Dissertation Report

On

"ROLE OF OBESITY IN THE DEVELOPMENT OF Polyendocrine Metabolic Ovarian Syndrome (PMOS) AMONG WOMEN: A DESCRIPTIVE CROSS-SECTIONAL STUDY"

At

International Institute of Health Management Research, New Delhi

IIHMR DELHI

NAAC 'A' Grade

From April 2024 to June 2026

Under the Guidance of

Dr. Sumant Swain

(Assistant Professor, IIHMR Delhi)

Submitted By - Dr. Kokil Agrawal

PG/24/030

Post-Graduate Diploma in Hospital and Health Management

BATCH - 2024-2026

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The certificate is awarded to

Kokil Agrawal

in recognition of having successfully completed her
Internship and Project on

ROLE OF OBESITY IN THE DEVELOPMENT OF Polyendocrine Metabolic Ovarian Syndrome (PMOS) AMONG WOMEN:

A DESCRIPTIVE CROSS-SECTIONAL STUDY

Date : 06/06/2026

IIHMR

She comes across as a committed, sincere and diligent person
who has a strong drive and zeal for learning.
We wish her all the best for future endeavors.

Training & Development

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

DECLARATION BY STUDENT

I hereby declare that this dissertation titled "**Role of Obesity in the Development of Polyendocrine Metabolic Ovarian Syndrome (PMOS) Among Women: A Descriptive Cross-Sectional Study**" is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



Kokil Agrawal

Date: 10.06.2026

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Kokil Agrawal, student of PGDM (Healthcare Management) from **International Institute of Health Management Research, New Delhi**, has undergone internship training at **International Institute of Health Management and Research, New Delhi** from **05/04/26 to 09/06/26**. The candidate has successfully carried out the project designed to her during internship training and her approach to the study has been sincere, scientific and analytical. The internship is in fulfilment of the course requirements.

I wish her all success in all her future endeavours.

Dr. Puneet Yadav
Associate Dean, Academic Affairs
IIHMR, New Delhi

Dr. Sumant Swain
Dissertation Project Advisor
IIHMR, New Delhi

CERTIFICATE OF APPROVAL

This is to certify that the primary research dissertation project report titled **"Role of Obesity in the Development of Polyendocrine Metabolic Ovarian Syndrome (PMOS) Among Women: A Descriptive Cross-Sectional Study"** carried out and presented by **Dr. Kokil Agrawal** under Roll Number **PG/24/030** in partial fulfillment of the course curriculum for the Post-Graduate Diploma in Hospital and Health Management at the International Institute of Health Management Research (IIHMR), New Delhi, is an authentic record of original research work.

The candidate has successfully integrated feedback from preliminary research proposals, completed data collection and analysis of 370 study participants under my supervision, and carried out a comprehensive evaluation of the study findings.

Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
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Dr. Shiv	

Certificate from Dissertation Advisory Committee

This is to certify that **Kokil Agrawal**, a graduate student of the **PGDM (Hospital & Health Management)**, has worked under our guidance and supervision. She is submitting this dissertation titled **"Role of Obesity in the Development of Polyendocrine Metabolic Ovarian Syndrome (PMOS) Among Women: A Descriptive Cross-Sectional Study"** in partial fulfilment of the requirements for the award of the **PGDM (Hospital & Health Management)**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Dr. Puneet Yadav
Associate Dean, Academic Affairs
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LIST OF ABBREVIATIONS

Abbreviation	Full Form
PMOS	Polyendocrine Metabolic Ovarian Syndrome
BMI	Body Mass Index
WHO	World Health Organization
IIHMR	International Institute of Health Management Research
RI	Insulin Resistance
SHBG	Sex Hormone-Binding Globulin
LH	Luteinizing Hormone
FSH	Follicle-Stimulating Hormone
GnRH	Gonadotropin-Releasing Hormone
MetS	Metabolic Syndrome
PGDHM	Post Graduate Diploma in Hospital and Health Management
DQL	Data Query Language
AKS	Azure Kubernetes Service
CI	Confidence Interval
SD	Standard Deviation
N	Sample Size
p	Probability / Prevalence estimate
q	Complementary probability (1 − p)
d	Margin of error / Precision
Z	Standard normal deviate

LIST OF SYMBOLS

Symbol	Meaning
%	Percentage
≥	Greater than or equal to
≤	Less than or equal to
<	Less than
>	Greater than
=	Equal to
±	Plus–minus
×	Multiplication
/	Division
kg/m²	Kilogram per square meter (BMI unit)
'	Minutes (if used in time context)
"	Inches or quotation marks (used in titles)
( )	Parentheses (used for grouping / explanation)
[ ]	Brackets (used for references or notes)
…	Ellipsis (continuation)
↑	Increase (used for trend interpretation, optional)
↓	Decrease (used for trend interpretation, optional)

ABOUT ORGANISATION



Introduction

The IIHMR (International Institute of Health Management Research), New Delhi is associated with the Society for Indian Institute of Health Management Research, which was constituted in October 1984 according to Societies Registration Act, 1958. It was set up in New Delhi in 2008 to satisfy the emerging requirement of sustainable management principle and administrative techniques needed for effectively running healthcare services in India and the Asia Pacific region.

Over the years IIHMR has grown as a reputable institute nationally and internationally known for producing socially committed and skilled and competent healthcare management experts.

IIHMR focuses on innovation in research, health policies, and management practices. In

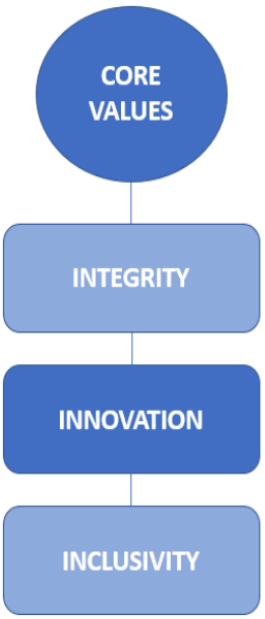
addition to having a well qualified faculty and modern facilities, IIHMR equips students to gain proficiency and expertise in public health, hospital administration, and health information technology. The institute ensures a collaborative learning process to prepare its students for leadership positions in national and international health organizations.

Mission

The ultimate objective of IIHMR Delhi is to enhance the quality of health by making healthcare-related operations more efficient. This is to be accomplished through institutional networking, along with both domestic and international training, consultancy, and management research.

Vision

As a premier player in health management education, training, research, program management, and consultancy, IIHMR is well known in the global health care industry. With its core values of quality, accountability, trust, transparency, and information sharing, the Institute promotes itself as a learning organization. Through its efforts in various programs for the disadvantaged and poor, the Institute aims for social justice and development.



CHAPTER 1:

INTRODUCTION

1.1 Introduction to the Issue

The Problem Introduction to the Issue The polyendocrine metabolic ovarian syndrome (PMOS) is considered a multifactor disease, occurring in women within their reproductive age. The syndrome is defined by the presence of a number of abnormalities related to reproductive system, hormones, and metabolism. Patients with PMOS usually suffer from irregular menstrual periods, ovulatory disorders, high androgen concentrations, and metabolic dysfunctions. In recent decades, the issue has become a major public health problem due to its rising prevalence rates and the consequences associated with the disease. Indeed, PMOS negatively affects the reproductive function and women's metabolic state. Moreover, patients with this syndrome are often faced with infertility problems, body weight regulation issues, insulin resistance, and the development of various diseases in the future. One of the key factors involved in the occurrence of PMOS includes obesity. The excess body weight has an effect on the hormonal level and insulin metabolism. This way, the interaction between the processes leads to the vicious circle, where obesity causes the progression of PMOS and PMOS, in turn, makes it more difficult to control body weight.

