

EATING ATTITUDES, BODY IMAGE AND SELF-ESTEEM AMONG WOMEN WITH AND WITHOUT POLYCYSTIC OVARY SYNDROME



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**EATING ATTITUDES, BODY IMAGE AND SELF-ESTEEM
AMONG WOMEN WITH AND WITHOUT PCOS**



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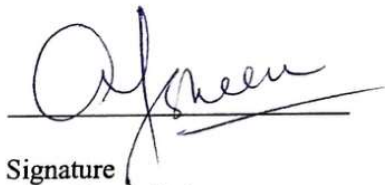
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Abstract

The aim of the study was to compare the differences in eating attitudes, body image and level of self-esteem among women with and without Polycystic Ovary Syndrome (PCOS). PCOS is a very complicated endocrine disorder, making it difficult and tough to diagnose in routine clinical practice even though it is quite common. This study was a cross-sectional research. A total of 142 women participated, out of which 71 women were diagnosed with PCOS, selected from a gynecology clinic through purposive sampling strategy and 71 women were without PCOS matched on age and marital status. Age range of the participants were 17-36 years ($M= 21.73$, $S.D= 3.96$). Eating Attitude Test (EAT-26), Body Image Concern Inventory (BICI) and Rosenberg Self-esteem Scale were used to collect data from participants. Data was analyzed by using IBM SPSS 25. Independent Sample *t*-test and Mann-Whitney U test were used for analysis of data. Results of the study indicated that there was significant difference between women with and without PCOS regarding eating attitudes (Dieting, Bulimia & Food Preoccupation and Oral Control), body image and self-esteem. Women with PCOS scored high on eating attitudes and body image which showed more disordered eating attitudes and body dissatisfaction among them. Women with PCOS scored low on self-esteem scale which showed low level of esteem among them as compared to non-PCOS. The study has implications for mental health workers, psychologists, sociologists, physician, gynecologists and community workers to better understand the syndrome and to design appropriate interventions and protective factors for women with PCOS.

Table of Contents

| Contents | Page No. |
|---|-----------------|
| Title Page | i |
| Research Approval Certificate | ii |
| Research Completion Certificate | iii |
| Anti-Plagiarism Declaration | iv |
| Acknowledgement | vi |
| Abstract | vii |
| Table of Content | viii, ix |
| List of Tables | x |
| List of Abbreviations | xi |
| List of Symbols | xii |
| List of Appendices | xiii |
| Chapter I Introduction | 1-15 |
| Rationale | 16 |
| Objectives | 17 |
| Hypotheses | 17 |
| Proposed Model of Study | 18 |
| Literature Review | 19-26 |
| Chapter II Methods | 27-31 |
| Research Design | 27 |
| Participants (Sample and Sampling Strategy) | 27 |
| Inclusion Criteria | 27-28 |
| Exclusion Criteria | 28 |
| Operational Definitions | 28-29 |

| | |
|-------------------------------|-------|
| Measures | 29-30 |
| Procedure | 30 |
| Ethical Considerations | 31 |
| Statistical Analysis | 31 |
| Chapter III Results | 32-41 |
| Chapter IV Discussions | 42-48 |
| Conclusion | 49 |
| Implications | 49-50 |
| Limitations | 50 |
| Recommendations | 50 |
| References | 51 |

List of Tables

| Table No. | Title | Page No. |
|------------------|---|-----------------|
| Table 3.1 | Demographic information of study participants | 28 |
| Table 3.2 | Psychometric properties of major Study Variables in the sample | 33 |
| Table 3.3 | Independent Sample <i>t</i> -test showing differences in eating attitudes of women with and without PCOS. | 34 |
| Table 3.4 | Independent Sample <i>t</i> -test showing differences in body image of women with and without PCOS. | 35 |
| Table 3.5 | Independent Sample <i>t</i> -test showing differences in self-esteem of women with and without PCOS. | 36 |
| Table 3.6 | Binary Logistic Regression Analysis showing BMI, eating attitudes, body Image and self-esteem as Predictors of PCOS among participants of study | 40 |

List of Abbreviations

| Abbreviations | Full Form |
|---------------|--|
| PCOS | Polycystic Ovary Syndrome |
| AV | Acne Vulgaris |
| BN | Bulimia Nervosa |
| BED | Binge Eating Disorder |
| AN | Anorexia Nervosa |
| IR | Insulin Resistance |
| ED | Eating Disorder |
| BMI | Body Mass Index |
| Ob/Ov | Obese or Overweight |
| ADHD | Attention Deficit and Hyperactivity Disorder |
| OCD | Obsessive Compulsive Disorder |
| EAT-26 | Eating Attitude Test |
| BICI | Body Image Concern Inventory |
| RSES | Rosenberg's Self-Esteem Scale |
| SPSS | Statistical Package for Social Sciences |

List of Symbol

| Symbols | Definitions |
|----------------|----------------------------|
| A | Cronbach alpha coefficient |
| Df | Degree of freedom |
| F | Frequency |
| K | Total no of items |
| N | Total Sample |
| P | Significant value |
| SD | Standard deviation |
| OR | Odds Ratio |
| S.E | Standard Error |
| % | Percentage |
| M | Mean |
| CI | Confidence interval |
| LL | Lower Limit |
| UP | Upper Limit |

List of Appendices

| Appendix No. | Title | Page No. |
|--------------|-------------------------------------|----------|
| Appendix A | Additional Analysis | 64,65 |
| Appendix B | Informed Consent | 67 |
| Appendix C | Sample Copy of Questionnaires | 69 |
| | Demographic Information Sheet | 69 |
| | Eating Attitude Test (EAT-26) | 70, 71 |
| | Body Image Concern Inventory (BICI) | 71,72 |
| | Rosenberg Self-esteem Scale | 72 |
| Appendix D | Email of Permissions to use Scale | 74-77 |
| Appendix E | SPSS Output | 79-85 |
| Appendix F | Permission Letter | 87 |
| Appendix G | Plagiarism Report | 89 |

CHAPTER I

INTRODUCTION

This study aims to compare the differences in eating attitudes, body image and level of self-esteem among women with Polycystic Ovary Syndrome and women without Polycystic Ovary Syndrome in Lahore, Pakistan. PCOS is a very complicated endocrine disorder, making it difficult and tough to diagnose in routine clinical practice even though it is quite common (Livadas & Kandarakis, 2013).

PCOS is a prevalent endocrine condition that mostly influences women (Azziz et.al, 2004). Since Stein and Leventhal's initial description of PCOS in 1935, these diagnostic challenges, the disease's heterogeneity, and its vague character have been clear. Over 1,500,000 websites on the internet are devoted to the syndrome (PCOS), indicating that it has attracted a lot of public attention in recent decades. A number of clinical symptoms, including obesity, hirsutism, acne, and amenorrhea, were seen among the 7 women mentioned in the original study and were all connected to enlarged bilateral polycystic ovaries. These distinguishing characteristics, which manifest to various degrees in each case, highlight the Polycystic Ovary Syndrome's phenotypic variety and actually help to describe its classification as a syndrome rather than a disease (Livadas & Kandarakis, 2013).

A syndrome is a collection of symptoms that cannot be described through the lens of a single pathophysiological mechanism or shared etiology. In PCOS the production of many hormones is altered. More precisely, PCOS women exhibit hyperandrogenemia, aberrations of the hypothalamic-pituitary-ovarian axis, hyperinsulinemia and dysfunctional adipokine secretion from adipose tissue. These factors interrelate at various tissues like in liver, ovaries, muscle and fat, resulting in a range of symptoms. The definition of PCOS has been a topic of ongoing discussion

because of these difficulties, over time, various symptom and sign combinations have led to considerable differences in diagnosis and treatment amongst various groups (Livadas & Kandarakis, 2013). In Clinical setting it is quite difficult to diagnose PCOS due to its vast variety of signs and symptoms. In 2003 Rotterdam proposed new diagnostic criteria for diagnosing PCOS; two out of three diagnostic criteria should be present (Smet & McLennan, 2018). These three criteria are as follows:

1. Oligo-anovulation
2. Hyperandrogenism
3. Polycystic ovaries

Prevalence of PCOS in European Caucasian women was 6-8% which has increased e.g. 20-25% in UK. Prevalence of PCOS among Pakistani women is much higher e.g. 52% as compared to European women (Sidra et al., 2019; Zulfiqar et al., 2022). Its definitive symptoms are appearance of cysts in ovaries, irregular menstrual, obesity, hyperandrogenism and oligomenorrhea. There are also possibilities of insulin resistance, cardiovascular disorders and diabetes mellitus (Eshre, 2004).

Androgens

Androgens are commonly known as "male hormones". Although not in equal amount, both men and women generate androgens. For instance, women typically only have 10% of the testosterone in circulation that males have. To make estrogens, the female sex hormones that women produce, a minimal quantity of androgen is required. Androgens are a class of sex hormones that give males their distinctive male traits, including virilization, or the development of the penile, the deepening of the voice, the growth of facial and body hair, the Adam's apple, and increased muscular mass. The male testicles, female ovaries, and adrenal glands are where androgen

hormones are largely produced. Hyperandrogenism can result from an overproduction of androgens in the ovaries and adrenals (Britannica, 2019).

Hyperandrogenism

The characteristic that distinguishes women with PCOS is hyperandrogenism. In PCOS, poor folliculogenesis is the initial effect of excessive androgen (Nisenblat & Norman, 2009). Hirsutism, acne, androgenic alopecia, as well as high levels of testosterone, are clinical signs of hyperandrogenism in females (Reddy et al., 2014). Increased androgen excess can also cause other symptoms including weight gain, irregular menstruation, acanthosis nigricans, and insulin resistance (Ashraf et al., 2019).

Hirsutism

It is one of the main characteristics of hyperandrogenism in PCOS. In 60–80% of PCOS-affected women, hirsutism is the most prevalent clinical symptom of hyperandrogenism (Spritzer et al., 2016). Hirsutism is characterized by excessive terminal hair growth with a distribution that resembles that of men. Some prior knowledge is required to comprehend the hirsutism phenomena properly. The human body is entirely covered in hair, with the exception of the lips, hand and foot soles, and the palms of both hands (Livadas & Kandarakis, 2013).

Depending on the impact of androgens, asexual, ambo-sexual and sexual are three main classifications of hair type. Lateral and occipital scalp, the eyelashes, and the eyebrows are the areas of asexual hair that are not sensitive to androgen levels. Ambo-sexual hair, on the other hand, is only present on lower arms and legs, pubis and axilla and is responsive to lower amounts of androgen. Hair that develops on the face, chin, chest, belly, thighs, back and upper arms is referred to as sexual hair; it is produced when there are high quantities of circulating androgens. As a result, the

presence of hirsutism, or excessive hair in certain regions, is symptomatic of hyperandrogenism in PCOS (Livadas & Kandarakis, 2013).

Acne

A common symptom of PCOS, acne vulgaris (AV), can aggravate the condition for about 62 percent of people throughout adolescence (Sharif et al., 2017). Acne occurrence is correlated with hyperandrogenism. Evidence suggested that increased and changed sebum production is caused, directly or indirectly, by androgens. The creation of comedones and cystic acne in the regions of the forehead, mouth, and jawline is caused by an excess of testosterone in the body, which also causes an increase in skin cell production and oil secretion. Since acne affects the majority of people, other symptoms and indicators should be taken into account to evaluate whether there is an androgen excess (Arora et al., 2011).

Alopecia

Another sign of the hyperandrogenic condition that affects PCOS women is androgenic alopecia, sometimes known as male pattern baldness. Alopecia in PCOS appears to occur often, with rates ranging considerably between 3.2 and 34.8% in different groups (Azziz et al., 2004). In contrast to the difficulty PCOS-afflicted women have managing excessive facial hair development, they also struggle with thinning scalp hair. This is due to the fact that testosterone, which causes hair loss in both men and women, is present in high quantities in PCOS women (Ashraf et al., 2019).

Anovulation

The anovulatory cycle was identified as one of the primary symptoms of PCOS in 1990. Anovulation, which causes oligo-amenorrhea (less than six menstrual cycles per year, occurring in more than 35 days of intervals) is cause of irregular

menstruation among women with Polycystic Ovary Syndrome. Additionally, it should be remembered that a regularly ovulating woman will lose one to two ovulations each year; this is considered as a normal occurrence.

