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Research Article

PCOS/PCOD as result of lifestyle and stress among college-going female students

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Abstract

This study aims to investigate PCOS/PCOD in college-going female students of the present time as a major health challenge at personal, familial and societal levels. This study is divided into two phases, which examine lifestyle and stress as characteristics and determinants of PCOS/PCOD in college-going females. The sample includes college-going female students, aged between 18-25 years, of undergraduate and postgraduate classes of all disciplines of Higher Education Centres, Bhopal. Purposive sampling was used. Simple quantitative analysis (analysis of percentage and conversion of scores into levels) has been done to get the comparative picture of various dimensions of life style factors. Phase I investigates lifestyle factors by using a self-developed 5-point interview schedule, which includes 10 lifestyle dimensions. Results of phase I suggest that excessive screen time, unregulated sleep patterns and poor dietary habits play a contributing role among females with PCOD/PCOS. Since adolescence is characterized by stress (Stanley Hall's 4s), it was deemed essential to plan a second phase of this study employing ex post facto research design with causal factors of stress comparing college-going females with PCOS/PCOD with two healthy controls (comparative groups). Phase II of this study explores perceived stress levels using a perceived stress questionnaire (PSQ). One-way ANOVA revealed no significant difference among the above-mentioned three groups. The results are discussed in the light of Adlerian theory and the bio-psycho-social model of health, with a specific emphasis on belief systems and lifestyle as well as its implications on health.

Keywords:
PCOS /PCOD, Lifestyle, Perceived stress, Psychosomatic, Women's health

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Introduction

Women play a quintessential role in society as multiple contributors to the workforce and communities. Prioritizing women's health, particularly conditions like PCOS (Polycystic Ovary Syndrome) and PCOD (Polycystic Ovary

Disorder), is crucial not only for individual wellbeing but for the very existence of humankind. PCOS and PCOD are complex endocrine disorders that significantly affect the health and quality of life of women worldwide. Despite being considered the leading cause of female infertility and a lifestyle disease, PCOS has received scarce attention in the social science literature from bio psycho social perspective.

There exists a subtle distinction between PCOS and PCOD. PCOD is a milder condition improved by nutrition and exercise with fewer fertility issues, whereas PCOS is a metabolic syndrome which poses a higher risk of infertility, miscarriage, insulin resistance, diabetes, cardiovascular disorders and endometrial cancers. Seeking medical advice is crucial for both, but PCOS entails more significant health challenges. Women with PCOS and PCOD are often confronted with distressing symptoms, including irregular menstrual cycles, hirsutism, obesity, infertility, an ovulation, and acne. [1]

The factors responsible for PCOS /PCOD involve both genetic and environmental components. According to the "two-hit" theory, predisposition combined with a triggering factor leads to PCOS. The former (the first "hit") includes genetic factors like exposure to maternal androgens, and the later (the second "hit") includes insulin resistance.[2]

Studies show that genetic factors like a family history play a very significant role in PCOS.[3] Environmental factors like toxins and socioeconomic status, along with geographic factors (e.g. climate and altitude), lifestyle choices, physical activity, and dietary habits, such as insulin resistance and exposure to endocrine disruptors, also contribute to PCOS.[2]

It is observed that menstrual cycle impairment, bad mood, family history of diabetes, infertility in the family, mother's menstrual irregularity, lack ofphysical exercise, etc., fall under the risk of PCOS. The environmental factors potentially contribute to the etiology, prevalence, and modulation of the syndrome.[4] Some studies found that other environmental factors, including elements like diet, advanced glycation-end products (AGEs), physical activity, vitamin D, and endocrine disruptors (such as bisphenol A), influence individuals from prenatal stages through adulthood.[5]

PCOS is considered as a complex genetic disease. Approximately seven percent of women of reproductive age group get affected by PCOS [1], and in India, it was 3.7 per cent to 22.5 per cent.[6] Because of the lifestyle of urban middle and upper classes, PCOS is particularly most prevalent among them. Also, a sedentary lifestyle has been found in analysing the occupation and lifestyle of the patients.[7] Physical activity like vigorous aerobic exercise improves body composition, cardiorespiratory fitness and insulin resistance and is considered an effective therapeutic alternative for reproductive and metabolic functioning.[8,9]

Additionally, physical activity with a balanced diet has been supportive to women with PCOS, yielding positive effects on both the reproductive and metabolic dimensions of PCOS also reducing menstrual irregularities and cardiovascular risks.[5] Its beneficial influence is observed on mental health, decreasing body image distress and depression rates, as well as enhancing overall quality of life, and mental wellbeing.

