



Overweight and Obesity among Female Teachers in State Schools in Sri Lanka

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Abstract

Overweight and obesity, marked by excessive body fat, significantly contribute to chronic diseases, including non-communicable diseases, leading to over 4 million deaths globally. In Sri Lanka, obesity is highly prevalent among female teachers, necessitating an exploration of associated factors for effective risk reduction. This study examined the prevalence and determinants of overweight and obesity among female teachers in Sri Lankan state schools. A cross-sectional study was conducted among 328 teachers in the Matara educational zone, utilizing a multistage sampling technique. Data on socio-demographic, lifestyle, work, environmental, and medical factors were collected. Physical activity was assessed using the Global Physical Activity Questionnaire (GPAQ) and analyzed with MET values. A validated questionnaire (IOC: 0.67–1.00, Cronbach's alpha: 0.70–0.84) ensured reliability, and binary logistic regression identified associated factors. The average age was 44.17 years, with 86.28% married. Based on Asian BMI standards, 73.2% were overweight or obese. Insufficient physical activity (71.04%) and poor dietary habits (58.54%) were the most common issues. Major risk factors included low physical activity (AOR = 7.14; 95% CI: 3.78–13.01) and poor dietary habits (AOR = 1.91; 95% CI: 1.03–3.54). Interventions should promote lifestyle behavior, including physical activity and healthier diets, while policies must raise awareness of obesity-related health risks.

Introduction

The World Health Organization (WHO) defines overweight and obesity as the abnormal buildup of excess fat, which poses health hazards (Choudhury, Arora, Jain, & Dey, 2022). This issue has escalated to epidemic levels, with over 5 million deaths each year linked to being overweight or obese in 2019, according to the Global Burden of Disease Report (Mahumud *et al.*, 2021). Once considered mainly problematic in wealthy nations, the occurrence of overweight and obesity is rising rapidly in low- and middle-income countries, particularly in urban settings. Most overweight or obese children live in developing nations, where the rate of increase exceeds that of developed countries by more than 30% (Mahumud *et al.*, 2021). In 2022, 2.5 billion adults aged 18 years

and older (43% of men and 44% of women) were classified as overweight, with more than 890 million adults grappling with obesity. About 16% of individuals aged 18 years and above globally were categorized as obese in 2022. The global prevalence of obesity surged by over two-fold from 1990 to 2022 (Choudhury *et al.*, 2022). Obesity significantly contributes to both mortality and morbidity, acting as a pivotal risk element for various non-communicable diseases (NCDs). Fatalities have been linked to conditions associated with obesity, including cardiovascular diseases, diabetes, cancers, neurological disorders, chronic respiratory diseases, and digestive issues (Budreviciute *et al.*, 2020).

Body Mass Index (BMI) serves as a metric for gauging underweight or obesity, computed

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by dividing weight in kilograms by the square of height in meters (kg/m^2). A threshold of 18.5 delineates thinness or acute undernutrition, while a BMI of 25 or higher typically indicates overweight, and 29.9 or above signifies obesity (Khanna, Peltzer, Kahar, & Parmar, 2022). In recent times, Asia has witnessed a rapid surge in overweight and obesity rates, primarily attributed to shifting dietary habits, sedentary lifestyles, and urbanization (Lui *et al.*, 2024). To cater to the unique characteristics of Asian populations, adjusted BMI thresholds have been suggested by international bodies like the International Association for the Study of Obesity and the International Obesity Task Force. These adaptations propose BMI ranges of less than 18.5 for underweight, 18.5 to 22.9 for normal weight, 23 to 24.9 for overweight, and over 25 for obesity among Asians (Lim *et al.*, 2017). Such adjustments acknowledge the diverse risk factors and health implications associated with BMI classifications in Asian populations compared to other ethnic groups. Numerous countries in the region have witnessed a significant uptick in obesity prevalence, especially among urban residents. Notably, China, as the most populous country in the region, has observed a substantial rise in obesity rates (Dong *et al.*, 2014).