Obesity

Obesity significantly affects the manifestation of clinical and endocrine symptoms of PCOS in women. Abdominal fat appears to be stored in part as a result of excess testosterone. Overweight PCOS patients are more likely to experience anovulatory cycles. Additionally, result of ovulation induction is impacted by obesity (Legro et al., 2007).

Other Risks

Beside these risks, PCOS is also feasible to induce psychiatric disorders like depression and anxiety in women (Dokras et al., 2011). Studies showed that increase in body weight and poor body image can increase the risk of mood disorders among women with PCOS (Hollinrake et al., 2007). Poor body image can also play role in eating disorders (Barry et al., 2011). Bulimia Nervosa (BN), Binge Eating Disorder (BED), and Anorexia Nervosa (AN) and other specified eating disorders like night eating syndrome are examples of eating disorders (American Psychological Association [APA], 2013).

In addition to endocrine and reproductive issues, PCOS patients frequently have metabolic alterations, such as elevated insulin concentrations, type II diabetes and insulin resistance (IR). Lipid problems are also prevalent (Teede et al., 2018).

Compared to young girls of normal weight with PCOS, obese girls have a more severe metabolic and hormonal level. Obese women have excessive production of androgens that is because of transformation of hormones. Due to these reasons

obese women are more likely to suffer from menstrual disorders, hirsutism and PCOS (Teede et al., 2018).

Eating Attitudes

The beliefs, feelings, thoughts and behaviors related to food are referred to as eating attitudes. Normal eating attitude includes complete understanding of physiological, social and emotional role of food in one's life. When we talk about eating attitude food couldn't be considered simply in a physiological manner, and food choices should not be made on the basis of contribution they made in nutrition. Eating attitudes can influence health status of people and their food choices. Eating behavior does not involve the concept of relationship with food because it doesn't involve thoughts, beliefs and feelings towards food but when we use term "eating attitudes" it do involve them (Alvarenga et al., 2012).

Increasing number of people are exhibiting unhealthy eating habits and attitudes without exhibiting severe manifestations. Early and timely detection of mild forms can stop severe ones from developing. Anorexia nervosa and bulimia nervosa are two of severe clinical manifestations of eating disorder (Klein & Walsh, 2004). A person with an eating disorder (ED) is someone who has aberrant eating patterns that are harmful to their health (physical or mental). "Binge eating disorder" is the most prevalent eating disorder (Alvero-Cruz et al., 2020).

ED is common among women with PCOS (Himelien & Thatcher, 2006). In fact, PCOS sufferers frequently have body image problems, and disruptions in this area tend to co-occur with eating disorders (EDs) such as anorexia nervosa (AN), bulimia nervosa (BN), or binge eating disorder (BED). An extreme fear of gaining weight and a mistaken impression of body image are all characteristics of AN, which also results in a low body weight. BN is characterized by recurring periods of binge

eating followed by unsuitable coping mechanisms, such purging. The difference between BED and BN is that binge eating episodes do not frequently involve incorrect compensatory actions (APA, 2013). The term "disordered eating" refers to ED-related behavioral, emotional, and cognitive symptoms that fall short of reaching the diagnostic criteria for a certain eating disorder. Compared to EDs, disordered eating is far more common (Hautala et al., 2008).

Early studies have shown that PCOS women may experience more disordered eating and EDs (Lee et al., 2017). Restrictive behaviors are less frequently observed, but binge eating and binge eating disorder (BED) is more frequently linked to PCOS (Hudson et al., 2007). BED and obesity are related in the general population. Critical gaps in the research still exist despite evidence that disordered eating is more prevalent in PCOS women (Lee et al., 2017).

Hirsutism raises the risk of developing ED, which may be linked to patients' reduced self-esteem (Morgan et al., 2008). Studies have also shown that those with abnormal body mass index (BMI) are more likely to have disordered eating attitudes (DEA) (Rodriguez et al., 2015). Additionally, it has also been claimed that polycystic ovaries and elevated androgen levels may promote bulimic behavior by affecting impulse control and food cravings in PCOS-affected women's eating attitudes. Anecdotal information suggests that PCOS women appear to struggle with controlling their weight. This may be attributed to insulin resistance and hyperinsulinemia, which are common in PCOS patients who are both overweight and lean, and may increase the risk of weight gain. Little is known about the eating habits and dietary intakes of women with PCOS despite the condition's relation to obesity (Wright et al., 2004).

Women who have been diagnosed with PCOS are usually obese or overweight. Obesity is clearly interrelated with onset of PCOS and the intensity of its

symptoms (biochemical, and metabolic) including hyperandrogenism, menstrual irregularities, infertility, insulin irregularities, and dyslipidemia (Lim et al., 2012). Obese females with PCOS are more likely to be involved in eating even when not hungry and after overeating they experience self-deteriorating emotions (Batcheller et al., 2013). Obesity is not the only factor rather it is a contributing factor to develop psychological disorders like depression, anxiety and body dissatisfaction (Barry et al., 2011). The association between polycystic ovaries and eating problems was investigated by Michelmore et al. (2001). Although women with PCOS scored higher than women without PCOS for binge eating episodes, eating disorder symptomatology, and dieting behavior, the difference was not statistically significant.

Today in Western culture, slim body shape is considered as attractive and it is linked with happiness and success. This idea of slimness has given to the young girls even in early school years, this aspiration of thinness induce problematic eating behaviors. Ideals and norms that are related to these attitudes and norms have created a public health concern that caused increase in dieting, clinical eating disorders and weight concerns. Disturbance in eating attitudes are also linked with other psychological problems like depression, poor coping skills, low self-esteem, substance use and eating disorders (Hallvarsson, 2000).

Body Image

The concept of "body image" was first introduced by Schilder in his English monograph "The Image and Appearance of the Human Body" in 1935 as an important and essential psychological phenomenon. According to Schilder body image is "the picture of our own body which we build in our minds, that is, the way in which the body seems to us" (p 11).

This term has recently been modified to include “mental image we have of the size, shape, and form of our bodies, as well as our sentiments regarding these features and our individual bodily parts” (Slade, 1988, p 20). In other words, the two core components of body image are regarded to be a "perceptual component" and an "attitudinal component." Perceptual component is the mental representation of one’s own body image. And the attitudinal component is person's attitudes, ideas, feelings, and interest in their own body (Demeireles et al., 2020). It may be further separated into two distinct aspects known as cognitive and affective: the way you think about your looks or body (cognitive) and the way you feel about your body (affective) regarding your appearance, weight or shape (National Eating Disorders Collaboration, 2011).

According to APA (2013), body image refers to mental picture someone forms of one’s body as a whole, including its physical characteristics (body percept) and one’s attitude towards these characteristics (body concept).

Body image affects how an individual views their body, and from that, many complex effects can arise that may cause feelings of satisfaction or dissatisfaction and may prompt a person to make drastic decisions about how to take care of his body, particularly when there are some dysfunctional changes in body perception (Naliato & Pinho, 2019). Self-perception of one's own physical self and the ideas and feelings that follow from that perception are connected to body image. Body image concern or negative body image can be formed with any disturbance in these domains (Grogan, 2006). Body dissatisfaction is presently a significant health issue and is more common among children and teenagers (Jung et al., 2009). However, adult physical changes might also have an impact on one's perception of one's body (Halliwell & Dittmar, 2003). At this period, the body's shape can drastically change, moving away from

social notions of the slim, feminine body and the muscular, masculine body (Mintem et al., 2015). Additionally, it has been demonstrated to be one of the best indicators of the emergence of unfavorable consequences including depression, low self-esteem, and eating disorders (Stice & Whitenton, 2002). When it comes to disordered eating, significant feelings of body dissatisfaction and weight worries are particularly common in adolescence and the early stages of adulthood (Neumark et al., 2006). Self-perception of women with eating disorders is significantly distorted and they have large difference between perceived body and ideal body weight and shape (Lewer et al., 2016).

Types of Body Image

Body Image has been classified into two types which are positive and negative. True and clear perception of one's body shape and person sees his different body parts as they really are is known as positive body image. This is also known as body satisfaction or body positivity. It includes the feelings of confidence and ease about the body. Person accepts his natural body shape and size, and believes that physical appearance tells a bit only about character and value as a person (Stice, 2000).

While negative body image refers to one's distorted perception about his/her body. This is also known as body dissatisfaction or negative body image, it includes the feelings of anxiety, self-consciousness and shame. Body dissatisfaction is a subjective, unfavorable assessment of one's shape, weight, and physical appearance and denotes a situation in which there is a significant gap between one's actual and desired body image. A person's psychophysical health can be significantly impacted by body image worries. All instances of clinically significant discomfort linked to body image dissatisfaction, such as in patients with obesity are considered to have a

negative type of body image. Elevated levels of body dissatisfaction can induce feelings of isolation, depression, eating disorders and low self-esteem in people who experience this and who compares themselves with others. There are many causes of eating disorders and researches indicate that body dissatisfaction is one of them (Stice, 2000).

Body Image among Women with PCOS

Females with PCOS are more likely to acquire weight compared to healthy females because of the condition's metabolic characteristics. Prevalence of obesity among females with PCOS is about 61% to 76% in USA. Females with PCOS also suffer from other clinical symptoms like acne and hirsutism that can cause a reduction in their self-esteem and body satisfaction which leads to eating disorders (Michelmore et al., 2001; Ching et al., 2007).

Females with Polycystic Ovary Syndrome are often less satisfied with their body image. Dissatisfaction with appearance, poorer wellness behaviors, dissatisfaction with physical appearance, negative affect, loss of femininity, less sexual attraction all are followed by negative perception of body image, which is predictor of psychological problems (Becker et al., 2019).

Obesity and overweight especially visceral obesity (fat stored underneath the skin) is common among the females with PCOS and it is also a risk factor of sexual dysfunction. Sexual dysfunction among these females is related to lubrication, arousal, pain, satisfaction and desire and in turn this sexual dysfunction is associated with more body dissatisfaction. Some other indications of PCOS include cystic acne, hirsutism which is noticeable to others and oneself may result in poor body image and dissatisfaction (Kogure et al., 2019).

Self-esteem

“Self-esteem typically refers to a person's overall positive evaluation of themselves” (Rosenberg, 1965, p 326).

This concept can also be explained by social comparison theory. Social comparison can influence individuals both negatively and positively. If individuals compare themselves with persons who are less attractive than him/her it increases their self-esteem. On the other hand if individuals compare themselves with persons who are more attractive than him/her it decreases their self-esteem (Barlett et al., 2008).

Self-esteem is influenced by judgement of competence by individual in different domains of personal values like physical attractiveness and acceptance by peers. In social psychology self-esteem is included in some of most frequently explored concept. Self-esteem is generally conceptualized as the part of self-concept. This concept is focused because of its high association with a lot of positive outcomes for individual and for society. It consists of two different dimensions which are worth and competence. The perception of an individual about himself/herself being able to do something is referred as the dimension of competence. The degree to which people believe they are valuable is referred to as the dimension of worth (Gecas, 1982).

According to National Institute of Health, among all regularly ovulating women 20% to 25% have PCOS. Hormonal disorder is much higher in women of South Asia especially in Pakistan than Western Women, which is 52% and 25% respectively (Akram & Roohi, 2015)

There is less awareness of PCOS among Pakistanis. Reason behind this might be the label or construct which is associated with PCOS. PCOS is considered as tabooed disease in Indian society as well. According to South Asians, women are

considered defective if they have lack of basics of womanhood and femininity. Women also perceive them incomplete and burdened at personal level and in society as well. Stamp of well-defined standards of womanhood, on their minds further highlights already entrenched social image of women. Extravagant concern about body image can be described by different factors like eating disorders, obesity, low self-esteem and genetics (Sharma & Mishra, 2018). Women's self-esteem particularly depends on the body image, it also influences interpersonal relations and social functioning. It becomes complex when physical symptoms related to PCOS appears like irregular periods, hirsutism, difficulty in conceiving, increase in body weight and other physical symptoms that adversely affects body image and in turn cause loss of feminine identity, low self-esteem and psychological distress (Kriti et al., 2022).

Many women's self-esteem is influenced by their body image, which also influence their social interactions and interpersonal connections. Self-esteem of many females is dependent upon their body image and influence their interpersonal relationships and social interaction. Attitudes of women with PCOS toward their body are different because sociocultural factors influences have an impact on their self-esteem and body image (Bazarganipour et al., 2013).

