An Interventional Study on Effectiveness of Structured Education Programme in Improving the Knowledge of Polycystic Ovarian Syndrome among Female Students of Ras Al Khaimah Medical & Health Sciences University, UAE

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Abstract: *This study was conducted to assess the effectiveness of structured education programme on the knowledge of PCOS among female university students. A validated questionnaire was administered to all the 244 participants to assess the baseline knowledge. The post intervention knowledge scores were assessed by administration of questionnaire again following a structured education programme on PCOS. A statistically significant difference was observed between pre and post intervention knowledge scores with p value 0.000. The knowledge of participants was improved through structured education programme that can play a vital role in prevention and early diagnosis of PCOS. This may also help in effective management of disease thereby preventing many long term complications.*

Keywords: PCOS, intervention, knowledge, structured education programme, endocrine disorder, adolescence.

1. Introduction

Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder that affects women and is a leading cause of infertility [1]. Women with PCOS may present with obesity, amenorrhea, oligomenorrhea, infertility, or androgenic features [2]. Individuals with PCOS are also at increased risk for both diabetes and its complications and cardiovascular disease [3]. With early detection and effective management of PCOS many long-term complications can be prevented. Both pharmacological and non-pharmacological approaches do exists for effective management of PCOS [4]. However, the success of treatment always depends on the compliance whichis influenced by individuals' understanding of the disease. Hence, educating the target population and creating awareness about the diseaseis an integral part of prevention and/or early detection that ultimately reduces the risks associated with PCOS [5].

The key objectives of this study was to assess the baseline knowledge and to assess effectiveness of structured education programme on knowledge of PCOS among female students of Ras Al Khaimah Medical and Health Sciences University (RAKMHSU), Ras Al Khaimah, United Arab Emirates.RAKMHSU is a leading health science university in the northern part of United Arab Emirates. Students from around 46 different nationalities are studying in four different specialties medical, dental, nursing and pharmaceutical sciences.

PCOS is one of the most common endocrine disturbances that affects about 4-12% of women of reproductive age. In addition there is limited number of studies conducted in United Arab Emirates that estimates the knowledge of PCOS among target population.

2. Literature Survey

The transformation, from child to adolescence is a journey with full of challenges, both for parents and children. Gynecological diseases are quite common but most of the adolescent females ignore the symptoms or they are unaware, till the time the problem really worsens. One of them is PCOS.The National Institute of Health (NIH) diagnostic criteria for PCOS is based on following:

1) A menstrual cycle that ranges from > 35 days or < 8 cycles/year (oligomenorrhea), to complete absence of menses (amenorrhea).
2) Evidence of androgen excess, such as acne, hirsutism, alopecia, Acanthosis Nigricans (dark hyperpigmented

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hyperplasia of the skin typically found at the nape of the neck and axilla, is a marker for insulin resistance. Acanthosis Nigricans is usually found in about 30% of hyperandrogenic women) anovulation or increased androgen levels on laboratory testing [6]-[8].

This criterion was broadened in 2003 as Rotterdam criteria to include PCO findings at ultrasound.The diagnosis of PCOS has life-long implications with increased risk of infertility, metabolic syndrome (dyslipidemia, hypertension), type 2 diabetes mellitus, and possibly cardiovascular disease and endometrial carcinoma. [1], [2].

*Relationship between PCOS and diabetes mellitus:*Women with PCOS are at higher risk of developing diabetes mellitus type 2 because of the relative insulin resistance. Also, these women tend to develop diabetes earlier in life, around the third or fourth decade [1], [2].

*Relationship of PCOS to cardiovascular diseases***:** Women who are hyperandrogenic and hyperinsulinemic are at increased risk for dyslipidemia, coronary artery disease, hypertension, and diabetes mellitus. The most common lipid abnormalities found in obese PCOS patients are decreased high-density lipoprotein and elevated triglycerides. In addition to the lipid abnormalities seen in women with PCOS, these patients are 7 times more likely to have a myocardial infarction [8]-[10]. Because cardiovascular disease is the leading cause of death among women, prevention is essential.

Previous studies: A study was conducted in Egypt to evaluate the effectiveness of education programme for upgrading nurses' knowledge about PCOS. There were 50 participants and a statistically significant difference in pre and post education scores were observed among the participants. The study concluded that the continuous education and training on PCOS is essential in order to update the knowledge of participants that helps them to contribute for early detection and prevention of complications of PCOS that is a common health issue among target population [11].

