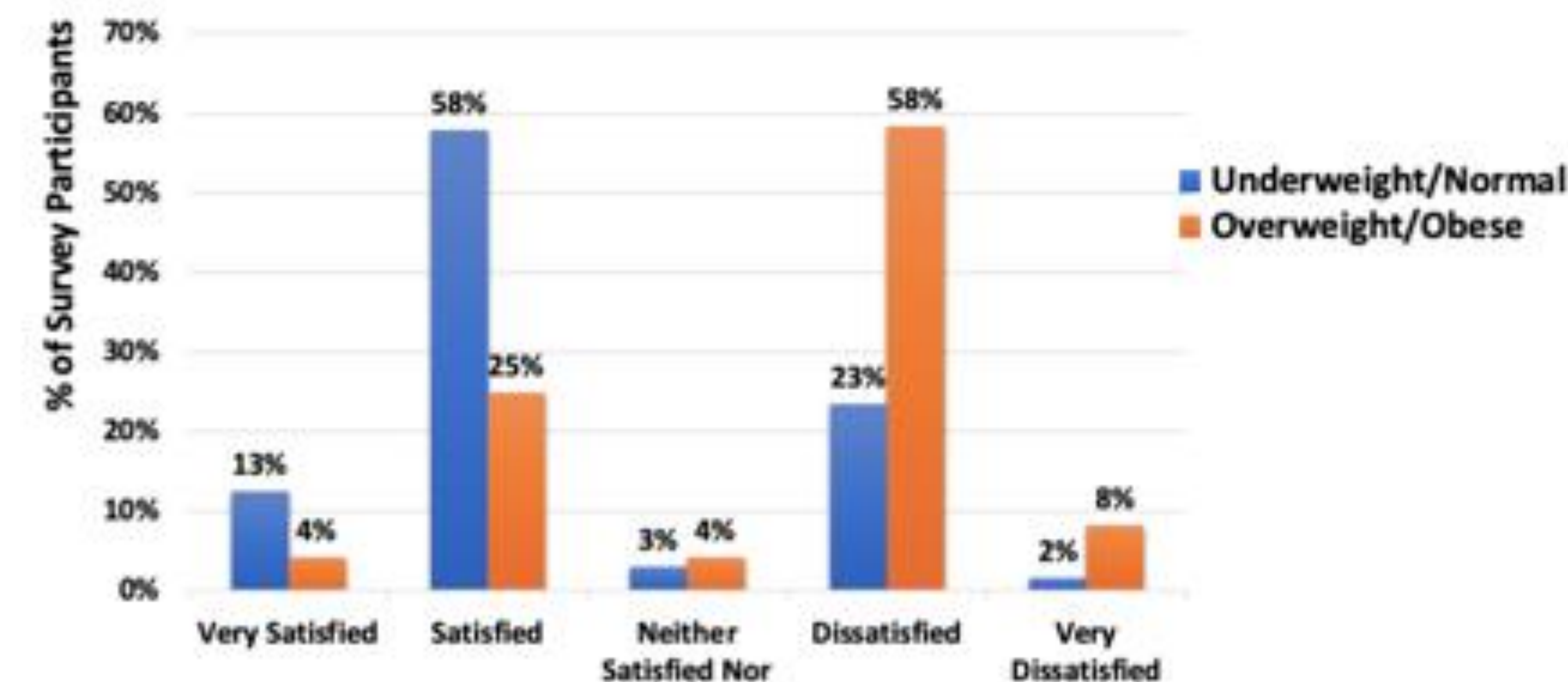
Methods

An electronic survey utilizing Survey Monkey was created to determine age, gender, height, weight, typical hours of sleep/night, physical activity level, total beverage intake, perceptions of health, body, diet and energy level, and factors affecting health and beverage choices of participants. The survey contained 62 questions total. The study was approved by the Institutional Review Board. A random sample of college-aged participants from Texas Christian University were recruited to take the survey. Researchers emailed organization officers, faculty, and staff to send out the survey link to students. In addition, researchers distributed paper recruitment slips on campus. Participants provided informed consent prior to completing the survey. Beverage intake was determined using a validated *BevQ15, Beverage Questionnaire* and *Scoring Tool*. The questionnaire includes questions regarding both the quantity and frequency of intake for nineteen different beverages. Total calories for each participant were determined from the computed beverage scoring tool. Participants' BMI values were computed using self-reported height and weight. The data were coded and analyzed in SPSS 25 to determine frequencies and correlations. Frequencies were determined for activity level, sleep level, factors that contribute to individuals' beverage choices, and participants' perceptions on health, body, diet, and energy level. Correlations were determined between BMI values and average calories consumed from SSB and between BMI and participants' perceptions on health, body, diet, activity, and energy levels. Correlations were also determined for BMI and participants reported activity and sleep levels. The mean and standard deviation was computed for age, BMI, and average calories and fluid ounces consumed from SSBs.

