

## EVALUATION OF NEUROLOGIC AND GIT MANIFESTATIONS IN INDIVIDUALS WITH DYSMENORRHEA

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### ABSTRACT

Dysmenorrhea is one of the most common gynaecological problems throughout the world. Dysmenorrhea is defined as pain in lower anterior pelvic area associated with periods. It can also be defined as difficulty in menstruation or painful menstruation due to reduction in blood flow and concomitant uterine ischemia. It can be classified into two major categories: Primary dysmenorrhea and secondary dysmenorrhea. Most common symptoms associated with dysmenorrhea are nausea, vomiting, diarrhoea, constipation, abdominal pain, dizziness, mood changes, fatigue, restlessness, sleeplessness, etc. The present study was cross sectional study conducted on 300 individuals (150 patients and 150 controls). The subject's profile, the anthropometric measurement (BMI, waist to hip ratio and percent body fats), vitals (B.P, pulse rate, pulse pressure) and stress score was recorded. The neurologic and GIT symptoms associated with dysmenorrhea, menstrual history, eating habits and personal medical history was also determined by using a questionnaire. The participants of the study (age 18 to 24 years), mean 20.79  $\pm$  1.56 with a mean BMI of  $19.98 \pm 3.72$ , mean W/H ratio of  $0.80 \pm 0.60$ , mean percent body fats of  $23.15 \pm 4.40$ , mean stress score of  $19.81 \pm 20.75$ . Various dysmenorrhea symptoms such as nausea, vomiting, abdominal bloating, aggressive behaviour, depression, dull or cry mood, sleeplessness, irritability, headache, lack of control and guilty feeling shows a significant difference ( $p < 0.05$ ) between patients and controls. Limitation of activities, menorrhagia, pain in abdomen, thighs, low back also shows a significant difference ( $p < 0.05$ ) between patients and controls. Dysmenorrhea symptoms in Pakistani females includes nausea, vomiting and abdominal bloating among GIT symptoms. Whereas aggressive behaviour, depression, dull or cry mood, sleeplessness, irritability, headache, lack of control and guilty were the most common associated neurologic manifestation in dysmenorrhea females in Pakistan. Sedentary life style is responsible for dysmenorrhea and its associated symptoms in Pakistani population.

**Key words:** BMI (body mass index), B.P (blood pressure), GIT (Gastro Intestinal Track)

### INTRODUCTION:

Dysmenorrhea is one of the most common gynecological problems throughout the world. Almost all the menstruating females' experiences pain during menstruation but teenagers experience it more vigorously. The incidence of dysmenorrhea is not known, as it frequently goes unreported. Dysmenorrhea is reported in

different countries of the world. One from every two women tolerates pain and cramps during menstruating but this pain begins after the ovulatory cycles begins. However, some women experiences dysmenorrhea with anovulatory cycles.

Dysmenorrhea is defined as pain in lower anterior pelvic area associated with periods. It can also be

defined as difficulty in menstruation or painful menstruation due to reduction in blood flow and concomitant uterine ischemia. It can also be described as crampy, shooting, throbbing, or spasmodic conditions but always occur as a cyclical periodic pain. It usually involves cramps in the abdomen, begins just before the onset of menses and diminishes after 1-3 days of the cycle affecting more than half of the menstruating women (Wijesiri & Suresh, 2012). Dysmenorrhea may be classified into mild, moderate and severe depending on the intensity of pain produced and the disabling effects produced by this problem. The quality of pain varies among individuals and those with severe pain have more negative effects. It can be classified into two major categories: Primary dysmenorrhea and secondary dysmenorrhea. (Ozerdogan et. al, 2009).

Primary dysmenorrhea (PD) usually begins from the onset of menstrual cycle without any pelvic pathology such as endometriosis, uterine myoma, uterine fibroid, ovarian cyst, etc (Guvenc et. al, 2012). It usually associated with the onset of ovulatory cycles from six months to one year after the onset of menarche. Three out of four women with dysmenorrhea suffer from primary dysmenorrhea. Primary dysmenorrhea is most common among the girls. It usually occurs in teenage girls but as the age increases the intensity of pain decreases. The pain of primary dysmenorrhea usually starts a few hours before or just after the onset of a menstrual period and may last as long as 48-72 hours. This pain is just like labor pain with cramping in suprapubic region and may be accompanied by lumbosacral back ache, pain in the thigh, in the abdomen, or general ache (Anton Calis K, 2011). Primary dysmenorrhea is always mediated by prostaglandins. Women's have a higher concentration of prostaglandins, PGF2 alpha (a potent myometrial stimulant and vasoconstrictor in the secretory endometrium), prostaglandin E2 and leukotrienes in their blood which contributes to cramps and pain (Chiou & Wang, 2008). It is also believed that a decline in the progesterone before the start

of menstrual cycle begins the arachidonic acid release and cytokine release from the degradation of arachidonic acid. Severe myometrial contraction, vasoconstriction, uterine ischemia, and subsequent dysmenorrhic pain are resulted from the release of these cytokines (Wong & Khoo, 2010). Primary dysmenorrhea is further classified into spasmodic and congestive. Both of them differ from each other in terms of the occurrence time in menstrual cycle, pain quality and other symptoms. However, the females with menstrual pain experiences a variety of physical and emotional symptoms (Shrotriya Charu et. al, 2012). Most common symptoms associated with dysmenorrhea are nausea, vomiting, diarrhea, constipation, abdominal pain, dizziness, mood changes, fatigue, restlessness, sleeplessness, etc. Symptoms of dysmenorrhea accompany the onset of menstrual flow (Roberts et. al, 2012).

