Disease Education on Knowledge and Attitude towards Polycystic Ovarian Syndrome Prevention among Female Postgraduate Students of University of Ibadan

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Abstract: *Polycystic ovarian syndrome (PCOS) is one of the most common hormonal disorders in women of reproductive age. Women with polycystic ovarian syndrome (PCOS) have irregular menstrual bleeding, male pattern baldness, acne, hirsutisms, weight loss or weight gain, depression and often face difficulty in getting pregnant The syndrome occurs when levels of hormones are abnormal. PCOS etiology is believed by expert to be related to Obesity resulting into the production of excess amount of androgens, a group of male sex hormones. Although all women produce some androgens, too much of this type of hormone prevents ovulation and disrupt the normal menstrual cycle. The study examined effect of diseases education on knowledge and attitude towards polycystic ovarian syndrome prevention among female postgraduate students and three hypotheses were tested. The study adapted pretest -posttest control group quasi-experimental research design and a population of female postgraduate students in University of Ibadan. A multistage sampling procedure was employed to select a sample size of 60 participants (30 each for experimental and control group), three hypotheses were formulated and tested while the instrument used for data collection.were standardized and self-structured questionnaire. The results of the study showed that there is a significant main effect of treatment on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan ($F_{(1/41)} = 51.114$, $p < .05$, $\eta^2 = .90$) and that there was a significant main effect of religion on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan ($F_{(1/41)} = 3.347$, $p < .05$, $\eta^2 = .58$). Also, findings showed that there was a significant main effect of Locus of control on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan ($F_{(1/41)} = 3.688$, $p < 05$, $\eta^2 = .25$). Based on the findings, it was recommended that adequate health education on polycystic ovarian syndrome prevention among women will go a long way to control the prevalence of the disease and also help women to stay healthy.*

Keywords: Disease Education, Knowledge, Attitude, Polycystic Ovarian Syndrome

1. Introduction

Polycystic ovarian syndrome (PCOS) is one of the most common hormonal disorders in women of reproductive age. Women with polycystic ovary syndrome (PCOS) have irregular menstrual bleeding and often face difficulty in getting pregnant. The syndrome occurs when levels of hormones are abnormal. The name "polycystic ovarian syndrome" refers to the appearance of small cysts along the outer edge of the enlarged ovaries of women with this condition. The cause of PCOS is believed by experts believe to be related to excess production amount of androgens, a group of male sex hormones. Although all women produce some androgens, too much of this type of hormone prevents ovulation. Excess androgens also disrupt the normal menstrual cycle. They may cause infertility, acne and abnormal hair growth, such as excess facial hair or male pattern baldness (Hignett & Kyle, 2011). Many factors may play a role in the production of androgens, and thus the development of PCOS. For instance, excess insulin may be a factor in developing PCOS. Excess insulin leads to insulin resistance, which in turn decreases one's ability to use insulin effectively. When the body cannot use insulin properly, it secretes more insulin to make glucose available to body cells. The resulting excess insulin is thought to additionally boost androgen production by the ovaries.

Polycystic ovarian syndrome is the most common female endocrinopathy, affecting 5–10% of the female population. The overproduction of ovarian androgens leads to hirsutism, acne, anovulation and infertility. Hyperinsulinemia, exacerbated by obesity, is often a key feature. Treatment depends on the presenting symptoms, which may often be ameliorated by weight loss where relevant. Anti-androgen preparations are used for hyperandrogenic symptoms, and clomiphene citrate (CC) is the first-line treatment for anovulation and infertility. Failure to conceive with CC can be treated in a number of ways, including the addition of insulin-lowering agents (mainly metformin), low-dose gonadotrophin therapy or surgically by laparoscopic ovarian drilling. (Hignett& Kyle, 2011).

