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Assessment of Anthropometric Measures and Prediction of Obesity among Selected Nursing College Students

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Abstract

Introduction: Obesity is a global epidemic that affects 500 million people worldwide and is predicted to increase to one billion people by 2030**.** Overweight and obesity are linked to more deaths worldwide than underweight. Obesity is now also a global epidemic

Objective: The aim of the present study was to estimate the prevalence of overweight and obesity among selected nursing college students and to explore the association between BMI with Waist Hip ratio

Method: A Quantitative approach and Descriptive survey design was conducted on a sample of students who were studying in the SRM College of Nursing during the academic year 2015–2016 . A Non Probability convenient sampling technique was used to select a sample. The Sample size was 200.Based on the Inclusion and Exclusion Criteria the Sample were selected. The tool comprises of two sections. Section A: Demographic variables and Section B: Anthropometric measurements. A total of 203 students who fulfilled the inclusion criteria were chosen as samples using non-probability convenient sampling technique. The study was conducted at SRM College of Nursing, Kattankulathur.

Results: Our study included 203 students at SRM college of Nursing . We found that 11.8% of the studied participants (24 students) were overweight, 1% (2students) were obese and 56.7% (115 students) represent normal and 30.5%(62 students) were underweight. The p-value from the table above is less than 0.05 showed that there is significant association between "BMI" and "WHR" at 5% level of significance.

Conclusion: The Waist hip ratio **(WHR**) is a simple measure of central obesity. WHR was shown to be a good predictor of health risk

Keywords: *Obesity, Global epidemic, prevalence, Overweight.*

Introduction

Overweight and obesity were found to be a rising public health crisis. The worldwide prevalence of obesity nearly tripled between 1975 and 2016. The CDC defines overweight and obesity as "ranges of weight that are greater than what is generally considered healthy for a given height" and which may "increase the likelihood of certain diseases and other health problems."[(1)]Changes in body composition vary in different stages of life and are always reflected in anthropometric measurements. Anthropometric evaluation is economical, non-invasive and provides detailed information on the different components of muscular and fat components and can support in assessing the nutritional status of a population[(2).] Anthropometric measurements include height, weight, BMI, Waist hip ratio, skin-fold thickness etc. Body mass index or BMI is a simple and broadly used method for estimating body fat mass**.** Body Mass Index is a person's weight in kilograms divided by the square of height in meters. BMI from 18.5 up to 25 kg/m^2 indicates optimal weight, a BMI lower than 18.5 suggests underweight, 25 to 30 indicate the person is overweight, and a number greater than 30 suggests the

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person is obese.[3,4] Obesity is an excessive accumulation of body fat. "Overweight" is defined as having any excess weight outside of the ideal range. Although adolescents have fewer weight-related health problems than adults, overweight students are at high risk of becoming overweight adults Overweight people of all ages are prone to a number of health problems.[5]

The Waist hip ratio **(WHR)** is a simple measure of central obesity. WHR was shown to be a good predictor of health risk [6]. The WHO states that abdominal obesity is defined as a waist-hip ratio above 0.90 for males and above 0.85 for females, or a body mass index (BMI) above 30.0.[7] These anthropometric indices have been frequently used in epidemiological studies as they can be determined easily and at low cost [8] Maintaining good health status during college stage is very crucial. Obese students are more likely to become obese adults.[9,10] students are overweight, obesity in adulthood is likely to be more severe.. BMI and WHR measurements can be utilized as a screening mechanism to gauge the risk for disease that can develop due to being overweight or obese.[11] Perfect anthropometric measurements helps in assessing the health of individuals and to choose suitable treatments and interventions essential to maintain or improve good health. Hence the present study was conducted to assess the anthropometric measures and predict obesity among selected nursing college students.

