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An Awareness Study On Reproductive Health With Special Reference To Endometriosis As Perceived By Female College Students

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ABSTRACT: Endometriosis is a chronic gynaecological disorder, that affects the women of reproductive age group. Many women with endometriosis experience delay between the onset of symptoms and initial diagnosis, which is mainly due to lack of awareness, which in turn affects progress of the disease and the prognosis of the condition. The present study aims to understand the knowledge on symptoms, pattern of menstrual cycle – type of flow, genetic background and other predisposing factors responsible for the condition. At present, there is a paucity of data on perception of endometriosis among the girl students of colleges, hencetheoutcome of the present study will clearly reveal the socio demographic pattern, etiology and current awareness pertaining tothis condition. A total sample size of 1001 female students participated in the study. A survey questionnaire (Google forms) regarding etiology, symptoms, and genetic factors etc., for endometriosis were combined into a composite knowledge score. The age group of the respondents were between 17-25 years. Nearly 53.7% had a familial history of cyclic menstrual pain, 69.3% reported pelvic & abdominal painduring menstruation, yet 80.6% did not use medications as an option for pain management. Nearly 75.6% lacked awareness on visiting a doctor though they had constant cyclic and acyclic pain. It is evident from the present study outcome, the general population has limited knowledge on the signs and symptoms of endometriosis, which inhibited them from turning towards medical treatment on right time, which contributes to the delay in diagnosis and proper management of endometriosis.

Keywords: Endometriosis, Awareness, Gynaecological disorder

1.INTRODUCTION

Endometriosis is a chronic inflammatory disease, which is estrogen dependent and progesterone resistant, characterized by the presence of endometrial tissues outside uterine

cavity. The disease is associated with intense pelvic pain and infertility(Giudice, L.C., 2010).Symptoms associated with this condition include chronic pelvic pain, dysmenorrhea, non menstrual pelvic pain, painful intercourse (dyspareunia), heavy menstrual bleeding, fatigue and depression (Bulletti et al., 2010). The severity and chronicity of symptoms considerably affects the quality of life in women. 10% of women with this condition might be asymptomatic, which can lead to delay in the diagnosis.Even in symptomatic patients there could be a diagnostic delay of 4-7 years .Laparoscopy is the gold standard in diagnosis of endometriosis,which depends upon the expertise of the surgeon and also it needs histopathological confirmation.Symptoms suchas pelvic pain & back pain related to the menstrual cycle are considered to be normal and even when it is severe,patients do not seek any medical attention and hence many affected women remain undiagnosed which deludes the rate of disease prevalence.(Vercellini, P., et al., 1996). According to the earlier reports, endometriosis was prevalent among women of reproductive age groupwith an incidence of 10%- 15% (JM . Wheeler , 1989) .Global burden is reported to vary between 2%- 45%·(Eskenazi. B., 1997; Fuldeore MJ & Soliman AM., 2017).

World endometriosis society reports more than 176 million women suffer from endometriosis across the world. According to Dr.Pramades Das Mahapatra of Endometriosis society of India quotes an incidence of 26 million women suffering from endometriosis in India (https://www.livemint.com/Leisure/5t3h6qb42qNdbiLA0gKo9O/The-silent-epidemic.html.)
The spike in endometriosis was observed up to 77% among infertility patients (Eskenazi. B., 1997) and 30.5% patients with benign gynecological diseases[7]haveassociated endometriosis .(Tanmahasamut, P et al., 2014). 50-70% of women with chronic pelvic pain have endometriosis. (Cramer DW., 2002)

Significant diagnostic delay is commonly reported with an average of 7 years in USA & 8 years in UK and somecountries upto 9.6 years (Weintraub,AY et al., 2014). Endometriosis is often mistaken for other conditions such as pelvic inflammatory disease (PID), ovariancyst or Irritable bowel syndrome (IBS) which delays the start of treatment. In general the time taken for the definitive diagnosis from the onset of symptoms varies from 5-12 years. This delay may prolong the suffering, reduce productivity and deteriorate health thus affecting the overall quality of life for women with endometriosis(Ballard .K et al.,2006).By increasing the awareness of endometriosis among the general population, we can drastically reduce the delay in diagnosis and also aidearly treatment and prognosis of the disease. (Husby et al., 2003 & Hudelist et al., 2012)
The present study aims to determine theprevalence of endometriosis and its associatedsymptoms and knowledge about endometriosis among young college girls, which will help in addressing the issue in future with a better approach.

2. METHODOLOGY

The objectives of the study:
- To study the general awareness on Endometriosis among college girls
- To describe the selected Physical parameters such as age, height, weight, BMI of the respondents .
- To study the parameters related to the awareness ofgynaecological conditions of the respondents – Age of menarche, Symptoms, Type of menstrual pain, Painseverity and use of medication .

- To study the association between selected Physical parameters and gynaecological conditions of the respondents pertaining to Endometriosis

Research Design:

- Descriptive research design was adopted for the present study. The purpose of the study is to describe the various physical parameters as well as the parameters related to the awareness of the gynaecological conditions namely Age of menarche, Symptoms, Type of menstrual pain ,Pain severity and use of medication .

Tools of Data Collection:

- A semi structured questionnaire was developed by the researcher using google form,link of the google form was generated to share for the purpose of collecting the data. The questionnaire comprised of questions related to physical parameters and questions related to awareness about Endometriosis.

