

## Consumption of Sugar Sweetened Beverages among Yoga Practitioners in India: A Convenience Sampling Survey

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Sugar sweetened beverages (SSBs) account for a considerable amount of sugar consumed.<sup>1</sup> Consuming SSBs increases the risk of obesity<sup>2-4</sup>, non-communicable diseases and dental problems.<sup>5-7</sup> Positive lifestyle changes including yoga help prevent and manage non-communicable diseases.<sup>8,9</sup> The benefits of yoga are ascribed to healthy lifestyle choices.

A U.S. based survey on forty-six persons showed that yoga practitioners have healthier dietary choices, including consuming less SSBs than non yoga practitioners. No such report exists for yoga practitioners in India.<sup>10</sup> There is no report from India on yoga practitioners' consumption of SSBs. Hence the present survey was conducted on yoga practitioners from India to determine:

- i. The percentage who consume SSBs.
- ii. The association between demographics and their consumption of SSBs.

Five hundred and eighty five yoga practitioners of both sexes from the database of a yoga institution in north India were recruited for the survey if they

- i. had completed 15 years of age.
- ii. had at least three months of experience in yoga.

Thirty four responses were excluded being incomplete. Hence the responses of five hundred and fifty one respondents (male: female = 314:237) who gave their consent to participate, were analyzed and are reported. A total of 94.18 percent respondents completed this survey.

The cross-sectional convenience sampling anonymous survey was administered with internet based (i.e., Google forms) and in person methods (distributing printed copies of the survey to the respondents). The study was conducted between December 2020 and March 2022 with permission from the institutional ethical committee (approval number PRF/YRD/020/005).

Survey questions were originally drafted in English and translated to Hindi with the assistance of two bilingual experts using a standard procedure describe else where.<sup>11</sup>

The survey determined respondents: (a) Socio-demographic characteristics (i.e., age, gender, and education), (b) Yoga practice related characteristics [i.e., (i) Minutes of yoga/week (i.e., yoga practice minutes/day X number of days of practice/week), and (ii) Experience of yoga practice (in months)], and (c) Survey questions pertaining to lifestyle choices reported elsewhere<sup>10</sup>, with one close ended question relevant to SSBs consumption, viz., "Do you consume SSBs with any sweetening agents (various examples were mentioned based on SSBs definition)?" There were two possible responses (yes/no). The completed survey sheets were scrutinized by two researchers independently to determine whether a respondent filled the survey completely and correctly.

Respondents were between 15 to 77 years of age (male: female= 237:314) most often educated 13-15 years graduate. The consumption of SSBs varied significantly with age ( $\chi^2 = 9.946$ , Cramer's  $V = 0.134$ ,  $P = 0.019$ , (where Cramer's  $V > .10 =$  moderate association)<sup>12</sup> with least consumption of SSBs in respondents aged 41 years and above (34.70%) and maximum consumption in ages between 15 and 19 years (54.41%).

## CONCLUSIONS

At each age range (i.e., 15-19 years, 20-29 years, 30-40 years and 41 years above) the consumption of SSB was less among yoga practitioners (85.46%) than the corresponding consumption for that age range in the general population (43.27%) reported earlier.<sup>13</sup> These results are comparable with previous reports from outside India that yoga practitioners consume less SSBs than non-yoga practitioners.<sup>10</sup> Though findings are limited by lack of additional information, such as amount and type of SSBs consumed, the results emphasize the importance of promoting healthy dietary choices among teenagers and young adults.

## REFERENCES

- World Health Organization. Guideline Sugars Intake for Adults and Children. World Health Organization; 2015.
- Ruanpeng D, Thongprayoon C, Cheungpasitporn W, Harindhanavudhi T. Sugar and artificially sweetened beverages linked to obesity: a systematic review and meta-analysis. *QJM: An International Journal of Medicine* 2017;110:513-520.
- Gulati S, Misra A. Sugar intake, obesity, and diabetes in India. *Nutrients* 2014;6:5955-5974. <https://doi.org/10.3390/nu6125955>.
- Pereira MA. Sugar-sweetened and artificially-sweetened beverages in relation to obesity risk. *Adv Nutr (Bethesda, Md.)* 2014;5:797-808. <https://doi.org/10.3945/an.114.007062>.
- Bellou V, Belbasis L, Tzoulaki I, Evangelou E. Risk factors for type 2 diabetes mellitus: An exposure-wide umbrella review of meta-analyses. *PloS one*, 2018;13:e0194127. <https://doi.org/10.1371/journal.pone.0194127>.
- Bernabé E, Vehkalahti MM, Sheiham A, Aromaa A, Suominen AL. Sugar-sweetened beverages and dental caries in adults: a 4-year prospective study. *Journal of dentistry*, 2014;42:952-958. <https://doi.org/10.1016/j.jdent.2014.04.011>.
- Jayalath VH, de Souza RJ, Ha V, Mirrahimi A, Blanco-Mejia S, Di Buono M, Jenkins AL, Leiter LA, Wolever TM, Beyene J, Kendall CW, Jenkins DJ, Sievenpiper JL. Sugar-sweetened beverage consumption and incident hypertension: a systematic review and meta-analysis of prospective cohorts. *Am J Clin Nutr* 2015;102: 914-921. <https://doi.org/10.3945/ajcn.115.107243>.
- Budreviciute A, Damiati S, Sabir DK, Onder K, Schuller-Goetzburg P, Plakys G, Katileviciute A, Khoja S, Kodzius R. Management and Prevention Strategies for Non-communicable Diseases (NCDs) and Their Risk Factors. *Front Public Health* 2020;8:574111. <https://doi.org/10.3389/fpubh.2020.574111>.
- Pandey AK, Das A. Implication of yoga in noncommunicable diseases. *J. soc. health diabetes* 2017;5:088-093.
- Watts AW, Rydell SA, Eisenberg ME, Laska MN, Neumark-Sztainer D. Yoga's potential for promoting healthy eating and physical activity behaviors among young adults: a mixed-methods study. *Int J Behav Nutr Phys Act* 2018;15:42. <https://doi.org/10.1186/s12966-018-0674-4>.
- Telles S, Sharma SK, Chetry D, Balkrishna A. Benefits and adverse effects associated with yoga practice: A cross-sectional survey from India. *Complement Ther Med* 2021;57:02644. <https://doi.org/10.1016/j.ctim.2020.102644>.
- Akoglu H. User's guide to correlation coefficients. *Turk J Emerg Med* 2018;18:91-93. <https://doi.org/10.1016/j.tjem.2018.08.001>.
- Mathur MR, Nagrath D, Malhotra J, Mishra VK. Determinants of Sugar-Sweetened Beverage Consumption among Indian Adults: Findings from the National Family Health Survey-4. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*, 2020;45:60-65. [https://doi.org/10.4103/ijcm.IJCM\\_201\\_19](https://doi.org/10.4103/ijcm.IJCM_201_19).

