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A Comparative Study on the Prevalence of Obesity among Married and Unmarried Women in Tamil Nadu

Dr.D.Suresh,
Assistant Professor
Physical Education Health Education Sports
A.V.V.M Sri Pushpam college (Autonomous)
Poondi Thanjavur

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Abstract
Obesity has emerged as a global health challenge, with women being particularly vulnerable as they age. This study examines the prevalence of obesity among married women without children and unmarried women in Vellore, Tamil Nadu, using Body Mass Index (BMI) as the primary indicator. A descriptive cross-sectional design was employed with 40 participants (20 married, 20 unmarried) aged 20–35 years, selected through random sampling. Data were collected through structured questionnaires and anthropometric measurements. Analysis using mean, percentage, and t-test revealed a statistically significant difference in BMI between married and unmarried women ($p<0.05$). Specifically, among married women, 55% were overweight and 10% obese, while 60% of unmarried women had normal BMI. The findings strongly suggest that marital status significantly influences weight status, highlighting the urgent need for targeted awareness and preventive strategies in this demographic.

Introduction

Obesity and overweight are recognized as major contributors to chronic disease worldwide, including cardiovascular disease, type 2 diabetes mellitus, hypertension, and certain cancers. The World Health Organization (WHO) has characterized the rise in obesity rates as a global epidemic, with devastating public health and economic consequences. Body Mass Index (BMI) serves as a widely accepted, though imperfect, measure of weight-related health risks, calculated as weight in kilograms divided by the square of height in meters (kg/m2).

Gender and Regional Vulnerability

In many developing nations, including India, the burden of obesity is disproportionately high among women. This trend is often attributed to biological factors, such as hormonal changes, as well as socio-cultural determinants, including changes in lifestyle associated with life transitions. Tamil Nadu, a rapidly developing state in Southern India, is undergoing a nutritional transition characterized by increased consumption of high-calorie, processed foods and a simultaneous decrease in physical activity, leading to a rising prevalence of non-communicable diseases (NCDs) and obesity.

Marital Status as a Correlate of Weight Gain

Beyond individual lifestyle choices, social determinants such as marital status have been identified as a significant influencing factor in body weight. Several international and national studies have indicated a higher obesity prevalence among married individuals compared to their unmarried counterparts. Proposed mechanisms for this "marriage-related weight gain" include changes in eating habits (e.g., shared meals, increased portion sizes, cooking for a family), reduced physical activity post-marriage due to domestic responsibilities, and psychological factors like reduced incentive for physical attractiveness or increased stress.

Study Rationale and Objectives

While the link between marriage and weight gain is established globally, specific data on this correlation within distinct regional and cultural contexts, particularly among younger women in urban Tamil Nadu, remain limited. Furthermore, isolating the effect of marriage from the confounding effect of childbearing (parity) provides a clearer insight into the direct lifestyle changes induced by marital life itself.

This study, therefore, was designed to investigate the relationship between marital status (married without children versus unmarried) and BMI among young adult women in Vellore, Tamil Nadu. The primary objective was to compare the mean BMI and the prevalence of overweight and obesity between these two groups.

Methodology

Study Design and Setting

A descriptive cross-sectional study was conducted to determine the prevalence of overweight and obesity at a single point in time. The study setting was Vellore, a city in the state of Tamil Nadu, India. The cross-sectional design was chosen for its feasibility and speed in assessing prevalence.

Participants and Sampling

The target population comprised young adult women in the reproductive age group. A total of 40 women were selected through a random sampling approach from attendees at various medical camps conducted within Vellore. The inclusion criteria were:

1. Age between 20 and 35 years.

2. Willingness to participate and provide informed consent.
3. Belonging to one of two distinct groups: a) Married Women (specifically, those who had not yet had children, to control for the confounding effects of parity). b) Unmarried Women.

Exclusion criteria included: women who were currently pregnant, women with known pre-existing conditions that significantly affect body weight (e.g., thyroid disorders), and women who had given birth. This focused sampling aimed to isolate the impact of marital status on weight.

Data Collection Instruments

Data were collected using two main components:

1. Structured Questionnaire: This collected socio-demographic data (age, marital status, education level, occupation) and basic information on lifestyle factors.
2. Anthropometric Measurements:
    - Height: Measured to the nearest 0.1 cm using a wall-mounted stadiometer with participants barefoot and standing erect.
    - Weight: Measured to the nearest 0.1 kg using a calibrated digital electronic scale, with participants wearing minimal clothing.

Body Mass Index (BMI) Calculation and Classification

BMI was calculated using the standard Quetelet's Index formula:

BMI=Height2(m2)Weight (kg)

Classification of BMI was performed using the Asian criteria for obesity, which are generally lower than the international WHO criteria, acknowledging the tendency for Asian populations to have higher body fat percentages at lower BMIs:

- Underweight: <18.5 kg/m2
- Normal: 18.5−22.9 kg/m2
- Overweight: 23.0−24.9 kg/m2
- Obese: ≥25.0 kg/m2

Ethical Considerations

The study protocol was reviewed and approved by the local institutional ethical committee. Informed written consent was obtained from all participants prior to data collection, ensuring confidentiality and voluntary participation.

Statistical Analysis

Data were entered and managed using Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0. Descriptive statistics, including mean and percentage, were used to summarize the socio-demographic and BMI classification data. The independent samples t-test was employed to compare the mean BMI between the married

and unmarried groups. A p-value of less than 0.05 (α=0.05) was considered statistically significant.

Results

Participant Characteristics and Descriptive Statistics

The study sample comprised 40 women, equally divided into 20 married (without children) and 20 unmarried individuals. The mean age of the overall sample was approximately 27.5±3.1 years. .