Low self-esteem may cause anxiety, depression and somatic symptoms on the other hand high level of self-esteem can help people cope with both acute and chronic diseases (Tay et al., 2019).

Self-esteem among Women with PCOS

PCOS illness influences the sense of body image of women and makes them to take their body more negatively. The way they perceived their body is also influenced by person's attitudes, beliefs, experience and ideals they follow within society. When a women negatively perceives her body she gets involve in many

behavioral changes like loss of self-esteem and social withdrawal on the other hand positive body image increase a person's self-confidence and motivation. So body image is closely associated with self-esteem. There are different researches that hypothesized that those girls who perceive them as objectively heavier are less satisfied with their bodies and have low self-esteem than lean females (Kriti et al., 2022).

Theoretical Framework

Causes of eating disorders are not completely understood. According to sociocultural theory there is emphasis of thin body as ideal that leads to adoption of body as object in place of body as process. This model explains that females especially adolescents get frequent signal from social environment that thin body is appealing and desired (Stice et al., 1994; Festinger, 1954). Another model which is social comparison theory explains that the human beings have a desire to check out their abilities and personal traits and they do this by contrasting themselves with others. When humans perceive an adverse difference in between self and others, they get motivation to modify their behaviors to reduce that discrepancy. Researchers have proposed that unhealthy social comparisons based on looks may be the cause of the symptoms of eating disorders. Women who constantly compare their appearance to others report more frequent disordered eating and body dissatisfaction. Women with PCOS have been found to have higher levels of body dissatisfaction even after adjustment for current BMI (Prize & Demarzio, 1986; Halbriech et al., 1990). Self-discrepancy theory was explained by Higgins (1987), this theory described that people develop internalized standards that is their ideal self and compare it with their actual self. Self-discrepancy is the gap between this ideal and actual self. These self-

discrepancies are associated with eating disorders and body image dissatisfaction (Strauman et al., 1991).

Some of the main frameworks of body image are also sociocultural theory and social comparison theory. Sociocultural theory demonstrates how culture identifies individuals. Individual who live in a society can be influenced by outside forces that may affect his thinking and behaviors. These factors contribute much in the production of perception of ideal body image. Sociocultural environment includes peer groups, family, friends and mass media (Dittmar, 2005; Bozard & Young, 2016).

Social comparison theory demonstrates how individual see themselves in relation to other members of society. Individual compares himself/herself to other individuals whom he/she thinks have better appearance and develops an image of self. There are three important components in this theory that are self-evaluation, self-enhancement and self-improvement. Individuals who compare themselves with other and find flaws in themselves might adopt negative behaviors to get their ideal physical appearance (Barlett et al., 2008). It can be noted that PCOS women have higher negative image of body due to characteristics of PCOS like hirsutism and acne. Hence PCOS leads to loss of self-esteem (Bazarganipour et al., 2013).

Rationale

Polycystic Ovary Syndrome (PCOS) is an endocrine disorder which is very prevalent that influence women commonly. Its definitive symptoms are appearance of cysts in ovaries, irregular menstrual, obesity, hyperandrogenism and oligomenorrhea. Other common symptoms of PCOS include cystic acne, hirsutism which is noticeable to others and oneself may result in poor body appearance and body dissatisfaction. This body dissatisfaction can lead to many distorted eating behaviors and attitudes to get the ideal body that results in eating disorders. This study explored eating attitudes, body image and self-esteem of women with PCOS. Current study may prove helpful in finding the difference in eating attitudes, body image and self-esteem among women with and without PCOS. Current research shall bridgeup the existing gap in literature particular for indigenious literature. Low self-esteem due to poor body image can negatively influence emotional attitudes and lead to other psychiatric illnesses. So alongside with medical treatment identification of psychological tendencies like disordered eating attitudes, body dissatisfaction, low self-esteem and their psychological treatment is also important. This research will help to get the body image perception of females with PCOS and without PCOS that will help to identify the risk factors in developing different psychiatric disorders. Also this research will help to get awareness about PCOS with reference to different variables. This study will help mental health workers, psychologists, physicians, gynecologists, sociologists and community workers at large to better understand the syndrome and to design appropriate interventions and protective factors for women with PCOS. Better understanding of PCOS and its biopsychosocial perspective can help doctors to diagnose patients quickly and to develop effective treatment methods. Also this study will help women with PCOS to develop understanding of healthcare and self-

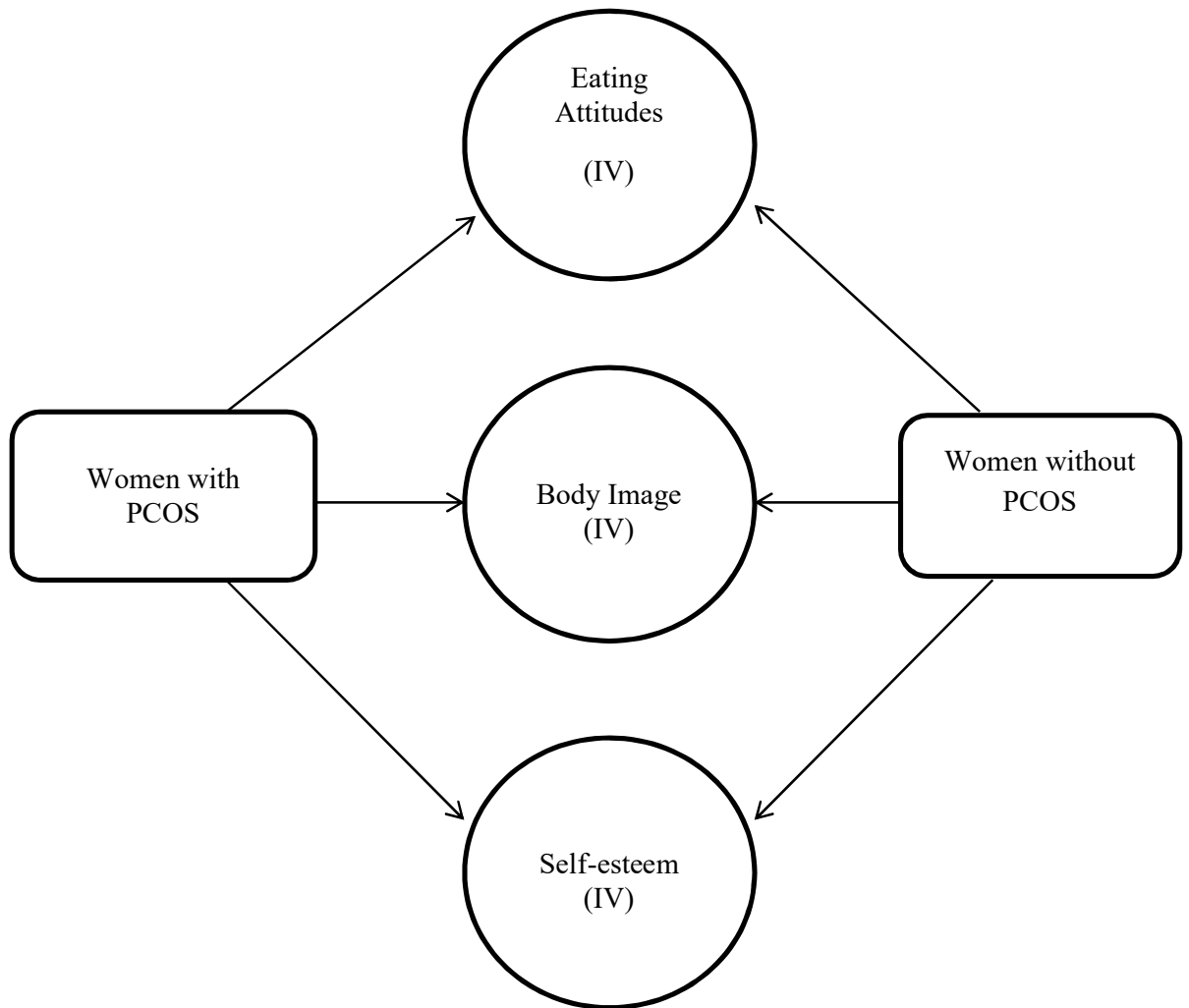
management, as well as recognition, insight and acceptance. In order to avoid major psychological and social decline of PCOS patients these factors should be considered and should be dealt properly.

Objectives

- To compare eating attitudes, body image and self-esteem of women with PCOS and without PCOS.
- To investigate sociodemographic variables of participants.

Hypotheses

- There is likely to be significant differences in eating attitudes of women with and without PCOS (i.e. dieting, bulimia & food preoccupation and oral control).
- There is likely to be significant differences in body image of women with and without PCOS
- There is likely to be significant differences in self-esteem of women with and without PCOS

Figure 1. Proposed Model of Study

LITERATURE REVIEW

This chapter provides relevant and adequate literature about the topic of research. It deals with the review of the literature on ideas connected to the study's topic, its findings, and a summary of the review of the literature that helps readers to get deep understanding of the topic under study.

Karacar et al., (2014) conducted a research in Turkey. They aimed to explore the connection of PCOS with body dissatisfaction and the eating attitudes. Also it aims to find whether body dissatisfaction is the predictor of low self-esteem and eating disorders or not. In this study 94 females participated, among which 42 were females with PCOS and 52 were without PCOS with age range 19-24 years. Participants completed a questionnaire that consist of demographics, measure of figure rating scale, Body Esteem Scale for Adolescence and Adults, Socio-cultural Attitudes towards Appearance Questionnaire and Eating Attitude Test. Data was analyzed through descriptive statistics. Findings indicated that the body esteem can predict eating attitudes between two groups also body dissatisfaction and sociocultural standards of being slim as ideal body are significant predictors of eating disorders. Other major study variables were not significantly high in any group.

A study was conducted by Bazarganipour et al., (2013) in Kashan, Iran. They aimed to find whether various PCOS characteristics are linked with body satisfaction and self-esteem. They conducted a cross-sectional study, 300 PCOS females participated in this study. Body Image Concern Inventory and Rosenberg's Self-esteem Scale were the main outcome measures. Obesity, acne, menstrual cycle disturbances, excessive body hair (hirsutism score) and infertility were the main clinical features of PCOS. Results indicated that there were low level of self-esteem and poor body satisfaction among females with infertility as compared to females

without infertility. Females with high hirsute score had poor self-esteem, females with menstrual irregularities and high BMI had poor body satisfaction but it was not related to their self-esteem.

Mizgier et al. (2020) carried out a research in Poland. This research aimed to distinguish between girls with Polycystic Ovary Syndrome who were obese or overweight (Ov/Ob) and those who were of average weight (N), in relation to disordered eating attitudes, abnormalities of hormones and metabolic system, and to identify pinpoint risk factors for being overweight. About 78 PCOS-afflicted teenagers between the ages of 14 and 18 were split into two groups. The Eating Attitudes Test-26 was used to find the DEA level. A score of 20 on the EAT-26 was considered positive for DEA. Numerical data from two groups that fit the normal distribution criteria were compared by using the Student's *t*-test or the Student's *t*-test with the Cochran-Cox adjustment when the difference of the groups were significant. When the assumption of normal distribution was violated, the Mann-Whitney test was applied. There was a statistically significant difference among two groups. Results showed that those girls with high score on DEA had approximately 7-fold greater odds of being overweight and obese than those without such a propensity. Furthermore, it was found that disordered eating attitudes are able to raise the risk of becoming obese.

Larsson et al., (2016) carried out a research in Sweden to investigate dietary intake, eating attitudes and meal patterns among females with PCOS and without PCOS. 72 women who had PCOS and 30 healthy controls participated in this research. Three-factor Eating Questionnaire and Eating Attitudes Test were used to measure eating behavior among participants. Data was analyzed by using Mann Whitney U test and logistic regression. Body Mass Index was high in females with

PCOS. Total Scores of EAT and scores on dieting subscales of EAT was high in females with PCOS as compared to healthy females. Results indicated that women who had PCOS showed high concern for their diet or weight and it showed high level of anxiety among these females.