Most research indicates that being female increases the likelihood of being overweight (Taylor, Ramirez, Musall, & Sullivan, 2019). In Sri Lanka, women exhibit a higher prevalence of both obesity and central obesity in contrast to men. Recent studies from Sri Lanka suggest that certain ethnic groups, females, and individuals with higher educational attainment face elevated risks of obesity (Somasundaram *et al.*, 2019). Childhood obesity rates are significantly elevated in developing nations found in the Middle East, Central, and Eastern Europe (Hossain, Luies, & Biswas, 2020). As overweight and obesity become increasingly common in society, they often become accepted as the norm, which makes it difficult for individuals to acknowledge their own overweight or obese status since they may compare themselves to others with similar weight patterns. This skewed perception makes it harder for them to seek the necessary interventions, resulting in reduced self-esteem

and heightened vulnerability to various health problems (Robinson, Haynes, Sutin, & Daly, 2020). Recent rises in obesity rates have been linked to inactive lifestyles and the consumption of high-energy diets lacking in nutritional quality. Additionally, insufficient calcium intake and reduced levels of vitamin D have been correlated with obesity (Somasundaram *et al.*, 2019).

The correlation between factors such as physical activity and weight has been extensively researched in Western cultures, but there's a scarcity of comparable data in South Asian countries. A recent investigation in Sri Lanka discovered a connection between physical activity and weight, but did not conclusively establish a direct relationship between food choices and obesity. Understanding these associations is crucial due to notable variations in dietary and lifestyle habits between Sri Lanka and other countries (Jayawardana *et al.*, 2017). Research in India indicates that educators who maintain a healthy weight and nutritious eating habits are more successful in motivating students to adopt healthier diets. However, data suggest teachers have higher rates of overweight/obesity than the general population, possibly due to calorie-rich meals and insufficient physical activity (Monica, John, & Madhanagopal, 2018). Studies found that several factors were linked to higher BMI and increased chances of being overweight or obese. A study revealed a high incidence of overweight and obesity among females in South Asia, with factors such as urbanization and high socioeconomic status being associated with these conditions (Awasthi, Panduranga, & Deshpande, 2023). Also, several studies have revealed that gender, age, waist circumference, education level, urbanization, junk food intake, physical inactivity, family history, ethnicity, alcohol consumption, and smoking are significantly related to overweight and obesity (Dalvand *et al.*, 2015; Jayatissa *et al.*, 2012; Katulanda, Jayawardana, Sheriff, Constantine, & Matthews, 2010; Monica *et al.*, 2018). The National Nutritional and Micronutrient Survey in Sri Lanka in 2022 highlights gender disparities in overweight and obesity. Nearly a third of women (29.6%) are overweight, with 12.6% classified as obese. Comparatively,

among men, 25.6% are overweight and 6.4% are obese. Recent research in Sri Lanka found higher rates of obesity and central obesity among women compared to men. It also showed elevated obesity risks among various ethnic groups, women, and those with higher education levels (Somasundaram *et al.*, 2019).

Schoolteachers work as a model for the students to promote reducing the risk of overweight and obesity, especially female teachers. The overwork of teachers will affect the individual health status and the teaching quality. Even though many studies have been conducted on the topic of obesity in Sri Lanka, not many have focused on highly influential groups like elementary and secondary school teachers. To reduce the prevalence of overweight and obesity in schoolteachers, one should identify the prevalence and observe the core factors that are associated with overweight and obesity. The intervention program to reduce risk should identify and investigate factors associated with being overweight and obesity. The information will inform authorities and policy implications for schoolteachers.

Methods

The cross-sectional analytical study took place from September 2023 to January 2024. The population was 1,596 female schoolteachers of national schools in the Matara Educational zone of 13 national schools spread across different divisions (Ministry of Education, 2020), Sri Lanka. Exclusion criteria involved pregnant individuals, those with a history of bariatric surgery, and individuals engaged in structured weight loss programs. The sample size was calculated by a proportional estimated formula considering 80% power with 95% confidence, frequency of outcome factors in the population (50% $\pm$ 5), and design effect cluster surveys were 2 (DEFF:2). The required sample size was approximately 310. However, to account for refusal to participate and faulty questionnaires, an additional 5.0% was added, resulting in a total sample size of 328.

A multistage sampling method was used to collect data. The first stage involved the random selection of one of nine provinces. The second stage involved the random selection of one of three districts. The third stage randomly

selected four educational zones in the Matara district in the Southern province. The last stage was a systematic random sample. A standard questionnaire was employed to gather data concerning the incidence and exploratory factors associated with obesity and overweight among female teachers, with questionnaires serving as the primary method of data collection. The principal researcher had intended to conduct face-to-face interviews. Over three months, information was gathered from the participants.

