



ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

IJDR

International Journal of Development Research

Vol. 13, Issue, 07, pp. 63364-63367, July, 2023

<https://doi.org/10.37118/ijdr.27017.07.2023>



RESEARCH ARTICLE

OPEN ACCESS

EFFECTIVENESS OF PROGRESSIVE MUSCLE RELAXATION ON PERCEIVED STRESS AMONG ADOLESCENT GIRLS WITH POLYCYSTIC OVARY SYNDROME

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ARTICLE INFO

Article History:

Received 10th April, 2023

Received in revised form

14th May, 2023

Accepted 19th June, 2023

Published online 30th July, 2023

KeyWords:

Progressive muscle relaxation,

Stress, Adolescent, Girls,

Polycystic ovary syndrome.

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ABSTRACT

A study to evaluate the effectiveness of progressive muscle relaxation (PMR) on perceived stress among adolescent girls with Polycystic Ovary Syndrome (PCOS) in selected schools of Ludhiana, Punjab. The objectives of the study were to assess the level of perceived stress among adolescent girls with polycystic ovary syndrome before and after progressive muscle relaxation in the experimental and control group and to evaluate the effectiveness of progressive muscle relaxation on perceived stress among adolescent girls with polycystic ovary syndrome. **Method:** A quantitative research approach, a pretest-posttest control group research design was used. 50 subjects were selected for the pilot study using the probability sampling technique. The present study revealed that in the experimental group, the perceived stress level was reduced from moderate to mild levels i.e., 36.0% to 16% and 08.0% in posttest-1 and posttest- 2 respectively. It was concluded that the level of perceived stress among adolescent girls with polycystic ovary syndrome was reduced after progressive muscle relaxation and was statistically significant at $P < 0.001$ level.

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Citation: Harjit and Dr. Devasirvadam Victor. 2023. "Effectiveness of progressive muscle relaxation on perceived stress among adolescent girls with polycystic ovary Syndrome". *International Journal of Development Research*, 13, (07), 63364-63367.

INTRODUCTION

Polycystic is an ovary syndrome (PCOS), a polygenic endocrine disorder, in most women (Ding, 2017). This syndrome's common physiological manifestations include ovarian enlargement, hyperandrogenism, androgenic alopecia, hirsutism, acne, menstrual irregularity, anovulation, or oligo-amenorrhea, miscarriage, and infertility (Sirmans, 2013). PCOS-related symptoms also harm the quality of life by affecting the psychiatric aspects of a patient's life of patients (Blay, 2016). Women with PCOS manifest dyslipidemia, hypertension, heart disease, and common gynecological endocrinopathy, type 2 diabetes mellitus (Orio *et al.*, 2016). It was discovered that women with PCOS are more likely to suffer from social anxiety, painful emotional stress, suicidal ideation, bipolar illness, and attention deficit hyperactivity disorder (Scaruffi *et al.*, 2014). Anxiety and depression are two of the most widespread psychological comorbid conditions associated with PCOS, and their prevalence is high hence this disorder is a substantial public health burden. The prevalence of PCOS was found at 4%-8% in Greece, Spain, and the USA (Teede *et al.*, 2010). A study in India revealed an overall prevalence of psychiatric disorders of 79%, where the prevalence of anxiety was 39%, depression was 43% and stress was 54%. (Pottipadu *et al.*, 2022). Clinically, PCOS may manifest as a moderate menstrual disorder or a severe disturbance of reproductive

and metabolic functions (Badawy A & Elnashar A. (2011). Most visible signs are caused by excessive production of insulin or androgens. Hirsutism (excess hair growth on the face and body) is present in 70% of women with PCOS and is considered a good marker for hyperandrogenism but should be evaluated biochemically (Tabassum *et al.*, 2021). Alopecia (thinning scalp hair), acne, and other skin symptoms are less common and are not good markers (Consensus on Women's Health Aspects of PCOS. 2012).