Comparative Analysis of Mean BMI

The primary finding was the significant difference in the mean BMI between the two groups:

- Married Women (without children): Mean BMI = 26.5 kg/m2 (SD=2.26)
- Unmarried Women: Mean BMI = 18.77 kg/m2 (SD=1.47)

An independent samples t-test was conducted to determine the statistical significance of this difference. The calculated t-value was 6.18. Comparing this to the table value of 1.99 for 38 degrees of freedom at the 0.05 level of significance, the result was highly significant (tcalc =6.18>ttable=1.99). This confirms a statistically significant difference in BMI, with married women having a substantially higher mean BMI than unmarried women ($p<0.001$).

BMI Classification and Prevalence

The distribution of participants across the BMI categories (Underweight, Normal, Overweight, Obese), according to the Asian criteria, revealed a stark contrast in the prevalence of abnormal weight status (overweight and obesity) between the two groups.

Marital Status	Underweight (%)	Normal (%)	Overweight (%)	Obese (%)
Married (n=20)	10	25	55	10
Unmarried (n=20)	25	60	10	5

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Key Prevalence Findings:

- Prevalence of Overweight and Obesity:
  - Married Women: A combined 65% (55% Overweight + 10% Obese) fell into the high-risk categories.
  - Unmarried Women: A combined 15% (10% Overweight + 5% Obese) fell into the high-risk categories.
- Normal Weight Prevalence: 60% of unmarried women maintained a normal BMI, compared to only 25% of married women.
- Underweight: Unmarried women had a higher prevalence of underweight (25%) compared to married women (10%).

The data unequivocally demonstrate that a majority of the married women in the study sample were either overweight or obese, while the majority of unmarried women maintained a normal weight.

Discussion

Interpretation of the Key Finding

The study demonstrates a highly significant association between marital status and BMI among young adult women in Vellore, Tamil Nadu. The substantially higher mean BMI and the alarmingly high prevalence of overweight/obesity (65%) in married women compared to unmarried women confirms the hypothesis that marriage is a potent, independent predictor of weight gain in this demographic, even when controlling for the variable of childbearing. The t-test result ($t=6.18, p<0.001$) provides robust statistical evidence for this claim.

Mechanisms of Marital-Related Weight Gain

The observed weight gain in the married group can be attributed to several intertwined behavioral and socio-cultural factors common in the Indian context:

- Dietary Changes: Post-marriage, women often assume primary responsibility for household meal preparation. This may involve cooking richer, higher-calorie family meals, increased social eating, or a shift towards convenience/processed foods due to time constraints, often leading to increased calorie consumption.
- Reduced Physical Activity: The onset of marital and domestic responsibilities (e.g., household chores, running errands for the extended family) often substitutes for dedicated leisure-time physical activity or exercise. The time and motivation previously allocated to fitness may diminish once the social pressures associated with dating and finding a partner are reduced.
- Socio-Cultural Norms: In certain segments of Indian society, a woman gaining weight after marriage is sometimes culturally perceived as a sign of well-being, prosperity, or successful adaptation to domestic life. This lack of social pressure to maintain a thin physique can contribute to weight creep.
- Stress and Adaptation: The adjustment to a new family and lifestyle, especially in joint family setups, can induce stress and emotional eating in some individuals, further contributing to weight gain.

These findings are consistent with earlier international studies (e.g., *Jackson et al., 2012*; *Kac et al., 2004*) and various Indian studies that have reported a consistently higher prevalence of obesity among married women compared to their unmarried counterparts.

Public Health Implications

The finding that 65% of young married women without children are already in the overweight or obese category is a major public health concern. This age group is at a critical juncture for establishing long-term health habits. Early-onset obesity drastically increases the lifetime risk of developing NCDs like diabetes and hypertension. Furthermore, obesity in this age bracket can negatively impact reproductive health and increase the risks associated with future pregnancies.

The relatively high prevalence of normal BMI in unmarried women (60%) suggests that targeted interventions focused on the period *immediately following marriage* could be highly effective.

Limitations and Future Directions

The main limitations of this study are:

1. Small Sample Size (n=40): While the results were statistically significant, the small sample size limits the generalizability of the findings to the broader female population of Tamil Nadu.
2. Cross-Sectional Design: This design only establishes an association, not a cause-and-effect relationship. Longitudinal studies are needed to definitively track individual weight changes pre- and post-marriage.
3. Lack of Detailed Lifestyle Data: The study did not deeply investigate specific changes in diet, physical activity levels, or psychological stress, which are the hypothesized mediators of the observed weight difference.

Future research should focus on: (1) larger, community-based samples; (2) longitudinal studies tracking women from pre-marriage to post-marriage; and (3) detailed qualitative and quantitative assessments of dietary, physical activity, and psychological changes to precisely identify the modifiable factors contributing to weight gain.

Conclusion

This comparative study decisively concludes that married women (without children) in Vellore, Tamil Nadu, exhibit a significantly higher tendency toward overweight and obesity compared to unmarried women of a similar age group. The mean BMI difference is statistically robust, and the prevalence of obesity-related risk is substantially elevated in the married group.

These findings underline the urgent need for public health interventions that are specifically tailored to address this high-risk life transition. Such interventions should include:

- Awareness Programs targeting newly married couples about the risks of post-marital weight gain.
- Lifestyle Modification Strategies focusing on couple-based physical activities and healthy cooking practices.
- Preventive Screening and counseling services integrated into routine pre- and post-marital health checks in both public and private health sectors in Tamil Nadu.

Addressing this weight disparity is crucial for improving the long-term health and reducing the NCD burden on women in the region.

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