Stress is instrumental in the pathogenesis of the syndrome and aggravation of many psychosomatic health issues. The link between psychological stress and PCOS is not fully understood and explained as the causal factor.

In the realm of women's health, especially concerning conditions like PCOD and PCOS, the prevalence of daily stress is a part of life. It is shaped by the demands of multitasking in this modern, fiercely competitive world. Studies show that the hypothalamic-pituitary-adrenal axis (HPA) is the main stress response system. Out of the several pathways that could be involved, the hypothalamic-pituitary-adrenal axis (HPA) remains the heart of the stress response system of the syndrome,[5,10,11] and immune function.[12] It is the neuroendocrine link between perceived stress and physiological reactions to stress.[12] Women with PCOS had a heightened heart rate response during stress in comparison to the control groups.[13]

There exist sleep disruptions in females with PCOS.[1] The complex interplay between genetic and environmental factors results in psychological distress. A study revealed that women with PCOS experienced psychological challenges, particularly anxiety disorders.[14] PCOS is often associated with psychological disturbances like social phobias,

body dissatisfaction, eating disorders and sleep problems. The exact causes of these conditions are uncertain, but they are attributed to factors like hyperandrogenism, insulin resistance, and chronic inflammation, as well as the stigmatization linked to visible symptoms like acne and hirsutism.[5]

The present study aims to get an insight into the lifestyle as a contributing factor in PCOS/PCOD. Since stress is considered as part and parcel of life, therefore to get a deeper understanding, the next phase of the study has been planned, and a hypothesis has been formulated. The study emphasizes the compelling need for additional awareness, research and intervention to enhance the diagnosis and management of PCOS/PCOD.

Objectives

1. To find out the factors of PCOS/PCOD among college-going females.
2. To identify the relative incidences of lifestyle factors on different dimensions.
3. To get an understanding of the effect of physical activities on PCOS /PCOD.
4. To see the effect of stress on PCOS /PCOD.

Working hypothesis for phase II of the study

The perceived stress level would be higher in college-going females with PCOS/PCOD than their comparative groups without PCOS/PCOD and sports females.

Methodology

Participants

The present study was conducted on college-going females with PCOS / PCOD as a potential group, and females without PCOS/PCOD and sports females as healthy controls (comparative groups) belonging to urban middle-class society. Females without PCOS/PCOD and sports females are considered healthy controls (comparative groups), as sports females have a disciplined lifestyle dedicated to their sport, including regular physical activity and training, dietary habits etc. Females without PCOS/PCOD represent the general population with some healthy hereditary endowments, personality types and familial-social belief systems. All three groups were matched on age ranging from 18-26 years, marital status (unmarried), education, environment (urban girls& rural girls living in an urban environment for 2-3 years and socioeconomic status (middle class). The sample size was 20 in all the groups, thus 60 in total. The sample was chosen from government colleges of Bhopal City (M.P.). Purposive sampling was done.

Method

In the first phase of the present study on lifestyle factors, a survey method was employed to conduct non-experimental descriptive research. To strengthen the study and gain a comprehensive understanding, a retrospective study was conducted using causal comparative ex post facto research in the second phase.

Measures

Phase I- The lifestyle was assessed using a structured interviewschedule- "Lifestyle & PCOS/ PCOD schedule" (LSPS). It consists of 10 dimensions, namely food habits, drinking habits, sleep patterns, screen time, social interaction, leisure activities, physical fitness, mental wellbeing, psychological dimension, and menstruation awareness.

Phase II- The perceived stress was assessed by using a perceived stress questionnaire (PSQ) developed by Levenstein and colleagues (1993). The questionnaire consists of two forms, General and Recent which means each item is applicable in general (during the last year or two) and recent, during the last month retrospectively. Given the retrospective nature of the study, the general form was employed to evaluate stress levels during the preceding year or two retrospectively. A reliability coefficient of 0.82 was estimated by the Test-retest method and 0.90-0.92 by the Internal consistency method.[18]

Ethical Considerations

Permission for visiting and collecting data was allowed by the Director, IEHE, Bhopal. Studying PCOS was discussed by a medical professional and city hospitals. Participants' consent and confidentiality of findings were assured.

Result

Phase I

College-going females with PCOS/PCOD showed

poor screen time habits in comparison to their healthy comparative groups, as presented in Table 1.All three groups demonstrated average to good scores across all other dimensions. However, the healthy controls exhibited better scores on the psychological dimension, menstrual awareness, as well as in physical fitness and leisure activities as graphically presented in Fig 1.

