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COMPARATIVE ANALYSIS OF OBESITY TRENDS AND SOCIO – ECONOMIC STATUS AMONG ADULT MEN IN COIMBATORE, TAMIL NADU

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ABSTRACT

Objective: This study examined the socioeconomic background and obesity prevalence among adult men in Coimbatore, Tamil Nadu, highlighting the crucial association among socioeconomic factors, nutritional habits, and obesity for targeted interventions. **Methodology**: A sample of 765 obese adult men aged 36–55 years was selected from the PSG hospitals in Coimbatore. The study was ethically approved, and all participants provided their consent beforehand. Questionnaire-based interviews gathered data on general characteristics and socioeconomic status, while standard procedures recorded anthropometric measurements including height, weight, and BMI. Statistical analyses were performed to evaluate associations between socioeconomic factors, nutritional status, and obesity. **Results**: Among 725 obese adult men aged 36-55, Grade I obesity was predominant (61.70%), followed by Grade II (37.12%), and Grade III (1.18%). Significant associations were observed between obesity and occupation ($\chi 2$=27.953, P =0.032), and monthly income ($\chi 2$=16.213, P =0.039), whereas age, marital status, and educational level were not significantly associated. **Conclusion**: This study underscores the impact of socio demographic factors on obesity in adult men in Coimbatore, emphasizing the need for tailored interventions that address age, religion, occupation, and income. Culturally sensitive approaches and comprehensive strategies are crucial to combat obesity, warranting further research on refined intervention strategies for prevention and management.

Keywords: Obesity trends, socioeconomic status, nutritional profiles, comparative analysis, adult men.

INTRODUCTION

Obesity has become a critical global health issue, affecting approximately 100 million individual's worldwide[1]. This complex condition, characterized by excessive body fat, affects people of all ages and socioeconomic backgrounds, and has significant social and psychological implications. Over the past few decades, obesity rates have surged significantly in metropolitan areas of both industrialized and emerging nations[2]. Overweight and obese people are becoming more common in India than in other countries. From 1998 to 2015, the percentage of overweight individuals increased from 8.4 to 15.5 percent, and the rate of obesity increased from 2.2 to 5.1 percent[3]. Although the incidence of overweight and obesity continues to increase in India, there is a scarcity of research focusing on forecasting future trends. By 2030, it is estimated that 28% of Indians will be overweight and 5% will be obese, with these rates also affecting approximately 20% of rural adults[4]. Body mass index is widely used to evaluate whether individuals are overweight or obese, with values above 23 kg/m² indicating overweight and values exceeding 25 kg/m² indicating obesity, based on Asian standards[5]. The rising rates of overweight and obesity in India, along with widespread access to nutrition, underscore a pressing public health issue that requires attention[6]. The correlation between overweight/obesity and various non-communicable diseases underscores the critical importance of addressing this issue, particularly in both the urban and rural areas of India[7].

Genetic predispositions and environmental factors, including diet and exercise habits, commonly contribute to overweight and obesity[8]. Understanding the impact of sociocultural, educational, financial, and ecological factors on excess body fat is essential for successful treatment of obesity[9]. Numerous studies have explored how demographic characteristics, socioeconomic status, and lifestyle choices impact overweight and obesity rates[10]. Identifying these risk factors is essential for designing intervention and prevention strategies, although this can be challenging, given the complexity of population-based research[11]. This research focused on examining the relationships between socioeconomic advancement, nutritional status, and the rates of overweight and obesity in adults. This study was designed to explore the relationship between particular nutritional, demographic, and social variables and the prevalence of overweight/obesity.

METHOD

Approach to Participant Selection

This study enrolled 765 obese adult males from PSG hospitals in Coimbatore, Tamil Nadu, with formal approval. Participants were recruited from the outpatient department, specifically voluntary male adults aged 36–55 years. The study included adult males aged between 36 and 55 years with a BMI of 25 kg/m² or above. The exclusion criteria were Individuals below 35 or above 55 years of age, those with mental disabilities, individuals affected by other health conditions such as AIDS or cancer, and anyone with a BMI < 25 kg/m² were excluded.