Tay et al (2019) carried out a research in Australia. They aimed to compare the prevalence of eating disorders in females with and without polycystic ovary syndrome. This study also explored how Psychological distress, BMI and self-esteem are related with PCOS. This was a cross-sectional and community based study, 8467 participated in this study out of which 875 females were diagnosed with PCOS and 7592 females were without PCOS. Kessler Psychological Distress Scale, Rosenberg Self-esteem Scale and Self-reported Eating Disorders were used for assessment. Findings indicated that there were more occurrences of eating disorders among PCOS females, also there was lower self-esteem and psychological distress occurred more frequently among females with PCOS as compared to females without PCOS. There was also a correlation of low self-esteem and psychological distress that increase the occurrence of eating disorders among females with PCOS. This disease is highly linked with high psychological distress and low self-esteem. Also obesity plays its role to decrease the level of self-esteem and high level of distress but not with eating disorders. So these problems are more likely to be reported by females with PCOS.

Thannickal et al., (2020) conducted a research in Minnesota to access how sexual function disorders, eating disorders and sleep disorders are related to PCOS. They represented meta-analysis and a systematic review for this purpose. Studies were chosen and data were gathered by independent reviewers. Total 36 studies included in this study with 349529 patients in total. Overall results indicated that PCOS-afflicted women had more binge eating (1.61 to 5.42), bulimia nervosa (1.17 to

1.60), or any eating disorder (1.18 to 3.24) compared to women without PCOS, except anorexia nervosa (0.78 to 1.10). According to a visual analogue scale, sexual satisfaction was lower in PCOS women. High risk of sleeping and eating disorders and lower sexual satisfaction, has all been linked to PCOS. Women with PCOS who are screened for these conditions may benefit from early intervention and a higher quality of life.

Narula and Mahapatra, (2022) conducted a cross-sectional research in Poland. The primary goal of the study was to determine if women with and without PCOS had disordered eating attitudes and to investigate their health orientation. Eighty females with age range 18-30 years participated in this study. Health Orientation Scale and Disordered Eating Attitude Scale were used in this study. Difference among females with Polycystic Ovary Syndrome and healthy females regarding health orientation was reported. There were ten subscales of Health Orientation Scale. Results on these scales demonstrated that the difference was significant among women with and without PCOS on five out of ten subscales. Results also showed that there was significant difference among two groups in terms of disordered eating attitudes. There were five subscales of this scale, out of five there were significant difference on four subscales among PCOS and without PCOS women. These four subscales were: Relationship with food, Restrictive and compensatory practices, Concern about food and weight gain and Feeling towards eating. Disordered eating attitude was also significantly associated with being obese or overweight.

Sari et al. (2020) carried out a cross-sectional research in Turkey. They investigated the body perception, self-esteem and psychiatric disorders in adolescents with and without PCOS with age range 12-18 years. Total 87 adolescents participated in the study, 50 adolescents were diagnosed with PCOS and 37 were healthy controls.

Semi-structured interview was taken from participants by a psychiatrist to assess all the participants for psychiatric disorders. Main instruments for the study were Rosenberg Self-esteem Scale, Children's Depression Inventory and Body Image Scale. Findings indicated that among group of adolescents with PCOS there were high rates of BMI as compared to other group. About 52% participants in PCOS group were obese and comparatively only 18.9% in healthy adolescents group were obese. Presence of psychiatric disorders like depression, anxiety, ADHD and OCD was significantly higher among PCOS group. Furthermore, findings indicated that participants with polycystic ovary syndrome had significantly low scores for self-esteem and body image which showed that adolescents with PCOS had low self-esteem and their perceptions about their body image were more dissatisfied compared to the other group.

Anangur et al., (2014) conducted a research in Turkey. They aimed to determine symptoms of depression, body image and self-esteem among participants with PCOS and their comparison with without PCOS controls. Total 84 participants with diagnosed PCOS and 64 participants who served as controls participated in the research. Body Image Scale, Rosenberg Self-Esteem Scale and Beck Depression Inventory were main tools for this research. Data was analyzed by using Chi-Square Test and Independent Sample *t*-test. Age, level of education, and socioeconomic status did not differ between PCOS patients and healthy controls. The mean of the BMIs for the control and PCOS groups were 22.00 kg/m² and 23.85 kg/m², respectively. The PCOS group's BMI values were substantially higher than those of the controls. Results elaborated that there was a significant difference among women with and without PCOS regarding Depression. Findings showed that depression scores were higher in females with PCOS. Results also showed that there was not any

significant difference among two samples regarding self-esteem and body image as the value of p was greater than 0.05.

In order to assess how women with and without PCOS perceive their bodies and their symptoms of depression, Kanwal et al. (2021) carried out research in Pakistan. This study also aimed to determine the link between depression and body image perception. Total 120 participants participated in this study; women with syndrome n=60 and women without PCOS n=60. Body Esteem Scale and Depressive-symptomology-self Report were used for evaluation of participants under study. SPSS 26 was used for analysis of data. Chi-Square, Fisher Exact Test and Binary Logistic Regression were used to analyze the data. Significant difference among the samples was found in terms of depression and body-image. Results indicated that 55% females in PCOS group and 36.7% females in control group had depression which showed high prevalence of depression among PCOS women as compared to healthy women. Results also demonstrated that in PCOS group only 65% females had positive body image but in control group 98.3% females had positive body image. This showed that negative body image was more prevalent among PCOS women..

Kriti, Kumari and Joshi (2022) carried out a research in India to find out body image and self-esteem in girls with PCOS. They presented a systematic review to show the significance of self-esteem and body image in Indian culture related to the physical appearance of young girls. In this study they defined the basic concepts of obesity, body image and self-esteem and how they are related with each other and PCOS. They concluded that body image is closely related to self-esteem. Body image is a complicated concept that is directly connected to one's identity and is thought to affect behavior. A person with a positive body image may be more confident and motivated to achieve goals than someone with a negative body image, who may

withdraw from social activities or experience loss of self-esteem.. Since self-esteem is solely dependent on body image, girls with PCOS experience more body dissatisfaction and low self-esteem due to its defined physical symptoms like acne, obesity and hirsutism. Negative body image may also be related to other problems of mental health like anxiety, depression and disorders of eating among PCOS women. Girls having PCOS who had negative body image perceptions frequently reported feelings of self-conscious about their looks, unhappiness with their appearance, a perceived loss of femininity, and a decrease in their sexual attractiveness.

Another study in India was conducted by Rajeev (2022). This study aimed to compare women with and without PCOS regarding anxiety, depression, self-esteem, stress, body satisfaction and quality of life. Total 124 females participated in this study, out of which 65 women diagnosed with PCOS and 59 healthy women (without PCOS). Sturdy's main instruments included a demographic sheet, DASS, Rosenberg Self-esteem Scale, WHO Quality of Life scale-BREF and Body Area Satisfaction Scale of the Multidimensional Body Self Relations Questionnaire. To make a comparison of scores of two groups a case control approach was used. Independent Sample *t*-Test Chi-Square Test and Fisher Exact Test were used for data analysis. According to results, there were significant differences among the two groups regarding all the variables. Mean scores of women having PCOS were significantly high regarding depression, anxiety, stress. Results also indicated that PCOS women had lower body satisfaction and self-esteem as compared to healthy women. There was significant different among two groups in two domains of quality of life (physical and psychological) and non-significant difference regarding other two domains (social relationships and environment).

Summary of Findings

Polycystic Ovary Syndrome (PCOS) is a frequently occurring disorder of endocrine that influence women. Findings indicated that there were high occurrence of eating disorders, negative body image and psychological distress among females with PCOS as compared to females without PCOS. Reviewed literature showed that there were low levels of self-esteem and poor body satisfaction among females having PCOS.

CHAPTER II

METHOD

Research Design

A cross-sectional study is a type of research design in which you collect data from many different individuals at a single point in time. In cross-sectional research, you observe variables without influencing them (Richardson, 2018). This study was a cross-sectional study and two groups were compared i.e. women with and without PCOS.

Sampling Strategy

Sample of 142 women was recruited through purposive sampling strategy. Purposive sampling is a sampling strategy in which the researcher uses his or her own judgement according to research purpose, to select individuals from the target population who participate in study (Black, 2010).

Sample

Sample consisted of 142 women, out of which 71 women were diagnosed with PCOS and 71 women were without PCOS (healthy women). Age range of participants was 17-36 years ($M= 21.73$, $S.D= 3.96$). Sample of women with PCOS was selected from a local hospital. Healthy women were matched on age and marital status who served as control group. The study only included women who met the inclusion criteria.

Inclusion Criteria

- Women who voluntarily agreed to participate in the study.
- Women who were diagnosed with PCOS by gynecologist or physician.
- The Rotterdam criteria (2003) were used to make the PCOS diagnosis.
- Women with age range 17-36 years were included in the study.

- Both married and unmarried women with PCOS were included.

Exclusion Criteria

- Women who had PCOS symptoms but are not clinically diagnosed by any physician or gynecologist.
- Women who were divorced or widow were excluded.
- PCOS women with other medical issues like diabetes, hypertension, vitiligo and other skin problems were excluded from the study.

Demographic Information

Participants were asked about their demographic information by using questionnaires. They were asked about some specific demographic information like whether they are diagnosed with PCOS or not, their age, marital status, education and weight and height. Demographic information of the participants has been represented in table 3.1.

Table 3.1

Demographic information of study participants

| <i>Variables</i> | <i>M</i> | <i>SD</i> | <i>n</i> | <i>%</i> |
|------------------|----------|-----------|----------|----------|
| PCOS | | | | |
| Yes | ----- | ----- | 71 | 50 |
| No | ----- | ----- | 71 | 50 |
| Age | 21.73 | 3.69 | ----- | ----- |
| Education | | | | |
| Middle | ----- | ----- | 1 | 7 |
| Matric | ----- | ----- | 6 | 4.2 |
| Intermediate | ----- | ----- | 54 | 38.0 |
| Graduate | ----- | ----- | 65 | 45.8 |
| Post Graduate | ----- | ----- | 16 | 11.3 |
| Marital Status | | | | |
| Married | ----- | ----- | 32 | 22.5 |
| Unmarried | ----- | ----- | 110 | 77.5 |
| BMI | 21.34 | 3.75 | ----- | ----- |

Note, N=142, f= frequency, %= percentage

Conceptual and Operational definitions of Variables

Eating Attitudes

Eating attitudes are thoughts, behaviors, feelings and beliefs of people towards food. It will be defined as scores obtained by participants on Eating Attitude Test (EAT-26) (Garner et al., 1982).

Body Image

It is mental picture of a person's own body as a whole, including its physical features and person's attitude towards these features. It will be defined as scores obtained by participants on Body Image Concern Inventory (Littleton et al., 2005).

Self-Esteem

It is described as an individual's overall positive evaluation about his self. It will be defined as the scores obtained by participants under study on Rosenberg's Self-Esteem Scale (Rosenberg, 1965).

Measures

Eating Attitude Test [EAT-26, Garner et al., 1982]

Using this scale, individuals' eating attitudes were evaluated. It consisted of 26 items. It consisted of 6 point Likert scale ranges from 0-3 where 3 indicated always and 0 indicated never. Other values were; usually=2, often=1, sometimes=0 and rarely=0. There are three subscales of this instrument namely; Dieting scale, Bulimia & food preoccupation scale and Oral control subscale. Only 26th item had reversed scoring. Cronbach alpha value of EAT-26 is .85 which represented good reliability. High scores on this scale represent disordered eating attitudes.

Body Image Concern Inventory (Littleton, Axsom & Pury, 2005)

This tool was used to access the body image of participants. It comprised of 19 items linked to body dissatisfaction, concern about one's appearance, avoidance related to concerns, social concern and reassurance seeking. It consisted of five point Likert scale ranges from 1 to 5 in which 1 indicated never and 5 indicated always.

Score ranged between 19 to 95, high scores show high level of dissatisfaction with body. The scale has Cronbach alpha value of .93 which represents excellent reliability. Two subscales were identified; dissatisfaction about appearance (12 items) and interference with functioning because of concerns related to appearance (7 items). These two subscales are highly interrelated so only a single cut-off score of 72 is suggested to use.

Rosenberg's Self-Esteem Scale (Rosenberg, 1965).

The participant's level of self-esteem was measured using this scale. It has 10 items consisted of four point Likert Scale that ranges from 1-4, where 4 indicates strongly agree and 1 indicates strongly disagree. Item 2, 5, 6, 8, 9 had reversed scoring. Higher score showed higher self-esteem. The scale had Cronbach alpha value of .77 to .88 that represents fair to good reliability. Scores ranges from 10-40. Scores from 10 to 25 show low levels of self-esteem.