Secondary dysmenorrhea is defined as painful menstruation associated with anatomic or pelvic pathology such as endometriosis, uterine fibroids, polyps, ovarian cyst, adenomyosis or infection. It is usually observed in women aged between 35- 40 years of age. Secondary dysmenorrhea can be treated and usually relieved by correcting the pelvic abnormalities. Like primary dysmenorrhea, the symptoms of secondary dysmenorrhea include irregular periods, bleeding between periods, pain between periods, vaginal discharge, heavy bleeding, dyspareunia, etc. One from every four women experiencing dysmenorrhea is secondary dysmenorrhea due to any pelvic pathology (Mahkam Tavallae, 2009).

Majority of the women experiences a tolerable menses. But for the rest of women, the pain is very exhausting and tiring, limits the daily activities and such women need immediate medications to get free from pain. The quality of pain and its associated symptoms varies among individuals and those with severe pain have more negative effects. It interrupts with daily activities and most of the women show lack of interest in doing their task which will definitely reduces the quality of life. It is the most

common problem among women occurring with different intensities and symptoms influencing the mental and physical health if remains untreated. It is also a major cause of impaired quality of life interrupting their educational and social life (Durain, et al, 2012).

## METHODOLOGY

The study had been conducted from August 2025 to December 2025. It included 300 subjects. Out of which 150 were cases and 150 were controls. Only female subjects were included ranging between 18 - 24 years of age, belonging to different departments such as department of physiology, chemistry, botany, zoology, women studies, mathematics and faculty of arts from University Of Karachi.

**Study Design:** Cross sectional study.

**Sample Size Calculation:** The sample size was estimated for the study by using the total number of adolescents at the age of 18 and 24 years in the city, the 10 % individuals were taken at the acceptable margin of 2 % and we keep the 95 % confidence level, the number of subjects yield were 150.

The expected possible sample losses an addition 13 % was inducted with calculated sample, and thus finalized the total minimum sample size of 150 patients. WHO 2009 software was used for sample size calculation.

**Population Interest:** The study was carried out on human female subjects.

**Sample Technique:** It was a convenient sample technique.

**Data Collection:** Selected participants were requested to fill a self administered questionnaire which was designed to collect the required data. The questionnaires were divided into six sections. The first section contains demographic data of the individual such as name, age, marital status, contact number, etc. The second section contains data related to

body measurements such as weight, height, blood pressure, pulse rate, pulse pressure, waist circumference and hip circumference. The third section contains data related to menstruation such as personal and family history of menstruation. The fourth section contains data related to history of personal and family diseases. The fifth section of the questionnaire contains data related to personal habits and eating habits. In the last section, the stress score was calculated by using Holmes-rahe life stress inventory scale. The score below 150 represents less stress, between 150 - 300 represents moderate stress and beyond 300 represents severe stress. After completion, the questionnaires were collected from the participants immediately on the spot.

**Anthropometric Measurement:** The body mass index and waist to hip ratio of the subjects were measured by taking their weight, waist, hip and height measurement. Weight was measured by using a digital portable scale with capacity for 200 kg and precision of 0.01 kg with the subjects wearing no shoes and bags. Height was measured by using inelastic metric tape with scale of 0.5 cm. The subjects were instructed to stand straight and motionless, with hands flat on thighs and head adjusted on the Frankfurt plane. Measurement of hip and waist was taken by inch tape.

**Blood Pressure Measurement:** Blood pressure of human subject can be measured by two methods. Direct method and indirect method. In this study blood pressure was measured by indirect method i.e. Auscultatory method. This method is based on sense of hearing. The pressure of upper side is the maximum pressure and is called the systolic pressure while the pressure of lower side is the minimum pressure termed as the diastolic pressure.

**Pulse Rate Measurement:** The pulse rate of a human subject can be measured by two methods. Manual method or Monitor method.

In this study, pulse rate was measured by manual method.

**Percent Body Fats Measurement:** There are several methods for % body fats measurement. Such as skin fold calipers, bioelectric impedance analysis, anthropometric, hydrostatic weighing, and DEXA scan. In this study we measured % body fats through Anthropometric factors.

**Data Analysis:** Standardized statistical programs including Independent T-test, ANOVA and Chi-square test was applied. Data was stored and analyzed by using SPSS 16.0. Mean and standard deviation computed for all quantitative parameters like BMI, W/H ratio, stress score, pulse rate, pulse pressure and percent body fats. For qualitative parameters, count and percentage reported using frequency tables were used. Pearson chi square test was used to see the association between parameters with patients and controls while independent T- test performed to compare the means of all quantitative parameters of patients and controls.

## RESULTS

The overall subjects under study were between 18 and 24 years of age, with a mean age of 20.79 years. Overall 66.66% females were patients of dysmenorrhea and 33.33% females were controls. BMI was found to be  $19.98 \pm 3.72$  kg/m<sup>2</sup> in overall population. The overall mean values of anthropometry, vitals and stress score are given in table-1. As discussed in methodology, in our data there were two types of parameters the quantitative and qualitative. The qualitative parameters include sign and symptoms of dysmenorrhea, menstrual history, eating habits, personal medical history, physical activity and stress. The quantitative parameters includes, Anthropometric measurements (BMI, W/H ratio, and percent body fats), Stress score, Blood pressure (systolic and diastolic blood pressure), pulse rate and pulse pressure. The qualitative as well as quantitative

parameters were compared between patients and controls.