A study was conducted in Delhi to assess the knowledge, practice and prevalence of PCOS among women visiting gynecological department in a hospital. The study revealed the prevalence of PCOS as 10.09% and majority of the study population lacked adequate knowledge about PCOS and its management. Researchers concluded that there is a need for structured education programme regarding PCOS designed for females of reproductive age that help would in early detection and effective management of PCOS [12].

A study was conducted by Sowmya et al. (2013) to assess the effectiveness of structured teaching programme on knowledge of PCOS among adolescent girls. A statistically significant difference between pre and post education scores was observed among 80 participants enrolled in this study [13].

In another study conducted in Mangalore, It was observed that after administration of Planned Teaching Programme (PTP) there was an overall gain in knowledge scores among 100 adolescent girls. Researchers concluded that PTP is an effective tool that can improve knowledge of PCOS among target population [14].

3. Methodology

This study was conducted inRas Al Khaimah Medical and Health Sciences University (RAKMHSU), Ras Al Khaimah, United Arab Emirates, after obtaining approval from RAKMHSU Research and Ethics Committee. Students of all the four constituent colleges' viz medical, dental, pharmacy and nursing were approached by the study investigators and briefed about the study. Students willing to participate were enrolled into the study after obtaining their written informed consent.

*Development and validation of questionnaire:*A questionnaire containing 14 multiple choice questions (MCQs) was developed by the study investigators following a literature review and was validated for its content by experts from medical and pharmacy faculty. Questionnaire had two domains one consisting of 08 MCQs related to anatomy and physiology of female reproductive system (Domain01) and another with 06 MCQs related to etiology, risk factors, clinical features, diagnosis and management of PCOS (Domain 02). For each correct response a score of 01 was given and the total maximum score was 14.

Data collection: All the necessary and required baseline characteristics of study participants such as age, nationality, year of study in RAKMHSU, and family history of PCOS were collected and documented in data collection forms initially and later were entered into the data base.

Administration of pre-education test: The validated questionnaire was administered to the study participants. A total of 20 minutes was given for each participant to record their responses. Participants marked their responses and returned the questionnaire along with their responses to the study investigators at the end of the session.

Structured teaching programme: After obtaining responses of pre-education questionnaire, participants were educated about PCOS through structured teaching programme. Study investigators developed a structured educational material about the anatomy and physiology of female reproductive system, definition, etiology, pathophysiology, risk factors, diagnosis and management of PCOS. Educational material included power point slides presentation and audio-visual aids. The educational material was validated for its content by the same team of experts who validated the questionnaire.

Administration of post-education test: A week after the structured teaching programme, post-education test was administered to the study participants. As in pre-education test participants were given 20 minutes time to record their responses and return the response sheet to the study investigators at the end of the session.

Data analysis: The overall difference between pre and post intervention knowledge scores was analyzed by paired t-test. Further, differences between pre and post intervention knowledge scores in each domain (Domain 01: anatomy and

physiology of female reproductive system, Domain 02: etiology, risk factors, clinical features, diagnosis and management of PCOS) was also analyzed using paired t-test.

The difference in the pre intervention knowledge scores of participants with and without a family history of PCOS was analyzed using independent t-test. The difference in pre intervention knowledge scores of participants with different years of study was analyzed using one way ANOVA and post hoc Tukey HSD test. Further, the difference between pre intervention knowledge scores of participants in each domain in different years of study was also analyzed by one way ANOVA and post hoc Tukey HSD test.

All the statistical analysis was carried out using SPSS software version 18 and a *p* value of less than 0.05 was considered as statistically significant.

4. Results and Discussion

Demographic characteristics: A total of 244 female students of RAKMHSU were enrolled into the study. The mean age of the study participants was 19.76 ± 1.68 years. The details of demographic characteristics of the study participants are presented in table 1.

Table 1: Demographic characteristics of the study participants:

Total number of study participants		244
Year of study in RAKMHSU	First	92
	Second	106
	Third	35
	Fourth	11
Avg. age of study participants		19.76 ± 1.68 years
Family history of PCOS	Yes	145 (59.4%)
	No	99 (40.5%)

The majority (18.8%) of the study participants were from Syria, followed by India (13.5%). About 9% of the participants were from United Arab Emirates. The percentage of the study participants from different nationalities are presented in table 2.