Procedure

Formal approval to conduct the study was sought from Departmental Research Committee and ORIC, Kinnaird College. Permission was sought from authors of the tools to be used in this study. Then researcher got the permission from advisor and visited private clinic of gynecology for the collection of data. Permission was sought from the head supervisor of the clinic to collect data from the patients of PCOS. After getting the approval from authorities, consent was provided to the participants before the collection of data. They were informed about all the required information about nature and purpose of study. After acquiring their willingness to participate they were provided with the questionnaires. Data was collected from participants within the 3 months of time period.

Ethical Considerations

- Informed written consent was obtained from all participants.
- Participants were allowed to back out from the research at any time. No one was forced to participate in the research.
- Participants received briefings and debriefings about study's objectives.
- The confidentiality of the participants was maintained.
- The respective authors were asked for their permission to use their scales in this study.

Statistical Analyses

For analysis of this research data, IBM Statistical Package for Social Sciences (SPSS Version 25) was used. After collecting data it was entered in and analysed through SPSS 25. Reliability analysis for the instruments of the study was done (Table 3.1). Demographic analysis was done (Table 2.1). Independent Sample *t*-test and Mann-Whitney U test were used to find the differences between two groups (women with PCOS & women without PCOS) regarding eating attitudes, body image and self-esteem.

CHAPTER III

RESULTS

This chapter deals with the analysis and interpretation of data. This study was a quantitative study so the data was analysed by using statistical procedures. After the data collection and scoring, statistical analysis was done to test the tentative hypotheses of the study. In initial section it represents demographic information of the study participants and reliability analysis of the study instruments. Afterwards it represents the main analysis of the study, followed by the tables and interpretation of the results. Data was analysed by using SPSS 25. Independent sample *t*-test and Mann Whitney U-test were used in this study. All of the study's goals were achieved by using these statistical methods.

Psychometric Properties of Study Variables

The extent to which a single test, technique, or instrument (such as a questionnaire) will generate the same findings under various circumstances, providing nothing else has changed, is known as reliability (Robert & Priest, 2006). Value of alpha coefficient is used to represent the Reliability and its value ranges from 0-1, the more value is close to 1 the more strong reliability is. Using SPSS 25, the internal consistency of the instruments was evaluated. Total 142 participants responded to study instruments. EAT-26 was consisted of 26 items out of which 13 items made the Dieting Subscale, 6 items made up the Bulimia & food preoccupation subscale and 7 items made up the Oral Control subscale, Body Image Concern Inventory was consisted of 19 items and Rosenberg's Self-esteem Scale was consisted of 10 items, reliability of all the scales were measured individually. Table 3.2 shows the Cronbach's alpha values of all scale.

Table 3.2

Psychometric properties of major Study Variables in the sample (N=142)

| <i>Variables</i> | <i>K</i> | <i>M</i> | <i>SD</i> | <i>A</i> | <i>Range</i> | | <i>Skewness</i> | <i>Kurtosis</i> |
|-------------------------------------|----------|----------|-----------|----------|------------------|---------------|-----------------|-----------------|
| | | | | | <i>Potential</i> | <i>Actual</i> | | |
| Dieting Scale | 13 | 4.63 | 4.42 | .73 | 0-39 | 0.00-1.00 | 3.28 | -2.34 |
| Bulimia & Food Preoccupation | 6 | 0.49 | 1.17 | .82 | 0-18 | 0.00-1.00 | 6.23 | -4.11 |
| Oral Control | 7 | 3.52 | 3.02 | .72 | 0-21 | 0.00-1.43 | 0.96 | -2.88 |
| Body Image Concern Inventory | 19 | 40.23 | 13.70 | .90 | 19-95 | 1.00-3.89 | 3.18 | -0.22 |
| Rosenberg's Self-esteem Scale | 10 | 29.95 | 4.22 | .80 | 10-40 | 2.00-3.90 | 0.61 | -1.11 |

Note: N=142, k=number of items, α =Cronbach alpha, M=mean, SD=standard deviation

Table 3.2 demonstrated that Bulimia and Food Preoccupation scale, Body Image Concern Inventory and Rosenberg's Self-esteem scale have good reliabilities and Dieting scale and Oral Control Scale have fair reliabilities.

Hypothesis 1

‘There is likely to be significant differences in eating attitudes of women with and without PCOS (i.e dieting, bulimia & food preoccupation and oral control)’.

To test this tentative hypothesis for Dieting and Oral control Scales, Independent sample *t*-test was used because data was normally distributed among two independent groups. On Bulimia and Food Preoccupation Scale data among two independent groups was not normally distributed so Mann Whitney U-test was used to test the hypothesis. Results of Independent Sample *t*-test are displayed in table 3.3.

Table 3.3

Independent Sample t-test showing differences in eating attitudes of women with and without PCOS.

| Variable | <u>Women with PCOS</u> | | <u>Women Without PCOS</u> | | <i>t</i> (<i>df</i>) | <i>p</i> | <u>95% CI</u> | | <i>Cohen's d</i> |
|----------------|------------------------|-----------|---------------------------|-----------|------------------------|-------------|---------------|-----------|------------------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | <i>LL</i> | <i>UL</i> | |
| 1.Dieting | 0.49 | 0.38 | 0.22 | 0.22 | 5.05(12.62) | .000 *** | 0.16 | 0.37 | 0.87 |
| 2.Oral Control | 0.66 | 0.44 | 0.35 | 0.37 | 4.56(40) | .000 *** | 0.18 | 0.44 | 0.76 |

Note: Women with PCOS=, Women without PCOS=M=mean, SD=standard deviation, CI=confidence interval, LL=lower limit, UL=upper limit.

p<.05, **p<.01, *p<.001*

Results in table 3.3 shows that there was a significant difference between women with Polycystic Ovary Syndrome and women without Polycystic Ovary Syndrome regarding Dieting and Oral Control attitudes. Women with PCOS showed more dieting and oral control attitudes as compared to women without PCOS. It also showed that women with PCOS had more disordered eating attitudes as compared to women without PCOS.

Mann-Whitney U test

Findings of Mann-Whitney U test showed that there was a significant difference between women with PCOS and women without PCOS regarding Bulimia and Food Preoccupation ($U= 1801, p=.000$).

Overall results indicated that PCOS women have more disordered eating attitudes as compared to the women without PCOS. There were significant differences among two groups regarding eating attitudes so the hypothesis was accepted.

Hypothesis 2

“There is likely to be a significant difference in body image of women with PCOS and without PCOS”. To verify this speculative claim Independent Sample *t*-test was utilized as all assumptions to use this test were met. Results of Independent sample *t*-test are displayed in table 3.4.

Table 3.4

Independent Sample t-test showing differences in body image of women with and without PCOS.

| Variable | <u>Women with PCOS</u> | | <u>Women Without PCOS</u> | | <i>t</i> (<i>df</i>) | <i>P</i> | <u>95% <i>Cl</i></u> | | <i>Cohen's d</i> |
|----------|------------------------|-----------|---------------------------|-----------|------------------------|----------|----------------------|-----------|------------------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | <i>LL</i> | <i>UL</i> | |
| BICI | 2.52 | 0.74 | 1.71 | 0.40 | 8.24(108.72) | .000 *** | 0.62 | 1.02 | 1.38 |

*Note: Women with PCOS=, Women without PCOS, SD=standard deviation M=mean, Cl=confidence interval, UL=upper limit, LL=lower limit * $p<.05$, ** $p<.01$, *** $p<.001$*

Findings showed that there was a significant difference between women with and without PCOS. Women with PCOS scored high on Body Image Concern Inventory which showed more appearance dissatisfaction or appearance concern in them as compared to women without PCOS. As the difference was significant among two groups so the hypothesis was accepted.

Hypothesis 3

“There is likely to be a significant difference in self-esteem of women with PCOS and without PCOS”. To test this tentative hypothesis Independent sample *t*-test was used as all the assumptions to use this test were met. Results of Independent sample *t*-test are displayed in table 3.5

Table 3.5

Independent Sample t-test showing differences in self-esteem of women with and without PCOS.

| Variable | <u>Women with PCOS</u> | | <u>Women Without PCOS</u> | | <i>t</i> (<i>df</i>) | <i>P</i> | <u>95% <i>Cl</i></u> | | <i>Cohen's d</i> |
|-------------|------------------------|-----------|---------------------------|-----------|------------------------|----------|----------------------|-----------|------------------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | <i>LL</i> | <i>UL</i> | |
| Self-esteem | 2.89 | 0.44 | 3.10 | 0.37 | -3.09(140) | .002 | -.35 | -.07 | -0.52 |
| | | | | | | ** | | | |

*Note: Women with PCOS=, Women without PCOS=M=mean, SD=standard deviation, Cl=confidence interval, LL=lower limit, UL=upper limit. **p*<.05, ***p*<.01, ****p*<.001*

Findings in table 3.5 showed that there was a significant difference between women without and without polycystic ovary syndrome. Women without PCOS showed high scores on this scale which showed that participants without PCOS had high levels of self-esteem as compared to women with PCOS. As the difference between two groups was significant, the hypothesis was accepted.

Figure 2

Framing results of t-test on dieting subscale

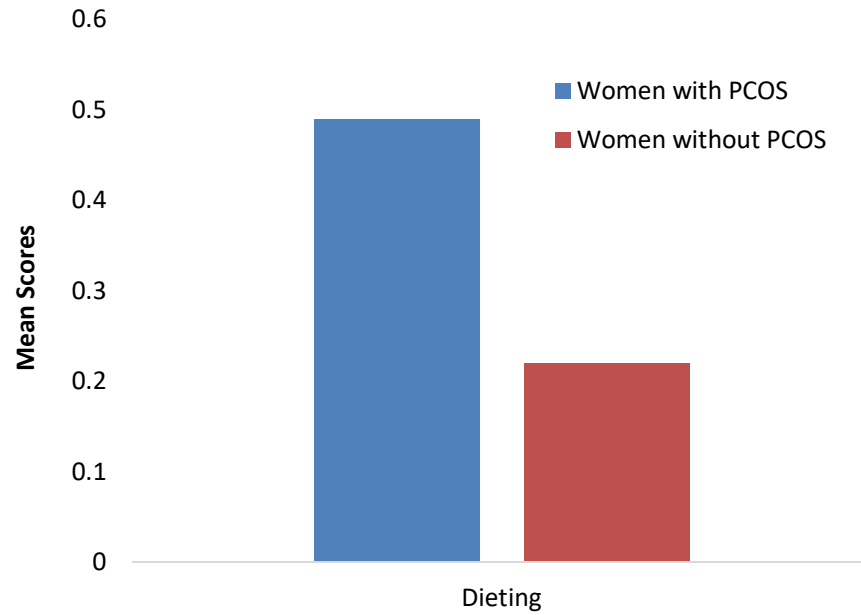


Fig 2 showing the difference in mean values of women with and without PCOS on dieting scale.

Figure 3

Framing results of t-test on oral control subscale

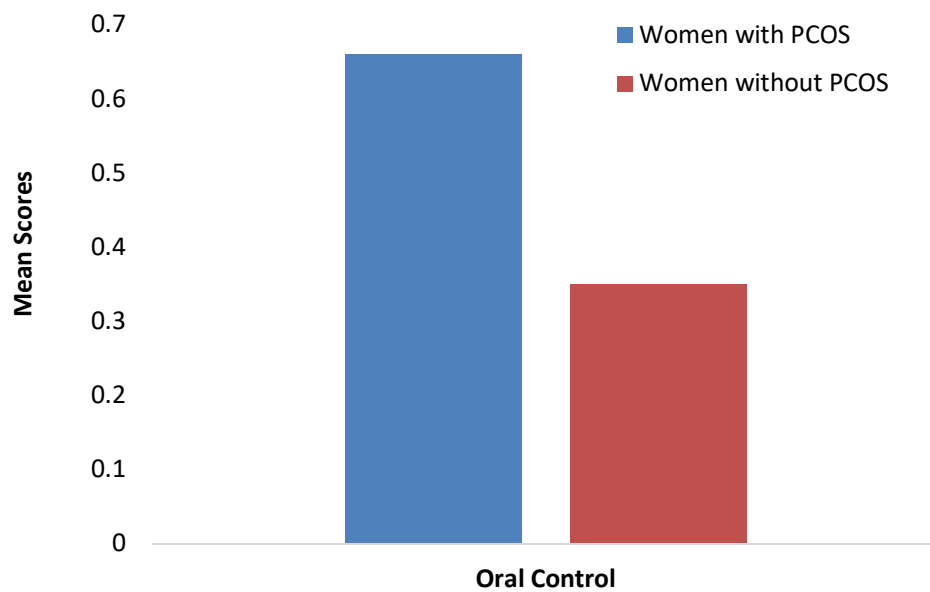


Fig 3 showing difference in mean values of women with and without PCOS on Oral Control subscale.