The study was carried out to investigate the prevalence of PCOS in a cross-section of women attending Infertility Clinics in Benin City, Nigeria using the three assessment criteria namely: the 1990 National Institutes of Health (NIH), the 2003 Rotterdam and 2006 Androgen Excess Society (AES) criteria. The study was carried out with a cross-section of consecutive women attending Infertility Clinics at the University of Benin Teaching Hospital (UBTH) and the Women's Health and Action Research Centre (WHARC) in Benin City, Edo State, Nigeria between April 1, 2009 and November 30, 2010. The Infertility Clinic

at UBTH is one of the largest such clinics in Nigeria and attends to a large catchment area spanning 8 contiguous States in the country. WHARC, a leading Nigerian non-governmental organization (NGO), also runs a reproductive health clinic that provides conventional infertility treatment.

A total of 421 women aged 18 - 45 years who gave their consent to participate in the fully informed study, were recruited into the study. The prevalence rates obtained from this study based on the 1990 NIH, 2003 Rotterdam and the 2006 AES criteria were 16.9% (95% CI: 13.4% - 20.8%), 27.6% (95% CI: 23.3% - 32.0%) and 20.7% (95% CI: 16.9% - 24.9%) respectively (Akpata, Uadia, and Okonofua, 2018). Therefore, there is prevalence of PCOS among women attending infertility clinics in Benin City. Therefore accurate and early diagnosis and intervention of the disease is necessary not only to prevent future health comorbidities, but also to reduce financial cost and burden, thereby ensuring good health and well-being (Akpata, Uadia, and Okonofua, 2018).

PCOS is the most common health problem associated with endocrine disturbance in women during their reproductive years and it is also the most common cause of an ovulatory infertility and hirsutism worldwide (Balen, 1999). (Norman, Wu, & Stankiewicz, 2004)The ovaries are the organs in a woman's reproductive system that produces ova. They are almond-shaped and about 3.5 cm long. The ovaries are located deep in a woman's pelvis, on both sides of the uterus, close to the ends of the Fallopian tubes. When the ovaries are enlarged, with a thick, scarred capsule associated with an abnormally high number of follicles in the ovaries. This gives the impression of multiple cysts and hence the term 'polycystic'. Any ovarian follicle that is larger than two centimeters is called an ovarian cyst. Cyst is a closed hollow sac that usually contains air, fluids, or semi-solid material. The follicles in polycystic ovaries may concurrently exist in varying states of growth, maturation, or degeneration.

Although higher awareness levels on polycystic ovarian syndrome have previously been reported among Nurses and adolescent girls, their knowledge levels on PCOS (i.e., symptoms and signs, detection, treatment, prevention and management) were low (less than 40%) (Omokanye, Ibiwoye-Jaiyeola, Olatinwo, Abdul, Durowade, and Biliaminu, 2015). Although early detection is an integral component of a successful polycystic ovarian syndrome therapy and management, but a majority (87.5%)of the patients in Nigeria end up with advanced disease due to low knowledge and lack of awareness about early screening services (MPHS &MMS, 2011). Several studies in Nigeria show that most PCOS patients report at hospital with advanced disease but their awareness and knowledge levels on PCOS are largely undefined. Additional studies also show that attitude and perception on self-vulnerability is low among African women and is associated with low awareness and knowledge levels on the disease (Omokanye, *et al.*, 2015) but perception on risk of polycystic ovarian syndrome has previously not been examined among Nigerian women.

In a study carried out to investigate the effect of education programme on the level of knowledge regarding PCOS. Quasi-experimental research design was used in the study,

which was described suitable for the nature of existing research problem. The study was conducted at Faculty of Nursing at Minia University, Egypt. Ninety six (96) female students recruited from previous mentioned setting were selected using simple random sampling technique according to the following inclusion criteria: Adolescent girls between 17-22 years old, second or third year's students and students accepted to participate in the study. More than half (52%) of the students between the ages of 21-23 years. More than one third (39.58%) of students' mothers' education were university educated while (18.75%) of them had primary and or illiterate education, more than one third (37.5%) of students' fathers' education were university educated while (16.67%) of them were illiterate education.