Pilot Study:

To find out the feasibility of the study, the researcher approached various Women College administrators and explained the purpose of the study in order to carryout the research in their respective colleges.

Pre testing:

To test the suitability of the questionnaire, the researcher administered Pre test with 20 female college students and the collected pre-tested questionnaires were analyzed.Based on the analysis some modifications were carried out to make it moresimple and relevant. These pre tested were not included for the final analysis.

Universe:

To four women colleges which are situated in Tiruchirappalli , constitute universe for the present study . The study period was from July 2020 – December 2020 and the size of the universe is 1651.

To collect the data, the researcher selected 4 Women colleges and in each college one teaching faculty was assigned by the Principal to help the researcher to collect the data and with the help of the staff member assigned the researcher was able to share the google form link through the Google Class Room (GCR) with the respective respondents.

The link was shared with 1651 respondents, out of which 1236 responses were received . 235 responses were incomplete, which were not included , the remaining 1001 responses were considered for final analysis . Hence, the sample size is 1001.

Inclusion Criteria :

1. Final year female UG & PG students alone were considered.

Exclusion Criteria:

1. Female Students in Co-education colleges were not considered for the study .

3. RESULTS

The data collected through the google forms were systematically processed and analyzed to draw meaningful inferences.
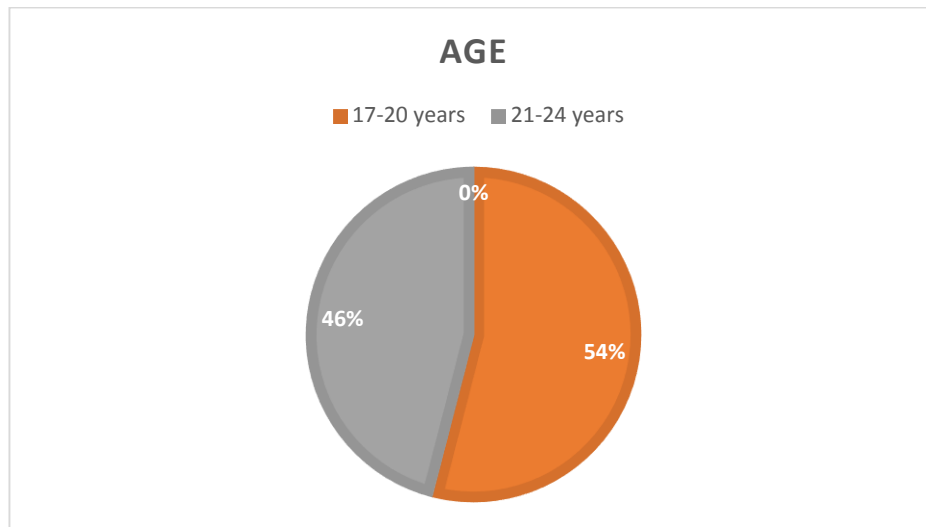
    i)   **Age**

Figure 1: Age distribution of the respondents

In the present study, majority of the respondents (54%) belong to the age group between 17 and 20 years (Figure 1).The incidence of endometriosis with respect to age is reported to vary with ethnicity. (Bougie O et al., 2019) and this study being done in South Indian Asian population the results reflected in the current study may vary fromanother ethnic groups.
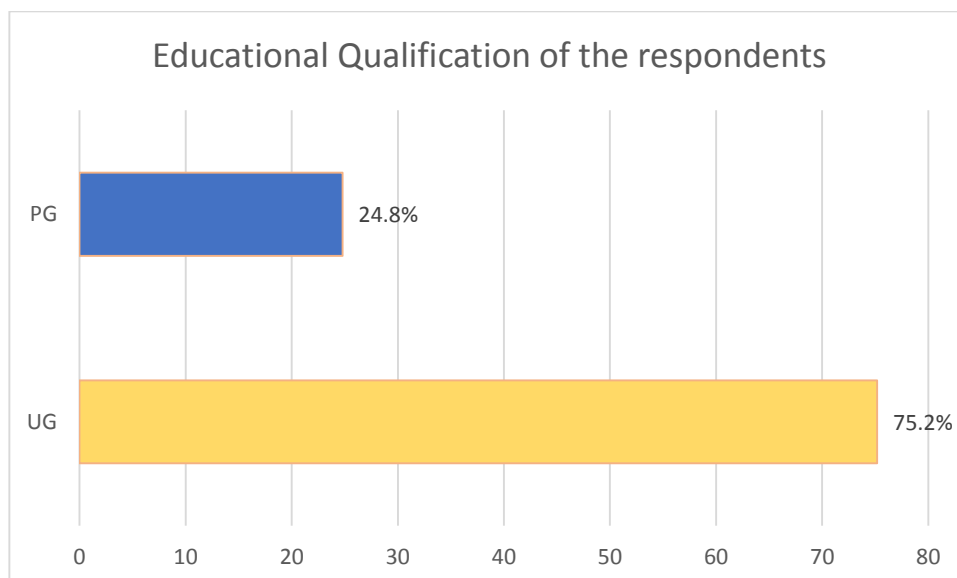
ii) Educational qualification of the respondents

Figure 2:Education Level of the respondents

The study findings reported,majority of the respondents (75.2 %) had under graduate level of education, whereas, 24.8% had Post graduate level of education (Figure 2).