Figure 4

Framing results of t-test on Bulimia and Food Preoccupation Subscale

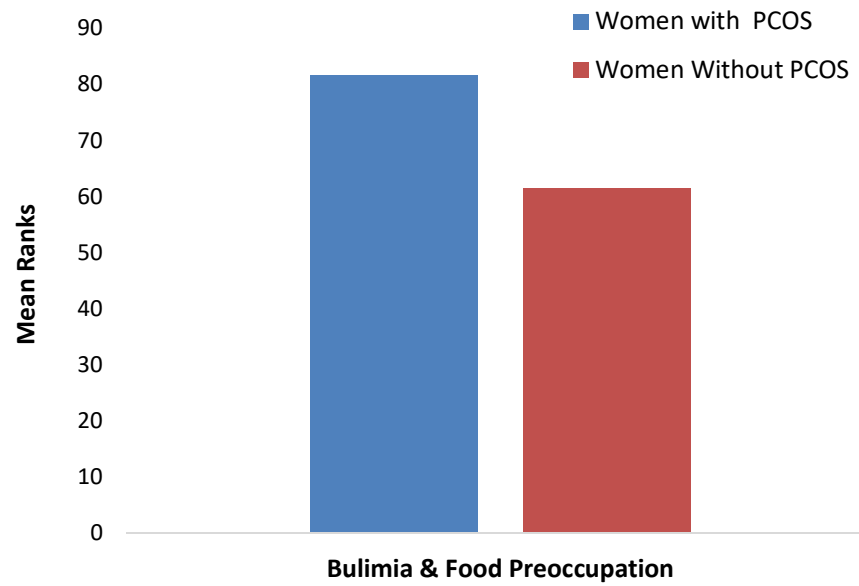


Fig 4 showing difference in mean rankings of women with and without PCOS on Bulimia and food preoccupation subscale

Figure 5

Framing results of t-test on Body Image Concern Inventory

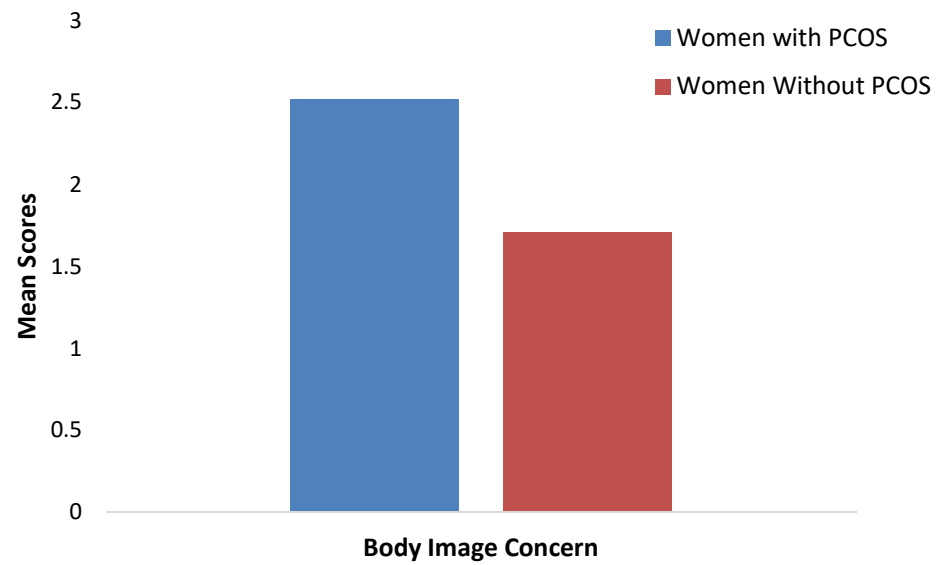


Fig 5 showing difference in mean values of women with PCOS and Without PCOS on Body Image Concern Inventory

Figure 6

Framing results of t-test on Self-esteem Scale

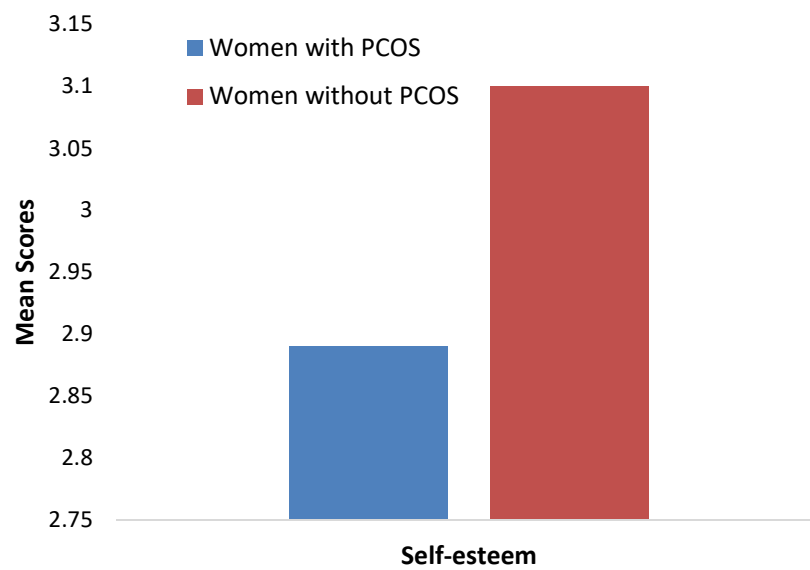


Fig 6 showing difference in mean values of women with and without PCOS on Rosenberg's Self-esteem Scale.

CHAPTER IV

DISCUSSIONS

Current study aimed to compare women with PCOS and without PCOS regarding their eating attitudes, body image and self-esteem. Total 142 women participated in this research, out of which 71 participants were with PCOS and 71 were without PCOS.

Hypothesis I: “There is likely to be significant differences in eating attitudes of women with and without PCOS (i.e. Dieting, Bulimia & Food Preoccupation and oral Control)”

It was hypothesized that there is likely to be a significant difference between women with and without Polycystic Ovary Syndrome regarding their eating attitudes (i.e. Dieting, Bulimia & Food Preoccupation and Oral Control). After analysis the hypothesis was accepted because there was a significant difference between women with PCOS and women without PCOS on all three subscales of EAT-26. Results indicated that women with PCOS had more disordered eating attitudes as compared to women without PCOS.

Results of first hypothesis of current study are supported by many previous studies including a study that was conducted by Larsson et al., (2016) in Sweden. Total 102 women participated in this research out of which 72 women had PCOS and 30 participants were healthy. According to the results of current research total scores of PCOS women on EAT and dieting subscale was high as compared to healthy women.

Another research that supports the hypothesis was conducted by Tay et al., (2019) in Australia. This was a cross-sectional and community based research. Total 8467 females participated in this study out of which 875 females were diagnosed with

PCOS and all the remaining participants were healthy females. Findings of the study indicated that there were more occurrences of eating disorders among women with PCOS as compared to non-PCOS women.

Results of present research were similar with the research that was carried out by Thannickal et al., (2020) in Minnesota to examine how eating disorders are related to PCOS. They conducted a meta-analysis consisted of 36 studies with 349529 patients of PCOS. Overall results indicated that PCOS women show more likelihood to have binge eating, bulimia nervosa or any other eating disorder as compared to women without PCOS. Increased risks of eating disorders are linked with PCOS.

Similarly, a cross-sectional study was conducted by Narula and Mahapatra (2022) in Poland. Results of this study also support the hypothesis of current study. Main purpose of this research was to find the disordered eating attitudes among women with and without PCOS. About 80 participants with age range 18-30 years participated in this study. Results demonstrated that there was a significant difference among two groups regarding eating attitudes. Disordered eating attitudes were high among group of women with PCOS.

Another study conducted by Bernadett (2016) in Hungary supported the hypothesis of the study. The study's primary objective was to ascertain the prevalence of eating disorders among PCOS-affected women. About 318 women participated in the research, out of which 95 women had PCOS, 100 healthy women served as control groups and 123 women made up hyperandrogen group. Among PCOS group the occurrence of Clinical Bulimia Nervosa was 5.3%, Subclinical Bulimia Nervosa was 10.5% and subclinical Anorexia Nervosa was 1.1% which was high as compared to other two groups.

Also a study which was conducted by Maher and Sanders (2017) supported the hypothesis of current study. They aimed to determine whether women with PCOS show disordered eating behaviors as compared to weight matched healthy women. Eight women diagnosed with PCOS and Eight weight matched healthy women participated in this research. Results of study indicated that women having PCOS reported disordered eating as compared to healthy participants. Reason for the similar results with other studies may be due to the similarity of symptoms among women with PCOS all over the world that is affecting the eating attitudes of women.

Hypothesis II: “There is likely to be a significant difference in body image of women with and without PCOS”.

In second hypothesis of the research it was assumed that there is likely to be a significant difference between women with PCOS and without PCOS regarding Body Image Concern. After analysis the hypothesis was accepted because there was a significant difference between two groups. Women with PCOS showed more body image concern and body dissatisfaction as compared to non-PCOS women.

Previous studies have also provided support for the findings of the current study. A study conducted by Himelein and Thatcher (2006) presented the similar results. They compared 40 women with PCOS with healthy women and women with infertility. Overall findings revealed that women having PCOS had high body dissatisfaction as compared to other two groups. Compared to healthy women, PCOS women were more likely to report low body satisfaction.

One more study that was carried out by Scaruffi et al., (2018) presented similar results. They aimed to assess the body image among women with PCOS. Total 59 PCOS women and about 38 women without PCOS participated in this research. PCOS-affected women showed high values for body dissatisfaction as compared to

healthy women. They concluded that physical appearance has a significant place in minds of PCOS women.

Investigation which was carried out by Azizi et al. (2020) in Iran also presented the similar results with current study. About 201 women with PCOS and 199 women without PCOS participated in this research. The results showed significant difference regarding body image of participants. Women with PCOS showed high score for body dissatisfaction with $M= 39.17$ as compared to women without PCOS with $M=32.61$.

Investigation by Altuntas et al., (2022) also supported the hypothesis of the present study. They aimed to investigate different psychological features like anxiety, depression, sexual dysfunction including body image among women with PCOS and to compare them with healthy controls. Total 240 participants participated in the study, out of which 167 were diagnosed with PCOS and 73 women were healthy controls. A significant difference was observed among two groups. Women who were diagnosed with PCOS showed significantly more negative body image as compared to healthy controls.

In Turkey, a cross-sectional study was presented by Sari et al., (2020) also supported finding of current research. The purpose of the study was to demonstrate the self-esteem and body perception of adolescents with age range 12-18 years. Total 87 adolescents participated in the study, 50 adolescents were diagnosed with PCOS and 37 were healthy controls. The body image scale scores were lower in participants with PCOS that showed more body dissatisfaction among PCOS group as compared to healthy control. The reason for similar results with other studies may be due to similarity of symptoms such as obesity, hirsutism, acne etc among women with

PCOS all over the world that is affecting body image of women with pcos in a negative way.

Hypothesis III: “There is likely to be a significant difference in self-esteem of women with PCOS and without PCOS”

In third hypothesis of the study it was assumed that there is likely to be a significant difference between women with PCOS and women without PCOS regarding self-esteem. Results of the *t*-test demonstrated that there was a significant difference in between women with PCOS and women without PCOS. Women with PCOS had low level of self-esteem in comparison of women without PCOS. The findings of the current study are also corroborated by other previous researches.

Investigation carried out by Tay et al. (2019) in Australia supported the findings of present study. Study was cross-sectional community based. About 8467 participants participated, out of which 875 had PCOS and 7592 women were without PCOS. The results of their study demonstrated that women with PCOS scored low on Rosenberg Self-esteem Scale as compared to women without PCOS. Obesity plays its role in production of low level of self-esteem among these women.