Regarding to the students' knowledge at the pretest on PCOS, the study revealed that most of the students had poor knowledge and only 7.3% of students had good knowledge. This lack of knowledge regarding PCOS may be due to that students did not receive the needed information about PCOS (Mahamed, 2016). The result of the post-test of students about PCOS showed that an enhancement in knowledge was observed after the educational program in which mean posttest score was higher than mean pre-test score knowledge. Also majority of the students had good knowledge in all variables. Highly statistically significant difference was found between pre and post-test (p =.001) regarding knowledge scores of polycystic ovarian syndrome. This may be due to clarity and consistency of the educational program and suitable media used, also this indicated that students gained knowledge regarding PCOS after implementing the educational programme (Mahamed, 2016).The results of the study also showed that there was highly statistically significant relationship between age of the students, family history and their mother education with level of knowledge at pre-test (Mahamed, 2016).

In a similar study that was undertaken to evaluate the effectiveness of structured teaching programme on polycystic ovarian syndrome in terms of knowledge and attitude among nursing students of Shimla nursing college, Annandale, Shimla (H.P). Experimental research approach was considered appropriate for the study,

The results of the study indicated the mean post-test knowledge score 12.6 was higher than the mean pre-test knowledge score 7.44 in experimental group whereas the mean posttest knowledge score 8.28 was higher than the mean pre-test knowledge score7.84 in the control group. Further result shows that the mean post –test knowledge and attitude score of nursing students in experimental group was 12.6 and 32.72 and the mean pre –test knowledge and attitude score was 7.44 and 30.48 with the mean difference of 5.16 and 2.24 the computed t value of 5.002 and 2.98 was found to be statistically significant at 0.05 level (Kumari, et al, 2017)

Sowmiyaet.al. (2013), conducted an experimental study to assess the effectiveness of structured teaching programme on knowledge of polycystic ovarian syndrome among adolescent girls. A significant difference between pre-test and post-test knowledge was found (t 2.0 79=p<0.05). The study findings showed that the structured teaching

programme was effective in improving knowledge of adolescent girls regarding polycystic ovarian syndrome. There was no significant association between the level of knowledge and demographic variables except the group in which they study (Science, Arts, Commerce).

Sunanda and Nayak (2016), in a study that was conducted to assess the knowledge on the polycystic ovarian syndrome among the student nurses. They believe that there is a need to increase awareness among women so as to avoid major cases of fertility problems in the future. A Nurse holds a critical role in health care that goes beyond the day to day duties. Nurses are in a position to provide comprehensive care to adolescent afflicted with the syndrome. Essential elements of nursing practice should be included in the nursing education. So upgrading the knowledge regarding PCOS to nursing students will enhance the adolescent girls to modify their lifestyle and reduce the risk. The data was collected from the nursing students by using structured questionnaire.

The data collected from 150 samples in Nitte Usha Institute of Nursing Sciences. Descriptive survey research approach was adopted and data was analyzed by using descriptive and inferential statistics. Distribution of the samples on demographic characteristics revealed that 85% of the samples were in the age group of 21-25years, 75% of the samples were Christians, 82% of the samples were consuming mixed diet, and 92% samples had regular menstrual cycle. 76% of the samples were with average knowledge and 10.7% with good knowledge regarding polycystic ovarian syndrome. Hence the study concluded that Source of information, consumption of junk food, dietary patterns of the students were associated with their level of knowledge on PCOS at 5% level of significance (Sunanda and Nayak, 2016).

The choice of treatment for women with PCOS depends on the symptoms with which a patient presents. Symptoms typically fit into three categories: menstruation related disorders; androgen-related symptoms; and infertility. Management strategies for these characteristic symptoms of PCOS are described by Badawy and Elnashar, (2011) as treatment of androgen-related symptoms. The most common androgen-related symptoms associated with PCOS are acne, hirsutism, and alopecia. The symptoms vary for each patient; some patients present with only one or two symptoms, while a few patients complain of all three. Typically, oral contraceptive pills (OCPs) are first-line for pharmacologic management of hirsutism in premenopausal women. Combined hormonal contraceptive (CHC) OCPs are a good treatment option for those patients that do not wish to become pregnant, and they are often considered first line for the treatment of PCOS-related hirsutism and acne. CHCs promote negative feedback on the production of LH, causing a decreased synthesis of androgens by the ovaries. Other mechanisms by which CHCs reduce androgens include: decreasing circulating levels of free androgen by increasing the production of sex hormone-binding globulin in the liver; decreasing adrenal androgen secretion; and inhibiting peripheral conversion of testosterone to dihydrotestosterone and binding of dihydrotestosterone to androgen receptors. Progestins have varying degrees of androgenic effects.