**Age and Anthropometric Indices:** The participants belong to age group 21 were more in the study while participants at age 24 remained less in number. The mean BMI was  $19.98 \pm 3.72$  kg/m<sup>2</sup>. More participants of our study shows the BMI valued 18 while BMI above 30 was found in few of the participants. The mean W/H ratio was  $0.80 \pm 0.60$ . Maximum participants of our study shows the W/H ratio of 0.82 and less number of participant shows the W/H ratio of 0.96 (figure-4). The data of percent body fats shoes the mean value of  $23.15 \pm 4.40$ . Most of the participants were having 20 percent body fats while the extreme value of 15 % is shown in few participants.

**Stress Score and Blood pressure:** The stress score was found with mean value of  $19.81 \pm 20.75$ . The minimum value stress score was 0.00 while maximum value of stress score was 114 in overall participants. The data of systolic blood pressure shows the mean value of  $107.63 \pm 0.60$  mmHg. Most of the participants were having 110 mmHg of systolic blood pressure while few participants have systolic blood pressure of 85, 140 and 180 mmHg. The mean value of diastolic blood pressure was  $73.21 \pm 0.45$  mmHg. Maximum participants of our study show the diastolic blood pressure of 70 mmHg and less number of participant's shows the diastolic blood pressure of 50 and 120 mmHg.

**Pulse Rate and Pulse Pressure:** The mean pulse rate was found with the mean value of  $76.21 \pm 8.14$  beats/min. Maximum participants of our study shows the pulse rate of 70 beats/min while less number of participants shows the pulse rate of 110 beats/min. The average pulse pressure was found to be  $34.64 \pm 11.04$  mmHg. Maximum participants of our study show the pulse pressure of 30 mmHg while pulse pressure of 40mmHg is found in less number of participants.

**Table 1: Mean value along with standard deviation of Anthropometric indices, Stress score, B.P, pulse rate, pulse pressure, and percent body fats**

| Parameters     | Mean    | Median   | Std. Deviation |
|----------------|---------|----------|----------------|
| AGE            | 20.7900 | 21.000   | 1.56227        |
| BMI            | 19.9847 | 19.100   | 3.72574        |
| WHR            | 0.8070  | 0.80000  | 0.6089         |
| SYSTOLIC B. P  | 107.632 | 110.0000 | 0.604050       |
| DIASTOLIC B. P | 73.2167 | 70.0000  | 0.45378        |
| PULSE RATE     | 76.2167 | 76.0000  | 8.14893        |
| PULSE PRESSURE | 34.6400 | 35.0000  | 11.04096       |
| % BODY FATS    | 23.1583 | 22.1500  | 4.40244        |
| STRESS SCORE   | 19.8133 | 20.0000  | 20.75881       |

**Comparison of Age, Anthropometric Indices, vitals and stress score in Patients and Controls:** The comparison of Age and anthropometric indices (BMI, W/H ratio and percent body fats and vitals) displays no

significant difference of age, WHR, BMI, systolic blood pressure, diastolic blood pressure, stress score, percent body fats and pulse rate and pulse pressure with ( $p = > 0.050$ ) in both patients and controls

**Table-2: Comparison of Quantitatively parameters in patient and control group**

| Parameters                        | GROUP        | N   | Mean    | Std. Deviation | p-value |
|-----------------------------------|--------------|-----|---------|----------------|---------|
| AGE years                         | controls     | 150 | 20.7700 | 1.50993        | 0.876   |
|                                   | dysmenorrhea | 150 | 20.8000 | 1.59143        |         |
| BODY MASS INDEX kg/m <sup>2</sup> | controls     | 150 | 19.7450 | 4.01546        | 0.432   |
|                                   | dysmenorrhea | 150 | 20.1045 | 3.57656        |         |
| WAIST TO HIP RATIO                | controls     | 150 | .8097   | .05827         | 0.583   |
|                                   | dysmenorrhea | 150 | .8056   | .06227         |         |
| SYSTOLIC BLOOD PRESSURE mmHg      | controls     | 150 | 108.582 | 10.36523       | 0.293   |
|                                   | dysmenorrhea | 150 | 107.152 | 11.43597       |         |
| DIASTOLIC BLOOD PRESSURE mmHg     | controls     | 150 | 72.6000 | 6.94422        | 0.337   |
|                                   | dysmenorrhea | 150 | 73.5250 | 8.27901        |         |
| PERCENT BODY FATS %               | controls     | 150 | 22.4600 | 4.40913        | 0.052   |
|                                   | dysmenorrhea | 150 | 23.5075 | 4.36830        |         |
| PULSE RATE beats/min              | controls     | 150 | 75.6500 | 11.56744       | 0.531   |
|                                   | dysmenorrhea | 150 | 76.5000 | 10.78665       |         |
| PULSE PRESSURE mm Hg              | controls     | 150 | 36.3100 | 7.73905        | 0.584   |
|                                   | dysmenorrhea | 150 | 33.8050 | 8.23871        |         |
| STRESS SCORE points               | controls     | 150 | 18.1300 | 15.96502       | 0.321   |
|                                   | dysmenorrhea | 150 | 20.6550 | 22.77144       |         |

\*P value: <0.05 considered as significant using independent sample T- test.