A study conducted in India by Rajeev (2022) supported the hypothesis. This study aimed to compare women with and without PCOS regarding self-esteem along with other variables. A total of 124 women participated in this study out of which 65 women were diagnosed with PCOS and 59 women served as healthy women (without PCOS). According to the findings there was a significant difference among two groups regarding self-esteem. Women with PCOS had lower self-esteem as compared to healthy women.

In Turkey, a cross-sectional study was presented by Sari et al., (2020) also supported findings of current research by presenting similar results as current study.

The study was cross-sectional. The purpose of the study was to demonstrate the self-esteem and body perception of adolescents with age range 12-18 years. Total 87 adolescents participated in the study, 50 adolescents were diagnosed with PCOS and 37 were healthy controls. There was a significant difference among two groups. Self-esteem scores were lower in participants with PCOS as compared to healthy control. Results showed that healthy women had higher level of self-esteem as compared to women with PCOS.

Glowinska et al., (2020) conducted a research in Poland. This was a cross-sectional study aimed to assess self-esteem with other psychological variables among women with PCOS and without PCOS. Participants with PCOS were 96 and participants without PCOS were 47 in total. Results showed that one aspect of self-esteem was lower in women with PCOS as compared to healthy women.

One study which was conducted by Acmaz et al., (2013) in Turkey supported the hypothesis by presenting similar results. The study was conducted among two groups. Participants with PCOS were 86 and 47 women served as healthy controls. They aimed to find which symptoms of PCOS increase problems like low self-esteem. Results demonstrated a significant difference among women with PCOS and without PCOS. Women having PCOS had lower levels of self-esteem. Among the PCOS group obese women got the lowest scores on self-esteem scale.

Conclusion

Findings of the research showed that there was a significant difference between women with PCOS and without PCOS. Women with PCOS had high levels of disordered eating attitudes, body image concern and low levels of self-esteem as compared to women without PCOS. Furthermore findings of Binary Logistic Regression revealed that oral control and body dissatisfaction are the significant

predictors of women with PCOS. The findings of current research increased implications for clinical practice and showed that a multidisciplinary strategy may be necessary in clinical practice to the treatment of PCOS in females. Further research is still needed to further deal with the limitation and to mind the gap in findings.

Implications

- This study will contribute in existing literature on same topic and will bridge up the gap in literature especially for indigenous literature.
- This study will help in better understanding and to provide awareness of Polycystic Ovary Syndrome, eating attitudes, body image and self-esteem.
- This research will help to understand the level of difference in women with and without PCOS regarding eating attitudes, body image and self-esteem.
- This study will help to identify the presence of disordered eating attitudes, poor body image and low self-esteem among women with PCOS that are also risk factors for other psychiatric disorders among these females.
- This study will help mental health workers, psychologists, sociologists, physician, gynecologists and community workers to better understand the syndrome and to design appropriate interventions and protective factors for women with PCOS.
- Better understanding of PCOS and its biopsychosocial perspective can help doctors to diagnose patients quickly and to develop effective treatment methods.
- This study will also help women with PCOS to develop understanding of healthcare and self-management, as well as recognition, insight and acceptance.

- In order to avoid major psychological and social decline of PCOS patients, the study will help to consider study variables and to deal them properly.

Limitations of the Study

- The sample size of the study was limited to 142 participants, which puts a limitation to generalization of results of the present study.
- Data was collected from a single gynecology clinic only and due to individual differences results can't be generalized to the whole population.
- Clinical characteristics of PCOS like hirsutism, acne etc were not measured objectively.
- There was restriction of time and resources.
- The results of the study are based on the expressed responses of the participants and objectivity is limited to the responses of the participants.

Recommendations

- Further study can be conducted on the same topic with increased sample size.
- Further study can be conducted by collecting data from more gynecology clinics and hospitals.
- Study with objectively measured characteristics of PCOS can be conducted.
- Eating attitudes, body image concern and low self-esteem should be considered as an important part in treatment of PCOS.

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Appendices

Appendix A
(Additional Analysis)

Additional Hypotheses

1. There is likely to be a relationship between dieting, oral control and body Image among women with PCOS.
2. There is likely to be a relationship between body image and self-esteem among women with PCOS.

Hypothesis 1

To test first tentative hypothesis Pearson Product Moment Correlation was used. Table below shows results of correlation among the variables.

Table 1

Descriptive Statistics and Pearson Product Moment Correlation Coefficient among dieting, oral control and body image in women with PCOS

| <i>Variables</i> | <i>n</i> | <i>M</i> | <i>SD</i> | <i>1</i> | <i>2</i> | <i>3</i> |
|------------------|----------|----------|-----------|----------|----------|----------|
| Dieting | 71 | .49 | .38 | ----- | | |
| Oral Control | 71 | .65 | .43 | -.10 | ----- | |
| Body Image | 71 | 2.52 | .73 | .54*** | .003 | ----- |

*Note n=sample size, M=mean, SD= standard deviation *p<.05, **p<.01, ***p<.001*

Pearson Product Moment Correlation analysis was used to investigate the relationship among dieting, oral control and body image in women with PCOS. Results showed that there was a significant, positive and strong relationship among dieting and body image. This showed that if the dieting behavior increases among women with PCOS their body image scores are likely to be increased or they are more likely to be satisfied with their body image. Relationship of oral control and body image was not significant.

Hypothesis 2

To test second tentative hypothesis Pearson Product Moment Correlation was used. Table below shows results of correlation among the variables.

Table 1

Descriptive Statistics and Pearson Product Moment Correlation Coefficient among dieting, oral control and body image in women with PCOS

| <i>Variables</i> | <i>N</i> | <i>M</i> | <i>SD</i> | <i>1</i> | <i>2</i> |
|------------------|----------|----------|-----------|----------|----------|
| Body Image | 71 | 2.52 | .74 | ----- | |
| Self-esteem | 71 | 2.89 | .44 | -.38** | ----- |

*Note n=sample size, M=mean, SD= standard deviation *p<.05, **p<.01, ***p<.001*

Pearson Product Moment Correlation analysis was used to investigate the relationship among body image and self-esteem. Results showed that there was a significant negative and moderate relationship between body image and self-esteem. Participant who scored high on body image concern it represents body dissatisfaction which was linked to low self-esteem. It showed that, as the body image score increases self-esteem of participant decreases.

Appendix B
(Informed Consent)

CONSENT FORM

I, _____ affirm that the researcher, Rabia Aslam has informed me about her research titled “Eating attitudes, body image and self-esteem among women with and without Polycystic Ovary Syndrome”. This research is being conducted under the supervision of Dr Masha Asad Khan from Kinnaird College for Women, Lahore. I shall fill a demographic sheet and 3 questionnaires for this research. Information that I shall provide will be kept confidential and will only be used for academic and research purposes. I can withdraw from this research at any time without the consent of researcher. Therefore, I am fully informed and willing to be a part of this research.

Signature of Participant

Appendix C

(Sample Copy of Questionnaires)

Demographic Sheet

Are you diagnosed with Polycystic Ovary Syndrome (PCOS)?

- Yes
- No

Age

_____ years

Education

- Middle
- Matric
- Intermediate
- Graduate
- Post Graduate

Marital Status

- Married
- Unmarried
- Divorced
- Widow

Weight

_____ (in Kgs)

Height

_____ (in feet)

Please fill out the below form as accurately, honestly and completely as possible.
There is no right or wrong answer. All of your responses are confidential.

| Sr.# | Statements | Always | Usually | Often | Sometimes | Rarely | Never |
|------|---|--------|---------|-------|-----------|--------|-------|
| 1 | I am terrified about being overweight. | | | | | | |
| 2 | Avoid eating when I am hungry | | | | | | |
| 3 | Find myself preoccupied with food | | | | | | |
| 4 | Have gone on eating binges where I feel that I may not be able to stop. | | | | | | |
| 5 | Cut my food into small pieces. | | | | | | |
| 6 | Aware of the calorie content of foods that I eat. | | | | | | |
| 7 | Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.) | | | | | | |
| 8 | Feel that others would prefer if I ate more. | | | | | | |
| 9 | Vomit after I have eaten. | | | | | | |
| 10 | Feel extremely guilty after eating | | | | | | |
| 11 | Am preoccupied with a desire to be thinner. | | | | | | |
| 12 | Think about burning up calories when I exercise. | | | | | | |
| 13 | Other people think that I am too thin. | | | | | | |
| 14 | Am preoccupied with the thought of having fat on my body. | | | | | | |
| 15 | Take longer than others to eat my meals. | | | | | | |
| 16 | Avoid foods with sugar in them. | | | | | | |
| 17 | Eat diet foods | | | | | | |
| 18 | Feel that food controls my life. | | | | | | |
| 19 | Display self-control around | | | | | | |

| | | | | | | | |
|----|---|--|--|--|--|--|--|
| | food | | | | | | |
| 20 | Feel that others pressure me to eat. | | | | | | |
| 21 | Give too much time and thought to food. | | | | | | |
| 22 | Feel uncomfortable after eating sweets. | | | | | | |
| 23 | Engage in dieting behavior. | | | | | | |
| 24 | Like my stomach to be empty. | | | | | | |
| 25 | Have the impulse to vomit after meals. | | | | | | |
| 26 | Enjoy trying new rich foods. | | | | | | |

Please respond to each item by circling how often you experience the described feelings or how often you perform the described behaviors.

| Sr.# | Statements | Never | Rarely | Sometimes | Often | Always |
|------|---|-------|--------|-----------|-------|--------|
| 1 | I am dissatisfied with some aspect of my appearance | | | | | |
| 2 | I spend a significant amount of time checking my appearance in the mirror. | | | | | |
| 3 | I feel others are speaking negatively of my appearance | | | | | |
| 4 | I am reluctant to engage in social activities when my appearance does not meet my satisfaction. | | | | | |
| 5 | I feel there are certain aspects of my appearance that are extremely unattractive. | | | | | |
| 6 | I buy cosmetic products to try to improve my appearance. | | | | | |
| 7 | I seek reassurance from others about my appearance | | | | | |
| 8 | I feel there are certain aspects of my appearance I would like to change. | | | | | |
| 9 | I am ashamed of some part of my body. | | | | | |
| 10 | I compare my appearance to that of fashion models or others. | | | | | |
| 11 | I try to camouflage (hide) certain flaws in my appearance. | | | | | |

| | | | | | | |
|----|--|--|--|--|--|--|
| 12 | I examine flaws in my appearance. | | | | | |
| 13 | I have bought clothing to hide a certain aspect of my appearance. | | | | | |
| 14 | I feel others are more physically attractive than me. | | | | | |
| 15 | I have considered consulting/consulted some sort of medical expert regarding flaws in my appearance. | | | | | |
| 16 | I have been embarrassed to leave the house because of my appearance. | | | | | |
| 17 | I fear that others will discover my flaws in appearance. | | | | | |
| 18 | I have missed social activities because of my appearance. | | | | | |
| 19 | I have avoided looking at my appearance in the mirror. | | | | | |

Please record the appropriate answer for each item, depending on whether you strongly agree, agree, disagree, or strongly disagree with it.

| Sr.# | Statements | Strongly Agree | Agree | Disagree | Strongly Disagree |
|------|---|----------------|-------|----------|-------------------|
| 1 | On the whole, I am satisfied with myself. | | | | |
| 2 | At times I think I am no good at all | | | | |
| 3 | I feel that I have a number of good qualities. | | | | |
| 4 | I am able to do things as well as most other people | | | | |
| 5 | I feel I do not have much to be proud of | | | | |
| 6 | I certainly feel useless at times. | | | | |
| 7 | I feel that I'm a person of worth. | | | | |
| 8 | I wish I could have more respect for myself. | | | | |
| 9 | All in all, I am inclined to think that I am a failure. | | | | |
| 10 | I take a positive attitude toward myself. | | | | |

Appendix D

(Email of Permissions to use Scale)

Permissions by Authors

From Rabia Aslam . rabiaaslam021@gamil.com

To: hlittleton@yahoo.com

Date Aug 31, 2022, 6:33 PM

Respected Author

My name is Rabia Aslam and I am a student of MS Clinical Psychology at Kinnaird College for Women University, Lahore, Pakistan. I am conducting a research with title “Eating Attitudes, Body Image and self-esteem among females with and without Polycystic Ovary Syndrome”. For this purpose I need permission to use your Body Image Concern Inventory (BICI). Kindly allow me to use this scale I shall be very thankful to you.