Newer OCPs typically contain less androgenic progestins such as norethindrone, desogestrel, and norgestimate. Bates and Propst, (2012)

Religion is a multidimensional construct that reflects the shared beliefs and practices of a faith-based, social organization and it has been established that a sizeable body of literature documents relationship between religiousness and outcomes (Miller and Thoresen2003). One's relationship with a higher power may affect perceived control over health behaviors and outcomes. For instance, a collaborative relationship with a higher power in the management of one's health, known as an active spiritual health locus of control, may empower people to engage in behaviors beneficial for their own health. Alternatively, a passive spiritual health locus of control may lead people to rely solely on God to determine their health. A better understanding of the specific dimensions of religiousness associated with health behaviors (in this case, cancer screening) among Latinos could enable the development of effective, religiously tailored interventions to promote cancer early detection with the ultimate goal of reducing health disparities. Studies conducted with African-American population suggest that incorporation of religious themes into health interventions may enhance their relevance, improve program participation, and, ultimately, boost intervention efficacy (Campbell, Hudson, Resnicow, Blakeney, Paxton, and Baskin, 2007). Church based interventions have been used to promote cancer education and cancer screening among low-income countries which Nigeria is not an exception as regards polycystic ovarian syndrome. Thoresen and Harris (2002)

Locus of control beliefs are cognitions that determine whether health behaviour change will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and failures. Locus of control influences the effort one puts forth to change risk behaviour and the persistence to continue striving despite barriers and setbacks that may undermine motivation. It is directly related to health behaviour, but it also affects health behaviour indirectly through its impact on goals as it influences the challenges that people take on as well as how high they set their goals (Bandura, 1997). The internal versus external dimension of attribution theory has been specifically applied to health in term of the concept of a health locus of control. Individuals differs as to whether they tend to regard events as controllable by them (internal locus of control) or uncontrollable by them (external locus of control). Wallston and Wallston (2002) stated that health locus of control has been shown to be related to whether an individual changes their behaviour and to the kind of communication style they require from health professionals. According to Murray and McMillan (2003), behavioural modification is greatly influenced by locus of control. They further stated that individuals with internal locus of control are more likely to modify their behaviour faster than those with external locus of control. Murray and McMillan (2006) discovered that men with internal locus of control adjusted well to prostate cancer screening and lung screening than their external locus of control counterparts.

Treatment of PCOS is complex as it requires multidimensional therapeutic approach in order to counter the co morbidities associated with it. Other than the physiological co morbidities, several studies have reported women who have PCOS are more prone to depression, anxiety, low self-esteem, negative body image, and psychosexual dysfunction (Deeks A 2010), which adds complexities to therapeutic management, Lifestyle changes have occurred over the year which have led to more sedentary lifestyles and there is a surge in availability of fast food outlets and increase in refined sugar in diet. Obesity is also associated with insulin resistance, and therefore initiates the escapade of hyperinsulinaemia, excess androgen production and annovulation. Therefore life style alteration is considered to be the first line in the management of PCOS. Evidence shows that lifestyle change with as little as 5–10% weight loss has significant clinical benefits improving psychological outcomes. (Bello and Folashade 2015)

Research underlines that prevention is necessary. Through high-quality prevention, we can create community environments that foster good health. Prevention is our best hope for reducing unnecessary demand on the healthcare system. Disease prevention covers measures not only to prevent the occurrence of disease, such as risk factor reduction, but also to arrest its progress and reduce its consequences once established; it is also conceptualized as the process of providing information and persuading people to utilize the information provided in order to prevent diseases (WHO, 1984)It has been established that lifestyle modification helps in the prevention of polycystic ovarian syndrome also realized early on that weight control improves many aspects of PCOS. The cycles become more regular, androgen levels are reduced, lipid and glucose metabolism improves, and spontaneous pregnancy may follow. It was also realized that obese patients do not have to reach the normal body mass index; a weight reduction of even a few percent has clinical benefits. This is because visceral fat is metabolically more active, and weight loss of a few percent is associated with significant loss of visceral fat. On the basis of these observations, weight management by dieting and exercise is now recommended to all overweight/obese women with PCOS.