Table.2 The percentage of study participants from different nationalities:

Nationality	Number (%)
Syrian	46 (18.8)
Indian	33 (13.5)
Emirati	22 (9)
Palestinian	19 (7.7)
Iraqi	18 (7.3)
Egyptian	13 (5.3)
Sudanese	12 (4.9)
Pakistani	11 (4.5)
Bahraini	10 (4)
Somalian	10 (4)
Jordanian	8 (3.2)
Nigerian	8 (3.2)
Algerian	4 (1.6)
American	4 (1.6)
Bangladeshi	4 (1.6)
Yemeni	4 (1.6)
Canadian	3 (1.2)
Irani	3 (1.2)

Afghani	2 (0.8)
Saudi	2 (0.8)
German	1 (0.4)
Kenyan	1 (0.4)
Kuwaiti	1 (0.4)
Lebanese	1 (0.4)
Malaysian	1 (0.4)
Srilankan	1 (0.4)
Swedish	1 (0.4)
Tanzanian	1 (0.4)

Pre and post intervention knowledge scores: The mean pre and post intervention knowledge scores of participants were 7.59 ± 2.64 and 12.77 ± 1.13 respectively. A statistically significant difference was observed between these scores with *p* value 0.000. A statistically significant difference was also observed between pre and posts intervention knowledge scores in both the domains. The details are presented in table 3. This clearly suggests that structured education programme has improved the knowledge among the study participants with respect to PCOS. Our findings are similar to those observed in other published literatures from Egypt and India [11], [13], [14].

Table 3: Pre and post intervention knowledge scores:

Domain	Knowledge score (mean ± SD)		*p* value*
	Post intervention	Pre intervention	
Domain 01	7.22 ± 0.83	4.37 ± 1.86	0.000
Domain 02	5.54 ± 0.72	3.22 ± 1.53	0.000
Overall	12.77 ± 1.13	7.59 ± 2.64	0.000

*p value < 0.05 is statistically significant

Pre intervention knowledge scores of participants with family history: One hundred and forty-five (59.4%) study participants had a positive family history of PCOS and influence of this family history on pre intervention knowledge scores was analyzed using independent t-test. However, no statistically significant difference (*p* 0.367) was observed in pre intervention knowledge scores between participants with and without family history.

Overall pre intervention knowledge scores of participants in different years of study: A statistically significant difference in overall pre intervention knowledge scores of participants in different years of study was observed with a *p* value 0.02. The post hoc Tukey HSD test revealed that the participants from higher years of study had better baseline knowledge. However a statistically significant difference in pre intervention knowledge scores of participants was observed only in two pair's i.e between year 2 and year 1 with a *p* value 0.02 and also between participants in year 4 and year 1 with a *p* value 0.018. The details are presented in table 4.

Table 4: Overall pre intervention knowledge scores of participants in different years of study:

Year of study pairs	Mean difference	P value
Year 2 and Year 1	1.06	0.021*
Year 3 and Year 1	1.20	0.088
Year 4 and Year 1	2.42	0.018*
Year 3 and Year 2	0.14	0.992*
Year 4 and Year 2	1.35	0.347
Year 4 and Year 3	1.21	0.524

* The mean difference is significant at the 0.05 level

Pre intervention knowledge scores of participants in different years of study in two domains:

*Domain 01: Anatomy and physiology of female reproductive system:*A statistically significant difference (*p* 0.047) in pre intervention knowledge scores across participants of different years of study was observed in anatomy and physiology domain. The posthoc Tukey test revealed that there was a marginally significant difference (mean difference: 0.69, *p* 0.048) in scores observed between year 1 and year 3. This difference may be because anatomy and physiology is taught as a subject in year 1 and it is fresh information (that they can recall) for participants from year 1 compared to participants from higher years of study.

*Domain 02: Etiology, risk factors, clinical features, diagnosis and management of PCOS:*A statistically significant difference (*p* 0.004) in pre intervention knowledge scores across participants of different years of study was observed in domain 02 as well. However unlike in domain 01, the statistically significant difference (*p* 0.004) here was between year 4 and year 1 with a mean difference of 1.65. This suggests that the baseline knowledge regarding PCOS and its management is comparatively better in participants of higher years of study as these participants were taught with management of disease in higher years and that made them to score better in this domain.

5. Conclusion

The study shows an improvement in knowledge of participants on PCOS and its management through structured education programme. Provision of structured education to the target population can play a vital role in prevention and early diagnosis of PCOS. Also, structured education programmes on strategies for effective management of disease will help in preventing many long term complications such as obesity, diabetes mellitus and cardiovascular diseases in patients diagnosed with PCOS. In addition, introducing PCOS and its management as a topic in the curriculum especially in allied health sciences programmes such as nursing, dentistry and pharmacy helps the students to play an important role as health care professionals in combating health issues.

6. Future Scope

Researchers are willing to take up this study forward as community engagement service, involving high school students as participants. This will help in creating awareness of PCOS, its health impact and management among adolescents there-bypossibly preventing and detecting PCOS at an early stage in the target population.

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