Objective

The aim of the present study was to estimate the prevalence of overweight and obesity among selected nursing college students and to explore the association between BMI with Waist Hip ratio

Variables

Study Variable: Assessment of Anthropometric Measures and Prediction of Obesity

Demographic Variables: Age, Year of Study, Gender, Residence, parents' educational level, Father occupation, Mother occupation,Family size and Numbers of Sibilings

Subjects and Method

Study design: A Quantitative approach and Descriptive survey design was conducted on a sample of students who were studying in the SRM College of Nursing during the academic year 2015–2016

Study population and sampling: All the students from the Nursing College were the Study population A Non Probability convenient sampling technique was used to select a sample. The Sample size was 200.Based on the Inclusion and Exclusion Criteria the Sample were selected.

Inclusion criteria

- Students aged between 18 and 22 years were included,.
- Students who are interested to participate in the study
- Students who are willing to participate

Exclusion Criteria

- Children with chronic illness as well as those on corticosteroid therapy or growth hormone replacement therapy and children with chromosomal disorders were excluded. chronic illnes, metabolic diseases and physically challenged.
- Participants taking medications that potentially cause significant weight gain (eg, risperidone, olanzapine, clozopine
- Participants using medications for weight loss

Data collection procedure: Permission was obtained from Head of the Institution.. Then the researcher visited the College Students to inform them about the survey. All the students from the Bsc(N)I yr to BSc(N)IV yr were included in the study. To each Student consent form was given.After having got the agreement consent from the Dean and the students, data were collected by the following tools.

A-Questionnaire: The contents of the prepared questionnaire were explained to the students before handling. The included questionnaires were.

Demographic Variables: Age, Year of Study, Gender, Residence, parents' educational level, Father occupation, Mother occupation,Family size and Numbers of Sibilings

B-Anthropometric measurements: The researcher personally took different anthropometric measurements at the examination room .All measurements were taken using the same type of apparatus and followed the same procedures recommended by Cameron.

- Height was measured to the nearest 1 cm while the students stood straight on the stadiometer barefoot and the head aligned so that the auditory canal and lower rim of the orbit were in a horizontal plane.
- Weight was measured to the nearest 0.5 kg using digital scales while the students wore a light school uniform and were barefoot.
- Body mass index: it was calculated by dividing weight in kg by square height in meters.
- Waist Hip ratio was measured by making the student stand up straight and breathe out. Use a tape measure to check the distance around the smallest part of their waist, just above their belly button. This is the waist circumference.
- Then measure the distance around the largest part of the hips — the widest part of the buttocks. This is the hip circumference.
- Calculate the WHR by dividing the waist circumference by the hip circumference.

Statistical analysis: The information collected from the study participants was scored and tabulated. The data were entered into the master coding sheet and saved in Microsoft Excel. Statistical analysis was conducted using Statistical Package for Social Sciences-16. Mean, percentage, and standard deviation were used to explain the demographic variables, and Chi-square test was used to associate the BMI with Waist Hip ratio

Results

Table 1: Frequency and Percentage Distribution of Body Mass Index

N=203

S. No.	BMI Level	No. of adolescent girls	Percentage
1	Under Weight	62	30.5%
2	Normal	115	56.7%
3	Over Weight	24	11.8%
4	Obese	2	1.0%
Total		203	

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Table 2: Frequency and Percentage Distribution of Waist Hip Ratio

N=203

S. No.	WHR Level	No. of adolescent girls	Percentage
1	Normal	78	38.4%
2	Obese	125	61.6%
Total		203	

We found that, 61.6 % (125 students) were obese and 38.4% (78 students) represent Normal.

Table 3: Association between BMI with WHR

S. No.	Body Mass Index	Waist Hip Ratio		Chi-Square value	Degrees of Freedom	P-value
		Normal	Obese			
1	Under Weight	18	44	9.539	3	0.023*
2	Normal	44	71			
3	Over Weight	14	10			
4	Obese	2	0			

*-Significant at 5% level

**-Significant at 1% level

The p-value from the table above is less than 0.05 hence we conclude that there is significant association between “BMI” and “WHR” at 5% level of significance.