a.Findings on general awareness about endometriosis:

Table 1: General awareness about endometriosis

S.No	Knowledge on awareness	No. of respondents n =1001	Percentage
1.	Awareness on the term 'Endometriosis' YES NO	244 757	24.4% 75.6%
1.	Awareness on symptoms YES NO	156 845	15.6% 84.4%
2.	Awareness on when to visit the doctor for treatment? YES NO	231 770	23.0% 77%
3.	Awareness about Endometriosis treatment options YES NO	56 945	5.6% 94.4%
4.	Awareness on association of Endometriosis& menstrual cycle pattern YES NO	213 788	21.2% 78.8%

From the present study it is inferred that, the awareness on endometriosis is relatively low among the college girls.Only 24.4% of the respondents were aware of the term 'Endometriosis'.15.6% of the respondents were not aware of the symptoms related to endometriosis. 23% of the respondents had no proper understanding of when to visit a doctor for treatment. Very low (5.6%) respondents only knew about the treatment options available for endometriosis. Almost majority of the respondents (78.8%) lacked the understanding that endometriosis is related to menstrual cycle pattern.(Table 1).

From the above Table , it is well understood that the awareness about endometriosis is least understood in the current population. Hence the present study would help to address the condition.

a. **Finding related to Physical parameters**

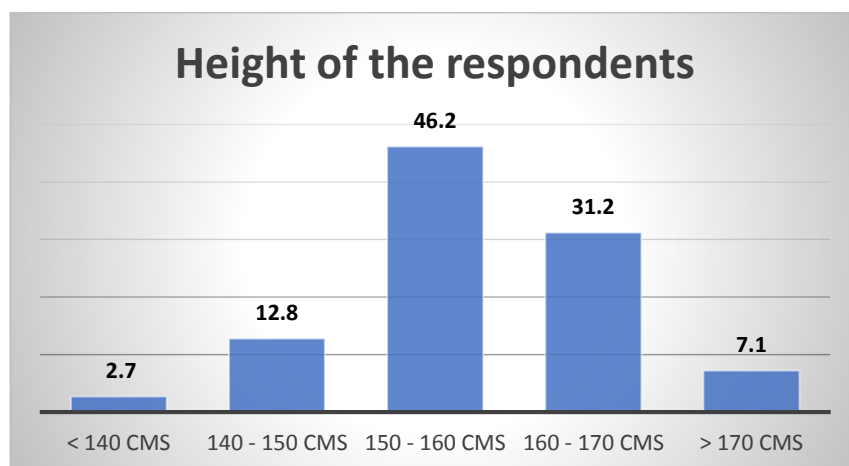i) **Height:**

Height of the respondents

Figure 3: Height of the respondents

It was inferred that, nearly half of the respondents (46.2 %) were between 150-160 cms height, followed by 31.2% between 160 and170 cms. (Figure 3)

ii)   **Weight :**
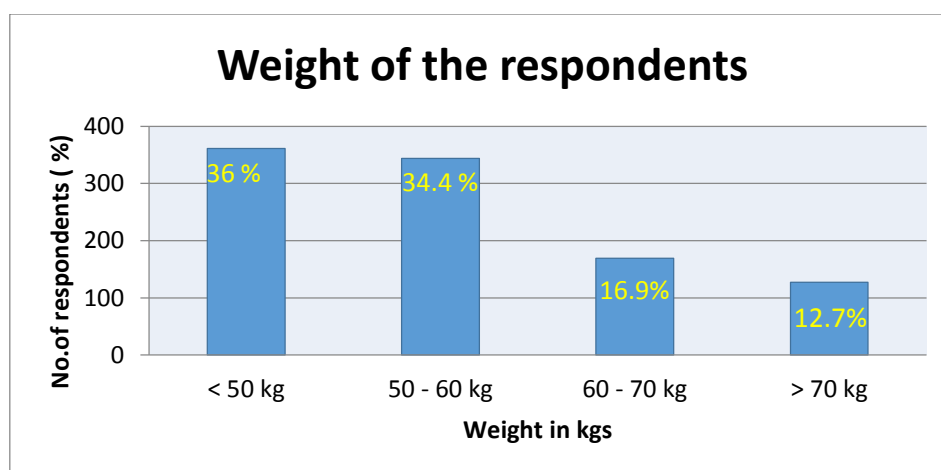
Weight of the respondents

Figure 4: Weight of the respondents

It was observed that , 36 % were less than 50 kg, followed by 34.4% between 50-60kg, implying that the majority of the respondents belong to normal weight category (Figure 4).
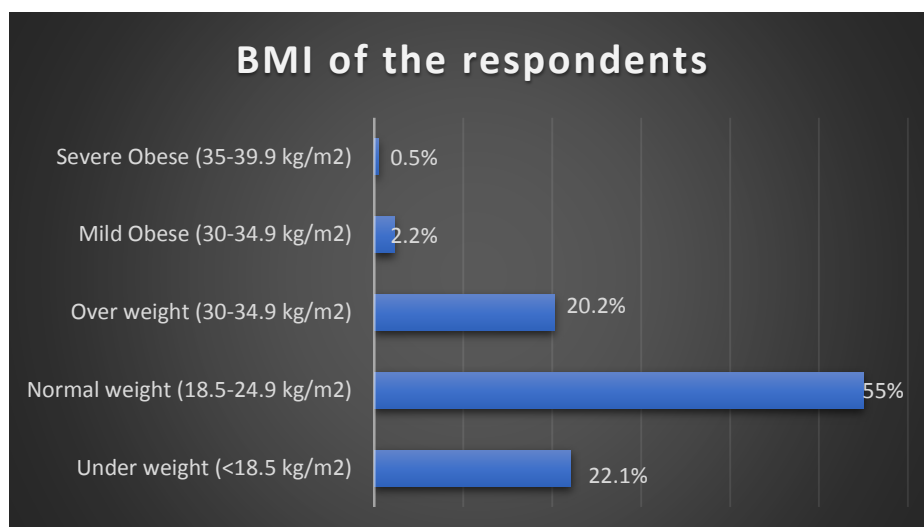
iii)   **Body Mass Index (BMI):**

