A Study on the Prevalence of Dysmenorrhea and Its Relationship with Physical Activity among Young Adults

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ABSTRACT

Introduction: Dysmenorrhea, which also known as menstrual pain or cramp is, considers one of the most prevalent menstrual disorders among female reproductive period. During the recent years, regular exercise and physical activities have been introduced as effective methods for prevention and treatment of dysmenorrhea. Physical activity leads to the release of endorphins which may enhance the pain threshold and thus reduce pain. Level of physical activity varies across countries. This study looks into the prevalence of primary dysmenorrhea among young adults to get a better understanding of the problem stated and to find out the relationship between physical activity and primary dysmenorrhea.

Materials & Methods: A cross sectional study design was adopted with total of 165 participants with the age range between 18 to 30 (22.8 + 30) was recruited using predefined inclusion and exclusion criteria. Self-administered questionnaire on dysmenorrhea and menstrual characteristics were administered. Physical activity level was measured using global physical activity questionnaire (GPAQ).

Results: A total of 144 participants (87.3%) were discovered to have primary dysmenorrhea. There is moderate negative correlation exist between pain intensity and primary dysmenorrhea, $r = -0.42$, $p <0.035$. This result suggests that maintaining a good physical activity is important in reducing dysmenorrhea symptoms.

Conclusion: Correction and prevention of primary dysmenorrhea is necessary in view of high incidence.

Keywords: Painful menstruations; exercises; menstruation disturbance

INTRODUCTION

Primary dysmenorrhea or painful menstruation is cha racterized as cramping pain in the lower abdomen that occurs just before or during menstruation. [1] It is one of the most common gynecological problems that occur in the absence of any specific pelvic disease such as endometriosis. [2] Dysmenorrhea has negative impacts on individual quality of life, which marks significant effects on the behavioral, social and psychological well-being of the person contributing to sickness absenteeism from both classes and work. [3] Dysmenorrhea is determined by presence of one or more episodes of menstrual cramps or pain in the last 12 months. [4]

The prevalence of dysmenorrhea in Malaysia has been reported to be as high as 74.5%. [5] It is noteworthy, that there is wide

variation in the estimate of dysmenorrhea from studies around the world reporting a range between 28% and 86%. [5-8] The variation in prevalence rate of dysmenorrhea between countries could be due to the differences in the cultural attitudes towards menstruation. [5] Individual's with dysmenorrhea manifest primary complaints of pain followed with nausea, vomiting, cramps, diarrhea, headache and syncope.[4] The possible reason for pain in dysmenorrhea is due to increase in the prostaglandins level in the body and decrease in the amount of progesterone at the end of the luteal phase. Increasing the level of prostaglandins leads to uterine contraction, uterine ischemia, and increased sensitivity to pain fibers and ultimately causing pelvic pain. [9]

During the recent years, regular exercise and physical activities have been introduced as effective methods for prevention and treatment of dysmenorrhea. [4,10,11] Previous studies have reported significant reduction in sign and symptoms of dysmenorrhea in exercise group compare to sedentary group.[6,12] Inversely, another study on examining the effect of exercise on cramping pain demonstrated no significant difference following aerobic exercises.[13]

Physical activity decreases the level of serum aldosterone by reducing the level of renin and increasing estrogen and progesterone thus improving physical symptoms.[14] Stress is another possible mechanism that further explains the positive impact of physical activity on pain intensity. Stress increases the sympathetic activity which can contribute to an increase in menstrual pain by raising the uterine contraction. [14] With exercise, there is reduction of sympathetic activity leading to decrease in the intensity of menstrual pain and cramps. In addition, physical activity leads to the production of endorphins, which may enhance the pain threshold. [15]

The need of this study is to establish the prevalence of primary dysmenorrhea among young adults and its relationship with physical activity. Level of physical activity may vary across the countries due to physiological variation. Pain severity may associate with cultural differences as regards to pain perception and variability of pain threshold. Studies pointed out a correlation between ethnicity and pain perception and assessment of pain severity is subjective.[16] Identification of modifiable risk factors for dysmenorrhea is important as more than 50% of women in the reproductive ages suffer with painful menstruation which contributes to school absenteeism, lost work time, and reduced quality of life. Thus, this study looks into the prevalence of primary dysmenorrhea among young adults to get a better understanding of the problem stated and to find out the relationship between physical activity and primary dysmenorrhea.

PARTICIPANTS AND METHOD

A cross sectional study design was adopted using convenience sampling method. 165 female participants were recruited in this study upon obtaining ethical clearance from Research and Ethics Committee of INTI International University. The inclusion criteria are participants between the age of 18 to 30, nulliparous and present with dysmenorrhea for the last 12 months. Whereas, participants with known history of gynecological disorders, undergoing clinical treatment to control menstrual disorder, present with amenorrhea, and consuming oral contraceptives were excluded from this study. Prior to data collection, all participants were given explanation about the study purpose and procedures, and written informed consent was obtained.