The measurement tools included a standardized questionnaire that was approved by three experts and used the index of item objective congruence (IOC) between 0.60 and 1.00. The questionnaire had 4 sections consist of (1) socio-demographic characteristics: age, marital status, income, number of children, and time experience of teacher & anthropometric measurements: weight, high, and waist circumference (2) lifestyle characteristics: work-related activities, travel to and from places, recreational activities, sedentary behavior, food habits, smoking, drinking alcohol, and sleeping hours (3) work and environmental factors and (4) family and medical history. The dependent variable was overweight/obesity status, measured by BMI. Employed a structured questionnaire administered through face-to-face interviews for data collection. The questionnaire creation process involved using established questionnaires as references and seeking guidance from literature reviews to ensure the content and structure were appropriate and aligned with existing research. The Socio-demographic section of the questionnaire collected information about the participants' characteristics. This included age, marital status, number of children, education status, working experience as a teacher, and average monthly income earned. Anthropometric measurements were taken using standardized techniques, including weight measured with a digital weighing machine, waist circumference with a non-elastic measuring tape, and height with a Stature meter tape.

In this study, the researcher calculated the body mass index using participants' weight and height measurements. BMI, measured

by dividing weight in kilograms by height in meters squared, was explained as an indicator of overweight and obesity. The research followed the WHO-Asia Pacific perspective guidelines 2000 for BMI in South Asians. These guidelines define underweight as less than 18.5, normal weight as 18.5–22.9, overweight as 23.0–24.9, and obesity as a BMI of more than 25.0 (Lim *et al.*, 2017). Waist circumference was assessed as less than 80cm is considered normal, and 80cm or above is considered a risk in this study (Assefa, Tsegaye, Addissie, & Worku, 2024). The lifestyle section of the questionnaire assessed various behavioral factors that could impact health. This section includes questions about lifestyle habits, including physical activity, dietary patterns, smoking, alcohol usage, and sleeping behavior. Using the Global Physical Activity Questionnaire (GPAQ), approved by the World Health Organization (WHO), to evaluate the physical activity levels of participants. MET (Metabolic Equivalent) values were employed for GPAQ data analysis.

According to WHO recommendations for physical activity, adults should engage in at least 150 minutes of moderate-intensity physical activity or 75 minutes of vigorous-intensity physical activity per week. In this research, the MET category is used to find out the amount of physical activity. If the MET value is less than 600 MET minutes, it is considered not enough physical activity (World Health Organization, 2022). In this study, food consumption behavior was assessed by using the “Food Consumption and Physical Activity Questionnaire” from the Bureau of Health Promotion, Ministry of Public Health, Thailand, with slight adaptations. The survey utilized questions 17 to 29, and responses were scored as 5 for “Always,” 3 for “Sometimes,” and 0 for “Never.” Interpretation of scores categorized behaviors into four levels: very good (70 scores), good (56 – 69 scores), normal (42–55 scores), or needing improvement (41 scores or less) (Gaysorn & Pongpanich, 2018).

This scoring system allowed for a comprehensive evaluation of individuals’ food consumption behaviors based on their questionnaire responses. Sleep patterns were assessed in line with the American Academy of Sleep Medicine (AASM) and Sleep Research

Society (SRS). It is mentioned that 7 or more hours of sleep are considered appropriate, while less than 7 hours is considered insufficient (Watson *et al.*, 2015). In this study, participants were asked about their smoking and alcohol consumption behaviors, including both current and past usage patterns. The questionnaire also assessed work and environmental factors, social support, and cultural influences, using a Likert scale for responses, with scores categorized into three levels based on Bloom’s criteria, Such as high, neutral, and low (Alzahrani, Alghamdi, Alghamdi, & Alotaibi, 2022). High-level scores ranged from 36 to 45 (80.0–100.0%), neutral scores ranged from 27 to 35 (60.0–79.0%), and low scores were below 27 (<60.0%). Medical and family history data, including contributions to obesity and chronic conditions, were gathered through “Yes” or “No” responses, aiding in understanding their impact on health. The content validity of the questionnaire was rated through item-objective congruence values, which varied between 0.67 and 1.00 (Rovinelli & Hambleton, 1976). Following consensus among experts, a pilot study involving 40 participants in a comparable setting to the principal study was conducted. The questionnaire’s reliability was evaluated using Cronbach’s Alpha Coefficient, yielding reliability values ranging from 0.70 to 0.84.

