ORIGINAL ARTICLE

# ASSOCIATION BETWEEN PRIMARY DYSMENORRHEA AND DEPRESSION LEVEL AMONG STUDENTS

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## Abstract

**Background**: Primary dysmenorrhea (PD) is a highly prevalent health related problem because of its effects on different aspects of physical and mental health. **Objectives**: To find association of primary dysmenorrhea with depression. **Methodology**: A correlational study was conducted at Royal group of colleges Gujranwala, Pakistan. Ninety-nine female students with confirmed diagnosis of primary dysmenorrhea were included with age range between 16-25 years. The data was collected through non-probability convenience sampling technique. The data was collected using numeric pain rating scale, daily record of severity of problems (DRSP) and patient health questionnaire (PHQ-9) for depression. Linear regression and chi square test have been used to observe association between variables. **Results**: The mean age was 21.06+2.59 years, age at menarche 13.15+1.03 years. The results showed significant association among pain, depression and severity of symptoms associated with primary dysmenorhhea (p≤0.00). **Conclusion**: The intensity of pain and associated symptoms was moderate in majority of subjects. There is positive association of pain and symptoms of dysmenorrhea with depression level. Increasing depression can cause difficulty in work, getting along with others and take care of other things.

**Keywords**: Primary dysmenorrhea, depression, DRSP, Numeric pain rating scale, PHQ-9.

## INTRODUCTION

"Dysmenorrhea" is derived from a Greek word which describes difficult menstrual flow. Primary dysmenorrhea (PD) is crampy pain occurring immediately before or during menstruation after the establishment of ovulatory cycles but without any pelvic pathology. It is due to myometrial activity which produces pressure exceeding 60 mm Hg, resulting in uterine ischemia. This myometrial activity is augmented by prostaglandin synthesis which stimulates contractions in the uterine and intestinal walls (1). The symptoms of primary dysmenorrhea include mild ache or pain or feeling of pressure in the lower abdomen, radiating to the hips, lower back, and inner thighs. Associated symptoms are: upset stomach, loose stools, vomiting, and feeling of tiredness, fatigue, depression, lower metabolic rate, and acne. 30 - 90% women present with menstrual pain having varying intensities (2). PD depicts health problems but there is a lack of evidence. The high prevalence of PD and its impact on health, and activities of daily living have been described in certain studies that conclude that primary dysmenorrhea has an unfavorable effect on productivity (3). In one study data on adolescent dysmenorrhea was collected from different cultures where attitudes about menstruation and gender differ from one another. Despite this, dysmenorrhea had high prevalence and poorly managed symptoms in young females who experience it (4).

PD is strongly associated with depression and anxiety but it is unclear if depression is caused by or is a consequence of chronic pelvic pain. Menstrual characteristic and PMS may be mediated psychologically as well as biologically. There has been an association between severity of dysmenorrhea and severity of PMS. More than half of those with PMS have a history of anxiety or mood disorders. Although psychological factors are not the cause of PD, but their association can cause non-responding to medical therapy and can cause increase in the perception of intensity of pain. A study done in MGH center found a correlation between depression and dysmenorrheal, therefore special attention should be given to mental health screening and including psychotherapy (5, 6). Management of menstrual cramps includes both pharmacological and non-pharmacological strategies. (7). Medical management consists of Aspirin or any other analgesic, Oral contraceptives, and local anaesthetics but pharmacological control has several side effects. Non-pharmacological treatment comprises of physical therapy, acupuncture, acupressure, microwave diathermy, placebo and toftness techniques (8). However, cultural variables and personality traits have been more influencing than psychological elements in the management of menstrual cramps. The impact of primary dysmenorrhea has been poorly researched. Studies have focused mainly on western populations with small sample sizes. Some studies describe the negative effects of the problem on social interactions such as absenteeism, but do not describe the full spectrum of disease-related loss of productivity at work (9). Very few studies have reported association of PD with mental health so this study has been done to observe the impact of primary dysmenorrhea on depression level.

## METERIAL & METHODS

Descriptive cross sectional study was conducted at Royal group of colleges Gujranwala. Subjects with diagnosed PD were recruited through non-probability convenience sampling technique by following the selection criteria. Inclusion criteria comprised: 16-25 years of age, non-athletes, nulliparous, free from any neuromuscular disorders. Subjects either having pain or any symptom of dysmenorrhea were included. Subjects showing any symptoms of complication or secondary dysmenorrhea, athletes, individuals with neuromuscular problems, married females were excluded.

