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Knowledge-Behavior Gaps in Obesity Awareness and Management among Young Female Students in Northern India: A Cross-Sectional Survey

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Abstract: *In India, obesity is a growing social health concern that is being influenced by diverse sociocultural forces and increased prevalence rates among the young population. The study is a survey of 506 female students aged 17-20 years in northern India to explore perceptions and emotional and behavioral patterns towards obesity. Results further demonstrate good awareness of the metabolic risks of obesity, including diabetes, hypertension, and cardiovascular disease, but poor awareness about the less commonly known complications such as non-alcoholic fatty liver disease and diabetic retinopathy. Although there is good intention to embrace a healthy lifestyle, there is still inconsistency in the practices. Emotional aspects of body dissatisfaction and peer pressure also make the control of body weight worse. In the context of the National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) and the Global Action Plan of Noncommunicable Diseases provided by WHO, the present study promotes collective action as a method to deal with obesity instead of thinking about it as an individual problem.*

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Introduction

Global and National Epidemiology

Obesity has become one of the urgent issues of public health of the 21st century, and its worldwide rates have almost tripled since 1975 (World Health Organization, 2022). India, as a developing country, faces a complex epidemiological scenario marked by the overlapping burden of rising obesity and undernutrition. Increasing levels of obesity have been added to a long-standing history of micronutrient deficiencies and food insecurity (Swinburn et al., 2019). According to NFHS-5 (2019–21), abdominal obesity affects more than 30% of adult women in several states, with the highest prevalence observed among urban females. The prevalence of obesity among adults in the nation is estimated at 20-25 percent, and the prevalence of overweight and obesity among children below the age of five has more than doubled in the last ten years. (Choudhary et al., 2023)

Insufficient nutrition sequences of micronutrient deficiencies and food insecurity accompany this wave of nutritional change as incomes increase, urbanization advances, and nutrition changes to accompany the changes in income and urbanization. The Global Obesity Observatory, organized by

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the World Obesity Federation, also notes the doubling of obesity rates in all socio-economic demographics and all regions of the nation, which is referred to as the "double burden of malnutrition" in India. (UNICEF India)

The Body Mass Index (BMI) is usually used in measuring obesity as the weight-to-height (kg/m²) ratio. A BMI of 25 is defined as overweight and above 30 is obese (World Health Organization, 2022). Although BMI is extensively applied, it fails to consider muscle mass and fat distribution as well as metabolic health, which are essential to correct diagnosis (Nuttall, 2015; Rothman, 2008).

Drivers of the Obesity Epidemic

The various factors mentioned below together have contributed to the rapid growth in obesity rates, often outpacing improvements in health systems or public awareness.

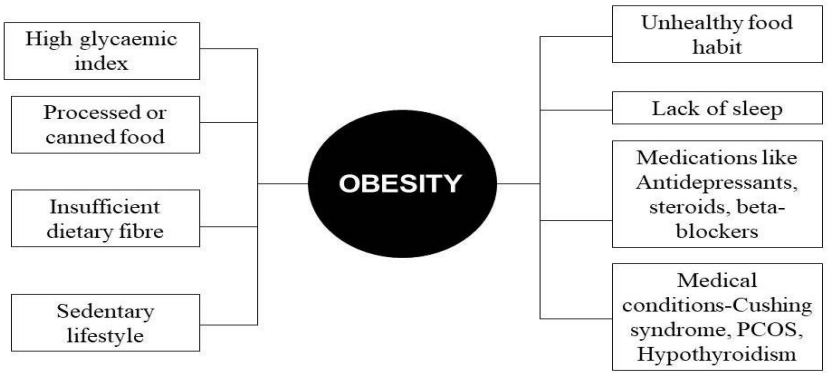

Figure 1: Multifactorial determinants of obesity.

Sources: NHLBI, Science Direct, NICHD.

Clinical Significance and Comorbidities

Obesity has been identified as a long-term and relapsing, progressive disease process rather than short-term solutions to the issue and is linked to a broad range of comorbidities, such as type 2 diabetes, hypertension, cardiovascular disease, non-alcoholic fatty liver disease (NAFLD), and diabetic retinopathy (Younossi et al., 2018; Cheung et al., 2022). Such complications do not only lower the quality of life but also cause colossal pressure on the healthcare system in India, particularly in the resource-limited environment.