Figure 5: BMI range of the respondents

The BMI was calculated by using the height (cms) and weight (kgs) of the respondents by referring to the BMI chart
BMI categories for Asians by WHO (underweight: $< 18.5\,\mathrm{kg/m^2}$, normal weight: 18.5–24.9 kg/m^2, overweight: 30–34.9 kg/m^2, mild obese: 30-34.9 kg/m^2, Severe Obese : 35-39.9kg/m^2) (Tang, Y., 2020).Majority (55%) had normal BMI of 18.5-24.9kg/m^2, 20.2%respondents were on overweight BMI. 2.2% respondents were in mild obese category and 0.5% respondents were in severe obese Category. (Figure 5).

b. Parameters related to awareness of medical condition with regard to Endometriosis
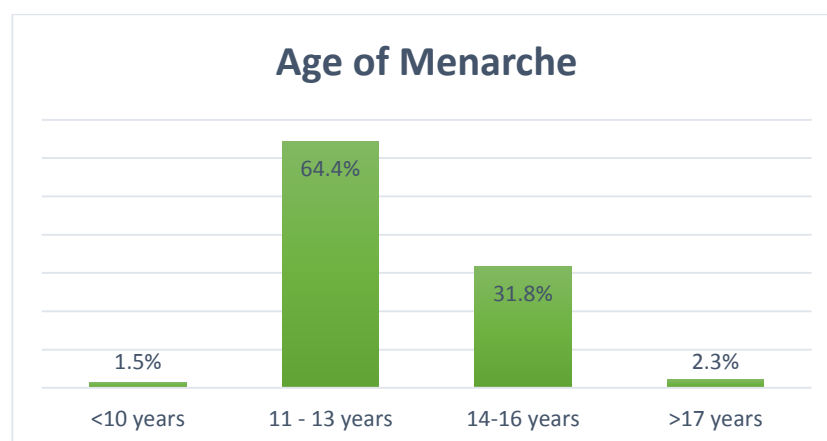
i)   Age of Menarche

Figure 6: Age of Menarche of the respondents

It is inferred from the study that, age of menarche for majority of the respondents were between 12-15 years (Figure 6). Similar results were reflected by Paria et al., 2014 which was reported to be between 13-18 years among adolescents girls in West Bengal. Tarannum F., 2018 reported nearly 69.7% had attained menarche between 12-14 years in Indian

Population. Early menarche predisposes to more number of menstrual cycles.According to retrograde menstruation theory, younger the age of menarche, higher will be the retrograde menstruation which is responsible for the origin of endometriosis(Marcellin , L,2019; Treloar SA, 2010). 85% respondents had regular menstrual cycle, whereas 15% had irregular cycles.
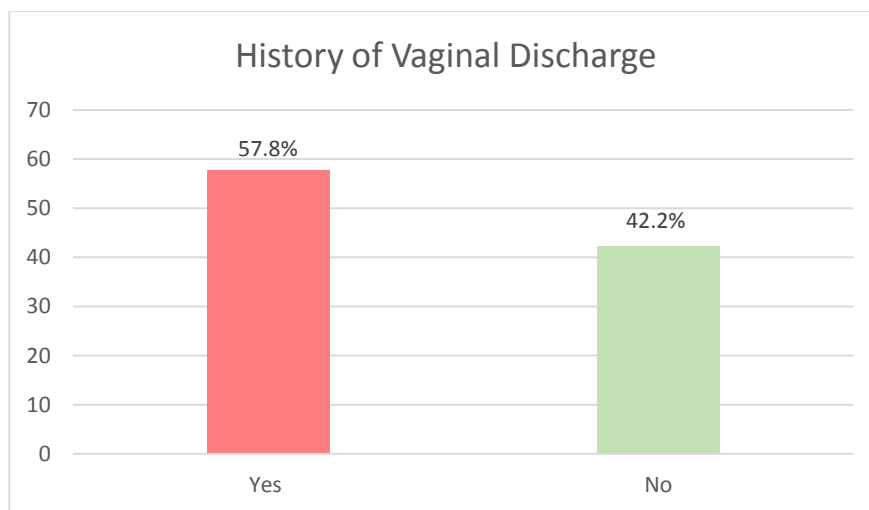
ii) History of Vaginal discharge:

Figure 7: History of Vaginal Discharge

Vaginal discharge was reported by 58.8% of the respondents and only 42.2 % reported no vaginal discharge (Figure 7).

iii) Difference in number of days between each cycle:

Table 2a:
Menstrual Cycle difference in days between each cycle

Parameters	Duration in days		
Difference in number of days, between each menstrual cycle	< 2 days	3 – 4 days	> 4 days
No. of respondents (n=1001)	254 (25.4 %)	523(52.2%)	224(22.4%)

It is observed that, majority, 52 .2 %of therespondents had 3-4 days of change in cycle duration every month, followed by 25.4 %respondents had a cycle duration change of less than 2 days for every cycle and 22.4% respondents reported more than 4 days of change in menstrual cycle duration (Table 2a).

iv) Blood loss in days during menstrual cycle

Table2b :

Menstrual Cycle blood loss (in days) between each cycle

Parameters	Duration in days		
Number of days of blood loss do you during each cycle ?	< 3 days	3 – 4 days	> 5 days
No. of respondents (n=1001)	122 (12%)	623(62%)	256(26%)

It is inferred from the study, majority ,62.2% of the respondentshad 3-4 days of blood loss during each monthly cycle. (Table 1b). only 26 % of the respondents had more than 5 days of blood loss and a minimum of 12% had less than 3 days of blood loss.Higher incidence of endometriosis could be seen among women, who have increased flow (menorrhagia)

  v)   **Type of Menstrual pain :**
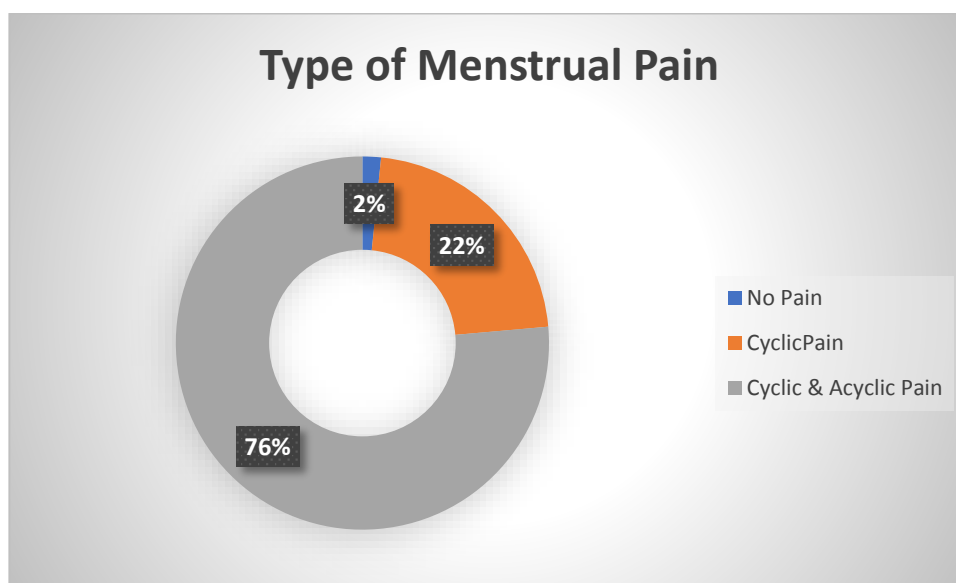
Figure 8: Type of pain during menstruation

Type of menstrual pain , play a major role in understanding the progression of endometriosis. The pain pattern contributes the pathophysiology of the disease. Cyclic pain (pain during menstrual cycle) was reported by 22%% respondents and 76% respondents reported both cyclic and acyclic pain and only 16% respondents reported no pain (Figure 8).
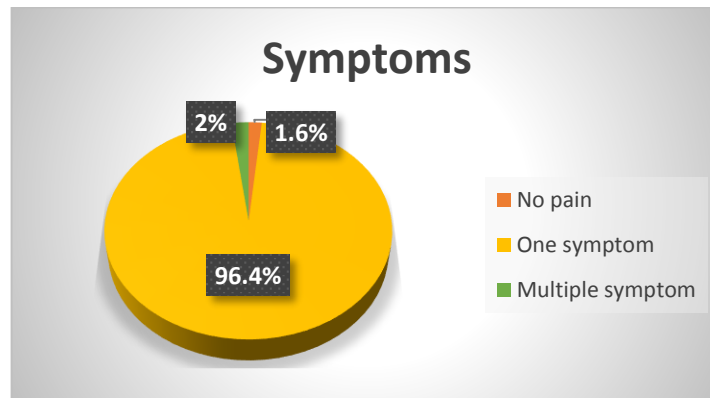
  vi)   Symptoms related to Menstrual Cycle

Figure 9:Symptoms related to Menstrual Cycle

Among symptoms such aschronic pelvic pain, abdominal pain, dysmenorrhea, non-menstrual pelvic pain, heavy menstrual bleeding and fatigue, almost all (96.4%)respondents of the study population had at least one symptom (abdominal pain) pertaining to the Menstrual cycle. 2% respondents had multiple symptoms i.e., more than one symptom. 1.6% respondents had no pain(Figure 9) .Among the listed symptoms in the questionnaire, 69.73 % respondents had abdominal pain & pelvic pain symptoms in common in addition to other types of symptoms. The prevalence of dysmenorrhoea varies from 16-91% (Ju H ., 2014) where the current study results even a higher percentage of 96.4% .
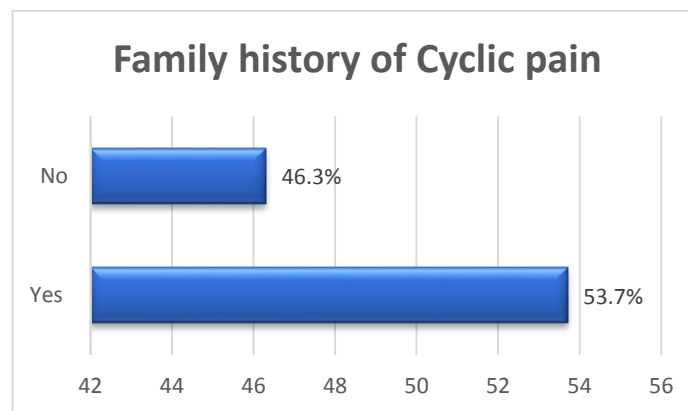
a. Family History of Cyclic pain:

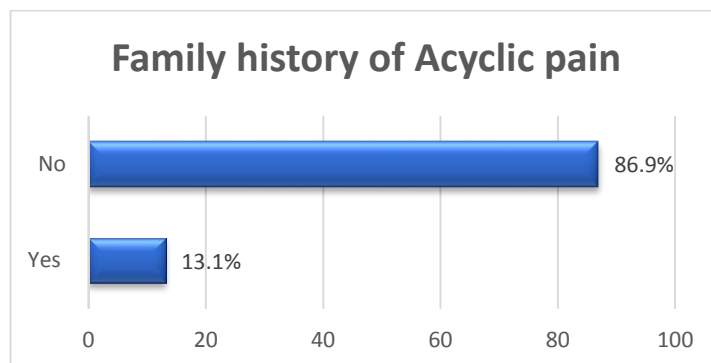Figure 10a: Family history of cyclic & acyclic pain

Figure 10b: Family history of acyclic pain

Family history of cyclic pain also had a significant influence on the condition (Ju H., 2014) A study found significant difference in endometriosis stages between patients with or without family history of cyclic pain (Matalliotakis,M., 2017). 53.7 % of the participants had members of the family (mother & sister) who are reported to have cyclic pain, which largely varied with the percentage of participant reported family members with acyclic pain (13.1%). (Figure 10a &10b).

vii)   Pain Scoring related to Menstrual cycle
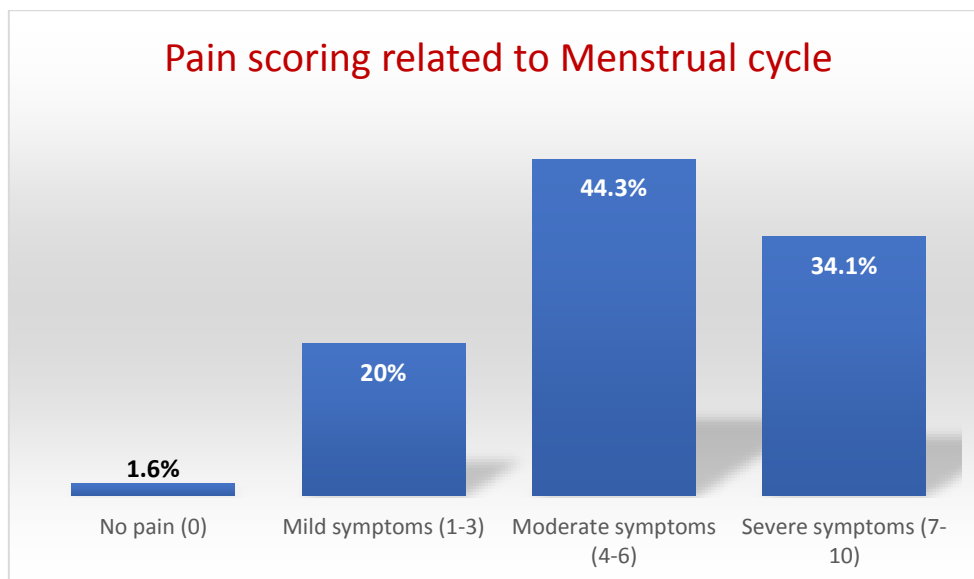
Figure 11: Pain Scoring related to menstrual cycle

Endometriosis being an inflammatory disorder, menstrual pain is considered one of the highly reported symptoms. The respondents were asked to provide pain score value depending on the severity of the condition the scoring was rated as 0- no pain, 1-3 scoring was designated as Mild pain, 4-6 scoring as Moderate & 7-10 scoring as severe pain (Vincent, K., 2010). Majority 44.3% of the respondents had moderate symptoms followed by 34.1% with severe symptoms (Figure 11).Respondents with severe pain should visit a doctor as they are likely candidates for endometriosis