1.2 Background of the Study

There has been a considerable rise in obesity cases globally within the last few decades. Changing dietary patterns, reduced physical activities, increasing urbanization and stressful lives of people have led to high incidences of obesity and overweight among both adults and adolescents. Besides, there has also been a rise in endocrine and metabolic diseases like PMOS in the society. Various researches conducted worldwide have established that there is a relationship between obesity and polycystic ovary syndrome (PMOS). Overweight women have been found to suffer from increased problems of insulin, male hormones and symptoms compared to those with normal weights. Nevertheless, overweight women do not have PMOS alone; PMOS can affect all women regardless of their body size. Nonetheless, being overweight makes the effects of the disease on both metabolism and reproduction of the women severe. Therefore,

management of weight can be part of treatment of PMOS. The burden of PMOS has been increasing in India. There are rapid changes in life styles in the country. Furthermore, there has been high intake of processed foods, sedentary jobs and reduction of physical activities among women in India. The implications of this development include worries about the increase in the occurrence of metabolic diseases among the reproductive age group. With this background in mind, it is necessary to study the impact of obesity on PMOS among women from a clinical as well as public health perspective.

1.3 Problem Statement

Statement of Problem PMOS is considered one of the most prevalent endocrine conditions amongst women of reproductive age. Although a considerable number of studies have been published on the subject in recent years, there is still lack of knowledge concerning the association between the development of obesity and the onset of PMOS. There is a lot of literature concerning the impact of obesity in the population admitted to hospitals, but it does not cover the entire community. There is little knowledge concerning the effects of obesity on a certain condition called PMOS in the case of Indian females. Such information is needed, because obesity can be modified and it is crucial to understand the way it affects the patients in order to develop an effective public health intervention program. It is impossible to develop such a program in case of a lack of data concerning the effects of obesity on particular diseases. We need to learn about the impacts of obesity on a certain disease in order to design a proper intervention strategy for the population of Indian females. The issue we are dealing with is PMOS and we try to establish whether obesity has any relation to PMOS. The question that interests us is as follows: Does obesity contribute to PMOS development among women?

1.4 Objectives of the Study

Primary Objective :

The purpose is to investigate the relationship between obesity and the formation of Polyendocrine Metabolic Ovarian Syndrome (PMOS).

Secondary Objectives :

- To determine the effect of obesity on the level of insulin resistance in women with PMOS.
- To make comparisons between the metabolic and hormonal factors between obese and non-obese women suffering from PMOS.
- To determine the impact of obesity on the severity and symptomatology of PMOS. To analyze the distribution of PMOS in different body mass index categories.

1.5 Research Questions

This research seeks to address the following queries:

- What is the BMI distribution in the study population of women?
- Is there any relationship between rising BMI levels and the presence of PMOS?
- Do women who are overweight and obese have more intense symptoms of PMOS?
- Can PMOS be experienced by women with normal BMI?
- How does obesity affect the development of PMOS?

1.6 Scope of the Study

This study examines women aged 15 to 49 years, which is the period when females are able to conceive. It aims to clarify the relationship between BMI of the female patients and their PMOS. In order to reach the aforementioned objective, the study analyzes data of 370 females who participated in it.

Specifically, this study focuses on the following aspects:

- BMI distribution among participants.
- Prevalence of PMOS by BMI categories.
- Clinical symptoms common to PMOS.
- Obesity as a risk factor that may lead to PMOS.

This study utilizes self-reports provided by the participants. Therefore, no biological testing of participants' organisms is required. It means that the results should be viewed as an approximate description of the situation, rather than as an accurate analysis of it.

1.7 Significance of the Study

The study is essential since it seeks to investigate one of the increasing public health concerns that affect women of reproductive age. The study will give insights on how obesity influences a woman's susceptibility and severity of PMOS. This would then inform healthcare practitioners of high-risk patients in order for treatment to begin as soon as possible. Publicly, the study will emphasize the significance of maintaining healthy lifestyles in prevention of complications of obesity. Awareness programs regarding proper nutrition and physical activities will be reinforced as a result of the findings of this study. Lastly, this research contributes to the field by investigating a health concern within an Indian setting which may differ greatly from other countries.

1.8 Outline of Research Approach

This research utilizes a descriptive cross-sectional research design. Data on demographic characteristics, BMI status, PMOS diagnosis, symptoms, and lifestyle factors were obtained from 370 women using a structured questionnaire. We reviewed the data collected by focusing on measures of occurrence, percentiles, and comparisons between groups. In this way, we managed to identify the relationship between being overweight and a disorder called PMOS. The use of such methodologies enabled us to reveal certain patterns and relationships. This research does not aim to determine the causal links between phenomena under consideration. This research examines the distribution of PMOS in different populations depending on the body mass index (BMI). The objective of this research is to examine the patterns or trends that may be revealed in the data collected by the researchers among participants.

1.9 Theoretical Framework

This study is grounded in the theoretical connection between obesity, insulin resistance, hormonal imbalance, and the development of PMOS. Obese patients experience changes in metabolism due to the increase in body fat and the presence of excess fat around the abdomen. An increase in body fat increases insulin resistance, which is defined as reduced insulin sensitivity of body cells. Consequently, insulin release from the pancreas increases, resulting in normal metabolism of glucose. High insulin levels

trigger the secretion of excess androgens in the ovaries and decrease sex hormone-binding globulin (SHBG). This triggers hormonal imbalance, affects ovulation, and contributes to the development of PMOS.

1.10 Pathophysiological Relationship Between Obesity and PMOS

Pathophysiology Linking Obesity and PMOS Pathophysiology link between obesity and PMOS encompasses metabolic and hormonal processes that are interconnected. The buildup of visceral fat leads to increased inflammation in the body. This inflammation causes the condition known as insulin resistance. Therefore, there is a rise in insulin levels in the body. High insulin levels cause the formation of androgens and abnormal functioning of ovaries. Thus, ovulation becomes abnormal and symptoms arise. It is a vicious cycle that is difficult to escape. Being obese leads to an aggravation of the condition of PMOS. In addition, PMOS interferes with your metabolism causing further obesity. Thus, without doing anything about the problem, the situation will get worse. It is a kind of vicious circle when being obese makes the condition of PMOS worse and vice versa.

1.11 Significance for Healthcare Management

PMOS is not only a disease of the gynecologic nature; it also carries metabolic significance and is a public health problem. The successful treatment of this pathology may involve the collaboration between several medical professionals, including gynecologists, endocrinologists, nutritionists, and others. The weight control is crucial for the prevention and treatment of PMOS. There are studies demonstrating the positive effect of weight loss on insulin resistance and hormonal disorders. Consequently, the early diagnosis of obesity and appropriate interventions in a patient's life style have the ability to promote improved health outcomes for women. From the perspective of healthcare management, there is a chance to alleviate the problems caused by PMOS through preventive measures, education, screening, and other methods.

CHAPTER 2:

REVIEW OF LITERATURE

One of the main themes in the research registry for endocrine science in the international community concerns the link between obesity and endocrine problems. In this section, the highlights of six studies will be presented that shed light on the connection between obesity and Polyendocrine Metabolic Ovarian Syndrome.

2.1 Introduction

Polyendocrine Metabolic Ovarian Syndrome (PMOS) is a complicated disease that has numerous manifestations for different spheres of a female's health. Although the syndrome is usually associated with menstrual disorders and infertility, in the last few years there were numerous studies proving close connection of this syndrome with obesity, insulin resistance, and metabolic disturbances. All these factors contribute significantly to the development and progression of the disorder. Over the past 20 years, a lot of researchers from all over the world have been researching the association between obesity and PMOS. There is a lot of evidence that being overweight, especially being centrally or abdominally obese, can cause the hormonal disturbance contributing to the development of this disease. However, it is also evident that women with PMOS have problems with maintaining their normal weight due to metabolic disorders. Thus, obesity becomes a key factor of PMOS study. In this chapter, the literature review on the problem of obesity, insulin resistance, hormonal imbalance, lifestyle factors, and PMOS will be conducted. It will form the theoretical and empirical basis for the study.