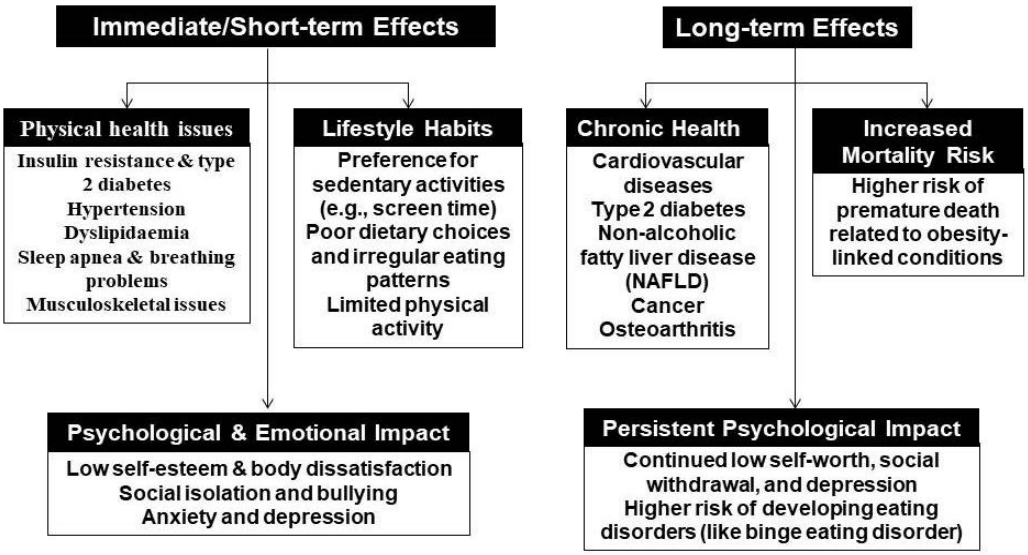

Figure 2: Short-term and long-term health consequences of obesity.

Even at the clinical level, there is still a lack of knowledge about obesity in the population. However, perceptions are frequently influenced by culture and stigma and a lack of proper information, resulting in under-valuing obesity as a health condition and over-reliance on unproductive or potentially harmful weight loss measures (Puhl and Heuer, 2010; Jebeile et al., 2021). In addition, the aspect of emotional reactions of shame, sadness, and eating behaviors under stress is another problem, which infringes on individuals attempting to adopt healthier lifestyles (Torres and Nowson, 2007; Konttinen et al., 2010).

Methodology

- **Study Design**

A cross-sectional survey design was employed among young females to assess obesity-related knowledge, perceptions, and health risks and lifestyle behaviors. The design enabled the collection of data at a point in time to provide a comprehensive overview of participants' awareness, behavioral practices, and attitudes related to obesity.

- **Participants**

The survey was carried out on 506 people. Despite the goals to recruit diverse age groups (18 years to 65 years), the final sample was composed of mostly students that were female and 17 to 20 years old, and the mean age was 18.5 years. Participants were selected in both urban and semi-urban areas of the northern regions of India with a stratified sampling approach that guaranteed that there were representatives of both gender identities, education levels, and socioeconomic classes.

- **Survey Instrument**

The questionnaire was created in a structured manner that includes 50 questions divided into five different thematic areas: obesity definition and identification, perceived contributory factors and causes, knowledge on obesity disorders, health behaviors, and self-perception.

All of the above employed categorical response conditions (e.g., always, very often, sometimes, rarely, never) to ease the quantitative analysis. To make sure that the questionnaire is understood, has culture-specific issues, and expresses validity to answer the questions, the pilot questionnaire was tested with 20 people. Feedback was used to perform minor revisions.

- **Data Collection**

Data were obtained over a period of 4 weeks using digital format (Google Forms) with participants' consent.

- **Data Analysis**

Data were analysed using Microsoft Excel. Descriptive statistics including frequencies and percentages were calculated for all survey variables. Results were summarized using tables, bar charts, and graphical representations prepared using GraphPad Prism and Canva.