Furthermore, females with PCOS/PCOD have slightly poorer food habits than their healthy controls (PCOS/PCOD- 72%, without PCOS /PCOD- 74% and Sports females - 73.6). Similarly, the sleep pattern of females with PCOS/PCOD was also found to be poor (PCOS/PCOD - 63%, without PCOS /PCOD - 65%, and Sports females - 64%).

Regarding screen time habits, poor screen time habitsare dominant in the lifestyle across all groups. However, females with PCOS/PCOD show even poorer scores in the screen time dimension (PCOS /PCOD- 38%, without PCOS /PCOD - 45%, sports females- 42%). Additionally, females with PCOS/PCOD reported poor scores in the psychological dimension (with PCOS/PCOD 59%, without PCOS/PCOD - 65%, and sports females - 64%).

However, in the dimensions of drinking habits (PCOS /PCOD- 77.5%, without PCOS/PCOD - 76% and sports females- 77.2%) and social interaction (PCOS /PCOD- 76%, without PCOS/PCOD - 74% and sports females 73%), females with PCOS/PCOD scored slightly better in comparison to their healthy controls.

Sports females demonstrated better scores in leisure activity (PCOS /PCOD - 70%, without PCOS/PCOD - 64%, Sports females- 82%) and physical fitness (PCOS/PCOD- 79.5%, and without PCOS/PCOD- 67.5%, and Sports females - 85%).

Besides, females without PCOS/PCOD depicted better menstruation awareness (PCOS /PCOD - 69%, non-PCOS/PCOD - 73% and sports 69.6%) and mental wellbeing (PCOS/PCOD - 70%, without PCOS/PCOD - 73% and sports females - 65%). Results are presented graphically in Fig 1.

Figure 1 : Percentages of lifestyle dimensions of each group

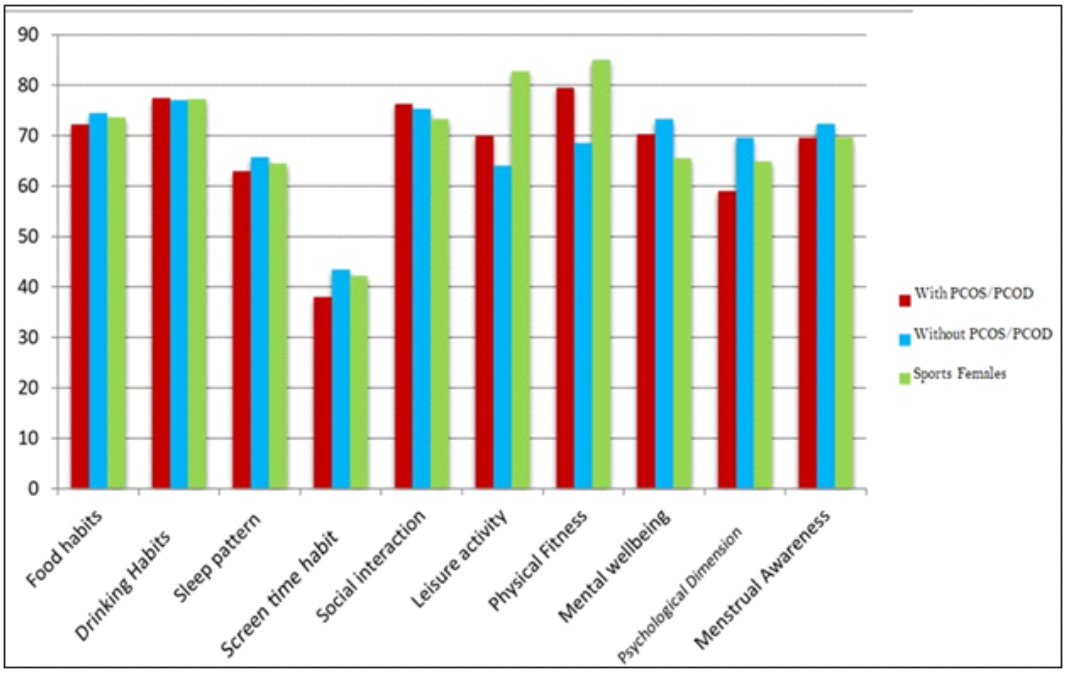

Table 1: Raw scores of all the three groups (PCOS /PCOD females, Without PCOS/PCOD females and sports female subjects) on life style dimensions

Group	Food habits	Drinking Habits	Sleep Pattern	Screen Time Habit	Social Interaction	Leisure Activities	Physical Fitness	Mental Wellbeing	Psychological Dimension	Menstr-uation Awareness
Females with PCOS/ PCOD	Average	Good	Average	Poor	Good	Average	Good	Average	Average	Average
Females without PCOS/ PCOD	Average	Good	Average	Average	Good	Average	Average	Average	Average	Average
Sports females	Average	Good	Average	Average	Average	Good	Good	Average	Average	Average

NOTE: The scores obtained are converted into three levels for interpretation, namely Good, Average and Poor. The high (191-260), moderate (121-190), and low (52-120) scores indicate Good, Average and Poor lifestyles in the given dimension, respectively.