Ethical Considerations

The study protocol was approved by the Institutional Human Ethics Committee at the PSG Institute of Medical Sciences and Research in Coimbatore, India. Prior to gathering data, written consent was obtained from all obese adult male participants after they were provided detailed information about the study.

2.3. Instruments and Techniques

A structured interview protocol was developed to gather data on participant's socioeconomic conditions and nutritional status, including factors such as total family income, educational attainment, and occupation. Standardized procedures were employed for anthropometric measurements including height, weight, and BMI. Participant height was recorded using a stadiometer, while weight was measured with calibrated scales with individuals wearing light clothing and barefoot. The BMI was determined by dividing the weight of each participant (in kilograms) by the square of their height (in meters). For Asian adult's criteria divided into four categories: < 25 signifies a non-obese status, Grade I ranges from 25 to 29.9, Grade II spans from 30 to 40, and Grade III encompasses values exceeding 40. Following the BMI classification, the collected data underwent thorough organization, tabulation, and statistical analysis, utilizing the mean values and standard deviations for interpretation.

RESULTS

This study involved 765 obese adult men aged 36–55 years. Among them,472 individuals (61.70%) were classified as Grade I obese, 284 (37.12 %) as Grade II, and 9 (1.18 %) as Grade III obese based on their BMI classifications (see Figure 1).

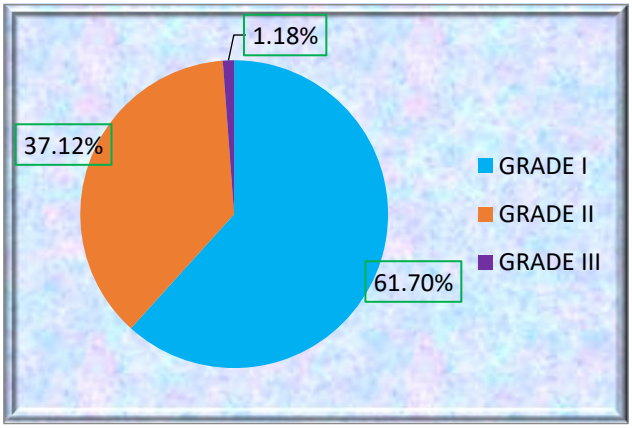

Figure 1: obesity category (n=765)

Table 1

Socio Demographic Profiles of the Respondents in Relation to Obesity Category (n=765)

Socio Demographic profile	Particulars	Obesity Category			Total	Significance
		Grade 1 N (%)	Grade 2 N (%)	Grade 3 N (%)		
Age (in years)	36 - 40	75 (60)	50(40)	0(0)	125	$\chi 2$=2.650 P=0.851
	41 - 45	66 (61.7)	40(37.4)	1(0.9)	107	
	46 - 50	73(60.3)	46(38)	2(1.7)	121	
	51-55	258(62.6)	148(35.9)	6(1.5)	412	
Religion	Hindu	440(62.3)	257(36.4)	9(1.3)	706	$\chi 2$=7.123 P=0.130
	Muslim	14(42.4)	19(57.6)	0(0.00)	33	
	Christian	18(69.2)	8(30.8)	0(0.00)	26	
Marital status	Married	467(61.6)	282(37.2)	9(1.2)	758	$\chi 2$=1.461