Structured questionnaire was used for demographics; numeric pain rating scale was used to assess the pain. It is a 11 point scale with 0 indicating no pain, 1-3 shows mild pain, 4-6 for moderate pain and 7-10 represents severe pain. Daily record of severity of problems (DRSP) was used to assess the associated symptoms of primary dysmenorrhea. It consists of 21 items which make 11 domains. Minimum score is 11 and maximum is 66. 11 represent "no symptoms at all" and 66 represent "extreme symptoms". For depression level "patient health questionnaire" (PHQ-9) scale consisting of 09 items was used. Every item is given numbers according to their severity then all items are added and depression level is categorized into none, mild, moderate, moderately severe and severe. Subjects were guided on how to report answers. Following instructions participants were asked to fill the numeric pain rating scale and PHQ-9 during the days of menstruation but reported every item only one time. For DRSP every item was reported for 4 days and average of each item was taken to calculate total score for every subject.

Data is described in form of frequencies and tables while linear regression has been taken for prediction. Chi square has been used for categorical data.

## RESULTS

The age categories of subjects shows that n=35(35.4 %) subjects were from age range of 16-20 years and n=65(64.6%) were from 21-25 years. Age at menarche showed that n=77(76.8%) subjects were from age range of 13-14 years at menarche, n=17(17.2%) were from 11-12 years and n=6( 6.1%) were from 15-16 years. It was observed that n=8(8.1%) were of low socioeconomic status, n=70(69.7%) of medium and n=22(22.2%) were of high socioeconomic status. Put of ninety nine subjects n=13(13.1%) were Sindhi, n=84(83.8%) were Punjabi and 2(1.8%) were Balochi. All of them were non-smokers. Mean and standard deviation of age, age at menarche, weight, BMI, pain, DRSP and depression can be observed in table 1.

**Table 1: characteristics of study participants**

| | Mean±SD |
|---|---|
| Age(years) | 21.06±2.59 |
| Age at menarche(years) | 13.15±1.03 |
| Weight(kg) | 54.27±5.69 |
| BMI(kg/m2) | 21.47±3.21 |
| Pain | 6.29±2.03 |
| DRSP | 40.66±7.88 |
| Depression level (PHQ) | 10.74±3.80 |

Frequency of subjects according to severity of pain, DRSP and depression level within age, age at menarche and BMI categories can be observed in Table 2

**Table 2: Patient's distribution according to severity of pain, DRSP and depression in relation to age, age menarche and BMI**

| | Age at menarche in years | | | Age of subject in years | | BMI in kg/m2 | | |
|---|---|---|---|---|---|---|---|---|
| | 11-12 | 13-14 | 15-16 | 16-20 | 21-25 | Under | Healthy | Over |
| **Pain** | | | | | | | | |
| No | 5 | 9 | 1 | 11 | 2 | 5 | 8 | 2 |
| Mild | 5 | 27 | 3 | 12 | 23 | 7 | 26 | 2 |
| Moderate | 7 | 40 | 2 | 12 | 27 | 8 | 36 | 5 |
| Severe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **DRSP** | | | | | | | | |
| Mild | 1 | 7 | 0 | 3 | 5 | 2 | 5 | 1 |
| Moderate | 10 | 44 | 5 | 20 | 39 | 7 | 47 | 5 |
| Severe | 6 | 22 | 1 | 12 | 17 | 10 | 7 | 2 |
| Extreme | 0 | 3 | 0 | 0 | 3 | 1 | 1 | 1 |
| **Depression** | | | | | | | | |
| None | 1 | 5 | 2 | 4 | 4 | 3 | 5 | 0 |
| Mild | 2 | 25 | 3 | 12 | 18 | 8 | 20 | 2 |
| Moderate | 9 | 34 | 1 | 15 | 29 | 7 | 33 | 4 |
| Moderately severe | 5 | 11 | 0 | 4 | 12 | 2 | 11 | 8 |
| Severe | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |

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**Associations:**

The results of study showed that pain and DRSP were significantly associated with Depression. Depression can increase 9 times with increase in severity of pain by 30 units. It can increase 6.9 times with increase in DRSP and with every unit raise of DRSP, 26 units of depression level will increase. However increase in depression level can cause difficulty in work or take care of things and also in getting along people 6 times by 25 units. R value, r square, beta coefficient and p values can be seen in Table 2.