Phase II

The result in Table 2 shows the mean and standard deviation of the three groups - females with PCOS / PCOD (M= 75.5; SD=18.42), females without PCOS /PCOD (M= 73.95; SD= 15.93), and sports females (M= 79.25; SD= 15.21). Retrospectively perceived stress as a cause of PCOS /PCOD exhibits no significant difference among the three groups by using One Way Analysis of Variance.

Table 2: Mean score of females with PCOS/PCOD, females without PCOS/PCOD and Sports females on Perceived Stress Questionnaire

Groups	Mean Score	S.D
WithPCOS/PCOD	75.5	18.42
Without PCOS/PCOD	73.25	15.93
Sports Females	79.95	15.21

Table 3: One-way analysis of variance: F-ratio

Source of Variation	SS	df	MS	F-ratio
Between Groups	465.0333	2	232.5167	0.845585
Within Groups	15673.7	57	274.9772	

Discussion

This study provides a comprehensive analysis of the lifestyle dimensions of three distinct groups of college-going females, namely PCOS/PCOD (target group) and non-PCOS/PCOD & sports females (healthy controls). The findings of this study reveal generally similar lifestyle dimensions of all three groups except for certain dimensions like screen time, psychological dimension, menstrual awareness, leisure activity, food habits and sleep pattern. Addressing screen time, females with PCOS/PCOD demonstrated poorer screen time compared to their healthy counterparts. This implies they have excessive screen time, which could lead to a sedentary lifestyle, obesity and disrupted sleep patterns.[15]

Additionally, it is observed that psychological dimension, menstrual awareness, leisure activity, food habits and sleep patterns were found to be poor in the females with PCOS/PCOD. The psychological dimension encompasses various elements, including emotional regulation,

interpersonal communication, body image concerns etc. Females with PCOS/PCOD reported a relative deficiency in this dimension. Several researches support the association between the presence of PCOS and an increased risk of psychological burden.[14] Findings show that nervousness, gloominess, frequent mood swings, obsessive-compulsive behaviours, eating disorders and poor quality of life are increased in women affected with PCOS.[3]

The sleep pattern dimension comprises several aspects of sleep behaviour, like total sleep duration, onset of sleep, daytime napping, etc. Females with PCOS/PCOD have reported poor sleep patterns than their health counterparts. Poor sleep patterns and a sedentary lifestyle are considered the implications of excessive screen time. They are also associated with obesity and hormonal imbalances, which are risk factors for PCOS.[16]

The food habits dimension examines dietary aspects like frequency and consumption of junk as well as healthy foods, meal intake frequency etc. Females with PCOS/PCOD show inadequate food habits compared to their healthy controls. This is confirmed by the findings which state that unhealthy dietary habits like frequent intake of junk food and sweets with fewer intake of fruits and green leafy vegetables add to the risk of non-communicable disease.[17]

The Bio-Psycho-Social model of health also seems relevant to discuss the present findings. Human beingsare not merely a constellation of biological properties but also governed by psychological and social characteristics. According to this, it can be stated that psychological, social, environmental factors and vice-versa influence an individual's biology.

The lifestyle choices of college-going students are affected to a great extent by the psychological changes they go through in this transitional period, i.e. from adolescence to adulthood. They are burdened with balancing multiple pressures of academics, career aspirations and societal expectations as well. For female college-going students, this pressure intensifies as they must adhere to familial responsibilities along with pursuing education successfully. Apart from this, self-doubt resulting from body image concerns also prevails in young adult females, which could be due to the culturally set standards of beauty.

The results of the present study can be interpreted in the light of the Adlerian theory, which posits that one's lifestyle is related to their belief system, which influences social interest and activities, which in turn affects an individual's health. This is further validated by Bronfenbrenner's (1977) bio-ecological theory, which states that human beings are embedded in many systems, and any change at any level can be observed in the development of individuals today.

In modern times, changed food habits, sleep patterns, technology usage, and overall lifestyle have resulted in several health issues. This includes a shift towards artificial activities such as gym workouts that have replaced healthier natural exercises. The traditional notion of "early to bed and early to rise" has changed in the multitasking society. An increase in night owls and late risers is noted, which is often justified by contemporary lifestyle choices.