	Widowed	1(50)	1(50)	0(0.00)	2	P=0.962
	Divorced	2(100)	0(0.00)	0(0.00)	2	
	Separated	2(66.7)	1(33.3)	0(0.00)	3	
Education	Primary School	2(66.7)	1(33.3)	0(0.00)	3	$\chi2$=3.339 P=0.972
	Middle School	31(64.6)	16(33.3)	1(2.1)	48	
	High School	169(61.2)	102(37)	5(1.8)	276	
	Intermediate/ Diploma	52(60.4)	33(38.4)	1(1.2)	86	
	Graduate	166(61.5)	103(38.1)	1(0.4)	270	
	Professional Degree	52(63.4)	29(35.4)	1(1.2)	82	
Occupation	Senior Officials & Managers	9(50)	9(50)	0(0.00)	18	$\chi2$=27.953 P=0.032
	Professionals	46(67.6)	21(30.9)	1(1.5)	68	
	Technicians and Associate Professionals	133(61.5)	82(38)	1(0.5)	216	
	Clerks	12(70.6)	5(29.4)	0(0.00)	17	
	Shop & Market Sales Workers	211(59.6)	138(39)	5(1.4)	354	
	Skilled Agricultural	23(82.1)	5(17.9)	0(0.00)	28	
	Craft & Related Trade Workers	19(55.9)	15(44.1)	0(0.00)	34	
	Plant & Machine Operators and Assemblers	10(58.8)	5(29.4)	2(11.8)	17(2.20)	
	Elementary Occupation	9(69.2)	4(30.8)	0(0.00)	13	
Monthly income	Rs.6175 -18496	47(69.1)	21(30.9)	0	68	$\chi2$=16.213 P=0.039
	Rs.18497 - 30830	28(66.7)	13(30.9)	1(2.4)	42	
	Rs.30831 - 46128	233(55.7)	178(42.6)	7(1.7)	418	
	Rs.46129 - 61662	158(69)	70(30.6)	1(0.4)	229	
	Rs.61663 - 123321	6(75)	2(25)	0	8	
Socio Economic Status *	Upper Middle II	229(64)	127(35.5)	2(0.6)	358	$\chi2$=3.237 P=0.198
	Lower middle III	243 (59.7)	157(38.6)	7(1.7)	407	

* "Updated modified kuppuswamy SES" scale 2021

Socio demographic profile analysis revealed several notable associations with obesity categories among the study participants. The chi-square test indicated no significant correlation between age and obesity among the different age groups ($\chi2$ = 2.650, p = 0.851).

Varying distributions of obesity categories were observed across the different age groups. Significantly, the age group of 51-55 years demonstrated the highest proportion of Grade I obesity, reaching 62.6%, with the highest rate observed in the 36-40 age group at 60%. Marital status did not show any significant association found between marital status and obesity category ($\chi2$ = 1.461, p = 0.962). Most obese individuals were married, comprising 61.6% with grade 1 obesity, 37.2% with grade 2 obesity, and 1.2% with grade 3 obesity. However, religion demonstrated a notable association with obesity categories ($\chi2$=7.123, p=0.130), with Hindus representing the majority of obese individuals, constituting 62.3% of grade 1 obese individuals, 36.4% of grade 2 obese individuals, and 1.3% of grade 3 obese individuals. Education level showed no significant association with obesity category ($\chi2$ = 3.339, p = 0.972). Across various educational levels, the distribution of obesity categories varied with no clear trend observed. Occupation was significantly associated with obesity ($\chi2$ = 27.953, p = 0.032). Professionals had the highest prevalence of grade 1 obesity (67.6 %), whereas skilled agricultural workers had the highest proportion of grade 2 obesity (17.9 %). Monthly income was significantly associated with obesity ($\chi2$ = 16.213, p = 0.039). Participants with monthly incomes ranging from Rs. 30,831–46,128 had the highest prevalence of grade 1 obesity (55.7 %). However, the "Updated Modified Kuppuswamy SES" scale for 2021 showed no significant relationship between socioeconomic status and obesity ($\chi2$=3.237, P=0.198)[12].These findings underscore the importance of considering socio demographic factors to understand and address obesity disparities within a population, thereby informing targeted interventions and public health policies.