viii)   Medication for Pain Management

It is observed that , most of the respondents (80.6%) did not use anytype of medication, only 19.4 % had medication for pain management(Figure 9), among which Majority (57.8%) reported to take medication once in a way for pain managementfollowed by 25.2 % for more than 7 months(Table 3). Ozawa Y, 2006 reported, pharmacologic treatments effectively relieve the pain associated with endometriosis, however, there is insufficient evidence to address the long- term effects. Though in the present study the population that used medication is only 19.4%, the effectiveness and long-term effects on use of these medication were unpredictable.Again these girls should be monitored for endometriosis.Candidates taking prolonged medication should be monitored for endometriosis (25.2%) (Table 3)
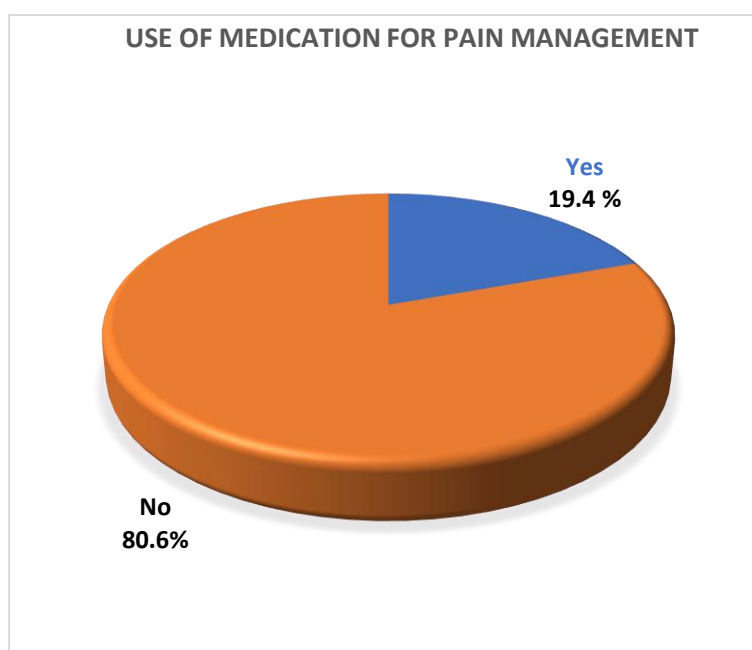
Figure 12: Use of Medication for pain managemen

Duration of medication	No of respondents n= 194	Percentage (%)
1 month	112	57.8
2 months	18	9.4
3 months	4	2.0
4 months	4	2.0
5 months	3	1.6
6 months	4	2.0
7 months	49	25.2

Table 3:
Duration of medication intake by the respondents

ix)   Visit to doctor for treatment:

Table 4: Respondents visit to doctor on existing conditions

S.No	Existing Condition	Visit to doctor n=985	
		YES	**NO**
1.	Based on Pain Severity		
	Mild pain	38 (3.9%)	162(16.4%)
	Moderate pain	66 (6.7%)	378 (38.4%)
	Severe pain	50 (5.1%)	291 (29.5%)
	TOTAL	154 (15.7%)	831 (84.3%)
2.	Type of Menstrual Pain		
	Cyclic Pain	37(3.7%)	183 (18.6%)
	Cyclic & Acyclic pain	111(11.3%)	654 (66.4%)
	TOTAL	148 (15%)	837 (85%)

(Note : The respondents who reported no pain were not included for the analysis)
From the above table it is inferred that, based on pain severity either to be mild, moderate or severe condition, only 15.7% of respondents visited doctor to get proper medical treatment. Only 15% of respondents either with cyclic or acyclic pain visited doctor for treatment. In both the conditions , majority of the respondents refrained from doctors visit because of temporarily managing the condition using home remedies or NSAIDS. (Table 4).

4. FINDING RELATED TO ASSOCIATION:

a.Association between Use of Medication and Type of Menstrual pain– 985

Table 4: Association between use of medication and type of menstrual pain

S.No	Type of Menstrual Pain	Use of Medication		Statistical Inference
		Yes n-194	NO n=791	
1.	Cyclic pain n= 499	152 (30.5%)	347 (69.5%	$X^2 = 74.105$ df = 1
2.	Cyclic & Acyclic pain n= 486	42 (8.7%)	444 (91.3)	P< 0.01 Significant

(Note: The respondents with no pain are not considered for the above analysis)

In association between use of medication & Type of Menstrual pain , p –value (74.105) indicates that the variables are dependent of each other and there is a statistical significant relationship between the type of Menstrual pain i.e., Cyclic pain (during mensuration and acyclic pain (during non-menstrual period). Even though only 35.7% of population had medication for pain management (Table4), Management of Primary dysmenorrhea generally includes NSAIDS (Non-steroidal anti-inflammatory drugs) or combined hormonal contraception (CHC), if unresponsive treated with GnRH antagonist. (Sachedina, A .,2020).

b.Association between Pain Severity and Absenteeism to College

Table 5: Association between Pain Severity and Absenteeism to College

S.No	Pain Severity	Absenteeism to College		Statistical inference
		Yes n- 363	NO n-622	
1.	Mild N= 200	54 (27%)	146 (73%)	$X^{2.} = 49.344$ df = 2
2.	Moderate N= 444	133 (30%)	311 (70%)	P< 0.01
3.	Severe N= 341	176 (51.6%)	165 (48.4%)	Significant

(Note : The respondents with no pain are not considered for the above analysis)

In association between pain severity & absenteeism to college, p –value (0.00001) indicates that the variables are highly dependent of each other and there is a statistical significant relationship between both the factors, which strongly implies that the daily activities are drastically affected due to the condition. (Table 5). Primary Dysmenorrhea and absenteeism from school during menstruation during adolescence have been identified as an important marker of Endometriosis (Chapron C., 2011). Most studies show severe pain or pain limiting women's daily activitiesoccur 2-28% of adult women(Ju H., 2014). A multivariate analysis, reported work productivity loss in employed women was greater in those with pelvic pain without subfertility (p=0.03) & severe pelvic pain (p<0.001) (Nnoaham KE., 2012).