All the eligible participants have answered structured questionnaire concerning dysmenorrhea. The first part of questionnaire captures participant's socio-demographic characteristics, second part on menstrual characteristics including presence of dysmenorrhea, volume (quality and quantity), rate of bleeding, onset and length of menstruation, while the third part comprises on menstrual characteristics

related to pain which were assessed using visual analog scale (VAS). The questionnaire was validated by a panel of experts. Meanwhile, global physical activity questionnaires (GPAQ) were used to assess the level of physical activity. It comprises of total of 16 questionnaire group to capture physical activity undertaken in difference behavioral domains (Activity to work, transport and recreational activities).[17] Each participant's physical activity level was quantified into metabolic equivalent of task-minute per week calculated by adding the score of work MET-minutes/week, travel MET-minutes/week and recreational MET-minutes/week.[17]

Participants were classified into 3 levels, high > 6.0 MET-min/ week; moderate between 3.0 to 6.0 MET-min/ week; and low below < 3.0 MET-min/ week. [9] The QPAQ is found to be valid and reliable which demonstrate moderate to strong positive relationship ranging between 0.45 to 0.65.[18]

Data was analyzed by using statistical software package SPSS (Version 22.0). The significant value was set less than 0.05 (p <0.05). Normality was tested using Shapiro-Wilk test, boxplots and skewness ranging between -1 to 1. Cross tabulation was used to analyze menstrual characteristics. Pearson correlation was used to determine the relationship between primary dysmenorrhea and physical activity.

RESULTS

A total of 165 participants were recruited. The sociodemographic data of participants stratified based on those with primary dysmenorrhea and without primary dysmenorrhea as depicted in Table 1. The highest percentages of participants were between the age of 21 to 23 years. Based on BMI, almost $3/5^{th}$ were categorized to have normal BMI according to Asian classification of BMI by WHO with the mean of 21.22 ± 2.66 and 23.86 ± 4.73 for participants with primary dysmenorrhea and without primary dysmenorrhea respectively. Majority of the participants had normal menstrual cycle length (24-38 days) with 96.5% from women with primary dysmenorrhea and 71.4% from women without primary dysmenorrhea with overall present with normal duration of menstrual flow (4.5-8 days).

Table 1: Sociodemographic characteristics of participant with primary dysmenorrhea and without primary dysmenorrhea

Variables	With Primary Dysmenorrhea n (%)	Without Primary Dysmenorrhea n (%)	Total (n =165)
Age range (mean + SD)			
18-20	32 (22.2)	6 (28.6)	38
21-23	64 (44.4)	7 (33.3)	71
24-26	28 (19.4)	1 (4.8)	29
27-30	20 (13.9)	7 (33.3)	27
Race			
Malay	31 (21.5)	2 (9.5)	33
Chinese	95 (66)	15 (71.4)	110
Indian	18 (12.5)	4 (19)	22
Others	0 (0)	0 (0)	0
BMI Range (kg/m^2)			
<18.5 (Underweight)	21 (14.6)	1 (4.8)	22
18.5-24.9 (Normal)	114 (79.2)	14 (66.7)	128
25.0-29.9 (Overweight)	8 (5.6)	3 (14.3)	11
30.0-39.9 (Obese)	1 (0.7)	3 (14.3)	4
Frequency of menses			
Frequent (Menses cycle less than 24 days)	2 (1.4)	2 (9.5)	4
Normal (Menses cycle length between 24-38 days)	139 (96.5)	15 (71.4)	154
Infrequent (Menses cycle length more than 38 days)	3 (3.1)	4 (19.0)	7
Duration of bleeding			
Prolonged (>8 days)	4 (2.8)	0	4
Normal (4.5-8 days)	131 (91.6)	19 (90.5)	150
Shortened (<4.5 days)	8 (5.6)	2 (9.5)	10

There were 144 participants who reported having primary dysmenorrhea for prevalence of 87.3%. Table 2 shows the menstrual characteristics of young adults with primary dysmenorrhea. Majority of the participants complain of mild intensity of pain with the VAS (between 1 to 4), followed with moderate VAS 16.6% (between 5 to 7) and 0.7 % with severe VAS (between 8 to 10). Meanwhile, almost half of the participant's complaints of pain only on the 1st day of menstruation and 2.4 % of participants reported using medication regularly to relief the pain.