Balance diet has also been proven to be effective in the prevention of PCOS, women with PCOS are often found to have higher than normal insulin levels. If enough insulin is not produced, blood sugar level can rise. This can also happen because of insulin resistance, meaning the body cannot use the produced insulin effectively. If a person is insulin resistant, her body may try to pump out high levels of insulin in an effort to keep her blood sugar levels normal. Too-high levels of insulin can cause her ovaries to produce more androgens, such as testosterone. Insulin resistance may also be caused by having a body mass index above the normal range. Insulin resistance can make it harder to lose weight, which is why women with PCOS often struggle with this issue. A diet high in refined carbohydrates, such as starchy and sugary foods, can facilitate insulin resistance, and therefore weight becomes more difficult to control. High-fiber foods can help combat insulin resistance by slowing down digestion and reducing the impact of sugar on the blood. Bello and folashade (2015).

Polycystic ovary syndrome is very common and affecting more than one in five women during reproductive period. PCOS is a hormonal disorder that often lead to serious health problems such as reproductive (hyper androgenism, infertility, hirsutism), metabolic (insulin resistance, cardiovascular disorders, diabetes mellitus) and psychological features (anxiety and depression). However, the lack of knowledge of the disease and low diagnosis compound the problem.

Furthermore, limited studies in Nigeria have led to over-reliance on research findings from elsewhere in the world. Study conducted by Hoda (2016) revealed that the students' knowledge on PCOS was poor and only 7.3% of students had good knowledge. This lack of knowledge regarding PCOS may be due to the fact that students did not receive the needed information about PCOS. Also, the study conducted by Kalpana (2013) who studied the effectiveness of structured teaching program regarding knowledge on polycystic ovaries among the students, showed that before programme, majority of students had inadequate knowledge, whereas (9.17%) of them had moderate knowledge. As well as Shanmugasundaram (2011) who studied the effect of structured teaching program on PCOS awareness among adolescent girls in a selected rural area and reported that there was a poor in the level of knowledge of PCOS among adolescent girls but improved after implementing their teaching programme. Finding a way to motivate young women to know and cultivate positive attitude towards PCOS screening would represent a way to avoid the development of the disease.Women with PCOS are at higher risk for many health problems. These health problems include pregnancy complications, endometrial cancer, obesity, depression, obstructive sleep apnea, fatty liver, Type 2 diabetes, and cardiovascular risk (Legro, 2016).

Several studies have been done on PCOS but most of these studies were on prevalence and causes with little research effort on means to reduce the incidence of the disease, hence this study is set to examine the effects of disease education on knowledge and attitude towards PCOS prevention among postgraduate female students of University of Ibadan, Ibadan, Oyo state.

Hypotheses
The following hypotheses were tested in this study
1) There will be no significant main effect of treatment on
   a) Knowledge
   b) and attitude towards polycystic ovarian syndrome prevention among postgraduate female students of university of Ibadan
2) There will be no significant main effect of religion on
   a) Knowledge
   b) and attitude towards polycystic ovarian syndrome prevention among postgraduate female students of university of Ibadan
3) There will be no significant main effect of locus of control on
   a) Knowledge

b) and attitude towards polycystic ovarian syndrome prevention among postgraduate female students of university of Ibadan

2. Methodology

The study adopted quasi-experimental research design as it allowed the researcher to match the respondents in the experimental and control group on similar variables as well as allowed to see the final difference in the outcome measured in the study which can be attributed to only the effect of the intervention given. Townsend, (2004)

The population for this study comprised all postgraduate female students of University of Ibadan, Ibadan, Nigeria during the period of the study. Sixty (60) female students were used as sample for the study. Multi-stage sampling procedure was used and the stages are explained below:

There are three (3) postgraduate halls of residence in the University of Ibadan
Stage 1: Purposive sampling method was used to select 2 postgraduate halls out of the three existing halls of residence in the University of Ibadan (Abdulsalam Abubakhar hall and Awolowo hall), in the University of Ibadan, because, Tafawa Balewa Hall is a PhD student hall, and PhD students were excluded from this study.
Stage 2: Simple random sampling technique was used to place the halls into groups (experimental and control).
Stage 3: Convenience sampling technique was used to select thirty students each across the two selected hall in the final stage, making sixty (60) students in both halls.