Descriptive statistics consisting of frequency, percentage, mean, and standard deviation were calculated to describe the general characteristics. To investigate the association among the main factors, including sociodemographic and lifestyle characteristics, work and environmental factors, and family and medical history, the chi-square test was used to select the factors to model, and binary logistic regression analysis was used to investigate factors that are associated with overweight and obesity. The odds ratio (OR) with its corresponding confidence intervals (CIs) was presented for all variables. P-values and CIs were set at <0.05 and 95%, respectively. This research received ethical approval from the Institutional Review Board (IRB) of Naresuan University (NU), Thailand (0603.01.13(1)/NU-IRB 3820). Participants at each national school from the four educational divisions were informed about the research and provided their

Table 1. Socio-Demographic Characteristics

Factors	Number	Percentage
Age (years)		
21-30	93	28.36
31-40	101	30.79
41-50	110	33.54
51-60	24	7.31
= 44.17 years, $\pm$ S.D. 9.51		
Marital status		
Married	283	86.28
Single, Separated/divorced, Widow	45	13.72
Number of children		
No children	52	15.85
1 or 2 children	224	68.29
3 or 4 children	52	15.86
= 1.63, $\pm$ S.D. 1.01		
Educational level		
Diploma	91	27.75
Degree	142	43.29
Postgraduate	95	28.96
Experience (years)		
≥ 21	112	34.15
11-20	106	32.32
0-10	110	33.53
X= 17.12 years, $\pm$ S.D. 10.46		
Average income per month (Sri Lankan Rupees)		
30,000-49,999	72	21.95
50,000-69,999	158	48.17
$\geq 70,000$	98	29.88

written consent.

Results and Discussion

A total of 382 participants found that the average age was 44.17 years old. Most of them were married and had an average family size of 1.63 children per person, income ranged between 50,000.00 and 69,999.00 Sri Lankan Rupees, had both degrees and diplomas, and had an average work experience of about 17.12 years in Table 1.

Most teachers did not engage in enough physical activity, while 58.5% need improvement in their food habits. Despite these challenges, most of them had reported getting enough sleep and a low risk for sedentary behavior.

Notably, alcohol and smoking behavior were not included, as Sri Lankan females, particularly teachers, do not consume these substances in significant percentages in Table 2.

According to work and environmental factors affecting individuals, most teachers had a low level of work-related support, a high level of emotional support, a low or moderate level of instrumental support, and a low or moderate level of cultural encouragement of physical activity in Table 3. Table 4 data provide an overview of family and personal medical history concerning obesity, chronic disease, and associated factors. It reveals that a notable portion of individuals have family members with chronic diseases, and some report unhealthy dietary habits within their families. On a personal level, 34.5% of individuals suffer

Table 2. Lifestyle Characteristics

Lifestyle Factors	Number	Percentage
Physical activity		
Not enough physical activity	233	71.04
Enough physical activity	95	28.96
Food habits		
Need improvement in food habits	192	58.54
No need for food behavior improvement	136	41.46
Sleeping hours		
Enough sleep	254	77.44
Not enough sleep	74	22.56
Sedentary behavior		
Low risk	282	85.98
Medium risk	46	14.02

Table 3. Work and Environmental Factors

Work and Environmental Factors	Number	Percentage
Work-related support		
Low	229	69.80
Moderate and high	99	30.20
Emotional support		
Low	86	26.22
Moderate	57	17.38
High	185	56.40
Instrumental support		
Low	136	41.46
Moderate	69	21.04
High	123	37.50
Informational support		
Low	123	37.50
Moderate	100	30.50
High	105	32.00
Culturally driven physical activity		
Low	123	37.50
Moderate	121	36.89
High	84	25.61

Table 4. Family and Medical History

Family and Medical History	Yes		No	
	n	%	n	%
Family history				
Have family members who are overweight or obese	83	25.3	245	74.7
Have close relatives with overweight or obesity	88	26.8	240	73.2
Have a family member with a chronic disease	237	72.3	91	27.7
The family has high-fat and sugar food habits	106	33.3	222	67.7
Personal medical history				
Suffer from chronic disease	113	34.5	215	65.5