Need of the Study: PCOS is a common disorder among adolescents, hence there is a need to collect relevant information. PCOS leads to long-term complications therefore early diagnosis and treatment are required to prevent long-term complications. Psychosocial problems arise in patients with PCOS, as shown by various investigators particularly due to obesity, excessive body hair, infertility and changes in physical appearance in addition to reproductive and metabolic concerns. PCOS is associated with psychological disorders, such as anxiety, depression, bipolar disorder, social phobia, and even suicidal ideation. However, comorbid psychological disorders in adolescents with PCOS remain underdiagnosed or even un-diagnosed, and consequently untreated. Limited studies have been conducted on adolescents with PCOS and associated mental health morbidity. The investigator while working in the college also observed that adolescent girls are suffering from PCOS and are having stress, anxiety and depressive symptoms. Moreover, it is evident that due to the high prevalence of associated anxiety and depression and their

significant impact on PCOS adolescents, psychological screening is vital.

Statement of Problem: An Experimental study to evaluate the effectiveness of Progressive Muscle Relaxation (PMR) on perceived stress among adolescent girls with Polycystic Ovary Syndrome (PCOS) in Selected Schools of Ludhiana, Punjab.

Objectives

1. To assess the level of perceived stress among adolescent girls with polycystic ovary syndrome before and after progressive muscle relaxation in the experimental and control group
2. To evaluate the effectiveness of progressive muscle relaxation on perceived stress among adolescent girls with polycystic ovary syndrome.

Hypothesis

H1: There will be a significant difference between mean pretest and posttest levels of perceived stress among adolescent girls with polycystic ovary syndrome in the experimental group.

H2: There will be a significant difference in the posttest level of perceived stress among adolescent girls with polycystic ovary syndrome between the experimental and control group.

Review of Literature

The literature review on a different aspect of the study has been organized under two main headings:

Section 1: Literature related to perceived stress among adolescent girls with PCOS.

Section 2: Literature-related to the effectiveness of progressive muscle relaxation training on perceived stress among adolescent girls with PCOS.

RESEARCH METHODOLOGY

Research Approach & Design: Quantitative research approaches and experimental (pretest-posttest control group) research design were used.

The setting of the Study: The study was conducted in the selected higher secondary schools of Ludhiana, Punjab.

Target population: The target population of the study was adolescent girls (14-18 years) with polycystic ovary syndrome who were studying in higher secondary schools in Ludhiana, Punjab.

Sample and sampling Technique: The study was conducted on 50 adolescent girls (14-18 years) with polycystic ovary syndrome. Out of 50 samples, 25 subjects were allocated to the experimental group and 25 to the control group using simple random sampling.

Inclusion Criteria

Adolescent girls who were:

- Available at the time of data collection and willing to participate.
- Not on treatment for PCOS.
- Able to read and write in Punjabi/ Hindi /English.
- Had < 9 cycles/year or >35 days between cycles or amenorrhea.
- Self-reported hirsutism scores ≥ 8 on the modified Ferriman Gallwey scale.
- Have mild to moderate levels of perceived stress.

Exclusion Criteria: Adolescent girls suffering from mental illness.

Tools Description: The research tool was divided into three parts.

Part 1: Socio-Demographic variables. This part of the tool consists of the items for obtaining the personal information of subjects. Socio-Demographic variables were age, academic level, education of mother, education of father, occupation of father, occupation of mother, area of residence, age at menarche, body mass index, duration of menstrual flow (days) and presence of acne.

Part 2: This part of the tool consists of Rotterdam criteria used to screen adolescent girls for PCOS.

Part 3: This part consists of the PSS-10 (Perceived stress scale) to assess perceived stress among adolescent girls with polycystic ovary syndrome. The perceived stress was measured at 3 levels: Mild (0-13), Moderate (14-26), and Severe (27-40).

Intervention: In the present study, progressive muscle relaxation is an intervention that was used. The researcher had a formal training program in Progressive muscle relaxation techniques.