**Table- 3: GIT Manifestations of Dysmenorrhea in Patients and Controls:**

| Characteristics                                                                         |     | Groups   |       |              |       | P value |
|-----------------------------------------------------------------------------------------|-----|----------|-------|--------------|-------|---------|
|                                                                                         |     | Controls |       | Dysmenorrhea |       |         |
|                                                                                         |     | n        | %     | n            | %     |         |
| Nausea                                                                                  | yes | 15       | 5.0%  | 38           | 19.0% | 0.001*  |
| Vomiting                                                                                | yes | 16       | 6.0%  | 35           | 17.5% | 0.007*  |
| Diarrhea                                                                                | yes | 18       | 8.0%  | 16           | 8.0%  | 1.000   |
| Constipation                                                                            | yes | 10       | 10.0% | 19           | 9.5%  | 1.000   |
| Loss of apatite                                                                         | yes | 13       | 13.0% | 45           | 22.5% | 0.062   |
| Abdominal bloating                                                                      | yes | 25       | 15.0% | 67           | 33.5% | 0.001*  |
| Regurgitation                                                                           | yes | 0        | 0.0%  | 4            | 2.0%  | 0.305   |
| Belching                                                                                | yes | 0        | 0.0%  | 4            | 2.0%  | 0.305   |
| P-value < 0.05 considered as significant using Pearson chi-square test of independence. |     |          |       |              |       |         |

#### **GIT Manifestations of Dysmenorrhea in Patients and Controls:**

Using Chi-square test it was revealed that nausea is significantly increased in patients as compared to controls with (p=0.001), vomiting also significantly increased in patients as compared to controls with (p=1.000), constipation is non significant in patients and

controls with (p=1.000), loss of apatite is also non significant in patients and controls with (p=1.062), abdominal bloating is significantly increased in patients as compared to controls with (p=0.001), regurgitation is non significant in patients and controls (p=0.305) and belching is also non significant in patients and controls during menstruation (p=0.305).

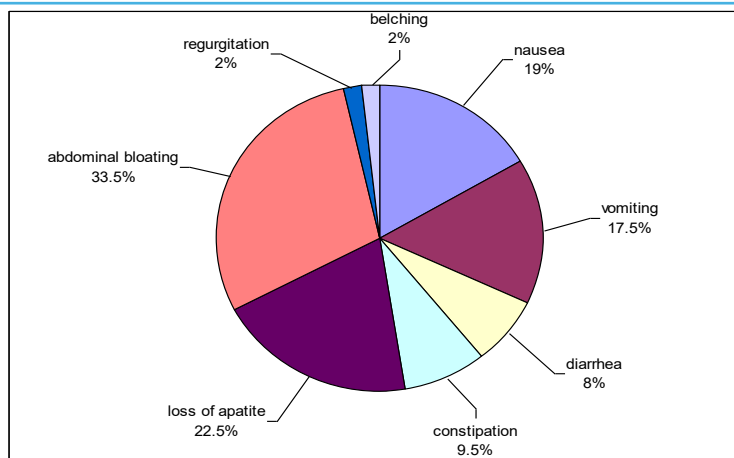


Figure-1: GIT Manifestations of Dysmenorrhea in Patients

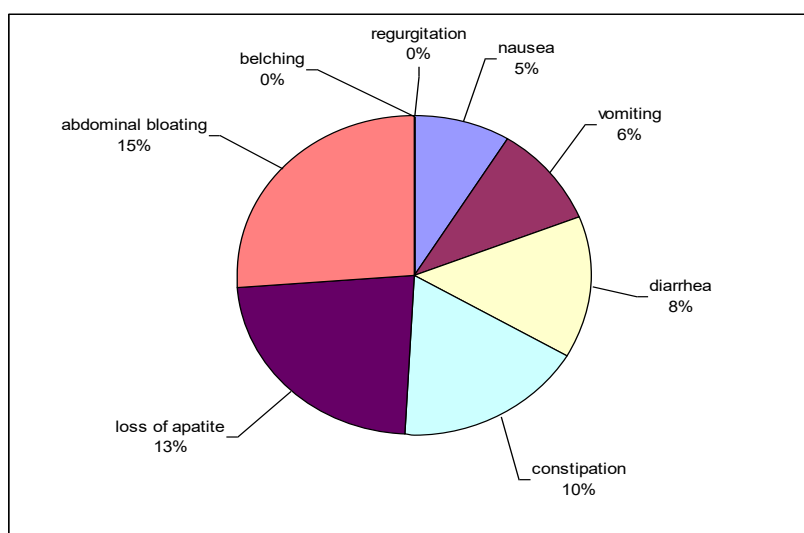


Figure-2: GIT Manifestations of Dysmenorrhea in Controls

Table- 4: Neurologic Manifestations of Dysmenorrhea in Patients and Controls

| Characteristics     | Group    |       |              |       | P value |
|---------------------|----------|-------|--------------|-------|---------|
|                     | Controls |       | dysmenorrhea |       |         |
|                     | n        | %     | n            | %     |         |
| Anxiety             | 14       | 8.0%  | 33           | 16.5% | 0.050   |
| Aggressive behavior | 16       | 10.0% | 38           | 19.0% | 0.047*  |
| Depression          | 12       | 6.0%  | 34           | 17.0% | 0.007*  |
| Light headedness    | 3        | 3.0%  | 11           | 5.5%  | 0.399   |
| Dull or cry mood    | 16       | 16.0% | 82           | 41.0% | 0.000*  |
| Sleeplessness       | 3        | 3.0%  | 49           | 24.5% | 0.000*  |
| Irritability        | 9        | 9.0%  | 48           | 24.0% | 0.002*  |
| Restlessness        | 19       | 19.0% | 59           | 29.5% | 0.052   |
| Food craving        | 9        | 9.0%  | 15           | 7.5%  | 0.656   |
| Headache            | 6        | 6.0%  | 38           | 19.0% | 0.003*  |