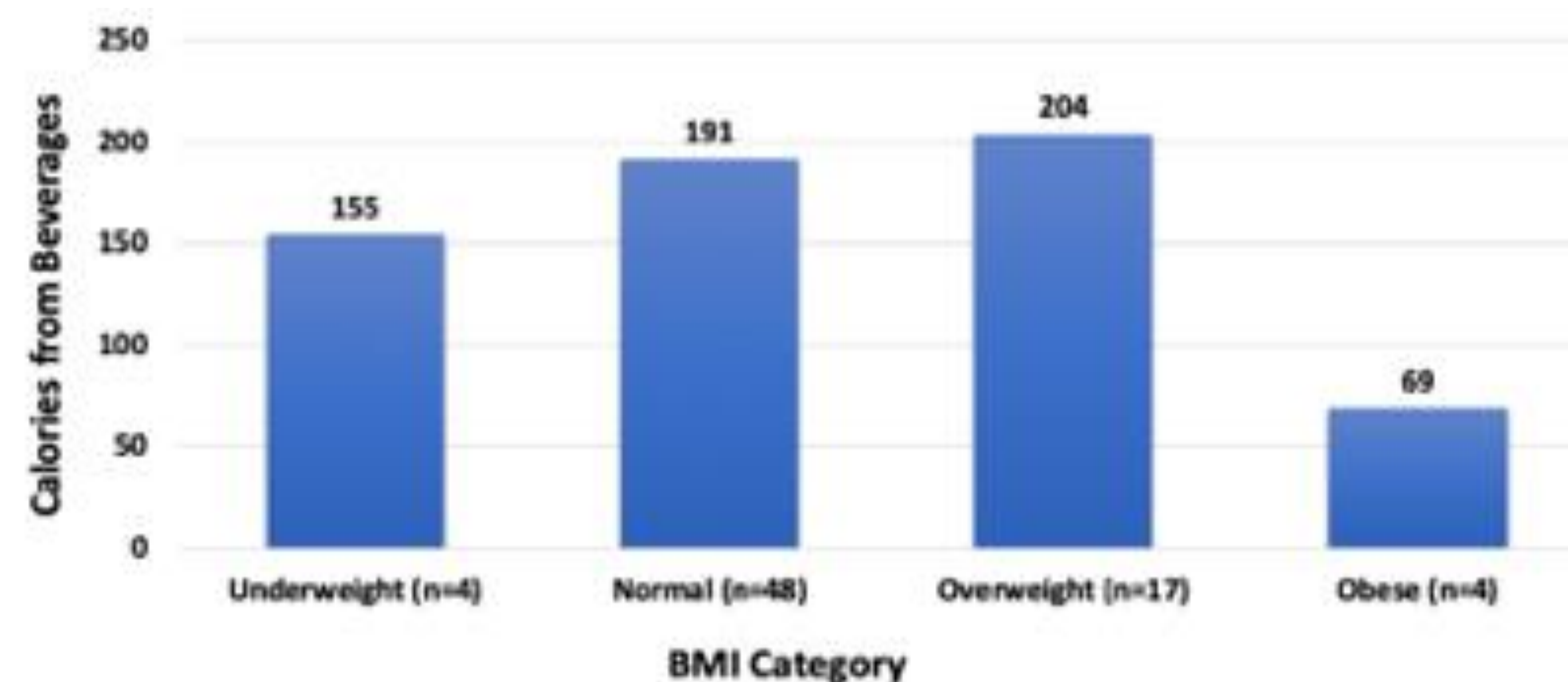
Factors Contributing to Beverage Intake Reported by Participants



Body Satisfaction Rating Among Participants Based Upon BMI Values



Average Daily Calories Consumed from Beverages Among Participants Based on BMI Category