2.2 Global Studies on PMOS and Obesity

Poly-cystic ovary syndrome or PMOS has been identified to be a very widespread issue among the majority of women of reproductive age group. A number of studies conducted in various parts of the world have attempted to assess the prevalence of this syndrome. However, these studies come up with conflicting results due to varying criteria employed by researchers to diagnose PMOS and varying samples studied. Despite this conflicting trend of research, there has been an agreement about one of the risk factors of developing PMOS – overweight/obesity. It is evident that the latter

is only one of the factors contributing to the development of PMOS, but the relationship between obesity and the syndrome should not be underestimated.

According to Azziz et al., PMOS is a significant health problem affecting many women all over the world. The authors mentioned the complications that this condition causes in terms of reproduction and metabolism. In addition, their article demonstrated the increasing significance of the understanding of those factors that contribute to the development and course of this disease. In a similar way, Bozdag et al. performed a systematic review and noticed a great variability of the prevalence rate for different territories. They also emphasized the effect of environmental and lifestyle factors. The studies in both developed and developing countries have proven that the women with obesity and PMOS have more pronounced symptoms compared with those who have normal body mass index. Those symptoms include menstrual problems, infertility, insulin resistance, and high androgen levels.

2.3 Obesity as a Risk Factor for PMOS

One of the most widely explored factors contributing to PMOS is obesity. Adipose tissue has an impact on the number of physiological processes such as carbohydrate metabolism, insulin activity, inflammatory response, and hormones. As a result, obesity can cause problems with reproductive and metabolic health. In particular, Lim et al. note that PMOS women who have excess weight are prone to greater metabolic abnormalities compared to women with normal weight. Insulin resistance, high level of androgens, and reproductive disorders were observed among obese patients. In addition, Barber and Franks view adipose tissue as an organ producing inflammation mediators that disturb proper hormonal activity. Obesity should be taken into account since we are able to deal with this problem. Unlike other risk factors that cannot be changed due to natural characteristics of an individual, obesity can be influenced by different lifestyle decisions. Thus, obesity prevention and treatment is a very important element of maintaining good health. It means that if it is possible to explore the way how obesity impacts people, it will be possible to create interventions aimed at changing people's behavior to improve their health status.

2.4 Insulin Resistance and Hormonal Imbalance

Thus, when it comes to the relationship between obesity and PMOS, insulin resistance may be one of the connecting factors. Insulin resistance refers to the process wherein the body does not react properly to the insulin hormone. The pancreas then needs to produce larger amounts of insulin in order to maintain normal blood glucose levels. Through her pioneering research on PMOS, Dunaif demonstrated that insulin resistance was one of the characteristic features of PMOS. According to the findings of the study, many patients with PMOS showed impaired insulin sensitivity regardless of their body mass, while obesity made the situation worse. Later on, Cassar et al. verified these results through a systematic review and indicated that there is a strong association between obesity and the progression of insulin resistance in PMOS patients. Elevated levels of insulin affect the functioning of ovaries by increasing the production of androgens. According to Diamanti-Kandarakis et al., hyperinsulinemia causes direct changes in the hormonal balance, which then affects the ovulation and menstrual cycle of women. Besides, the higher levels of insulin decrease the concentration of SHBG, causing increased levels of testosterone.

2.5 Clinical Manifestations of PMOS in Obese Women

Numerous studies on the effects of obesity on the symptoms of PMOS have been carried out. The findings clearly suggest that overweight and obese women tend to show more pronounced symptoms than women of lower BMI. Pasquali et al. state that abdominal obesity is highly linked with metabolic disturbances and hormonal dysfunctions among women suffering from PMOS. According to them, fat deposition in the abdomen plays an important role in the development of the disease. Moran et al. noticed that overweight women usually suffer from menstrual irregularities, infertility, and metabolic disturbances more than women with normal weight. Thus, just being obese does not necessarily lead to the disease. There exist lean women with PMOS as well. This phenomenon has been labeled "lean PMOS" by Carmina et al. It turns out that genetics, hormone imbalance, as well as fat deposition, can influence PMOS development in the body. Therefore, being obese is not the only factor that plays a key role in the development of this disorder.

2.6 Central Obesity and Fat Distribution

Recent Several studies have found fat distribution to be as crucial to understand PMOS as overall body weight. Central obesity, in particular, which is characterized by an excessive accumulation of abdominal fat, has been linked with metabolic disorder. Several studies have found that women who have PCOS, otherwise known as PMOS, develop more central fat than healthy individuals. The dangerous aspect of such fat is that it is active in the sense that it causes the production of inflammatory substances, leading to insulin resistance and hormonal disorders. In the same way, it was also found that people of South Asian origin are usually prone to "thin-fat phenotype". By that, it is meant that such people despite their appearance being slim still accumulate much fat in their abdomen region, making themselves more vulnerable to metabolic abnormalities. This is particularly dangerous as even seemingly healthy people may still face such risks if they have lots of fat around their abdomen. It means that simply measuring the Body Mass Index of an individual is not enough in order to understand how obesity may influence his/her metabolic state.

2.7 Indian Studies and Lifestyle Patterns

PMOS is increasingly becoming prevalent among people in India, particularly those living in cities. Such prevalence is attributed to various lifestyle changes that are being experienced currently. First, there are differences in the diets that individuals consume currently as compared to the past. People are less active and therefore lack physical exercises. Additionally, the level of stress and obesity is on the increase. This explains why PMOS is on the increase in India. According to Nidhi et al., prevalence of PMOS was noted to be common among adolescent girls, showing that it starts when people are young. As noted by Joshi et al., prevalence of PMOS varies greatly across India and its population groups. Their findings stressed the importance of conducting further studies in various settings to determine the exact prevalence rate. According to Gupta et al., there has been rapid urbanization in India resulting in change of lifestyle trends leading to obesity among women. In the same vein, Sharma et al. pointed out that the major causes of PMOS include poor diet habits, sedentary behavior, and psychological

stress.

2.8 Lifestyle and Environmental Factors

Several factors have been found to play a crucial role in the development of obesity and PMOS. Poor diet, lack of physical activity, sleep disturbances, and high levels of stress have been shown to trigger metabolic dysfunction and hormonal imbalances. According to WHO, one of the major factors behind the world's obesity epidemic is changes in people's lifestyles. As obesity continues to increase, there is also an increase in diseases related to it such as PMOS. According to the findings of Teede et al., a change in lifestyle is regarded as the primary means to address the problem of PMOS. Nutritional and behavioral interventions have been suggested to improve reproductive and metabolic conditions of those suffering from PMOS. Numerous studies have revealed that regular physical activity and healthy nutrition are able to enhance insulin sensitivity, assist in weight reduction and reduce the severity of PMOS symptoms. Thus, changing one's lifestyle can be regarded as a necessary strategy aimed at preventing and managing PMOS. Changing one's lifestyle simply means introducing some modifications into one's habits. For example, walking for 30 minutes a day or eating more fruits and vegetables may bring considerable benefits.

2.9 Metabolic Syndrome and Long-Term Health Risks

PMOS is now considered to be a metabolic disorder, not just a reproductive one. Patients with PMOS have a higher chance of being diagnosed with metabolic syndrome, type 2 diabetes mellitus, hypertension, and cardiovascular diseases. According to Moran et al., the risk of developing metabolic syndrome is significantly higher in patients with PMOS than among general population. Zhang et al. noticed the high prevalence of risk factors for cardiovascular diseases as well. Such results indicate the necessity of considering long-term health consequences of the syndrome and taking actions to prevent them. In addition, obesity increases these risks. Thus, doctors are trying to diagnose PMOS and take necessary measures earlier and more consistently.

2.10 Management Approaches and Lifestyle Interventions

The management of PMOS should be approached holistically, taking into account its effects on your overall state and menstruation period. The initial recommendation from healthcare providers would include modifying your lifestyle through diet and exercise. It is typically the first step that is suggested for any woman who deals with PCOS. Weight loss can have a significant effect on the functioning of our organism. Some studies have shown that weight loss even of small amounts has been proved to have a beneficial effect on the state of our bodies – it can result in regulation of menstrual periods, improved functioning of our bodies in production of insulin, as well as balanced hormone levels. According to two specialists, Legro and Escobar-Morreale, it is necessary to note that in order to deal with PMOS, it is important to change our everyday routines rather than trying to do everything at once. Such actions can positively affect us not only in terms of PCOS but regarding our overall well-being and the functioning of our metabolic and hormone systems. Working with a group of specialists, such as gynecologists, endocrinologists, nutritionists, and even mental health professionals, may have a significant effect on your wellbeing. This team effort may be useful in addressing both the physical and emotional challenges that arise from PMOS. The collaboration among these specialists will help to achieve better outcomes for the patients.