Inclusion Criteria: Students who consented to take part in the study, haven filled the informed consent form, and were ready to make themselves available for the time agreed upon with the researcher

Exclusion Criteria: PhD students and Masters Degree students who live off campus were excluded from the study.

3. Research Instruments

Two instruments were used for the study (questionnaire and training package on disease prevention education manual). Both standardized and self-structured questionnaire was used. Multidimensional Health Locus of Control (MHLC) consist of 6 items with reliability coefficient of 0.74, developed by Wallston, Kaplan and Maides in 2006 is standardized scale was adopted for this study. The Knowledge towards Polycystic ovarian syndrome prevention Questionnaire Scale (KPCOSPQS) consist of 10 items with a reliability coefficient of 0.68 while Attitude towards Polycystic ovarian syndrome Questionnaire (APCOSQS) consist of 15 items with a reliability of 0.70.

The purpose of the study was explained to the participants and consent form was given. Only the students who indicate willingness to participate in the study and duly signed the consent form were selected to participate in the study. The researcher organized a training programme for the nine (9) research assistants. This exposed them to their roles as well as educating them on the manuals to be used.

The treatment package was administered on the participants for a period of eight (8th) weeks in their respective groups on their campuses. The programme was carried out once a week and the duration per class was two hours. The posttest was administered on the ninth (9th) week.

Completed questionnaire were coded and analyzed with SPSS using inferential statistics of Analysis of Co-variance (ANCOVA) to test the hypotheses at 0.05 alpha level.

4. Results

Ho$_1$: There will be no significant main effect of treatment on knowledge and attitude of polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan

Table 1: ANCOVA Summary of Treatment, religion, locus of control on polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan

Source of Variance	Sum of Squares	DF	Mean Square	F	Sig.	η^2
Intercept	30580.748	1	30580.748	1037.352	0	0.962
Main Effect:						
Treatment group	1506.832	1	1506.82	51.114	0	0.901
Religion	10.217	1	10.217	3.347	0.029	0.584
Locus of control (LOF)	108.721	1	108.721	3.688	0.006	0.253
2-way Interactions:						
Treatment x Religion	163.32	1	163.32	5.54	0.023	0.39
Treatment x Locus of control (LOC)	54.583	1	54.583	1.852	0.018	0.432
Religion x Locus of control (LOC)	30.25	1	30.25	1.026	0.317	0.024
3-way Interactions:						
Treatment x Religion x LOC	61.633	1	61.633 29.480	2.907	0.016	0.485
Error	1208.664 **79922.000**	41				
Total		**60**			.	

From Table 1.It was shown that there is a significant main effect of treatment on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (F $_{(1/41)}$ = 51.114, p <.05, η^2=.90). Null hypothesis is therefore rejected. This implies that the use of the experimental groups: Experimental group

and control Group had positive influence on the polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan. To find out the mean score obtained by each of the two experimental groups and the control group, the estimated marginal mean was computed. The result shown is presented Table 4.2

Table 2: Estimated Marginal Means of knowledge and attitude of Polycystic ovarian syndrome prevention in Post-Test by Treatment Groups

Treatment Groups	Mean	Std. Error
Experimental Group	42.64	1.146
Control Group	26.83	1.311

Table 2 showed the estimated marginal mean scores of knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan. The participants in the Experimental group obtained the highest mean score of ($\overline{\chi}$ =42.64), followed by the Control group had the low mean score of ($\overline{\chi}$ = 26.83).This means that the experimental strategies used for the treatment group had a positive effect on the knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (Experimental group) being the best instructional for Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan among the two strategies.

Ho$_2$: There will be no significant main effect of religion on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan.

From table 4.4, it was shown that there was a significant main effect of religion on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (F ($_{1/41}$) =3.347, p <.05, η^2=.58). The null hypothesis is therefore rejected. This means that the religion had influence on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan. To find out the mean score obtained by the two levels of religion (Christian and Islam) the estimated marginal mean was computed.