Kind Regards

From: Heather Littleton. Hlittleton2yahoo.com

To Rabia Aslam, rabiaaslam021@gamil.com

Date: Sep 5, 2022, 9:37 PM

Rabia,

Thank you for your interest in the BICI. You can find a copy of the measure along with a document listing all published psychometric studies on the BICI at this link: <https://osf.io/cvew3/> Best of luck with your project. Heather

Heather Littleton, Ph.D. | Director of Research Operations and Associate Professor

Lyda Hill Institute for Human Resilience

University of Colorado Colorado Springs

hlittlet@uccs.edu

resilience.uccs.edu

She/her/hers

From Rabia Aslam . rabiaaslam021@gamil.com

To: dmgarner@gmail.com

Date: Aug 31, 2022, 6:21 PM

Hi

My name is Rabia Aslam. I am a Student of MS Clinical Psychology at Kinnaird College for Women University Lahore, Pakistan. I am conducting a research with title "Eating attitudes, body image and Self-esteem among women with and without Polycystic Ovary Syndrome". For this purpose I need to use your Eating Attitude Test (EAT). Kindly grant me permission for using your scale, I shall be very thankful to you.

Kind Regards.

From: dmgarner@gmail.com

To: rabiaaslam021@gamil.com

Date Jan 29, 2023, 12:14 AM

Rabia Aslam,

Thank you for your request to use the EAT-26. The EAT-26 is protected under copyright; however, all fees and royalties have been waived because it has been our wish for others to have free access to the test.

Please consider this email as granting you permission to reproduce the EAT-26 for the purpose suggested in your e-mail as long as the EAT-26 is cited properly. The correct citation is: "The EAT-26 has been reproduced with permission. Garner et al. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. Psychological Medicine, 12, 871-878." I would also appreciate it if you could direct those taking the test to the EAT-26 website (www.EAT-26.com) so that they can obtain additional information about the test. Also, please include the copyright symbol © on the test that appears on your website.

Again, thank you for requesting permission to use the EAT-26. If you intend on publishing your work, please send me your results so that they can be included in a research database being developed on the EAT-26 website (www.eat-26.com).

Best wishes,

David M. Garner, Ph.D.

President, Eating Attitudes, LLC

www.eat-26.com

6897 Brentwood Ct.

Arvada, CO 80004

Phone: 419-276-8800

e-mail: dmgarner@gmail.com

Rosenberg's Self-esteem Scale was free to use.

Appendix E
(SPSS Output)

SPSS Output

Scale: Dieting reliability

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 142 | 100.0 |
| | Excluded ^a | 0 | .0 |
| | Total | 142 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .725 | .744 | 13 |

Summary Item Statistics

| | Mean | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|------------|------|---------|---------|-------|-------------------|----------|------------|
| Item Means | .357 | .183 | .472 | .289 | 2.577 | .008 | 13 |

Scale Statistics

| Mean | Variance | Std. Deviation | N of Items |
|--------|----------|----------------|------------|
| 4.6408 | 19.537 | 4.42004 | 13 |

Scale: Bulimia and Food preoccupation reliability

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 142 | 100.0 |
| | Excluded ^a | 0 | .0 |
| | Total | 142 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .817 | .832 | 6 |

Summary Item Statistics

| | Mean | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|------------|------|---------|---------|-------|-------------------|----------|------------|
| Item Means | .081 | .049 | .169 | .120 | 3.429 | .002 | 6 |

Scale Statistics

| Mean | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| .4859 | 1.372 | 1.17138 | 6 |

Scale: Oral Control reliability

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 142 | 100.0 |
| | Excluded ^a | 0 | .0 |
| | Total | 142 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .715 | .710 | 7 |

Summary Item Statistics

| | Mean | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|------------|------|---------|---------|-------|-------------------|----------|------------|
| Item Means | .503 | .331 | .711 | .380 | 2.149 | .015 | 7 |

Scale Statistics

| Mean | Variance | Std. Deviation | N of Items |
|--------|----------|----------------|------------|
| 3.5211 | 9.159 | 3.02640 | 7 |

Scale: Body image reliability

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 142 | 100.0 |
| | Excluded ^a | 0 | .0 |
| | Total | 142 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .900 | .898 | 19 |

Summary Item Statistics

| | Mean | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|------------|-------|---------|---------|-------|-------------------|----------|------------|
| Item Means | 2.118 | 1.289 | 2.810 | 1.521 | 2.180 | .220 | 19 |

Scale Statistics

| Mean | Variance | Std. Deviation | N of Items |
|---------|----------|----------------|------------|
| 40.2394 | 187.786 | 13.70351 | 19 |

Scale: Self-esteem Reliability

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 142 | 100.0 |
| | Excluded ^a | 0 | .0 |
| | Total | 142 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| .795 | .827 | 10 |

Summary Item Statistics

| | Mean | Minimum | Maximum | Range | Maximum / Minimum | Variance | N of Items |
|------------|-------|---------|---------|-------|-------------------|----------|------------|
| Item Means | 2.995 | 2.155 | 3.282 | 1.127 | 1.523 | .137 | 10 |

Scale Statistics

| Mean | Variance | Std. Deviation | N of Items |
|---------|----------|----------------|------------|
| 29.9507 | 17.834 | 4.22308 | 10 |

T-Test**Group Statistics**

| | Are you diagnosed with PCOS? | N | Mean | Std. Deviation | Std. Error Mean |
|-----------------|------------------------------|----|--------|----------------|-----------------|
| SelfEsteemMeans | Yes | 71 | 2.8887 | .44418 | .05271 |
| | No | 71 | 3.1014 | .37282 | .04425 |
| OralControl | Yes | 71 | .6579 | .43631 | .05178 |
| | No | 71 | .3481 | .37075 | .04400 |
| BICIMeans | Yes | 71 | 2.5285 | .73627 | .08738 |
| | No | 71 | 1.7072 | .40444 | .04800 |
| DietingMeans | Yes | 71 | .4897 | .38401 | .04557 |
| | No | 71 | .2232 | .22376 | .02656 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | | | |
|-----------------|-----------------------------|---|------|--------|---------|-----------------|
| | | F | Sig. | t | df | Sig. (2-tailed) |
| SelfEsteemMeans | Equal variances assumed | 1.275 | .261 | -3.090 | 140 | .002 |
| | Equal variances not assumed | | | -3.090 | 135.915 | .002 |
| OralControl | Equal variances assumed | 1.332 | .250 | 4.560 | 140 | .000 |
| | Equal variances not assumed | | | 4.560 | 136.445 | .000 |
| BICIMeans | Equal variances assumed | 36.436 | .000 | 8.239 | 140 | .000 |
| | Equal variances not assumed | | | 8.239 | 108.718 | .000 |
| DietingMeans | Equal variances assumed | 51.096 | .000 | 5.053 | 140 | .000 |
| | Equal variances not assumed | | | 5.053 | 112.621 | .000 |

Mann-Whitney Test**Ranks**

| | | Are you diagnosed with PCOS? | N | Mean Rank | Sum of Ranks |
|-----------------|-------|------------------------------|-----|-----------|--------------|
| BulimiaSubscale | Yes | | 71 | 81.63 | 5796.00 |
| | No | | 71 | 61.37 | 4357.00 |
| | Total | | 142 | | |

Test Statistics^a

| | | BulimiaSubscale |
|------------------------|--|-----------------|
| Mann-Whitney U | | 1801.000 |
| Wilcoxon W | | 4357.000 |
| Z | | -4.066 |
| Asymp. Sig. (2-tailed) | | .000 |

a. Grouping Variable: Are you diagnosed with PCOS?

Logistic Regression**Case Processing Summary**

| Unweighted Cases ^a | | N | Percent |
|-------------------------------|----------------------|-----|---------|
| Selected Cases | Included in Analysis | 142 | 100.0 |
| | Missing Cases | 0 | .0 |
| | Total | 142 | 100.0 |
| Unselected Cases | | 0 | .0 |

| | | |
|-------|-----|-------|
| Total | 142 | 100.0 |
|-------|-----|-------|

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable

Encoding

| Original Value | Internal Value |
|----------------|----------------|
| yes | 0 |
| no | 1 |

Classification Table^{a,b}

| Observed | Are you diagnosed with PCOS? | Predicted | | Percentage Correct | |
|--------------------|------------------------------|-----------|----|--------------------|-------|
| | | Yes | no | | |
| Step 0 | Are you diagnosed with PCOS? | Yes | 0 | 71 | .0 |
| | | No | 0 | 71 | 100.0 |
| Overall Percentage | | | | | 50.0 |

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|--------|----------|------|------|------|----|-------|--------|
| Step 0 | Constant | .000 | .168 | .000 | 1 | 1.000 | 1.000 |

Variables not in the Equation

| | | Score | df | Sig. | |
|--------------------|-----------|-----------------|--------|------|------|
| Step 0 | Variables | SelfEsteemMeans | 9.067 | 1 | .003 |
| | | BulimiaSubscale | 15.635 | 1 | .000 |
| | | OralControl | 18.364 | 1 | .000 |
| | | BICIMeans | 46.366 | 1 | .000 |
| | | DietingMeans | 21.903 | 1 | .000 |
| | | BMI | 9.795 | 1 | .002 |
| Overall Statistics | | | 59.785 | 6 | .000 |

Omnibus Tests of Model Coefficients

| | | Chi-square | df | Sig. |
|--------|-------|------------|----|------|
| Step 1 | Step | 76.749 | 6 | .000 |
| | Block | 76.749 | 6 | .000 |
| | Model | 76.749 | 6 | .000 |

Model Summary

| Step | -2 Log likelihood | Cox & Snell R | Nagelkerke R |
|------|----------------------|---------------|--------------|
| | | Square | Square |
| 1 | 120.105 ^a | .418 | .557 |

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

| Step | Chi-square | df | Sig. |
|------|------------|----|------|
| 1 | 7.520 | 8 | .482 |

Variables in the Equation

| | B | S.E. | Wald | Df | Sig. | Exp(B) | 95% C.I. for EXP(B) | |
|---------------------|--------|-------|--------|----|------|---------|---------------------|-------|
| | | | | | | | Lower | Upper |
| Step 1 ^a | | | | | | | | |
| SelfEsteemMeans | .433 | .619 | .489 | 1 | .484 | 1.542 | .458 | 5.186 |
| BulimiaSubscale | -3.022 | 2.323 | 1.693 | 1 | .193 | .049 | .001 | 4.619 |
| OralControl | -2.220 | .658 | 11.370 | 1 | .001 | .109 | .030 | .395 |
| BICIMeans | -1.756 | .478 | 13.493 | 1 | .000 | .173 | .068 | .441 |
| DietingMeans | -.486 | .922 | .277 | 1 | .599 | .615 | .101 | 3.753 |
| BMI | -.144 | .080 | 3.216 | 1 | .073 | .866 | .739 | 1.013 |
| Constant | 6.758 | 2.725 | 6.149 | 1 | .013 | 860.824 | | |

a. Variable(s) entered on step 1: SelfEsteemMeans, BulimiaSubscale, OralControl, BICIMeans, DietingMeans, BMI.

Appendix F
(Permission Letter)

KINNAIRD COLLEGE FOR WOMEN



Date: 27-Dec-2022

PERMISSION LETTER

To,

Head Supervisor of Hospital

Our student, Rabia Aslam of MS (Clinical Psychology) 2 years Program of Kinnaird College for Women, Lahore, is conducting her research on:

Eating Attitudes, Body image and self-esteem among women with and without Polycystic Ovary Syndrome.

She is interested to carry out the study in your institution/organization/hospital with patients of PCOS. She will be administering her research questionnaire to identify the self-esteem, body image and eating attitudes. I request you to grant her permission to conduct research work at your prestigious institute. Your cooperation/help in providing the necessary facilities for collecting data will be highly appreciated. Your support in this respect will also promote research work in Pakistan.

Thanking in anticipation

Afshen.
 Dr. Afshen Gul
 Head of Applied Psychology Department
 Kinnaird College for Women, Lahore

Dr. Ayyub D. Bhatti
 A.B.B.S, D.Drm (Singapore)
 Skin & Allergy Specialist

Appendix G
(Turnitin Report)



- Assignments
- Students
- Grade Book
- Libraries
- Calendar
- Discussion
- Preferences

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