DISCUSSION

This study highlights the incidence of obesity among adult men in Coimbatore, Tamil Nadu, aligning with the worldwide patterns. Grade I obesity emerged as the most prevalent category, followed by grades II and III obesity. This underscores the immediate need for tailored interventions to address the obesity epidemic in this locality. Furthermore, the significant association between obesity and socioeconomic factors emphasizes the intricate relationship between social determinants and health outcomes. Religion, occupation, and monthly income were significant predictors of obesity, indicating the influence of cultural, economic, and occupational factors on nutritional habits and body weight. For example, Singh, Hussain et al., and Yadava et al. also noted similar associations between obesity and socioeconomic status. Notably, the socio demographic associations with obesity were found to be marginally higher in married individuals, followed by widows/widowers and unmarried persons, consistent with results observed in prior research [13, 14, 15]. Similar trends were also noted by Yadava et al. in their research, indicating the necessity for a more thorough examination of these variables[13]. The high prevalence of obesity among adult men aged 51-55 years aligns with the global trends, indicating an increased risk of obesity with advancing age. Age, as a factor beyond modification, affects an individual's predisposition to weight gain and obesity. Shailendra Kumar et al. (2022) also observed a similar pattern of increasing BMI with advancing age. This can be attributed to changes in metabolism, lifestyle, and physical activity, which are commonly observed in older adults[16]. The predominance of Hindus among obese individuals suggests that potential cultural and dietary influences contribute to the obesity prevalence. Further exploration of dietary patterns and cultural norms regarding food consumption among different religious groups could provide valuable

insights for targeted interventions. Baumann et al., (2018) provides insights into how cultural and religious factors influence food choices, eating patterns, and ultimately, obesity prevalence[17]. Similarly, the association between occupation and obesity highlights the impact of socioeconomic status on nutritional habits and lifestyle choices. Shop and Market Sales Workers exhibited the highest prevalence of obesity, possibly because of the sedentary nature of their jobs and limited access to healthy food options. The incidence of overweight/obesity is strongly influenced by sedentary behavior, physical inactivity, and employment, all of which increase adult adiposity. Vaidhya et al. (2006) observed notable correlations between obesity and those working in managerial, professional, and technical fields, along with those possessing higher literacy levels and belonging to higher socio-economic groups[18]. Furthermore, the correlation between monthly income and obesity underscores the impact of income disparity in determining access to nutritious foods and lifestyle preferences. Interventions aimed at improving the socioeconomic status and enhancing access to nutritious foods could help mitigate obesity disparities in the population.

These findings have significant implications for public health policies in Coimbatore and similar settings. Comprehensive interventions targeting individual behaviors, social determinants, and structural inequalities are essential to address the multifaceted nature of the obesity epidemic. Policy initiatives aimed at promoting healthy eating, physical activity, and socioeconomic equity are critical for achieving sustainable public health improvements. It is essential to consider the limitations of this study, such as its reliance on self-reported data and its prospective design. Subsequent investigations using longitudinal and qualitative methodologies could offer further understanding of the underlying mechanisms that contribute to obesity disparities among adult men in the Coimbatore region. By comprehending the intricate relationship between socioeconomic status and health outcomes, policymakers and public health professionals can devise more impactful strategies to address obesity and enhance overall health and wellness within the population.

CONCLUSION

In conclusion, this study highlights the occurrence of obesity among adult men in Coimbatore, Tamil Nadu, with 61.70%, 37.12 %, and 1.18% experiencing Grade I, II, and III obesity, respectively. Notable correlations were found between obesity and factors such as occupation ($\chi 2=27.953$, $P=0.032$) and monthly income ($\chi 2=16.213$, $P=0.039$). However, no significant relationships were identified with age, marital status, or educational level, which underscores the need for targeted interventions that address cultural, economic, and occupational factors to effectively combat the obesity epidemic. Considering socio demographic disparities, policymakers and public health practitioners can develop tailored strategies to promote healthier lifestyles and mitigate obesity-related health risks in the community. However, further research using long-term and detailed methods is needed to better understand the reasons behind obesity trends and to create more effective intervention strategies.

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Conflict of interest: **None**

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