2.11 Research Gap

While there has been extensive research into the connection between obesity and PMOS, there are still some areas that require attention. The majority of research works have been performed in clinical settings, which makes it difficult to generalize results to the whole population. There is also a shortage of community-level studies that can help identify how the BMI group is connected to PMOS among Indian women. What is more, a lot of research work has been devoted to the treatment or diagnosing of PMOS without looking into the distribution of symptoms among different groups depending on weight. Another problem that can be identified in the literature is the absence of studies where BMI classification and obesity, clinical symptoms, and PMOS are studied together.

2.12 Summary of Literature Review

Several studies have proved that there is a strong correlation between obesity and Polycystic Ovary Syndrome (PMOS). Researches conducted in different parts of the world including India have proven that obesity is associated with the development of insulin resistance and hormonal imbalance leading to worsening symptoms for women suffering from PMOS. Although PMOS can also occur in women with healthy body mass index (BMI), excess body fat and abdominal fat increases the severity of the syndrome and its effects on metabolism. This issue is a matter of great concern as it not only affects the reproductive system of women but has adverse impacts on their overall health. There is ample literature on the fact that unhealthy lifestyle and obesity are responsible for the development of PMOS. In spite of significant evidence available globally, the need for local research at community level in India still persists. The current research aims at filling this void by exploring the association between BMI and PMOS among women based on primary data gathered from 370 respondents.

CHAPTER 3
METHODOLOGY

3.1 Introduction

A good research methodology was necessary for the investigation of the impact of obesity on women of childbearing age, more specifically the women suffering from Polyendocrine Metabolic Ovarian Syndrome (PMOS). The research methodology ensures that the collected information is accurate and valuable. In the current research, a methodical approach was applied to investigate the connection between obesity and PMOS in fertile women. The objective of this research was to reveal whether there is any association between Body Mass Index (BMI) - an index that measures body fatness - and the probability of developing PMOS. With such structured methodology, it became possible to receive valuable information regarding the issue under consideration. This chapter describes the way we have designed our research and conducted it. We will speak about the target population, the number of participants in our study, the process of selection of the participants, the methods of collecting information, data analysis, and ethical considerations.

3.2 Research Questions

Methodology was formulated to provide answers to the following research questions:

- What is the distribution of BMI among the female subjects enrolled in the study?
- Is there any relationship between BMI and the prevalence rate of PMOS?
- Are overweight/obese women more prone to PMOS compared to women with normal BMI?
- What are the common clinical symptoms of PMOS among the subjects?
- How does lifestyle play a role in obesity and PMOS in women?

3.3 Research Design

In this research, a straightforward technique was applied for analysis of correlations between BMI and physical mobility (PMOS). The authors selected such a research design due to their need to assess the prevalence of a particular health problem

among a specific population and its associations with certain variables. This helps to obtain an understanding of the correlation between BMI and PMOS which is quite important. Cross-sectional research designs are excellent choices for assessment of prevalence and associated variables among a specific population. The descriptive nature of this study was helpful in describing the characteristics of the participants and identifying associations with body weight and PMOS occurrence. Due to the fact that the associations but not causal relationships were to be assessed, the cross-sectional design seemed to be appropriate.

Justification of Research Design Selection This design was chosen for the following reasons:

- It allows evaluation of both exposure and the outcome at the same time.
- It is cost- and time-efficient.
- It can be used to study prevalence.
- It helps determine the relationship among the variables in the population.

It gives us some valuable information which we can use for future research.

3.4 Study Area

This study specifically targeted women who lived in urban regions and the outskirts of such areas. The rationale behind choosing such samples was that the prevalence of weight and lifestyle-related disorders is increasing rapidly in such populations. Studies have shown that urbanization results in less physical activity among individuals, unhealthy eating habits, disturbed daily routines, and greater amounts of stress. All these factors are known to contribute to obesity and metabolic disorders. Thus, analyzing the selected groups of women would help to identify the effect of modern lifestyles on PMOS prevalence.

3.5 Study Population

The women between the ages of 15 to 49 were the targeted population in this study. The targeted age group is significant since most women in this age bracket are at

the reproductive stage of their lives experiencing a lot of body changes. The development of PMOS usually occurs in this age group, and may significantly affect their general health status, especially reproduction and metabolic activities. In the study, women who provided information regarding their weights, heights and menstrual conditions, symptoms associated with Premenstrual Ovarian Syndrome (PMOS) and lifestyle practices were selected as the sample. Such a population is considered ideal for conducting research on the link between obesity and PMOS. Characteristics of the Target Population Selected participants: From the reproductive age bracket. Were aware of their general health conditions and had knowledge about their menstrual cycles. Had the capability to fill out self-report questionnaires. Were in diverse BMI categories. Had both women with PMOS diagnosis and those without.

3.6 Inclusion and Exclusion Criteria

Inclusion Criteria:

The participants for this research are as follows:

- Females age 15-49.
- Individuals willing to participate.
- Respondents who answered the questionnaire fully.
- Females who could give information about their heights, weights, and PMOS symptoms.

Exclusion Criteria:

The people who were not allowed to participate include the following: Pregnant women. Women who lactate. Respondents who did not respond consistently. People who do not want to give their informed consent. In order to make sure that the data collected is both accurate and reliable, some standards were used in the study.

3.7 Sample Size

The number of respondents in this research comprised 370 females. The number of samples was obtained using the Cochran formula of sample size for estimation of proportion: $n = (Z^2 \times p \times q) / d^2$ Where: $Z = 1.96$ (for 95% confidence level) $p = 0.40$ (estimate from earlier studies) $q = 1 - p = 0.60$ $d = 0.05$ (tolerable margin of error) By applying these figures, the minimum number of samples needed is 369. In order to have adequate samples and avoid any form of data discrepancies, information was sought from 370 respondents.

Importance of Sample Size The sample size selected was adequate due to the following reasons: It qualified the numbers test, which was computed. It increased the validity of results. It facilitated comparison among different BMI categories.

3.8 Sampling Technique

Convenience sampling method was used as a non-probability sampling technique for the selection of participants. We decided to apply a convenient method of participants' recruitment. This means that we asked people to join our research who were available and met the required criteria at that moment. It was chosen due to its simplicity and relatively low cost and time requirements. We could easily contact people who would be interested to take part in our research, which made the chosen technique quite a convenient one to use for our work. The method might not reflect the whole picture of the population, but is widely applied when studying some health condition among a target group of people. This technique allows revealing certain trends and connections in the field under consideration.

Advantages of the Sampling Method Easy implementation. Cost-effective data collection. Ability to obtain a relatively large sample within a limited period. Suitable for preliminary and descriptive research. Limitation of the Sampling Method The results obtained will not be completely generalizable for all women in the broad population due to participants' selection on the basis of accessibility.

3.9 Data Collection Instrument

Our information gathering was done by means of a unique set of questions specifically designed for our research project.

The survey included both multiple choice and open ended questions in order to receive information on different aspects. These included identification of the individuals, their physical parameters (weight and height), whether they suffered from a specific illness, their feelings, activities, and knowledge on healthy behavior. Our aim was to learn more about people's lifestyle and its effect on their health.

In order to ensure clarity, simple and comprehensible language was used. Structure of the Questionnaire The questionnaire was comprised of the following sections:

Section A:

Demographic Data The following demographic data was collected: Age Education level Occupation Marital Status

Section B:

Anthropometric Data This portion contained information about: Height Weight BMI classification Obesity history

Section C:

Information on PMOS Information was gathered about: PMOS diagnosis Menstrual disorders Acne Skin issues Hirsutism Problems in weight loss Family history

Section D:

Lifestyle Factors Participants were questioned regarding: Physical Activity Levels Dieting Practices Fast Food Consumption Stress Levels Health Practices Per Day.