Suffer from a hormone-related disease	90	27.4	238	72.6
Take medicine for a chronic disease	35	10.7	293	89.3
Take medicine that has side effects on weight	25	7.6	303	92.4
Have a consultation or treatment for overweight and obesity	123	37.5	205	62.5
Have physical limitations or difficulties in daily activities	84	25.6	244	74.4

Table 5. The Anthropometric Measures of the Participants

Anthropometric measures	Mean $\pm$ SD	n (%)
Weight (kg)	61.99 $\pm$ 9.59	
Height (cm)	156.77 $\pm$ 6.75	
Body mass index (kg/m ²)	25.26 $\pm$ 3.78	
Waist	85.45 $\pm$ 9.62	
($\leq$ 80 cm)		89 (27.10)
(> 80 cm)		239 (72.90)
Body Mass Index Level		
Normal or underweight		88 (26.80)
Overweight and Obesity		240(73.20)

kg = kilogram, cm = centimeter, kg/m² = kilograms per meter square

from chronic diseases, and 37.5% have sought obesity treatment, while a smaller percentage take medications that affect weight. The data underscores the influence of family history, lifestyle, and medical conditions on obesity risk and health outcomes.

Table 5 presents the anthropometric measures of the participants, revealing that the average body mass index (BMI) was 25.26 kg/m² and the average waist circumference was 85.45 cm. Most of the participants had a waist circumference greater than 80 cm, and more than 70% had a prevalence of overweight or obesity. According to the univariate test, factors associated with being overweight and obesity were sociodemographic factors, including age, marital status, number of children, educational level, experience, and income; the lifestyle factors were physical activity and food habits, and those who suffer from chronic disease.

According to the multivariate test, a binary logistic regression analysis was conducted to investigate the effects of age, marital status, educational level, number of children, experience of teacher in years, income level, physical activity level, food habits level, and suffering from chronic disease. The model was statistically significant = 100.88, $p < 0.001$, explaining between 26.50% (Cox & Snell R square) and 38.5% (Nagelkerke

R square) of the variance in overweight and obesity, and correctly classifying 81.40% of cases. The Hosmer and Lemeshow Test suggested a good fit of data = 7.55, $p = 0.48$). In the model, participants who had not enough physical activity had 7.01 times more likely to have overweight and obesity than those who had enough (OR = 7.01, 95%CI [3.78, 13.01]), who need improvement of food habits had 1.91 times more likely to have overweight and obesity than those who had not (OR = 1.91, 95%CI [1.03, 3.54]), and who had suffering from chronic disease had 2.16 times more likely to have overweight and obesity than those who had not (OR = 2.16, 95%CI [1.03, 4.55]) in Table 6. This analytical cross-sectional study addresses the escalating global concern of being overweight and obese. Its primary objectives were to ascertain the prevalence and associated factors of overweight and obesity in this demographic. The results found that female schoolteachers' prevalence of overweight and obesity was very high (73.4%), a category based on the Asian BMI categorization. Factors associated with being overweight and obesity were physical activity, food habits, and suffering from chronic disease.

According to a high prevalence of overweight and obesity among schoolteachers in Sri-Lanka, a study conducted by Monica *et*

Table 6. Factors Associated with Overweight and Obesity.