Current study has reported that almost 55.6% participant met the recommended physical activity levels of ≥ 600 MET-min/ week according to WHO physical activity guidelines. The mean physical activity level among participants with primary dysmenorrhea was 1671.94 ± 2365.47 MET-min/week. The Pearson correlation test demonstrated a moderate negative correlation between the physical activity and pain which was statistically significant, r = - 0.42, p <0.035.

Table 2: Menstrual characteristics of young adults with primary dysmenorrhea

Variables	With Primary Dysmenorrhea n (%)
Pain starts each period	
Previous day	17 (11.8)
First day	111 (77.1)
Second day	14 (9.7)
Third day	1 (0.7)
Forth day	1 (0.7)
Days of pain during menstruation	
1 day	69 (47.9)
2 days	64 (44.4)
3 days	8 (5.6)
4 days	0
>= 5 days	2 (1.4)
Entire period	1 (0.7)
Intensity of pain	
Mild pain (VAS:1-4)	119 (82.6)
Moderate pain (VAS: 5-7)	24 (16.7)
Severe pain (VAS: 8-10)	1 (0.7)
Medications to relief pain	
Yes	4 (2.4)
No	112 (77.8)
Sometimes	28 (19.4)
Pain location	
Lower abdomen	84 (58.5)
Low back	26 (18.1)
Lower limb (Thigh/inguinal)	3 (2.1)
More than one region of body	31 (21.5)

DISCUSSION

The objective is to determine the prevalence of primary dysmenorrhea among young adults and to determine the relationship between physical activity and primary dysmenorrhea. The results of this study show among 165 participants, the prevalence of primary dysmenorrhea is 87.3%.

The prevalence of dysmenorrhea documented in the literature varies substantially. The prevalence rate of dysmenorrhea in our study was in accordance to study done by other countries. For examples, the prevalence rate of dysmenorrhea in Singapore is 83.2%, 72.7% in Turkey, 84.2 % in Thailand, and 91% in Iran. [7,8,19,20] On contrary, the prevalence rate in our study found to be higher compare to study in Japan which reports 15.8%, in Hungary 20.1 % and in United states 36.7 %. [21-23] The variation in the prevalence rates across the countries was probably due to the dissimilarity in the methods of data collection, varying term used to define dysmenorrhea and the study populations themselves.

In current study the highest prevalence rate was found in the age group between 21 to 23 years. Our study results found to be similar with the study conducted among medical students in Malaysia. [24] Previous studies have highlighted that prevalence of dysmenorrhea decrease with increasing age thus indicating that primary dysmenorrhea peaks in late adolescent by 20s and then the incidence falls with increasing age. Our study has also reported similar results where the age group between 27 to 30 years had the lowest prevalence of primary dysmenorrhea.

Pain usually has the highest severity on the 1st day of bleeding and gradually decreases its severity. [9] Present study also showed similar results with 77.1% of participants had pain during the first day and subsequently decrease the severity with days. The pain intensity in the present study was measured using verbal rating system which not only grades the severity of pain

but also takes account on the effect of daily activity, systematic symptoms and analgesic requirements. Our study has reported that majority of participants (82.6%) report to have mild intensity of pain while only 0.7% of participants reported to have severe pain. Our study finding was consistent with previous studies reporting the severe intensity pain was low. [14,25] These results were in contrary with study from Greece which concludes majority of participants presents with severe pain. The discrepancy in the level of pain across studies could be explained by the variance in menstrual pain perception with differences of social, lifestyle, or cultural backgrounds among the population. In the present survey, pain typically occurred in the lower abdomen and lower back. Lower abdominal pain is due to elevated release of prostaglandins into the uterine tissue once the menstruation begins. [26] These metabolites increase vasoconstriction and myometrium contractions causing uterine ischemia and pain. Most of the participants (77.8%) did not use medications to relief pain. This could be due to most of the participants reported only mild intensity of pain and thus need not consume medications to relief pain.

Our study results also reported that there is moderate negative correlation between physical activity and pain. With increased level of physical activity, there is decline in the pain level. Our study results further strengthened by previous studies which highlights significant improvement in sign and symptoms of dysmenorrhea following exercise.[4,11,18] However, the results of these studies are in contrary with previous study which demonstrate increase in the level of pain with participants who regularly exercise compare to those don't exercises.[28] It is noteworthy, that measuring physical activity among young adults is difficult and may result in a substantial non-differential misclassification, which can explain the variation in the results. Performing physical activity leads to the release of endorphins, which may increase in pain threshold. [29]

CONCLUSION

In summary, our present study reported higher prevalence of primary dysmenorrhea among young adults and demonstrate a moderate negative correlation exist between physical activity and pain.

ACKNOWLEDGEMENTS

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