Section E:

Awareness and Prevention Questions asked: Awareness about PMOS Awareness about the health risks of being obese Weight loss efforts Lifestyle change perceptions.

3.10 Data Collection Procedure

Our data were collected by means of an online survey. A link to the survey was sent to those people who were eligible to participate in the study. Prior to commencing with the questionnaire completion, participants were provided with information regarding the purpose of the study, data confidentiality measures, and the voluntary nature of their participation in the study. This ensured all participants were fully aware of what to expect and whether they wanted to participate in the survey. Our procedure consisted of the following stages: introduction of the research purpose, obtaining of informed consent, distribution of the questionnaire, responses collection, checking for data completeness, compilation of responses for analysis.

3.11 Variables of the Study

Independent Variable: The primary independent variable was:
Body Mass Index (BMI) BMI classifications:

- Underweight
- Normal weight
- Overweight
- Obese Class I
- Obese Class II

Dependent Variable
The dependent variable for this experiment was: PMOS Present/Not present.
Variables Other Than The Dependent Variable:

- Menstrual irregularity
- Acne
- Weight management difficulties
- Physical activity
- Dietary practices
- Stress levels

These things helped us understand more about what is related to PMOS.

3.12 Data Analysis Plan

We collected all the responses and classified them. We then used simple arithmetic to interpret their meanings.

Descriptive Analysis The following measures were used:

- Frequencies
- Percentages
- Proportions
- Category-wise distributions.

These studies helped in summarizing the essential information on the characteristics of the participants and prevalence of PMOS.

Comparative Analysis

The study sought to determine the frequency of occurrence of Polyendocrine Metabolic Ovarian Syndrome (PMOS) among women with varying body weights through the use of a specific technique referred to as cross-tabulation. The technique enabled the researchers to identify trends in relation to the frequency of occurrence of PMOS among underweight, average weight, overweight, and obese women.

Presentation of Findings

Results were presented using:

- Tables
- Graphs
- Charts
- Descriptive interpretations

This approach really assisted the audience in comprehending the findings and their implications.

3.13 Ethical Considerations

Ethical standards were an important consideration within the research.

The following ethical considerations were followed:

- Voluntary participation.
- Consent was gained prior to the collection of data.
- Anonymous responses were ensured.
- Personal identifiers were not collected.
- The information was only used for academic purposes.

- The respondents were told that they could withdraw from the survey if they wished to do so.

These measures ensured that respondents were treated fairly and that their personal information was secure at all stages of the research process.

3.14 Reliability and Validity of the Study

To increase the reliability and validity of the research the following was done:

- Use of a structured questionnaire.
- Uniform method of collecting data.
- Standardization of criteria for BMI classification.
- Proper sample size.
- Organization of collected responses.

This helped increase credibility and proper interpretation of the connection between obesity and PMOS.

3.15 Summary of Methodology

The objective of this study is the examination of the association between obesity and Polyendocrine Metabolic Ovarian Syndrome (PMOS). In order to accomplish this objective, the researchers collected information from 370 women through a questionnaire that contained specified questions on the matter in question. The sample used for the experiment was selected in an easily accessible manner. After this, they used descriptive statistics and data analysis techniques such as cross-tabulation to analyze the collected data. The researchers adhered to all the ethical guidelines during the research process. This method made it possible for the researchers to examine the frequency distribution of various body mass index (BMI) categories among the sample population and their associations with PMOS.

CHAPTER 4
RESULTS AND DATA INTERPRETATION

This section presents the findings of the study in alignment with the stated research objectives using descriptive statistical analysis.

The raw primary data collected from the 370 participants was categorized and analyzed to evaluate the relationship between weight categories and PMOS prevalence.

4.1 Introduction

In this chapter, the outcomes of the analysis of data collected from a population of 370 women who participated in the study will be reviewed. The aim of the analysis was to see how Body Mass Index (BMI) is linked to Polyendocrine Metabolic Ovarian Syndrome (PMOS) and whether obesity has an effect on the symptoms and the severity of the disease. The findings are represented by means of descriptive statistics, percentages, and comparative analysis in order to facilitate understanding of the trends in the population.

The section will examine the data reflecting BMI and PMOS distribution among the participants.

4.2 BMI Distribution

The first aim of the research was to investigate how the participants were classified according to BMI criteria. A total of 370 women were classified according to the standard BMI classification.

BMI CATEGORY TIERS	ADJUSTED RANGE (KG/M^2)	RESPONDENT FREQUENCY (N=370)	PERCENTAGE SHARE (%)
Underweight	< 18.5	19	5.1%
Normal Weight	18.5 – 22.9	192	51.9%
Overweight	23.0 – 24.9	95	25.7%
Obese Class I	25.0 – 29.9	51	13.8%
Obese Class II	≥ 30.0	13	3.5%
Total Sample Base		**370**	**100.0%**

Interpretation

This seems to indicate that a considerable number of the participants in this study were either overweight or obese individuals, which poses quite a significant threat to their health status. While more than half of the women fell under the category of having a normal body mass, a relatively high percentage of them were obese or overweight. This means that by considering those that had obese and overweight body mass index, about 43% of the total number of the study participants were obese or overweight. Being overweight or obese is one of the major health problems that may result in a number of other conditions. This shows the rising influence of lifestyle habits in the state of health. As obesity has been linked to disturbances of metabolism and hormones, this distribution is important for the analysis of BMI and PMOS connection.

4.3 Association Between BMI and PMOS

PMOS prevalence was assessed across the various BMI categories in order to meet the main goal of the study.

Interpretation

The findings indicate that with increasing BMI, PMOS prevalence also grows. No PMOS cases were revealed in underweight participants, but almost one-fourth of those in the normal weight group reported PMOS diagnosis. The prevalence was even larger in overweight and people suffering from obesity.

The largest prevalence was noted in women belonging to the Obese Class II group where more than 60% had PMOS. This finding implies that with the rise of BMI, one has great chances of developing PMOS.

Hence, it was established that the pattern might suggest that obesity could play a key role in the hormonal and metabolic processes associated with the PMOS. Nevertheless, being cross-sectional, the results cannot prove the causality, still the presented tendency indicates the association of obesity with the above condition.

BMI STATUS CATEGORY	CONFIRMED PMOS (COUNT)	NO PMOS SYMPTOMS (COUNT)	TOTAL TALLY	PROPORTIONAL DIAGNOSIS RATE (%)
Underweight	0	19	19	0.0%
Normal Weight	48	144	192	25.0%
Overweight	33	62	95	34.7%
Obese Class I	18	33	51	35.3%
Obese Class II	8	5	13	61.5%
Aggregate Base Total	**107**	**263**	**370**	**28.9%**

4.4 Analysis of PMOS-Related Symptoms

In addition, the study examined how frequently women with PMOS showed certain symptoms.

Table 4.3: Some of the Symptoms Found in Women with PMOS

Symptom	Percentage (%)
Menstrual Irregularity	82.0
Acne and Skin Problems	74.0
Difficulty in Weight Management	68.0

Interpretation

The symptom that was most often cited by women with PMOS was irregularity in menstrual cycle, with more than four out of five participants reporting an occurrence of either an irregularly long or short menstrual cycle. Other skin problems, such as acne, were also prevalent, suggesting underlying hormonal disturbances that characterize this condition.

A large share of the women in the sample also experienced difficulties with body weight. This corresponds to the fact that obesity and PMOS tend to go hand in hand, contributing to each other's occurrence through different metabolic and hormonal processes.

For this reason, the obtained results on the symptom prevalence clearly show that PMOS affects various dimensions of women's health, not just reproductive ones.

4.5 Overall Pattern of PMOS Prevalence

The analysis for BMI and PMOS indicates that there are certain trends among the set of individuals who have been examined.