Procedure for data collection: Formal permission from the authorities of the selected school was obtained. After the permission, the investigator introduced her self to the subjects and the purpose of the study was explained to the groups. Written consent was taken from the subjects and was assured that confidentiality will be maintained. Only those adolescent girls were selected who had fulfilled the inclusion criteria. The investigator used a probability sampling technique to select 50 samples, 25 in the experimental group and 25 in the control group. After collecting the baseline data, a pre-test was conducted for both groups. The standardized perceived stress scale was used to collect data. The time taken for the pretest and posttest was approximately 10-15 minutes. After the pretest, the experimental group was given progressive muscle relaxation training for 5 sessions of approximately 30 minutes each in the group of 6-7 adolescent girls. After making sure the mastery of the subjects on PMR the experimental group performed PMR 6 days a week, 48 sessions in 8 weeks. No intervention was given to the control group. The Post-intervention data were collected after completion of training at 4 weeks and 8 weeks.

Ethical consideration: Under ethical consideration, Ethical clearance was taken for the study from the institutional ethical committee. permission from the school authority was taken. Informed and written consent was obtained from each participant. The anonymity and confidentiality of each participant were assured.

RESULTS

Analysis of data was done in accordance with objectives. The data analysis was done using descriptive and inferential statistics computing mean score, mean percentage, standard deviation, and t-test. The level of significance chosen was $p < 0.05$. Table 1 depicts the distribution of subjects according to demographic variables i.e., age (in years), academic level, education of mother, education of father, occupation of father, occupation of mother, area of residence, age at menarche, Body Mass Index (BMI), Duration of Menstrual flow (days) and Presence of Acne. In the experimental group, the majority (36%) of adolescent girls were in the age group of 15.1 to 16 years, 36% were in 10th standard, 36% of fathers and mothers were Graduates and above, the majority (52%) of fathers were in business and majority (84%) of mothers were home-maker, the majority (88%) belonged to the urban area, the majority (48%) had menarche at the age of 13 years, the majority (52%) were overweight, a majority (60%) had 5 to 7 days of menstrual flow and a majority (60%) had acne. In the control group, the majority (52%) of adolescent girls were in the age group of 15.1 to 16 years, 48% were in 10th standard, 56% of fathers were graduates and above and 52% of mothers were Graduates and above, majority (52%) of fathers were in service and majority (72%) of mothers were home-maker, majority (96%) belonged to urban area, the majority (52%) had menarche at the

Table 1. Frequency and Percentage Distribution of Subjects According to Demographic Variables

Demographic Variables	Control Group(n=25)		Experimental Group(n=25)	
	n	%	n	%
Age (in years)				
14- 15	8	32	6	24
15.1 -16	9	36	13	52
16.1 -17	3	12	4	16
17.1-18	5	20	2	8
Academic level				
8 th Std	3	12	1	4
9 th Std	4	16	7	28
10 th Std	9	36	12	48
11 th Commerce	3	12	1	4
11 th Non-Medical	2	8	0	0
11 th Humanities & Arts	0	0	4	16
12 th Commerce	3	12	0	0
12 th Non-Medical	1	4	0	0
Education of Father				
Primary	2	8	0	0
Secondary	7	28	6	24
Senior Secondary	7	28	5	20
Graduate &Above	9	36	14	56
Education of Mother				
No Formal Education	2	8	0	0
Primary	2	8	0	0
Secondary	6	24	4	16
Senior Secondary	6	24	8	32
Graduate &Above	9	36	13	52
Occupation of Father				
Labour	3	12	0	0
Business	13	52	12	48
Services	8	32	13	52
Occupation of Mother				
Housemaker	21	84	18	72
Business	3	12	2	8
Services	1	4	5	20
Area of Residence				
Urban	22	88	24	96
Rural	3	12	1	4
Age at Mensuration				
Up to 11 years	5	20	2	8
12 years	4	16	13	52
13 years	12	48	3	12
14 years	4	16	7	28

Table 2. Frequency and percentage distribution of pre-test and post-test levels of perceived stress among adolescent girls with polycystic ovary syndrome before and after progressive muscle relaxation in experimental and control group

Perceived Stress	Experimental Group (n=25)		Control Group (n=25)	
	f	%	f	%
Pretest				
Mild (0-13)	16	64	15	60
Moderate (14-26)	09	36	10	40
Post-test -1				
Mild (0-13)	21	84	14	56
Moderate (14-26)	4	16	11	44
Post-test -2				
Mild (0-13)	23	92	14	56
Moderate (14-26)	02	08	11	44