Results

Participants (N=103) were 19.6+/-1.9 years of age with a healthy mean BMI of 23.3+/-3.7. Almost 70% (n=48) had a healthy BMI, ~25% (n=17) were overweight, 6% (n=4) were obese, ~81% (n=83) reported that they were lightly to very active, and 5% (n=5) reported that they were sedentary. Average beverage kcals/day (BKD) was 180.8+/-156.2 and ranged from 0-795 BKD. Among participants (n=75) that completed the *BevQ15*, 33% (n=26) consumed <100 BKD, 47% (n=35) consumed 100-300 BKD, and 19% (n=14) consumed >300 BKD. Healthy BMI participants on average consumed 191 BKD+/- 168.3, overweight BMI participants consumed 204+/-131.4 BKD and obese BMI participants consumed 69+/-22.0 beverage BKD. There was no significant correlation between BMI and BKD. Participants chose the three primary factors contributing to beverage choices as taste, quenching thirst, and health reported by 54% (n=55), 46% (n=47) and 44% (n=45), respectively. Additionally, 7% (n=5) reported calories, 4% (n=3) reported caffeine intake, and 4% (n=3) reported convenience as primary reasons for beverage choices. Twenty-two percent (n=23) reported that calories were one of the three most important factors contributing to beverage intake choices. There was a positive correlation (r=.23, p<.05) between choosing health and choosing calories as a primary determinants of beverage choices. Beverage kcal intake was significantly associated with portion size intake of 100% fruit juice (r=.34, p<0.05), sugared/creamed coffee (r=.41, p<0.01), hard liquor (r=.36, p<0.05) and frequency of intake of sugar/creamed coffee (r=.37, p<0.01), beer/ale/wine coolers (r=.33, p<.01), liquor (r=.41, p<0.01), and mixed drinks (r=.34, p<0.01). There was a positive correlation between caffeine intake and average calories from beverages consumed (r=0.30, p<0.01). There was a positive correlation between BMI and body dissatisfaction (r=.41, p<0.01). Among individuals, 58.3% (n=14) of overweight and obese BMI participants reported that they were dissatisfied with their body while 23.4% (n=15) of underweight and normal BMI participants reported that they were dissatisfied with their body. In contrast, 25% (n=6) of overweight and obese BMI participants reported they were satisfied with their body while 57.8% (n=37) of underweight and normal BMI participants reported that they were satisfied with their body. There was a negative correlation between sleep levels and participants' body satisfaction levels (r=-.27, p<0.05). Among participants that completed the survey, 11% (n=11) reported they slept 4-6 hours per night, 61% (n=63) reported they slept 6-8 hours per night, and 15% (n=15) reported that they slept 8-10 hours per night.

Conclusions

Overall total calories consumed from SSBs varied widely among participants from 0-795 daily. Participants with a normal BMI consumed less calories from SSBs than participants with an overweight BMI. However, obese participants consumed the least amount of calories from SSBs overall. The decreased consumption of SSBs among obese participants could be caused by an effort among obese individuals to try to reduce total energy intake. Although there were no significant correlations between participants' BMI and beverage calorie intake, many factors were identified for reasons influencing individuals' beverage choices. Taste, thirst and health were the most frequently reported reasons for individuals' beverage consumption choices. Taste was the primary reason individuals consumed beverages indicating that calories and SSB contribution to total energy intake was not the main focus among majority of participants. Thirst was the second most reported factor contributing to participants' beverage intake and health was the third most reported factor. According to Valero et al., participants who valued health also valued the impact of beverages on physical appearance, as well as freshness, and quality of food and drink. These participants consumed less added sugars from SSBs compared to individuals who valued taste, convenience, routine, and the ability to feel full.

Additionally, in the current study caffeine intake, calories, and convenience were commonly reported factors contributing to SSB consumption but were not reported as frequently as taste, thirst, and health.

Although many factors and trends among BMI categories were detected for SSB consumption, the sample size from the study is not representative of the larger population. Overall this sample had healthier BMI values than typically seen in the United States. Additionally, BMI was calculated using participants' self reported height and weight which is a study limitation.

Overall, SSBs contribute added sugars and calories potentially leading to weight gain and the development of obesity in the future. Many factors are related to SSB consumption trends. Nutrition intervention efforts directed to reduce the rising obesity rates are needed.