c.   Association between BMI& Pain Severity

Table 6: Association between BMI & Pain Severity

S.No	BMI	Pain Severity			Statistical Inference
		Mild n=200	Moderate n=444	Severe n=341	
1.	Under weight n= 218	42	97	79	$X^{2.} = 12.99$ df = 4
2.	Normal Weight n=541	125	224	192	P< 0.05
3.	Overweight & Obese Group n= 226	33	123	70	Significant

(Note : The respondents with no pain are not considered for the above analysis)

In association between BMI & pain severity, p –value (0.011311) indicates that the variables are dependent of each other and there is a statistical significant association between both the factors. (Table6). Majority of respondents76.8% who had normal BMI reported moderate to severe dysmenorrhea(Khodakarami B., 2015), which highly correlated with the current study outcome.This could be explained that the girls with higher BMI had fewer cycles and retrograde spill may not be heavier.

5. FINDINGS RELATED TO AWARENESS

1. In general, awareness about endometriosis was poor among the respondents. 96.4%respondents of the study were able to identify at least one symptom (dysmenorrhea) pertaining to the endometriosis, but the awareness on the other related like dysuria, dysphasia, diffuse abdomen pain, dysfunctional uterine bleeding etc., were relatively not known. (Chopin et al., 2006 ; Lemaire , 2004).
2. In the present study finding, incidence of menstrual pain is more common in girls with normal BMI than overweight or obese category, which contradicted the general assumption of increase incidence of menstrual pain is seen only in overweight or obese category girls. (Holdsworth SJ., 2018).
3. In the study, 96.4% respondents reported at least one symptom (most common is pelvic pain) pertaining to the Menstrual cycle(Schenken, 1996), but only 15.7%respondentsturned for proper medical treatment to manage the condition, which implies that the awareness regarding the need for evaluation of symptoms were not there, rather it was considered to be a common physiological abnormality.
4. 34.1%respondents reported severe pain, among which only 5.1% turned up for a medical help. Similar type of results was reflected even for moderate type of pain 6.7% respondents out of 44.3%turned up for medical treatment. Common practice of using home remedies and self-medication which caused temporary management of pain, would have prevented them from reaching for medical consultation, these were considered as a practical reason for delay in diagnosis of endometriosis. Studies reported that average length of delay in diagnosis of endometriosis was 6-10 years, dependent on ethnic group (Nnoaham KE., 2012). Delay in diagnosis of endometriosis was considered to be long especially with women with pelvic pain not seeking medical help.(Arruda MS., 2003)
5. Educational level of the respondents did not provide a profound knowledge about the condition as only 17% of respondents, who had Post Graduation level of education turned up for medical help. 57.8% reported of Vaginal discharge, yet only 16% respondents have gone for medical assistance, which implies the awareness of when to visit the gynecologist? and what Symptoms should be addressed and given priority is least understood in the study population. 3.7% respondents out of 22% respondents who had cyclic pain alone visited the doctor for treatment, 11.3% out of 76.5% respondents who had both cyclic and acyclic pain visited doctor for treatment inferring the intensity and constant inability to manage pain has been given priority to seek medical assistance.

In general, pertaining to various conditions of endometriosis and related alignments seeking medical help or proper treatment is poor, which implies that the knowledge and awareness about the condition is low in the study population.

6. SUGGESTIONS

1. A special awareness program regarding endometriosis should be given to all women students starting at the age of adolescence
2. Students with underweight, should be advised to take proper balanced nutritious diet.
3. Students who belong to obese category, should be educated on reducing the weight by giving proper physical exercises and balanced diet, which would help in mitigating the severity of the condition.

4. Students with abnormal vaginal discharge , even those having regular menstrual cycle need to consult the doctor , to reduce further complications.

5. As there is a very good correlation between school absenteeism, which could be due to dysmenorrhea, a symptom of underlying endometriosis, these girls should be further evaluated, so that the disease can be picked up much earlier.

6. The significant relationship between pain severity and absenteeism to college or work drastically affects the potential ability of women and quality of life. Proper medical management and treatment on right time can uplift the quality of life in women and prevent the progress of the disease

7. Even among girls with normal BMI, dysmenorrhea (cyclic & acyclic pain) should not be neglected, since most of respondentsconsider the symptoms as physiological. Awareness has to be provided to avoid delay in diagnosis and further treatment.

8. Family history of dysmenorrhea (cyclic & acyclic pain) in first degree relatives of patients with endometriosis have higher chances (4-7 folds) of developing endometriosis than general population. It is important to educate the women students with family history of endometriosis(indirectly mother having dysmenorrhea or underwent surgery for chronic pelvic pain) to turn up for early medical aid, if they have associated dysmenorrhea(cyclic & acyclic pain) to prevent the delay of diagnosis and to have a better prognostic outcome.

7. CONCLUSION

To conclude,the present study outcome regarding various symptoms related to endometriosis in young college girls seeking medical help or proper treatment is poor, which implies that the knowledge and awareness about the condition is low in the study population.(School absenteeism has got significant association with endometeriosis). Nearly 25.2% of respondentswho were on medication for more than 7 months & 15.7 % ofrespondents who turned up for medical treatment for management of dysmenorrhea are likely candidates for endometriosis, should be further subjected for further investigations and counselled and guided properly to alleviate the condition of endometriosis .

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