|                           |    |       |    |       |        |
|---------------------------|----|-------|----|-------|--------|
| Fainting                  | 0  | 0.0%  | 4  | 2.0%  | 0.305  |
| Dizziness                 | 11 | 11.0% | 37 | 18.5% | 0.132  |
| Lack of control           | 0  | 0.0%  | 16 | 18.0% | 0.002* |
| Guilty                    | 3  | 3.0%  | 13 | 6.5%  | 0.029* |
| Unreasonable behavior     | 6  | 6.0%  | 28 | 14.0% | 0.052  |
| Hypersensitivity to touch | 3  | 3.0%  | 13 | 6.5%  | 0.279  |
| Hypersensitivity to smell | 3  | 3.0%  | 13 | 6.5%  | 0.279  |
| Hypersensitivity to sound | 3  | 3.0%  | 13 | 6.5%  | 0.279  |
| Hypersensitivity to light | 3  | 3.0%  | 13 | 6.5%  | 0.279  |

P-value < 0.05 considered as significant using Pearson chi-square test of independence.

### Neurologic Manifestations of Dysmenorrhea:

Using Chi-square test it was revealed that aggressive behavior is significantly increased in patients as compared to controls with (p=0.047), depression is also significantly increased in patients as compared to controls with (p=0.007), dull or cry mood is significantly increased in patients as compared to controls with (p=0.000), sleeplessness also significantly increased in patients as compared to controls with (p=0.000), irritability is significantly increased in patients as compared to controls with (p=0.002), headache also significantly increased in patients as compared to controls with (p=0.003), lack of control is

significantly increased in patients as compared to controls with (p=0.002) and guilty also significantly increased in patients as compared to controls with (p=0.029). Where as, anxiety is non significant in patients and controls with (p=0.050), light headedness is also non significant with (p=0.399), restlessness is non significant with (p=0.052), food craving is also non significant with (p=0.656), fainting is non significant with (p=0.305), dizziness is also non significant with (p=0.132), unreasonable behavior is non significant with (p=0.052) and hypersensitivity to touch, sound, light and smell all are non significant with (p=0.279).

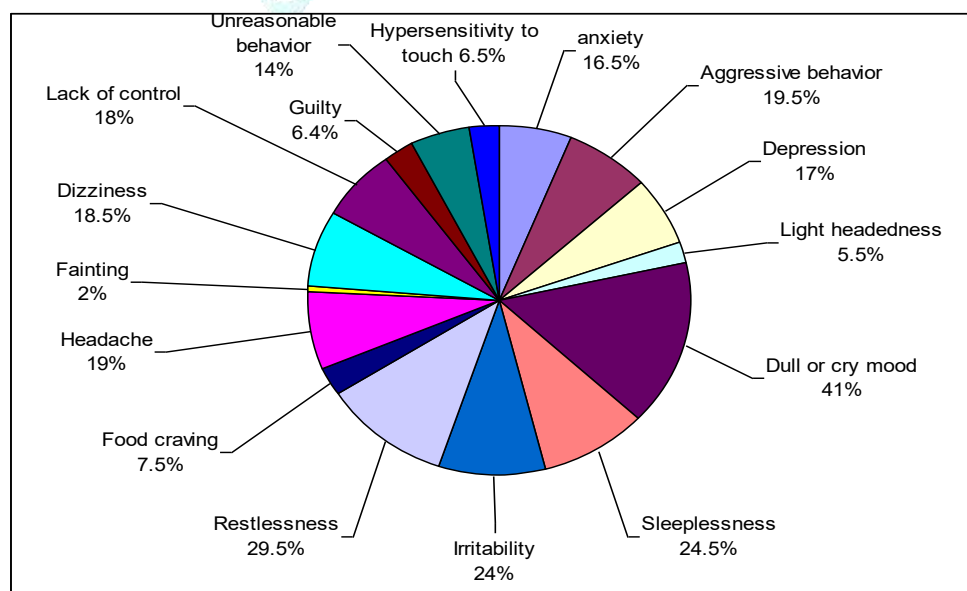


Figure 03: Neurologic Manifestation of Dysmenorrhea in Patients.