Discussion

Global scenario: Obesity is a global epidemic that affects 500 million people worldwide and is predicted to increase to one billion people by 2030**.** Overweight and obesity are linked to more deaths worldwide than underweight. Obesity is now also a global epidemic. Globally there are more people who are obese than underweight Worldwide obesity has more than doubled since 1980. Globally, the prevalence of childhood obesity has risen in recent years. The International Association for the Study of Obesity (IASO) and International Obesity Task Force (IOTF) estimate that 200 million school children are either overweight or obese [8]. Accordingto **WHO-2016.** Obesity has increased from 4.2% in 1990 to 6.7% in 2010 worldwide and is expected to reach 9.1% in 2020. Worldwide 43 million children were estimated in year 2010 including 35 million (81.4%) from developing countries. Mexico ranks second to the United States in rates of pediatric obesity[12]

International scenario: Globally, the prevalence of childhood obesity has risen in recent years. The International Association for the Study of Obesity (IASO) and International Obesity Task Force (IOTF) estimate that 200 million school children are either overweight or obese [13].

According to **centers for disease control and prevention** (2011-2014) among children and adolescents aged 2-19 years in the united states the prevalence of obesity has remained fairly stable at about 17% and affects about 12.7 million children and adolescents. The prevalence of obesity was higher among Hispanics (21.9%) and non-Hispanic blacks (19.5%) than among non-Hispanic whites (14.7%).The prevalence of obesity was 8.9% among 2- to 5-year-olds compared with 17.5% of 6- to 11-year-olds and 20.5% of 12- to 19-year-olds.[14]

Recent figures from the IOTF website showed prevalence rates of overweight/obesity as 40 per cent in both genders in US.

UK National schools measurement program suggest that 21.90%children are overweight (>85th percentile)and 9.1% of children are obese(>95th percentile).(23).By the age of 11 years 33.2% of children are overweight and 19.1 % obese.

The Times of India, **Jul 4, 2015** reported across the globe 42 million children were affected by obesity in 2013 and the prevalence rate of obesity worldwide rose by 47% or children between 1580 and 2013

National scenario

The Times of India, Jul 4, 2015 reported that in India, over 15 million children are currently estimated to be overweight and added that if current trends continues over 70 million infants and young will be overweight or obese by 2025

According to national family health survey 2015-16 report, Women 15-49 years who are overweight or obese (BMI ≥ 25.0 kg/m2)14 (%) 36.2 % in urban 25.4% in rural area is obese. Men15-49 years who are overweight or obese (BMI ≥ 25.0 kg/m2) (30.6% in urban, 25.6 in rural areas in women age 20 In Tamil Nadu

Healthy people 2010 identified obesity is largely preventable but the incidence continue to increase worldwide. childhood obesity is associated with higher chance of premature death and disability in adulthoods.Schools are a potentially important channel of intervention because they offer access to large populations of students and provide the opportunity to institutionalize programs in communities;Improvements inanger, mood, bodily pain, physical functioning and vitalityare associated with gains in aerobic fitness (capacity of theCirculatory and respiratory systems to supply and utilize oxygen during sustained physical activity

While intensive lifestyle programs can have positive clinical outcomes in adults,few studies have reported successful interventions in children and adolescents**.** The prevention of child obesity has been recognized as a public health priority considering the difficulty in curing obesity and overweight in adults and many long term adverse effects of childhood obesity

Statement of Humanand Animal Rights All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008

Statement of Informed Consent Informed consent was obtained from all the study participants for being included in the study.

Conclusion

Nurses have a role in promoting preventive measures and identifying and treating obesity-related co morbidity. Pediatric obesity is not an individual child's problem, but a problem that involves the whole family and the community. Recommending a healthy diet and increased physical activity and counseling families on behavior change is the best approach to preventing and managing childhood obesity

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