Table 3: Estimated Marginal Means of knowledge and attitude of Polycystic ovarian syndrome prevention in Post-Test by Religion

Religion	Mean	Std. Error
Christianity	36.12	.951
Islam	23.62	2.351

Table 3 showed the estimated marginal mean scores of knowledge and attitude of polycystic ovarian syndrome prevention by Religion among postgraduate female students of University of Ibadan. The participants in the Christian Religion obtained highest mean score of ($\overline{\chi}$ =36.12), followed by the Islam Religion had the low mean score of ($\overline{\chi}$ = 23.62).This means that the Christianity Religion had a positive effect on the knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female

students of University of Ibadan (Christianity Religion) being the best religion strategies for knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan among the two Religious.

Ho$_3$: There will be no significant main effect of Locus of control on knowledge and attitude of polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan.

From table 4.it was shown that there was a significant main effect of Locus of control on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (F ($_{1/41}$) =3.688, p <05, η^2=.25). The null hypothesis is therefore rejected. This means that the Locus of control had influence on knowledge and attitude of polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan. To find out the mean score obtained by the two levels of Low and High the estimated marginal mean was computed.

Table 4: Estimated Marginal Means of knowledge and attitude of Polycystic ovarian syndrome prevention in Post-Test by Locus of Control

Locus of Control	Mean	Std. Error
High	34.025	1.195
Low	33.015	1.327

Table 4 showed the estimated marginal mean scores of knowledge and attitude of polycystic ovarian syndrome prevention by Locus of Control among postgraduate female students of University of Ibadan. The participants in the High Locus of Control obtained highest mean score of ($\overline{\chi}$ =34.025), followed by the Low Locus of Control had the low mean score of ($\overline{\chi}$ = 33.015).This means that the High Locus of Control had a positive effect on the knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (High Locus of Control) being the best Locus of Control for Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan among the two levels.

5. Discussion of findings

The result from the findings revealed that there is a significant main effect of treatment on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (F ($_{1/41}$) = 51.114, p <.05, η^2=.90). Experimental group obtained the highest mean score of ($\overline{\chi}$ =42.64), followed by the Control group had the low mean score of ($\overline{\chi}$ = 26.83).This means that the experimental strategies used for the treatment group had a positive effect on the knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (Experimental group) being the best instructional for Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan among the two strategies. This finding is in agreement with the

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findings of Mahamed, (2016), who observed that regarding to the students' knowledge at the pretest on PCOS, the study revealed that most of the students had poor knowledge and the lack of knowledge regarding PCOS may be due to that students did not receive the needed information about PCOS. He further explained the result of the post-test of students about PCOS and the finding showed that an enhancement in knowledge was observed after the educational program in which mean posttest score was higher than mean pre-test score knowledge. Majority of the students had good knowledge in all variables. Highly statistically significant difference was found between pre and post-test (p =.001) regarding knowledge scores of polycystic ovarian syndrome. This may be due to clarity and consistency of the educational program and suitable media used; also this indicated that students gained knowledge regarding PCOS after implementing the educational programme

More also, findings showed that there was a significant main effect of religion on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (F $_{(1/41)}$ =3.347, p <.05, η^2=.58). Christian Religion obtained highest mean score of ($\overline{\chi}$=36.12), followed by the Islam Religion had the low mean score of ($\overline{\chi}$ = 23.62).This means that the Christianity Religion had a positive effect on the knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (Christianity Religion) being the best religion strategies for knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan among the two Religious. Supporting this finding, Miller and Thoresen (2003) observed in his findings that religion is a multidimensional construct that reflects the shared beliefs and practices of a faith-based, social organization and it has been established that a sizeable body of literature documents relationship between religiousness and outcomes. They however explained further that one's relationship with a higher power may affect perceived control over health behaviors and outcomes. For instance, a collaborative relationship with a higher power in the management of one's health, known as an active spiritual health locus of control, may empower people to engage in behaviors beneficial for their own health.