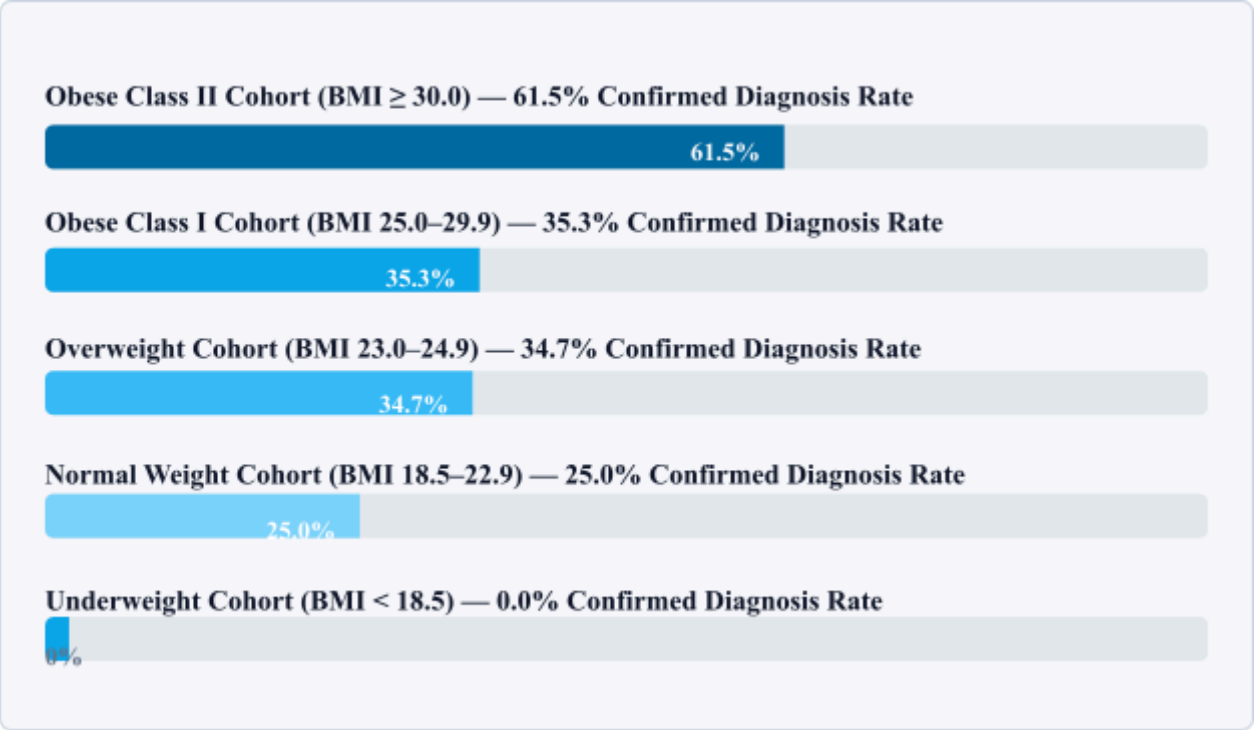
The study has revealed three key findings:

1. PMOS was found in different BMI groups.

2. PMOS occurred more often with rising BMI.

3. Women from heavier BMI groups showed more complications associated with the disease.

The findings obtained from this study imply that obesity can be an important factor in developing and worsening of PMOS. Although PMOS was found in women with normal BMI, their lower prevalence implies that obesity may lead to hormonal and metabolic disturbances.



4.6 Descriptive Statistical Interpretation

A descriptive analysis of the study's participant group reveals more about health trends across the population.

The data shows that concerns regarding weight are becoming a rising trend among women of childbearing age. There are more overweight people than those who fall within the healthy weight category, and there are many factors that have contributed to this increase.

The prevalence of PMOS of 28.9% indicates that the condition is still very relevant among the people of this population. This comes with the observation that many people affected by PMOS are also overweight which speaks for the importance of early detection and prevention programs.

4.7 Key Findings of the Study

According to the findings of the study that has been conducted, the following conclusions can be drawn:

Finding 1: High Incidence of Obesity

Almost 43% of the participants were found to be either overweight or obese resulting in a major obesity problem in this study population.

Finding 2: The Significant Incidence of PMOS

Over one quarter of the total replies received had indicated a positive response for PMOS and therefore resulted in a percentage of 28.9% in general.

Finding 3: The Positive Correlation Between PMOS and Body Mass Index

With an increase in the Body Mass Index, the PMOS rate increases consistently in the various BMI groups, reaching its highest levels with obese women, Obese Class II.

Finding 4: The Menstrual Problem as the Most Common in PMOS Victims

Menstrual problems were the biggest issue suffered by PMOS women, followed by acne and weight maintenance problems.

Finding 5: PMOS in Normal Weight Women

According to the current research, normal weight women may also develop PMOS because of some other factors apart from being overweight.

4.8 Discussion of Results in Relation to Study Objectives

The main aim of the study was to explore whether obesity is related to PMOS in women. The results suggest that there is indeed such a connection. Women with a higher BMI prevalence of PMOS was noted as higher than in women of lower BMI groups.

The secondary aim of the study was to study severity and patterns of the symptoms in women with PMOS. The frequencies of menstrual irregularities, acne, and problems with weight indicate that PMOS causes significant effects on both reproductive and metabolic systems.

In general, the research proved that obesity should be treated as one of the main factors affecting the risk of PMOS and conducting preventive measures.

4.9 Summary of Results

Analysis of data collected from a sample of 370 women indicated a significant correlation between obesity and PMOS. Of the sample, two-fifths of the women were overweight or obese, with PMOS appearing more commonly among individuals with increasing BMI scores. PMOS diagnosis was highest in the category of Obese Class II. Some of the most common symptoms included menstrual irregularity, acne, and issues in weight control. These results help support the idea that there is a strong link between obesity and PMOS, while at the same time identifying the fact that PMOS appears with individuals who are not considered to be obese.

CHAPTER 5
DISCUSSION

5.1 Introduction

The objective of the study is to identify the influence of obesity in the emergence of Poly-Endocrine Metabolic Ovarian Syndrome (PMOS) among women and to reveal the impact of weight on occurrence and severity of this ailment. The results show a direct relationship between increase of BMI and detection of PMOS. This chapter provides a discussion concerning the findings of the study in relation to those given by other researchers and shows the significance of the findings for the field of healthcare in general.

The findings suggest that obesity is not just a prevalent condition but seems to contribute greatly to hormonal and metabolic disorders typical for PMOS. However, the fact that PMOS develops among patients with normal BMI indicates that there are other factors related to PMOS.

5.2 BMI Distribution and Risk of Metabolic Disorders

One of the fascinating observations from this research was that the number of women who were found to be classified as overweight or obese is very high. Although most of the people involved in the study belonged to the normal BMI group, still there were a lot of women who are more than the acceptable weight. This suggests a growing trend obesity among women of childbearing age and is an alarming issue for public health.

The increasing problem of obesity can be attributed to the alteration in the lifestyle of city dwellers. Less physical activity, long hours of sitting, inappropriately planned meals, and high consumption of processed food are all contributing to weight gain.

The findings of this research indicate that women with excessive weight might be at risk of serious health problems related to metabolism even if there are no visible health symptoms yet.

5.3 Connection Between BMI and PMOS Rate

A major finding of this research is the rising number of PMOS cases with increased BMI. Overweight and obese women were identified as having the highest PMOS incidence compared to those with lower BMI. The findings suggest a possibility of a connection between excessive weight and disruptions in metabolism and hormonal changes leading to PMOS. Nevertheless, the current study design does not prove a cause-and-effect relationship, yet the findings support earlier conclusions. Research has shown that higher accumulation of fat tissues affects insulin and reproductive hormone function, along with the process of inflammation, which has been commonly associated with PMOS.

It is important to note that some patients with a normal body mass index were also found to have PMOS. This means that the weight of the patient alone cannot determine whether PMOS will develop.

5.4 Impact of Insulin Resistance on PMOS Development

An explanation for the findings of this study can be proposed by considering the mechanism of insulin resistance. While the authors did not directly measure insulin resistance, there is an abundance of evidence in literature indicating that insulin resistance is a major factor responsible for the link between obesity and PMOS.