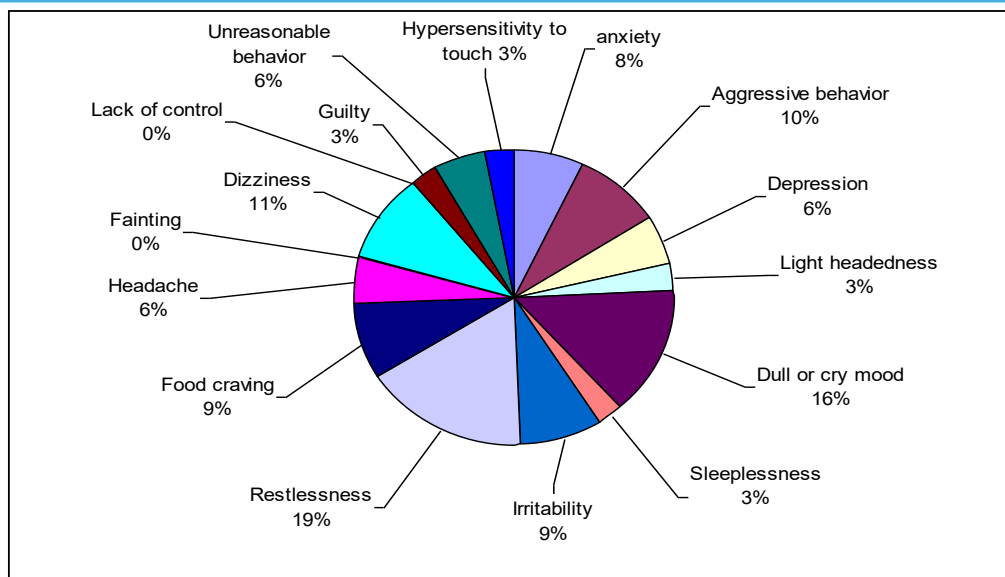


Figure-04: Neurologic Manifestation of Dysmenorrhea in Controls.

Table- 5: Menstrual History of Patients and Controls

| Characteristics     |              | Group    |      |              |       | P value |
|---------------------|--------------|----------|------|--------------|-------|---------|
|                     |              | Controls |      | dysmenorrhea |       |         |
|                     |              | n        | %    | n            | %     |         |
| Age of menstruation | 8-13yrs      | 17       | 17%  | 59           | 29.5% | 0.050   |
|                     | 13-16yrs     | 73       | 73%  | 128          | 64%   |         |
|                     | >16yrs       | 10       | 10%  | 13           | 6.5%  |         |
| Length of cycle     | <21 days     | 26       | 26%  | 42           | 21%   | 0.321   |
|                     | 21-35days    | 72       | 72%  | 148          | 74%   |         |
|                     | >35 days     | 2        | 2%   | 10           | 5%    |         |
| Duration of periods | 1-3 days     | 22       | 22%  | 39           | 19.5% | 0.793   |
|                     | 4-7 days     | 73       | 73%  | 148          | 74%   |         |
|                     | >7 days      | 5        | 5%   | 13           | 6.5%  |         |
| Intensity of pain   | no pain      | 100      | 100% | 0            | 0%    | 0.000*  |
|                     | Mild         | 0        | 0%   | 49           | 24.5% |         |
|                     | Moderate     | 0        | 0%   | 95           | 47.5% |         |
|                     | severe       | 0        | 0%   | 56           | 28%   |         |
| Location of cramps  | Abdomen      | 17       | 17%  | 123          | 61.5% | 0.000*  |
|                     | Thighs       | 7        | 7%   | 54           | 27%   | 0.000*  |
|                     | Low back     | 11       | 11%  | 76           | 38%   | 0.000*  |
|                     | legs         | 14       | 14%  | 46           | 23%   | 0.068   |
|                     | General ache | 3        | 3%   | 18           | 9%    | 0.058   |
| Heavy bleeding      | yes          | 23       | 23%  | 55           | 27.5% | 0.485   |

|                                                                                         |     |    |     |     |       |        |
|-----------------------------------------------------------------------------------------|-----|----|-----|-----|-------|--------|
| Limitation of activities                                                                | yes | 6  | 6%  | 104 | 52%   | 0.000* |
| Regularity of periods                                                                   | yes | 89 | 89% | 144 | 88.5% | 1.000  |
| Family history of menstrual symptoms                                                    | yes | 31 | 31% | 106 | 53%   | 0.000* |
| Past abdominal / pelvic surgery                                                         | yes | 3  | 3%  | 4   | 2%    | 0.690  |
| P-value < 0.05 considered as significant using Pearson chi-square test of independence. |     |    |     |     |       |        |

#### Menstrual History of Patients and Controls:

The Pearson chi square test shows that menarche age is non significant among patients and controls because the p value is >0.05. Both the patients and control have approximately the same age at menarche. Similarly

There is no significant difference in length of cycle in patients and controls with p value >0.05. The duration of periods in the study also appears non significant as both the patients and controls have almost same duration of periods with p value >0.05. The intensity of pain appears to be significant with p value <0.05 because controls do not experiences any kind of pain during menstruation but patients experiences different intensities if pain during menstruation (table-5).

#### Comparison in Location of Cramps between patients and controls:

The Pearson chi square test reveals that most of the participants under study have their menstrual cramps located in the abdomen, thighs and low back as it appears to be significant with p value <0.05. While few participants have their cramps located in the legs and experiences general ache as it appears non significant with p-value >0.05. The data is shown in table-5.

#### Comparison of Heavy Bleeding, limitation of activities and regularity of periods in patients and controls:

The Pearson chi square test shows most of the participants in the study do not experience heavy bleeding during menstruation in both patients and controls and appears to be non significant with p value >0.05. The Chi-square test also reveals that most of the patients of dysmenorrhea limit their activities during menstruation as compared to the controls and appears significant with p value <0.05. All the participants under study show that is no significant difference in regularity of periods with p value >0.05. Both the patients and controls have regular periods. The data is shown in table-5.

#### Comparison between family history of menstrual symptoms and pelvic surgery in patients and controls:

The Pearson chi square test shows that patients of dysmenorrhea have family history of dysmenorrhea symptoms as compared to controls and appears to be significant with p value <0.05. While no significant difference of past abdominal or pelvic surgery appears among patients and controls with p value >0.05. The data is shown in table-5.