Similarly, result revealed that there was a significant main effect of Locus of control on knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (F $_{(1/41)}$ =3.688, p <05, η^2=.25). High Locus of Control obtained highest mean score of ($\overline{\chi}$=34.025), followed by the Low Locus of Control had the low mean score of ($\overline{\chi}$ = 33.015).This means that the High Locus of Control had a positive effect on the knowledge and attitude of Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan (High Locus of Control) being the best Locus of Control for Polycystic ovarian syndrome prevention among postgraduate female students of University of Ibadan among the two levels. This finding is similar to a study by Wallston and Wallston (2002) stated that health locus of control has been shown to be related to

whether an individual change their behaviour and to the kind of communication style they require from health professionals. In agreement with this view, Murray and McMillan (2003) observed that behavioural modification is greatly influenced by locus of control. They further stated that individuals with internal locus of control are more likely to modify their behaviour faster than those with external locus of control in relation to knowledge and attitude.

Also, a study by Kumari, et al, (2017) which was undertaken to evaluate the effectiveness of structured teaching programme on polycystic ovarian syndrome in terms of knowledge and attitude among nursing students of Shimla nursing college, Annandale, Shimla (H.P). The results of the study indicated the mean post-test knowledge score 12.6 was higher than the mean pre-test knowledge score 7.44 in experimental group whereas the mean posttest knowledge score 8.28 was higher than the mean pre-test knowledge score7.84 in the control group. The study however concluded that there were improvement of all variables of knowledge and there was highly statistical significant difference between pre and post educational sessions. So it indicates that educational sessions were effective.

6. Conclusion

The study however concluded that there were improvement of all variables (knowledge, attitude and locus of control) and there was highly statistical significant difference between pre and post educational sessions. So this means that those educational sessions were effective. Therefore, the effectiveness of structured teaching program regarding polycystic ovarian syndrome among female student is highly important in not just University of Ibadan, but among all tertiary institutions in Nigeria. Also, Postgraduate female students had high knowledge with both positive and negative attitude towards polycystic ovarian syndrome.
The findings from the study concluded that adequate education of polycystic ovarian syndrome prevention among women will go a long way to control the prevalence of the disease and also help women to stay healthy.

Categorically, this study has far reaching implication for health professionals as well as tertiary institution students in Nigeria as a result of the pressing need for effective education of the polycystic ovarian syndrome and prevention. Although, most Postgraduate students have a high level of knowledge of the syndrome but there is still need for further awareness campaign among other categories of students. The study therefore concluded and related the findings to literature reviewed and affirms that disease education, or any forms of structured educational packages are potent, and could enhance the improvement of knowledge and attitude towards polycystic ovarian syndrome prevention among any group of women populations. This is because the main objective of disease education and informative sensitization are to enlighten people about their health and well-being.

7. Recommendations

Based on the findings of this study as well as literature reviewed with theories, the study found it necessary to give

the following recommendations to guide researchers, those in the health sector, stakeholders and students on best practices and preventive mechanism for polycystic ovarian syndrome. They however include:

1) Adequate knowledge and proper attitude are expected from not just students but all females who are prone to polycystic ovarian syndrome in order to prevent and control it in our society.

2) Since polycystic ovary syndrome is very common ailment and is affecting more than one in five women during reproductive period which often lead to serious health problems such as reproductive (hyper androgenism, infertility, hirsutism), metabolic (insulin resistance, cardiovascular disorders, diabetes mellitus) and psychological features (anxiety and depression), it is important for government as well as ministry of health in conjunction with all stakeholders to come up with policies and programmes that will help to prevent the problem.

3) Research has shown that there is poor knowledge of the syndrome among student especially in Nigeria as little research exists on it. It is therefore important for more serious research to be carried out on polycystic ovarian syndrome so as to know the extent of the effect on females and then come up with programs to prevent it.

4) There should be programmes on creating awareness to the generality of female population on the importance of polycystic ovarian screening, diagnosis and lifestyle modifications in a bid to reducing infertility, irregularities in menstrual cycle, depression and obesity among the women populace.

5) The school management and other policy makers should try to make policies helpful in facilitating implementation of programmes and interventions that will contribute to reproductive life style of adolescents, young female adults, University of Ibadan postgraduate students (female) and the society at large.

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