In the case of women with excessive body weight, particularly abdominal obesity, the body may become less effective in responding to the effects of insulin. In turn, the pancreas compensates for it by producing more insulin, which causes hyperinsulinemia.

Insulin plays a crucial role in stimulating the production of androgens in the ovaries and reducing the concentration of sex hormone-binding globulin, which produces hormonal changes leading to ovulatory dysfunction and development of PMOS symptoms.

The results of the study support this explanation because the increasing prevalence of PMOS was observed with the increase in BMI, which shows that the metabolic disorders associated with obesity are likely to play an important role in the development of the disease.

5.5 Clinical Manifestations and Severity of PMOS

It was found that problems with menstruation, acne, and problems with maintaining a healthy body weight were the signs that showed up most often in women with the disease known as PMOS. The above symptoms correlate directly with the disorder being discussed and indicate a hormone imbalance.

Menstrual irregularities were shown to be the most commonly experienced problem, thus revealing the significant impact that PMOS has on the reproductive health of women. Problems with ovulation and hormone regulation contribute to the emergence of menstrual irregularity that might negatively affect fertility and cause other problems. Acne and other skin complaints were widespread, and there seems to be a connection to increased levels of androgens.

Moreover, a large number of women reported their struggle with body weight. It demonstrates the relationship between PMOS and obesity because weight gain may further enhance the progression of the disease while hormonal problems associated with PMOS hinder the efforts aimed at weight loss.

5.6 The Occurrence of PMOS Among Women with Normal Weight

An important finding of the study relates to the timely observation of PMOS in women who fall under the standard BMI subcategory. Even though the occurrence of PMOS was less than in those who fall in the overweight and obese categories, the findings point out that a significant number of women belonging to the normal weight category also have an occurrence of PMOS. That means the occurrence of the disorder is the not only factor responsible for its development. The role of other factors, such as genetic tendency, hormonal control, insulin sensitivity, fat deposits, and lifestyle, is extremely important in determining the risk of the disease.

The existence of the PMOS phenomenon among the group of normal-weight women suggests a very common phenomenon known in the literature as "lean PMOS."

What should be mentioned is that this issue proves the necessity of conducting specific evaluation of women suffering from PMOS, thus emphasizing the need for doctors in

evaluation not only based on BMI values but using a comprehensive approach that takes into account the presence of the symptoms, medical history, and metabolic indicators of the patients.

5.7 Lifestyle Elements and PMOS

As a result of the research, it was found out that some aspects of the lifestyle influence the problem of obesity and PMOS. Mostly the participants of the survey were residents of the urban or semi-urban environment where the sedentary lifestyle, irregular meals and a high level of stress are common.

These factors could influence the metabolism and body weight; consequently, they could become a problem and increase the probability of obtaining insulin resistance and hormone-related problems. So, these results prove that there is a need to consider the change of the way of life as the factor of PMOS prevention and treatment.

Some traditional steps as physical activity, healthy diet, proper sleep, and reduction of stress level can decrease the probability of PMOS and obesity development.

5.8 Consequences of PMOS on Women Health

As seen from the findings, PMOS is more than just reproductive problem. PMOS needs to be considered as an ailment which influences the general state of health of women. The women who have PMOS will face complications associated with fertility, metabolic processes, mental health and possible development of diseases.

The relationship between PMOS and obesity reveals the necessity of the early treatment of the illness. In case if the women susceptible to this disease are diagnosed before the onset of significant problems, they may be treated effectively. This might involve weight loss, along with nutrition counseling and examination.

Therefore, the physicians need to take into account all the components of women's health when they treat the patients with PMOS.

5.9 Public Health Implications

The results of the current study highlight the need to focus more on the prevention of obesity among women and particularly those who are of reproductive age. As the number of people suffering from overweight and obesity increases, the frequency of the PMOS syndrome and other metabolic diseases will likely go up.

Campaigns in public health aimed at encouraging healthy eating and physical activities as well as regular medical checkups can help decrease the chances. In addition, health education programs targeted at youth can be more efficient since changes in lifestyle adopted at a younger age can lead to good health later in life.

Also, it would be wise for planning authorities and healthcare agencies to include PMOS detection and education programs in existing programs focused on women's health.

5.10 Advantages and Disadvantages of the Research

Advantages

The research has various advantages:

- Engaged a comparatively large group of 370 respondents.
- Concentrated on a key and developing women's health subject.
- Employed standardized categories of BMI in undertaking the research.
- Gathered primary data right from the respondents.

Disadvantages

Some drawbacks should be remembered:

- The cross-sectional design does not prove any causal connections.
- The data was collected primarily through self-reports.
- Clinical and biochemical studies were not carried out.

In terms of convenience sampling, the findings cannot be applied to a wider audience.

Nonetheless, the research sheds light on the relation between obesity and PMOS among women.

5.11 Conclusion of Discussion

It has been established that obesity is closely linked with PMOS onset and progression among women of reproductive age. It was confirmed that the higher BMI, the more patients were reported with PMOS and severity of the disease symptoms was worse. Common symptoms include irregularities of menstruation, acne and challenges with weight management. Evidence of PMOS occurrence in normal-weight women proves that factors other than body weight contribute to PMOS development.

In general, the gathered data indicates the significance of weight management, early detection, lifestyle modification, and healthcare collaboration in the management of PMOS.

CHAPTER 6
CONCLUSION & RECOMMENDATIONS

6.1 Conclusion

The current research investigated the link between obesity and PMOS in women of childbearing age. The data obtained from 370 respondents was examined to see whether the differences in BMI correlated with the differences in the prevalence and symptoms of PMOS.

The results indicate that PMOS is more common among overweight and obese women than among participants having lower BMI. Among the women affected by PMOS there were cases of irregularities in menstrual cycle, acne, and problems with weight management. The results show that excess weight of the body may lead to the onset of the condition and increase its severity.

However, the results of the research show that the existence of PMOS in normal weight participants means that obesity is not the only factor influencing the condition. Other factors like hormone regulation, genetic factors, family history, and behavioral patterns might also be equally important.

Hence, it becomes essential to highlight the significance of proper weight and good behavior.

6.2 Recommendations

Following the results of this research, some suggestions are to be made.

6.2.1 Encouraging Healthy Lifestyle

Women should be educated about the important aspects of healthy living from an early stage. This approach includes regular physical activity and proper nutrition with the healthy way of living. Medical specialists should somehow focus on the importance of modifying

lifestyles to prevent diseases.

6.2.2 Early Diagnosis and Screening

Women with overweight and obesity, should be diagnosed regularly in order to discover the initial symptoms of PMOS. Regular screening for menstrual irregularities, abnormal weight gain and other issues of this kind can help doctors to do timely diagnosis and treatment. Timely actions can help avoid getting severe complications.

6.2.3 Raising Awareness about Health Issues

The level of awareness about PMOS is still low in many communities. There should be developed educational programs allowing people to know more about the disease, its symptoms and risk factors, and the ways of managing it. Educational programs can encourage women to get advice from doctors at the early stages of the disorder.

6.2.4 Concentration on Weight Control Initiatives

The weight management programs should be included within the healthcare services for women. The standardized approaches like diet programs, exercises, and counseling can help in reducing fat-related problems. Special attention needs to be paid to women who have higher fat levels.

6.2.5 Application of Multidisciplinary Approach

Coordination of PMOS is impossible without collaboration of various specialists in medicine. Such specialists as gynecologists, endocrinologists, nutritionists, psychologists, as well as public health experts should combine their efforts for the provision of a complex treatment of patients. In this way, the use of multidisciplinary approach will facilitate dealing with the somatic and psychological sides of the problem.

6.2.6 Integration into Primary Healthcare

It is essential for primary care organizations to inform and do tests for PMOS among their women's health clinics in order to help the community health workers and physicians help detect the symptoms at an early stage.

6.2.7 The Implementation of Community Programs

Development of community-based programs for the promotion of good nutrition practices and physical activities as well as prevention of obesity is strongly recommended. This will reduce the risk factors associated with PMOS in women.