In the second phase of the study, no significant difference is found in perceived stress levels among the three groups namely females with PCOS /PCOD, females without PCOS /PCOD and sports females. This has been linked to various stress-inducing factors, including career expectations, peer dynamics, parental conflicts and body image concerns. These stressors are prevalent during adolescence, a period marked by physical growth and emotional upheaval. Additionally, Stanley Hall delineated adolescence with the4 'S': stress, storm, strike, and strain, highlighting the turbulent nature of this developmental period.

The study also exhibits metabolic disturbances playing a role in the mental status of women with PCOS. Here, it is important to highlight the observations based on the mean scores that sports and PCOS /PCOD-diagnosed females are experiencing more stress than without PCOS counterparts. The higher stress in females with PCOS/PCOD can be attributed to their susceptibility to stress because of their family, career conflict, peer group pressure and many others. Perhaps they didn't have problem-focused coping strategy; they are more emotion-focused. The stressors of sports females are different from other females as they have to face tough competition, limited career opportunities, physical

and emotional abuse and exploitation. The stress levels do not show any significant variations among all three groups which can be explained by the various types of stressors faced by everyone in the society to some extent.

Also, stress is considered a contributing factor in many psychosomatic diseases such as heart diseases, thyroid and gastric problems and so on. Gender difference also exists in the experience of perceived stress. For females, the experience of stress and its impact on their health is a function of both their work/study environment and home environment. Work stress frequently combines with other areas of demand in their lives to influence levels of stress and risk for disease, which is termed as' "work-home spill over".[18] This is supported by the finding which states that occupational stress has a direct and indirect relationship with PCOS.[19] It means that stress can be one of contributing factor in increasing the susceptibility for PCOS /PCOD.

This can be seen in the light of bio-psycho-social model of health because Long-term work stress is associated with neuroendocrine responses.[20,21] and the primary neuroendocrine system related to psychological stress is the hypothalamus-pituitary-adrenal (HPA) axis, where cortisol is considered as final hormonal effector responsible for chronic stress. Its increased level may cause the accumulation of visceral fat and facilitate the gluconeogenesis and lipolysis pathway, finally resulting in insulin resistance.[22,23,24] which is considered as a potential factor for PCOS /PCOD.[25] This highlights that the interplay of biological, psychological and social factors can contribute in the development of psychosomatic disorder.

Females with PCOS/PCOD demonstrated poorer scores on various lifestyle dimensions compared to the healthy controls, which implies that they face a more pronounced impact on lifestyle factors such as screen time, food habits, sleep patterns, psychological well being and menstrual awareness. However, it has been suggested that lifestyle modifications can improve menstrual cycle disorders, insulin resistance, and hyperandrogenism by reducing energy intake and weight management.[26] Females without PCOS/PCOD displayed shortcomings in leisure activities and physical fitness, while sports females faced challenges in mental well being but excelled in sports and physical fitness, which can be seen as a strategy for managing stress in adult populations.[27]

Concerning stress, the second phase of this study surprisingly revealed that despite diverse lifestyle factors, no significant difference in perceived stress levels was observed across all three groups, attributed to the interplay of various stressors and coping unique to each group.

Finally, it could be stated that studying women's health issues is the need of the hour. Further, awareness about all sections of society and its management is very much required. It was observed during data collection that sports girls were not aware of PCOS /PCOD, and their coaches, too, were not aware of it. Research must be promoted in this area by psychologists, educationists, policymakers, and sociologists for humanity and human existence.

Implications of the study

The unique feature of the present study is comparing urban middle-class college-going female students, including all the important strata with PCOS/PCOD, Without PCOS /PCOD and sports females.

No study has yet been available with sports girls who are involved in physical activities and have less incidence of PCOS due to environmental factors. It can be helpful to understand PCOS in sports girls.

Self-developed interview schedule of Lifestyle has covered 10 dimensions, which is also unique and different from other scales. The dimensions are screen time, leisure activities, psychological dimension, menstrual awareness, drinking habits, social interaction, and physical fitness. The perceived stress levels of females with PCOS/PCOD, Without PCOS /PCOD and sports females have also been compared. There are less studies on the causative factors of PCOS/PCOD.

Limitations

1. There is a lack of standardized tools covering all the dimensions of Lifestyle.
2. There is also a lack of literature on causal factors of PCOS/PCOD based on a psychosocial

perspective, which affected the reviewing of the findings of the present study.

Further suggestions

1. Large samples could be used on the urban and rural women of above-mentioned strata.
2. The study could be done with tribal women, different geographical conditions and women from different communities.

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Conflict of interest: None

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