**Table- 6: Stress, eating habits, physical exercise and personal medical history patients and controls.**

| Characteristics                      |     | Group    |     |              |       | P value |
|--------------------------------------|-----|----------|-----|--------------|-------|---------|
|                                      |     | Controls |     | dysmenorrhea |       |         |
|                                      |     | n        | %   | n            | %     |         |
| Stress level using Holmes Rahe Scale |     |          |     |              |       |         |
| Under stress                         | yes | 74       | 74% | 139          | 76.5% | 0.670   |

|                                                                                         |              |    |     |     |       |        |
|-----------------------------------------------------------------------------------------|--------------|----|-----|-----|-------|--------|
| Stress management                                                                       | yes          | 73 | 73% | 128 | 74%   | 0.793  |
| <b>Eating habits</b>                                                                    |              |    |     |     |       |        |
| Breakfast                                                                               | yes          | 80 | 80% | 140 | 70%   | 0.072  |
| Tea                                                                                     | 1 time a day | 19 | 19% | 49  | 24.5% | 0.128  |
|                                                                                         | 2 time a day | 33 | 33% | 84  | 42%   |        |
|                                                                                         | 3 time a day | 11 | 11% | 17  | 8.5%  |        |
|                                                                                         | 4 time a day | 2  | 2%  | 5   | 2.5%  |        |
|                                                                                         | 5 time a day | 3  | 3%  | 1   | 0.5%  |        |
| <b>Physical exercise</b>                                                                | no           | 40 | 40% | 29  | 14.5% | 0.000* |
|                                                                                         | Rarely       | 25 | 25% | 76  | 38%   | 0.037* |
|                                                                                         | Sometime     | 22 | 22% | 72  | 36%   | 0.018* |
|                                                                                         | daily        | 13 | 13% | 23  | 11.5% | 0.709  |
| <b>Personal Medical History</b>                                                         |              |    |     |     |       |        |
| Obesity                                                                                 | yes          | 18 | 18% | 20  | 10%   | 0.65   |
| Ovarian cyst                                                                            | yes          | 2  | 2%  | 2   | 1%    | 0.063  |
| Menorrhagia                                                                             | yes          | 0  | 0%  | 17  | 8.5%  | 0.001* |
| Pelvic Inflammatory Disease                                                             | yes          | 0  | 0%  | 2   | 1%    | 0.554  |
| P-value < 0.05 considered as significant using Pearson chi-square test of independence. |              |    |     |     |       |        |

### Comparison of Stress, Eating Habits and Physical Activity in Patients and Controls:

The Chi-square test reveals that both the patients and controls were equally under stress and the results reveal no significant difference (p value is 0.670 which is greater than 0.05). Eating habits including daily intake of breakfast and tea were also same in patients and controls. There is no significant difference between them with p value >0.05. The physical exercise appears to be significant suggesting that all controls which are having no pain do not perform any kind of exercise as compared to controls with p value <0.05. Chi square also reveals a significant increase in rarely performed physical exercise in patients as compared to controls with p value <0.05. Similarly there is also a significant increase in some timed perform physical exercise in patients as compared to controls with p value <0.05. However, there is no significant difference in daily performed exercise in both patients and controls with p value >0.05. The data is shown in table-6.

### Personal Medical History:

The Chi square test shows that obesity is non significantly increased in controls as compared to patients with p value >0.05. While there is no significant difference for ovarian cyst in patients as compared to controls with p value >0.05. However, menorrhagia appears to be significant as it is increased in patients as compared to controls with p value <0.05. Pelvic inflammatory disease also appears to be non significant because there is no significant difference in patients and controls with p value >0.05. The data is shown in table 6.

### DISCUSSION

It is a fact that almost every woman in Pakistan experiences pain during menstruation. Some experience it with out pain while others experience it with the onset of pain and for some women it becomes severe to bear together with the menstrual symptoms. Dysmenorrhea is a world wide problem faced by the menstruating women. It gives rise to a variety of symptoms mainly the GIT and Neurologic symptoms. The occurrence of these symptoms may occur before or during the onset of

menses. A number of factors have been related with menstrual pain.

Our study investigated that anthropometric indices, vitals and stress score were not associated with dysmenorrhea in both patients and controls because the p value of all these factors appears to be ( $> 0.05$ ). A study found that dysmenorrhea had a strong relation with BMI. Its severity increases with the increase in BMI (Shrotriya Charu, et. al, 2012).

It was found that nausea and vomiting is strongly associated with dysmenorrhea. Nausea and vomiting was considered to be the most commonly observed symptoms in dysmenorrhic females. (Rafia Bano et. al, 2013). It is believed that the excessive production of prostaglandins during menstruation leads to the contraction of uterus wall, causing more cramps and nausea (Apay et. al, 2010; Negriff et. al, 2009).

Abdominal bloating in the present study was found to be significant and is associated with dysmenorrhea. Lower abdominal cramping and bloating is one of the most common dysmenorrhea symptoms (Rafia Bano et. al, 2013). As estrogen affects synthesis of bile (that is responsible for intestinal lubrication). During menstrual period a drop in estrogen leads to decrease in bile synthesis. As a result waste material which is present in small intestine becomes hard and dry, ultimately results in abdominal bloating (Rafia Bano et. al, 2013).

The neurologic manifestations which were found to be associated with dysmenorrhea were aggressive behavior, depression, irritability, headache, lack of control, and guilty in our study. While the most commonly occurring symptoms were dull or cry mood and sleeplessness. Aggressive behavior and lack of control was found to be associated with dysmenorrhea in our study. It may be due to studies stress as all the participants in our study were university students.