6.3 Consequences for Healthcare Operations

The results of this study have several important implications in the areas of healthcare management and policy making. PMOS is a condition that needs to be considered both a reproductive and a metabolic disease. Obese precautions will save money and make one's quality of life much better.

There are some actions to be taken in order to control PMOS, and those include:

- Programs of prevention and early diagnosis.
- Lifestyle-changing counseling services.
- Public health campaigns against obesity.
- Integrated healthcare delivery system.

All in all, the implementation of these measures will help achieve positive results in managing PMOS.

6.4 Recommendations for Further Research

Although the current study has made important contributions, there are still other areas of investigation that will help us understand more about the relationship between obesity and PMOS.

Long-term Investigations

Research in the future should include longitudinal studies in order to understand how body mass and PMOS develop over time. This will give better evidence about causation.

Clinical and Biochemical Studies

It is important that future research should incorporate lab studies to determine insulin, glucose tolerance, and testosterone levels and other interesting hormonal markers.

Larger Study Samples

Conducting studies with larger and more diverse samples would increase the likelihood of finding generalizable results of research. A bigger geographical coverage would provide more information on PMOS.

Comparison of Rural vs Urban Women

Additional studies that would compare women living in the rural areas and those in cities could help identify environmental factors contributing to differences in PMOS.

Assessment of Lifestyle Interventions

Researchers need to check whether lifestyle intervention programs such as diet, training, or stress management can help cope with PMOS.

6.5 Final Summary

In conclusion, it has been established through studies that there is a positive correlation between obesity and PMOS in reproductive age females. Even though the incidence of PMOS has been found to be considerably high in obese and overweight females, the most commonly occurring symptoms include menstrual irregularities, acne, and weight management issues. Since body weight is to some extent under one's control due to life style modifications, obesity can be seen in the context of dealing with PMOS by way of preventive measures. Moreover, it has been emphasized that the requirement of knowledge with regard to health, diagnosis and management of PMOS is crucial.

The significance of this research is in its contribution to the field of reproductive and metabolic health studies in women. Importance has also been placed on raising awareness and changing life styles.

Supplementary

Instrumentation

A systematic quantitative questionnaire was applied as the means for collecting information for the present study. The questionnaire consists of questions which demand answers concerning demographic profile, anthropometric measurement (e.g., BMI), symptoms of PMOS, issues related to lifestyle, and information on PMOS and obesity.

The tool was constructed in a straightforward and clear way for ease of participation and correct data collection. The questionnaire comprises several parts in order to cover all the information needed.

1.1 Questionnaire Structure

To collect primary data from women between the ages of 15 and 49 years, a questionnaire was developed. The purpose of the questionnaire was to study the link between Body Mass Index (BMI) and occurrences and symptoms of PMOS.

The questionnaire consisted of the following sections:

Section A: Demographic Information

This is the section that generated basic information about respondents. The main intention is to explore respondent's background to find any correlation between socio-demography and PMOS.

The information required in this section was as follows:

1. Age

2. Educational background

3. Employment

4. Marital status

These parameters are important because:

- Education level contributes to awareness of health issues.

- Employment indicates one’s lifestyle.
- Age and marital status affect hormonal health.

Section B: Anthropometric Information

This section is meant to assess one’s body weight which is the independent variable in this study.

The info required in this section is as follows:

1. Height

2. Weight

3. BMI (calculating/ defining BMI)

4. Experience of excess weight

The importance of this is that BMI is directly connected with metabolic health and helps to identify the risks of PMOS.

Section C: Data on PMOS

This section provided information about symptoms and diagnosis of PMOS.

The questions included:

- Diagnosis of PMOS
- Irregular menstrual patterns
- Large body or facial hair (hyperandrogenism)
- Acne or oily skin
- Difficulties concerning the control of weight
- Family history of PMOS

The variables include:

- Symptoms related to reproduction
- Hormonal imbalance
- Genetic background

The section was important since it allowed establishing:

- The PMOS occurrence in the group
- The severity of symptoms in different groups based on BMI

Section D: Living Style Influences

The section includes information on the behavior and living style of the respondents.

The following aspects were covered:

- The times of exercising
- Eating habits
- Fast food consumption
- Stress levels

This was significant, as:

- Bad lifestyle causes obesity
- Obesity leads to the increase of insulin resistance
- Insulin resistance is one of the contributors of PMOS

The section helped to prove the dependency of each variable discussed above.

Section E: Awareness and Administration

In this section, women's understanding of PMOS and obesity was assessed, including:

- Awareness of the effect of obesity to PMOS risk
- Efforts made to lose weight
- Knowledge for the belief that lifestyle change works
- The importance of this section lay in the ability to know:
- The gaps in knowledge possessed by the participants
- The attitude towards the preventive actions and treatment
- The readiness of the lifestyle changes

1.2 Data Collection Procedure

Data collection was done using a self-directed digital survey. Eligible participants were asked to respond online.

Steps involved:

- Providing study information
- Conducting voluntary participation and securing consent
- Collecting the responses anonymously
- The use of a digital platform led to:
- Wide outreach
- Less human error
- Speedy and efficient data collection
-

1.3 Data Analysis Tools

Data analysis was done through:

- Frequency distribution
- Percentage analysis
- Cross-tabulation

These tools aided in:

- Examining the distribution of BMI
- Understanding the prevalence of PMOS
- Understanding the relationship between variables

The analysis included:

- Descriptive patterns
- Comparative relationships

1.4 Informed Consent

In advance of their participation, respondents received detailed information about:

- The reason for conducting the study

- Their right to participate freely
- The confidentiality of information collected
- How the results will be used academically
- Their ability to back away from participation whenever they wish to do so

Upon agreeing to take part in the study, the participants had to sign the consent form, which:

- Ensured that ethical principles were followed
- Protected confidentiality of participants' personal data
- Secured transparency of data gathering process

Appendix

2.1 Introduction and Informed Consent

Dear Participant,

My name is **Kokil Agrawal** and I am a postgraduate student in the Post Graduate Diploma in **Healthcare and Hospital Management (PGDHHM) program at IIHMR Delhi**.

As part of my research, I am conducting a study entitled:

"**Role of Body Mass Index (BMI) in Developing the Polyendocrine Metabolic Ovarian Syndrome (PMOS) in Women.**"

The main aim of this study is to find out the correlation between BMI and possible influencing lifestyle factors with PMOS incidence in women.

Your participation in this study is completely voluntary. The questionnaire will take around 5-10 minutes to complete. The collected information will be confidential and will only be utilized for academic purposes and research. No individual identification will be disclosed in any report or study.

Your participation is very valuable in gaining knowledge about PMOS and may help in improving healthcare practices.

Thank you for your valuable time.

Consent Form

Kindly review the information below before proceeding

- I acknowledge that I have reviewed and comprehend all the information pertaining to this research.
- I am fully cognizant of the fact that my participation is optional.
- I have full freedom to withdraw my participation at any moment without any obligations to state my reason.
- I understand that all the information I provide during the research will be kept anonymous.
- No personal details about me will be included in any report or articles.
- I confirm that I am an adult and consequently I accept to participate in this research.

Question regarding consent:

Do you consent to take part in the research on a volunteer basis?

- - I do consent
- - I do not consent

2.2 Structured Questionnaire

Section A: Demographic Details

- What is your age?
- What is your gender?
- What is your education level?
- What is your job position?
- What is your marital status?

Section B: Anthropometric Details

- What is your height?
- What is your weight?
- What is your BMI?

- Do you have a history of being overweight or obese?

Section C : PMOS Information

- Diagnosis of PMOS
- Irregular menstrual cycle
- Acne problems
- Unwanted body hair
- Difficulty losing weight
- The family link

Section D : Lifestyle Factors

- Frequency of exercise
- Diet being followed
- Use of fast food
- Stress levels

Section E : Knowledge of and dealing with the issue

- Knowledge of the connection between overweight and PMOS
- Attempts at weight loss
- Belief in change of lifestyle

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