As this study involved an anonymous, voluntary questionnaire survey with no collection of personal identifiers or biological samples and posed minimal risk to participants, formal Institutional Ethics Committee approval was not required according to institutional policy. Participant anonymity and confidentiality were strictly maintained throughout the study, which was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Result

The survey included 506 female students aged 17–20 years, with a mean age of 18.5 years. The findings were registered in five areas: definition of obesity, perceived causes, obesity-related disorders, self-consciousness and behavioral awareness, and the most preferred weight reduction methods. Participants were fully aware of the definition of obesity. Multiple contributing factors to obesity, such as unhealthy dietary habits, physical inactivity, and stress, were identified by the participants, indicating that they possessed good knowledge associated with the multifactorial nature of obesity. Most participants correctly identified multiple contributing factors to obesity. They asserted that obesity has multiple medical complications. Abdominal fat associated with cardiovascular disease and obesity leads to high blood pressure and heart attack was believed to be true by most of the participants. The findings indicate a positive level of confidence among participants in adopting healthier lifestyle behaviors. With respect to dietary practices, the participants reported being extremely confident in avoiding fried foods and replacing their regular meals with low-calorie foods or salads.

Figure 3: Participants' awareness and recognition of obesity.

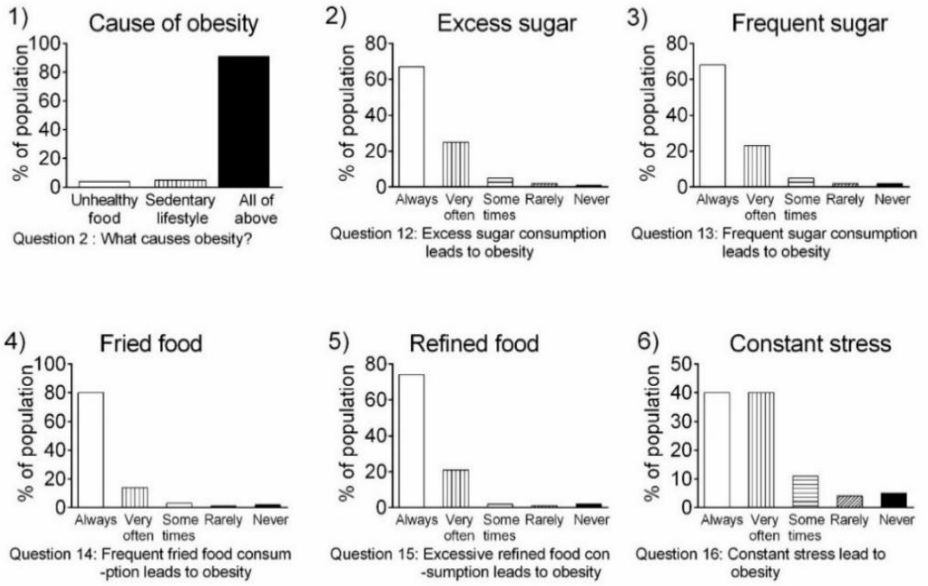

Figure 4. Perceived causes and risk factors of obesity

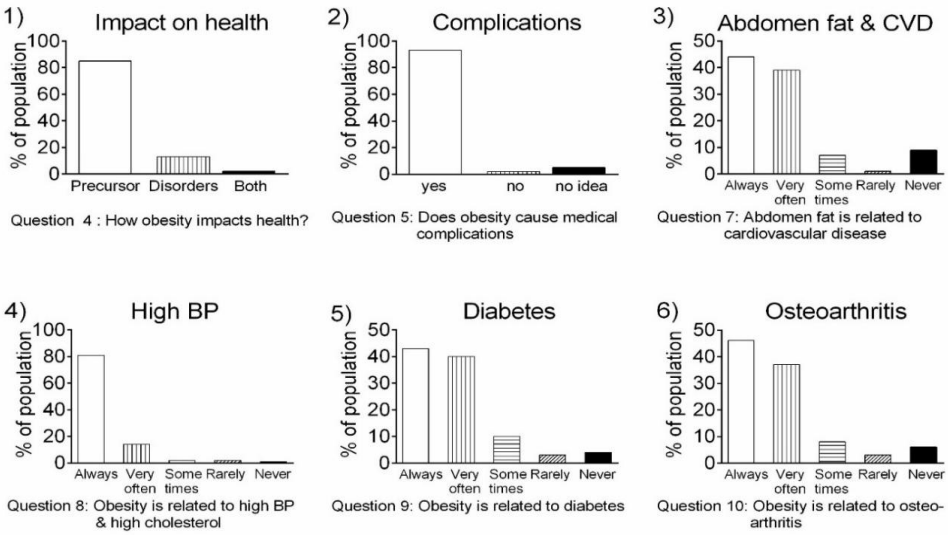

Figure 5: Awareness of obesity-related disorders

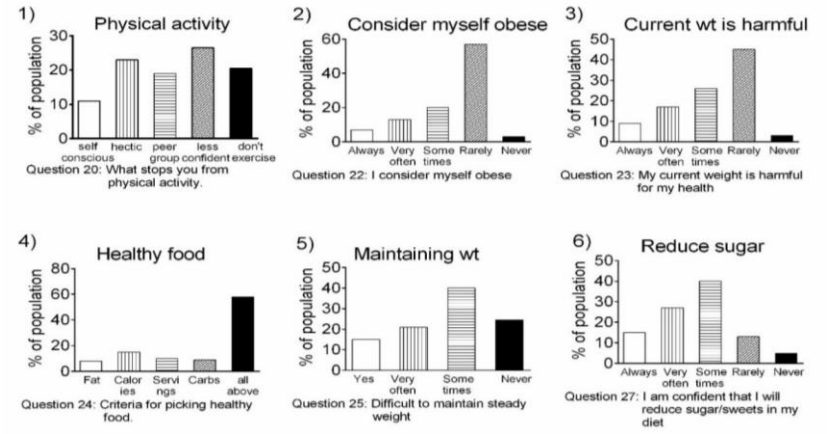

Figure 6: Self-perception and awareness regarding obesity