Depression and dull mood was also found to be associated with dysmenorrhea in our study. It is associated with low levels of progesterone which leads to bad mood. On the other hand increased level of estrogen also causes changes in mood and depression (Rafia Bano et. al,

2013). Irritability was also found to be associated with dysmenorrhea in our study. It occurs because of a decline in estrogen level (Campbell, & McGrath, 1999).

Headache was also found to be associated with dysmenorrhea in our study. The cause behind this is that a drop in estrogen prior to menses may give rise to headache (Rafia Bano et. al, 2013). Anxiety, light headedness, food craving, restlessness, fainting, dizziness, unreasonable behavior, hypersensitivity to touch, sound, light and smell were found non significant in our study suggesting that these symptoms were not associated with dysmenorrhea. Our study also found that sleeplessness was associated with dysmenorrhea. As progesterone is responsible for sleep induction but its level drops suddenly as menstruation begins resulting in sleeplessness. However, when it rises during ovulation, the person sleeps as usual (Rafia Bano et. al, 2013).

The feeling of guilty is also found to be associated with dysmenorrhea in our study. However, the exact cause is not known (W. Steven Pray, 2011). Our study reveals that the age of menstruation did not appears to be significant as there was no significant difference in the age of menarche in both patients and controls. Those females having their menarche at an age of about 11 yrs or less possess 23% higher risk of having menstrual pain as compared to the females having their menarche at an age greater than 11 yrs. This shows that dysmenorrhea strongly associated with age of menarche (Shrotriya Charu et. al, 2012).

Similarly, duration of menstruation was also found to be non significant as there was no significant differences among patients and controls. Dysmenorrhea becomes more severe as the duration of menstruation increases. As progesterone is helpful in maintaining the duration of cycle but due to increase level of progesterone, women experiences more dysmenorrhea (Andersch et. al, 1982). Subjects who were taken as controls did not feel any kind of pain during menstruation where as the subjects who were taken as patients feel pain of varying intensities like 24.5% mild, 47.5%

moderate and 28% severe pain. It suggests that dysmenorrhea intensity vary from individual to individual depending upon the amount of prostaglandins produced. A study investigated that out of 664 dysmenorrhic females, 55.3% experiences mild pain, 30% experiences moderate pain while 14.8% of them experiences severe pain during menstruation (El-Gilany et. al, 2005).

Our study also investigated that dysmenorrhea cramps are mostly located with in abdomen, thighs and low back. It can be caused because all of the participants were university students and they have to travel a long distance by walking from department to department with in the university. However, cramps in legs and general ache were almost same in the patients and controls and show no significant difference.

It was also found that dysmenorrhea causes limitation of daily routine activities. Dysmenorrhea symptoms produce a negative effect on the quality of life by causing work absenteeism or school absenteeism (Wong & Khoo, 2011). The intensity of dysmenorrhea symptoms exaggerated women daily life routine and causing them to take long time rest and makes them disable to do any work (Sharma A 2008).

The regularity of periods was not associated with dysmenorrhea because the women having regular periods and those that do not have regular periods, both of these groups experiences dysmenorrhea in our study. The females having dysmenorrhea with irregular menses were 63.7% as compared to the non-dysmenorrhea females which were 55.7%. A decline in the level of estrogen and progesterone is responsible for irregular periods either due to obesity, unhealthy diet or with certain disease conditions like PCOs, cancers, etc (Chiou & Wang, 2008).

The family history of menstrual symptoms was strongly associated with dysmenorrhea in our study. It can be due to genetics linked between the female and her mother. Dysmenorrhea is 3.5 times more in females with a family history of dysmenorrhea. This describes the genetic

susceptibility towards dysmenorrhea (Ozerdogan et. al, 2009).

A strong association of physical exercise with dysmenorrhea has been investigated in our study. Decrease in physical activity was found to be associated with dysmenorrhea as our controls perform more exercise as compared to controls. This occurs because our females have a sedentary life style. However, it was found that posterior pituitary hormone i.e. anti diuretic hormone produces its effects by constricting the blood vessels. This hormone becomes active during exercise or any physical activity. Therefore, by producing the vasoconstriction and reduction in the pelvic blood flow, it decreases the synthesis of prostaglandins (Noorbakhsh Mahvash et. al, 2012).

Our study also reveals that menorrhagia as a personal medical illness was associated with dysmenorrhea where as obesity, ovarian cyst and pelvic inflammatory disease found no association with dysmenorrhea. In Pakistani population menorrhagia occurs due to the anovulatory dysfunctional uterine bleeding.

## CONCLUSION:

Dysmenorrhea is a very common problem among Pakistani females because a number of factors have been associated with it. The females having family history of dysmenorrhea and its associated symptoms are more prone to this problem. It should be the primary goal to guide the females about dysmenorrhea symptoms. This study was performed basically to create awareness about GIT and Neurologic manifestation in dysmenorrhic females as our population is experiencing number of symptoms during menstruation and to investigate the factors associated with it such as anthropometric indices, vitals, stress, etc. As dysmenorrhea is affecting a large number of Pakistani populations, from the information provided in this study, they become aware of these manifestations. This study also contributed to women health by providing the knowledge about factors associated with dysmenorrhea in Pakistan. It is very important

to create awareness among the females in order to improve their quality of life. These symptoms can be minimized if our females maintain their diet; decreases work stress, and reduce their physical activity.

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