Factors	Normal Underweight		or Overweight or Obesity		COR	95%CI	AOR	95%CI
	n	(%)	n	(%)				
Age groups (Years)								
21-30	14	15.1	79	84.9	5.64	(2.12-15.06) **	3.24	(0.31-33.95)
31-40	16	15.8	85	84.2	5.31	(2.03-13.90) **	1.94	(0.26-14.57)
41-50	46	41.8	64	58.2	0.39	(0.57-3.37)	4.99	(0.80-31.03)
51-60	12	50.0	12	50.0	1			
Marital status								
Married	65	23.0	281	77.0	3.51	(1.84- 5.70) **	1.24	(0.45-3.45)
Single, separated/ divorced, widow	23	51.1	22	48.9	1			
Number of children								
No children	29	55.8	23	44.2	0.17	(0.07-0.41) **	0.32	(0.08-1.71)
1 or 2 children	50	22.3	174	77.7	0.72	(0.33-1.59)	0.86	(0.33-2.30)
3 or 4 children	9	17.3	43	82.7	1			
Educational level								
Diploma	20	22.0	71	78.0	0.89	(0.44-1.80)	1.14	(0.46-2.78)
Degree	49	34.5	93	65.5	0.47	(0.26-0.87) **	0.76	(0.27-1.75)
Postgraduate	19	20.0	76	80.0	1			
Experience (years)								
0–10	14	12.5	98	87.5	5.22	(2.66-10.26) **	4.22	(0.46-2.78)
11–20	27	25.5	79	74.5	2.18	(1.22-3.89) *	0.68	(0.36-1.74)
≥21	47	42.7	63	57.3	1			
Average income per month (Sri Lankan Rupees)								
30,000–49,999	35	48.6	37	51.4	0.16	(0.08-0.34) *	0.82	(0.26-2.56)
50,000–69,999	40	25.3	118	74.7	0.45	(0.23-0.89) **	1.17	(0.45-3.07)
≥70,000	13	13.3	85	86.7	1			
Physical activity								
Not enough	35	15.0	198	85.0	7.14	(4.15-12.27) **	7.01	(3.78-13.01) **
Enough	53	55.8	42	44.2	1			
Food habits								
Need improvement	35	20.8	133	79.2	1.88	(1.15-3.09) *	1.91	(1.03-3.54) *
No need improvement	53	33.1	107	66.9	1			
Suffering from chronic diseases								
No	71	33.0	144	67.0	2.78	(1.55-5.02) **	2.16	(1.03-4.55) *
Yes	17	15.0	96	85.0	1			

* Significant level at 0.05, ** significant level at 0.001, COR = crude odd ratio, AOR = adjust odd ratio

al. (2018), similar to the present research, the focus was on the prevalence of BMI among female teachers in India. Employing BMI criteria specific to Asians, the study discovered a significant obesity rate of 70.2%, with 43.2%

classified as Grade I obese, 20.4% as Grade II obese, and a minor 6.6% as Grade III obese. Monica *et al.* investigated various factors contributing to overweight and obesity, such as age, waist circumference, dietary patterns,

levels of physical activity, and health conditions like hypertension and arthritis (Monica *et al.*, 2018). In similar studies conducted on teachers, both (Rocha *et al.*, 2015) and Zulkepli *et al.* (2019) reported prevalence rates of obesity at 47.2% and 74.3%, respectively (Rocha *et al.*, 2015). In contrast with this research, a narrative review by Awasthi *et al.* (2023) on the prevalence of overweight/obesity in South Asia revealed a broader perspective, indicating a high prevalence ranging from 22.4% to 52.4% across adults in the region. The prevalence of obesity is rising in South and Southeast Asia. Excessive fat accumulation in the body leads to impaired health and an increased rate of mortality (Tham *et al.*, 2023). This trend significantly impacts the economy and development of countries, especially as it places a considerable burden on their healthcare systems. The prevalence of overweight and obesity among teachers poses an important health challenge within the education sector. This issue not only threatens the well-being of teachers but also presents a substantial health concern for any nation.

Factors associated with overweight and obesity were found by univariate tests. Sociodemographic factors included age groups, marital status, number of children, educational level, and level of income associated with overweight and obesity. Lifestyle factors were physical activity and food habits, and family and medical history of suffering from chronic disease associated with overweight and obesity. Female teachers who were 21-30 and 31-40 years old were 5.61 times and 5.31 times more likely to be overweight and obese than those who were in the 51-60 age group. A previous study revealed that individuals aged 15-49 have a higher BMI compared to those aged 50 and above (Jayatissa *et al.*, 2012). The teachers who were married were 3.5 times more likely to be overweight and obese than those who were single, separated, or divorced and widowed. A systematic review found that 72% of studies (76 studies) reported a higher obesity risk in married individuals than in unmarried individuals (Nikolic Turnic *et al.*, 2024). Participants who had experience as teachers for 0-10 years and 11-20 years were more likely to be overweight and obese than those who had 21-30 years, and those who had an income level between 30,000

and 69,999 Lankan Rupees were more likely to be overweight and obese than those who had 70,000 or more, who had no children, had a positive to prevent overweight and obesity than those who had 3 or more children and those who had a bachelor's degree had a positive to prevent overweight and obesity than those who had a postgraduate. A study in 2021 highlighted that higher income, number of children, and level of education are significantly associated with a higher BMI (Silva, Perera, & Samarasinghe, 2021). According to lifestyle factors, teachers who did not have enough physical activity were more likely to be overweight and obese than those who had enough physical activity, and those who needed food habits improvement were more likely to be overweight and obese than those who did not need. Family and medical history factors, female teachers who had not suffered from chronic disease were more likely to be overweight and obese than those who had suffered from chronic disease. Otherwise, the final model was found to have three factors associated with overweight and obesity, including physical activity, food habits, and suffering from chronic disease.