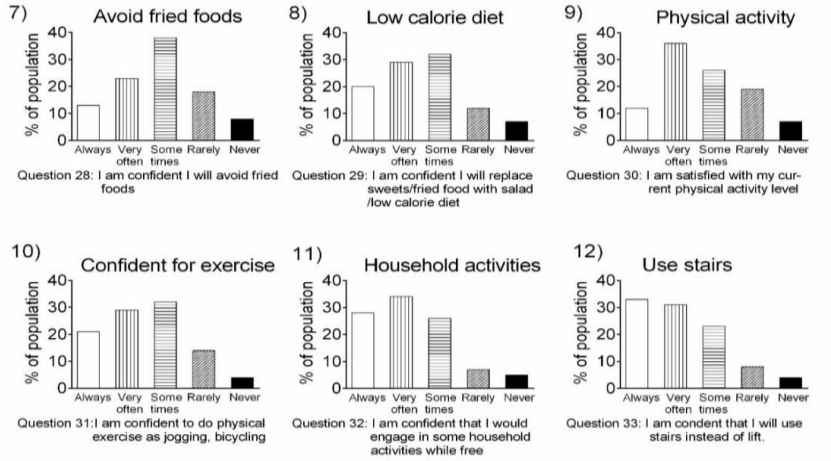

Figure 7: Confidence in Lifestyle Modifications

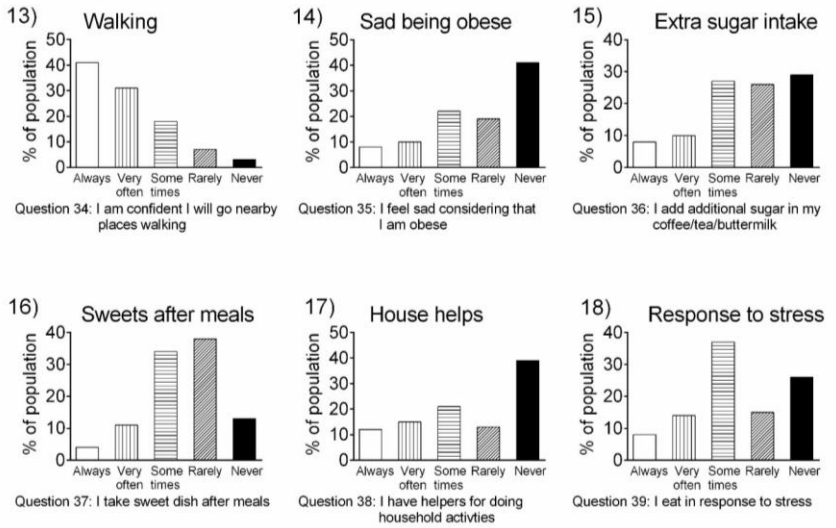

Figure 8: Emotional and behavioral responses related to obesity

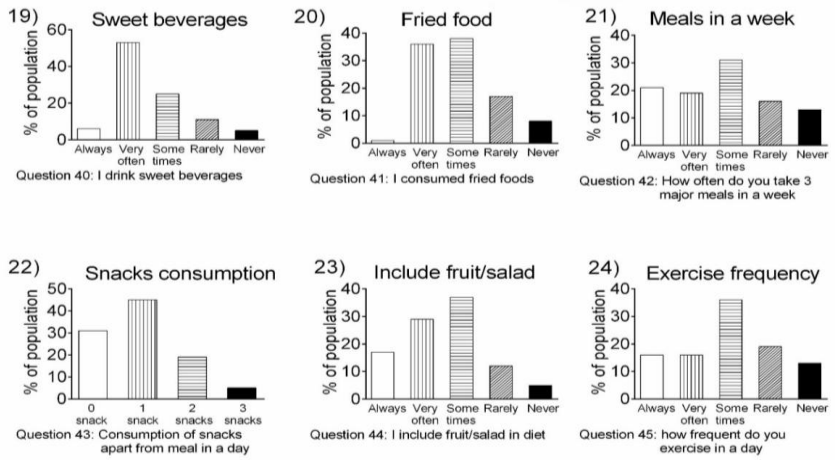

Figure 9: Dietary habits and physical activity patterns

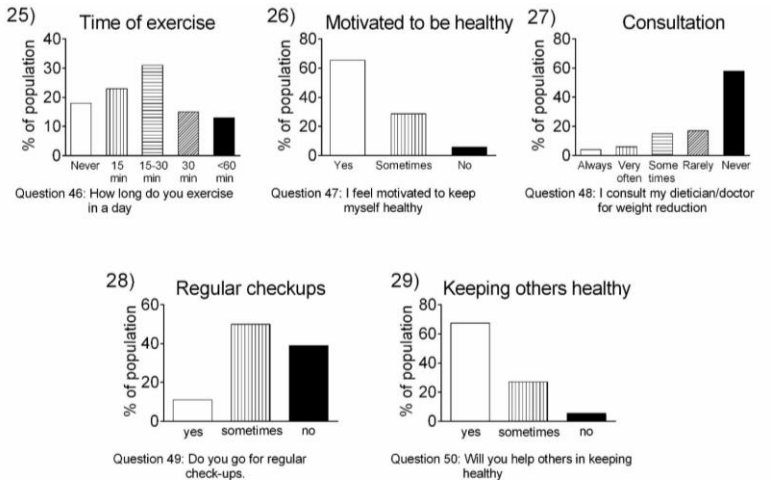

Figure 10: Motivation and Health Practices

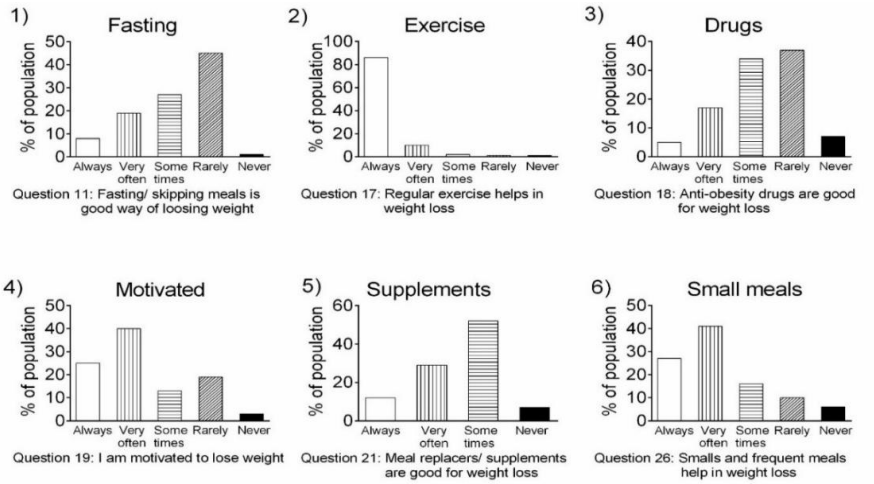

Figure 11. Methods and Suggestions to Reduce Weight

Discussion

The research contains valuable data regarding the understanding of obesity, its perceived causes, and effects on emotions and behavior in young women in the north of India. One of the paradoxes is that people are well-aware of the metabolic danger of obesity, but there are no consistent health-related actions. This knowledge-behavior gap is consistent with further findings in behavioral science, in which the only difference between information and long-term lifestyle change is low (Sheeran and Webb, 2016).