Minimum Score: 00; Maximum Score: 40

Table 3. Mean, SD and “t”test of pretest and posttest score of perceived stress among adolescent girls with polycystic ovary syndrome before and after progressive muscle relaxation in experimental group

Variable	Experimental Group (n=25)								
	Pre-Test		Post-Test		Paired differences		df	t	‘P’ value
	Mean	SD	Mean	SD	Mean Difference	SD			
Perceived Stress	1.96	0.200	1.48	0.510	0.480	0.586	24	4.096***	0.001

age of 12 years, majority (48%) had normal weight, majority (44%) had 5 to 7 days of menstrual flow and the majority (56%) had no acne.

Objective 1: To assess the level of perceived stress among adolescent girls with polycystic ovary syndrome before and after progressive muscle relaxation in experimental and control group.

Table 2(a) depicts that in the pre-test majority (64%) of adolescent girls had a mild level of perceived stress followed by 36.0% had a moderate level in the experimental group whereas, in the control group (40%) the adolescent girls had a moderate level and 60% had mild level of stress. In Post-test -1 majority (84%) had a mild level of perceived stress followed by 16% had a moderate level in the

experimental group whereas, in the control group, 44.0% had a moderate level and 56% had a mild level of perceived stress. Post-test 2 showed a reduced level of perceived stress from 16% to 8% on a moderate level of perceived stress in the experimental group, whereas the control group had no change in the level of perceived stress. It can be concluded that in the experimental group, perceived stress among adolescent girls with polycystic ovary syndrome had reduced whereas in the control group, perceived stress had reduced minimum.

Objective 2: To evaluate the effectiveness of progressive muscle relaxation on perceived stress among adolescent girls with polycystic ovary syndrome.

Table 3 depicts the pretest and posttest scores of perceived stress among adolescent girls with polycystic ovary syndrome before and after progressive muscle relaxation in the experimental group. The perceived stress was measured in 3 levels: Mild (0-13), Moderate (14-26), and Severe (27-40). In the pretest mean perceived stress score was 1.96 with a standard deviation of 0.200, whereas in the posttest mean score was 1.48, with a standard deviation of 0.510 and the mean difference (pre vs. post) is 0.480. The t value was 4.096. The degree of freedom was 24. The difference between the mean pre-test and post-test perceived stress scores was statistically significant at $P < 0.001$. Hence the null hypothesis was rejected and the alternative hypothesis was accepted.

CONCLUSION

It was concluded that the perceived stress had been significantly reduced after the intervention in the experimental group

Major findings

Section-1 Finding related to pretest and posttest levels of perceived stress among adolescent girls with polycystic ovary syndrome before and after progressive muscle relaxation in experimental and control group

The experimental group showed reduced perceived stress levels from moderate to mild levels i.e. 36.0% to 16% and 08.0% in posttest 1 and posttest 2 respectively.

Section-2 Finding related to the effectiveness of progressive muscle relaxation on perceived stress among adolescent girls with polycystic ovary syndrome.

In the experimental group, the pretest mean perceived stress score was 1.96 and the posttest score was 1.48.

The mean difference between perceived stress scores among adolescent girls with polycystic ovary syndrome was reduced after progressive muscle relaxation and was statistically significant at $P = 0.001$, whereas in the control group, the perceived stress score was non-significant at $P < 0.05$ level.

Discussion: The present study was conducted to evaluate the effectiveness of progressive muscle relaxation (PMR) on perceived stress among adolescent girls with polycystic ovary syndrome. The finding of the present study showed a significant reduction in perceived stress scores in the experimental group at $P = 0.001$. A significant decrease in PSS at $P < 0.001$ was also observed by Chaudhuri, et al. in 2014 on the effect of progressive muscle relaxation on the stress levels of PCOS patients and their influence on the cardiovascular risk factors. Conclusion: The finding of the study showed that adolescent girls with polycystic ovary syndrome had perceived stress. Progressive muscle relaxation has a positive effect on reducing perceived stress hence it could be performed as a routine practice.

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