The study's findings indicate that insufficient physical activity significantly increases the risk of obesity among teachers, highlighting the importance of exercise in weight control. Research by Jakicic, Rogers, Davis, and Collins (2018), supports this, emphasizing the crucial role of physical activity in managing body weight, with evidence suggesting specific durations required for effective weight regulation (Jakicic *et al.*, 2018). Insufficient physical activity among teachers may result in a more sedentary lifestyle, exacerbating weight gain and obesity (Monica *et al.*, 2018). Physical activity is required to maintain a healthy weight and energy balance since it burns calories (Cox, 2017). Cultural and social issues limit the physical activity of women in South Asia (Misra, Jayawardena, & Anoop, 2019). Conversely, regular exercise promotes better health outcomes, including improved metabolism and cardiovascular health (Nystoriak & Bhatnagar, 2018). The WHO attributes this weight issue mainly to an imbalance between calories consumed and calories burned. Factors such as increased

urbanization, changes in transportation methods, and sedentary work environments contribute to this energy imbalance by promoting higher consumption of energy-dense foods and reducing physical activity (Choudhury *et al.*, 2022). This research highlights an important aspect of how food behaviors influence BMI. Food behaviors encompass habits and practices related to eating, such as meal frequency, portion sizes, food choices, eating environment, and emotional eating patterns.

These behaviors play a pivotal role in determining BMI. Several studies have examined the food behaviors of women, particularly among working adults, university students, and non-working women. Research highlights several factors significantly associated with BMI, including a low intake of fruits and vegetables, diets high in fats and sugars, frequent consumption of fast food and confectionery, and unfavorable dietary changes (Begum, Islam, Anowar, & Lee, 2020; Ghorbannejad, Alizadeh, Didarloo, & Bakhshimoghaddam, 2020; Popovic-Lipovac & Strasser, 2015). Studies typically show higher obesity rates among people with disabilities due to factors like limited access to healthy food, physical restrictions, and medication use (Fox, Witten, & Lullo, 2013). However, this study found that individuals with physical limitations or disabilities were less likely to be overweight or obese. Overall, the study underscores the urgency of interventions promoting healthy lifestyles and physical activity among female teachers in Sri Lanka, aligning with global efforts to combat obesity. Suffering from a chronic disease is associated with being overweight and obese. It may be because they were not concerned about chronic diseases that would develop in the future, or did not get any information or perception of the risk associated with obesity. The study found that groups aged 21-40 years had a higher prevalence of overweight and obesity than the 51-60-year-old groups.

This was a cross-sectional study, which is limited to exploring the causal association between factors and overweight and obesity due to the use of questionnaires. The study represents one of the 9 provinces of Sri Lanka and an educational zone.

Conclusion

This research shows that there seems to be an incredibly high rate of overweight and obesity in Sri Lanka among female teachers, and around 73:20% can be labeled either as obese or overweight, which is very concerning for public health and women in education. Women with excess body weight and high BMI were more likely to be obese than women with lower body weight, indicating a need for such individuals to be targeted. Similar studies also showed other concerns, as they explained how physical inactivity, diet, and urbanization could lead to obesity. Especially, those who do not suffer from chronic disease are more likely to be overweight and obese and have health effects.

We recommend that authorities in public health should provide interventions to promote the prevention of overweight and obesity among schoolteachers about physical activity, food habits, and perception of suffering from chronic disease. The target groups should be concerned, including the reproductive groups of age between 20 and 40 years old, married marital status, having no children, low experience groups between 0 and 20 years, and lower income. The policy implication should support a chance to have more opportunities and support for physical activity and food habits, and have a campaign to increase perception and information of the health effects of obesity. The future study of the observational factors associated with overweight and obesity should observe more information, such as social support, accessibility, and environmental factors. The intervention study or model that tests the effectiveness of a program to reduce the risk of obesity.

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