- **Awareness and Knowledge Gaps in the Population**

The participants showed excellent awareness regarding obesity as a chronic illness and how it is linked to diabetes, hypertension, and cardiovascular disease. Nonetheless, the less popular complications like non-alcoholic fatty liver disease (NAFLD) and diabetic retinopathy were not well known. This gap reflects a global trend of focusing on public health promotion to highlight so-called headline diseases without paying attention to developing comorbidity (Younossi et al., 2016; Cheung et al., 2010). Early detection and prevention of the same may be enhanced by filling these gaps by creating awareness. The majority of participants regarded BMI as a global standard for assessing and validating obesity (WHO, 2022; Nuttall, 2015; Rothman, 2008). Similarly, the high consumption of sugary beverages observed among participants reflects established evidence that such drinks increase the risk of obesity and cardiovascular complications (Malik et al., 2006).

- **Behavioral and Emotional Dimensions**

The emotional states of stress eating, body unhappiness, and avoiding exercise because of peer pressure highlight the issue of the emotional weight of obesity. These results are in accordance with the previous studies that have found out that weight management efforts can be impaired by stigma and negative perceptions of self-image and identity (Puhl and Heuer, 2010; Lee and Pause, 2016).

- **Intersectionality: Gender & Cultural Pressures**

Women often face heightened stigma related to body image, peer influence, and societal expectations, which can exacerbate stress eating and avoidance of physical activity (Puhl & Heuer, 2010; Rubino et al., 2020). In the Indian context, these pressures are compounded by traditional dietary practices and family expectations, creating unique barriers to effective weight management. Recognizing these gendered dimensions is critical for designing interventions that are sensitive to the lived realities of young women, ensuring that strategies are both equitable and culturally relevant.

- **Digital Influence**

Social media has a very significant role in shaping perceptions and behaviors related to obesity management. Exposure to online diet trends and health misinformation such as the promotion of extreme fasting or misuse of weight loss medications can contribute to unhealthy behaviors and misconceptions regarding effective weight management. (Holland & Tiggermann, 2016; Cohen et al., 2017). On the other hand, digital health tools, mobile apps, and peer-reviewed communities offer promising avenues for promoting accurate information and sustainable lifestyle changes (Michie et al., 2017; Islam et al., 2020), further distorting perceptions of effective management of obesity. Therefore, there is a need to integrate health education and digital literacy into obesity interventions, which will help mitigate risks while harnessing the potential of technology for positive impact.

Conclusion

The multifaceted interactions between knowledge, emotions, and behaviors in forming the perception of obesity in young women in northern India is highlighted. Recent evidences from the National Family Health Survey (NFHS-5) shows that more than 30% of adults in various Indian states have abdominal obesity. Placing these insights in the context of the National Program on Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke in India (NPCDCS) and the WHO Global Action Plan on Noncommunicable Disease, this study recommends the use of multi-level intervention strategies that combine education, behavioral support, digital health support, and community engagement. To adequately address the increasing rate of obesity in India, it is necessary to have customized, sensitive interventions sensitive to regional differences and cultural background. Finally, it is necessary to stop focusing on individual responsibility and turn to collective responsibility and actions in which health systems, communities, and policymakers work together to provide favorable conditions

under which people can make lasting lifestyle changes. The research provides evidence towards such initiatives, focusing on the fact that the obesity war should be interdisciplinary and inclusive.

Author Declarations

- Conflict of Interest: Its authors state that they have no known competing financial interests or personal relationships that might have manifested themselves in the reporting of the work in this paper.
- Funding: No particular grant was obtained by the fabric of funding providers (public, commercial, and not-for-profit) in this study.
- Ethical Approval: The conducting of the survey was approved ethically. All the participants signed informed consent forms, and their privacy and anonymity were kept throughout the research.
- Author Contributions: MT: conceptualization, methodology, supervision of data collection, writing of the manuscript, and final approval; JS: statistical validation of the data and data editing; NS: literature review, figure making, and reference formatting; AS and DK: figure editing and reference formatting. The final manuscript was read by all authors and accepted by them.

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