**Table 3: Associations among pain, DRSP and depression level**

| | *r* | *r2* | *β* | *p-value* |
|---|---|---|---|---|
| Pain - Depression | 0.30 | 0.09 | 0.30 | 0.00 |
| DRSP - Depression | 0.26 | 0.06 | 0.26 | 0.00 |
| Depression- Difficulty in work, take care of things and get along people | 0.25 | 0.06 | 0.25 | 0.01 |

Frequency of subjects with pain and DRSP severity categories showing their depression level can be seen in table 4 Value of chi square for pain and depression is 13.132 and for DRSP and depression are 18.961.

**Table 4: Frequency Of Subjects According To Pain And DRSP Severities With Depression Categories**

| | Depression Categories | | | | |
|---|---|---|---|---|---|
| **Pain** | No | Mild | Moderate | Moderately Severe | Severe |
| No | 4 | 5 | 5 | 1 | 0 |
| Mild | 3 | 12 | 16 | 4 | 0 |
| Moderate | 1 | 13 | 23 | 11 | 1 |
| **DRSP** | | | | | |
| Mild | 3 | 1 | 4 | 0 | 0 |
| Moderate | 5 | 22 | 22 | 9 | 1 |
| Severe | 0 | 7 | 16 | 6 | 0 |
| Extreme | 0 | 0 | 2 | 1 | 0 |

## DISCUSSION

According to results of present study depression is associated with primary dysmenorrhea including pain and associated symptoms. Within present study 50% of females were suffering from moderate intensity of pain, 35% from mild pain but no one reported severe intensity of pain. 60% of females showed moderate intensity of associated symptoms of primary dysmenorrhea, 29% showed severe intensity, 8% were with mild intensity, and 3% showed extreme intensity of symptoms. “Depression is the most common psychiatric disorder associated with pain,” but it is unclear if depression is caused by or is a result of chronic pelvic pain. In present study 45% subjects had moderate depression and as pain level increased, the depression level also increased by 9 times and showed association 6.9 times with symptoms of PD. In one study positive correlation between anxiety or depression and dysmenorrhea was found (6). There is no study which reported association of pain along with associated symptoms of primary dysmenorrhea with depression. . In one case control study association of depression and anxiety with PD was assessed by using beck depression inventory scale for depression and Taylor Manifest Anxiety Scale (TMAS) and Spielberger State-Trait Anxiety Inventory (STAI) for anxiety that included 424 girls with age of 14-20 years. Results of this study found high scores of depression and anxiety as compared to control group. Moderate depression was more prevalent like present study with 15.9% in primary dysmenorrhic females as compared to control group (6.2%) and severe depression with ratio of 1.8% to 0% ($P < .003$). High anxiety was also more prevalent in adolescents with primary dysmenorrhea as shown by TMAS (44% vs. 9.9%; $P < .001$) and STAI scores (68.9% vs. 25.0%; $P < .001$) (5). One study was done to quantify the impact of primary dysmenorrhea on physical and mental health status and work-related aspects in the adolescent population of Tbilisi Georgia. It used EuroQol five dimensions questionnaire (EQ-5D). Mobility, self-care, usual activities and pain/discomfort along with anxiety/depression reported significantly lower value for quality of life as compared to healthy controls ($p < 0.05$). (10). In Taiwan a focus group discussion was done which reported reduced physical activity, modification in diet, and depression (11).

Data was collected from one area so it cannot represent the whole community as compared to community based studies. Depression was assessed only during symptomatic days. So it cannot give any comparison with asymptomatic days. Further community-based studies should be conducted with larger sample size. Depression level should

be compared in symptomatic and asymptomatic days. Impact on mental health should also be assessed.

## CONCLUSION

Majority of subjects lie within moderate severity of pain and associated symptoms intensity. There is positive association of pain and symptoms of dysmenorrhea with depression level. Increasing depression can cause difficulty in work, getting along with others and take care of other things.

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