A study to examine the relationship of Stress and Dysmenorrhoea among adolescent girls

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ABSTRACT
Background: Adolescence is a transition period from childhood to adulthood and is characterized by a spurt in physical, endocrinological, emotional and mental growth with a change from complete dependence to relative independence. The period of adolescence for a girl is a period of physical and psychological preparation for safe motherhood. Objectives were to: examine the relationship between dysmenorrhoea and stress ,determine the association between stress level of adolescent girls and their intensity of pain during menstruation and find the relationship between intensity of pain during dysmenorrhoea and the mean stress score in adolescent girls. Materials and Methods: A correlative survey design was used to establish the relationship between dysmenorrhoea and stress. Results: Majority of the adolescent girls under the study had experienced dysmenorrhoea. The mean stress score was 132.25 with a standard deviation of 13.91. As stress increases, dysmenorrhoea severity also increased significantly. It is also found that higher the stress level the higher was the intensity of pain during menstruation. Conclusion: Stress and dysmenorrhoea are related and the higher the stress the more is the severity of dysmenorrhoea problem and the intensity of pain during dysmenorrhoea and Vis-à-vis.

Key words: Dysmenorrhoea, Stress, Adolescent

INTRODUCTION

Adolescence is a transition period from childhood to adulthood and is characterized by a spurt in physical, endocrinological, emotional and mental growth with a change from complete dependence to relative independence.

According to the World Health Organization (WHO), adolescents are individuals aged 10-19, while the broader term "youth" refers to the 15-24 age group. Based on CEDPA 2001report girls up to the age of 19 comprise about one-quarter of India's population[1].

The period of adolescence for a girl is a period of physical and psychological preparation for safe motherhood. The percentage of female population between the age of 10 to 19 years has increased from 20.6 to 22 from 1971 to 1981. [2] One of the major physiological changes take place in adolescent girls is onset of menarche which is often associated with problems of irregular menstruation, excessive bleeding and dysmenorrhoea. Of these, dysmenorrhoea is one of the common problems experienced by many adolescent girls. [3,4]

In a study of 1034 unmarried and 460 married adolescent girls in India, 57.75 percent and 48.7 percent respectively complained of menstrual irregularities, of which 33.84 percent unmarried and 33.5 percent married adolescent were suffering from dysmenorrhoea. [4] Prevalence of dysmenorrhoea was reported to be 74.2% in a cross sectional study done on 1092 girls in Malaysia. [5] Similar findings (74%) have been reported in rural married women of Andrapradesh. [6] A survey done among 356 undergraduate nursing students in Karnataka,India showed that 93.3 percent of them experienced dysmenorrhoea. [7]

The objectives of the present study were to : examine the relationship between dysmenorrhoea and stress , determine the association between stress level of adolescent girls and their intensity of pain during menstruation and find the relationship between intensity of pain during dysmenorrhoea and the mean stress score in adolescent girls.

The research hypotheses for the study were:

- H_1 Severity of dysmenorrhoea will be directly related to stress scores in adolescent girls.
- H_2: There will be significant relationship between intensity of pain during menstruation and the mean stress scores in adolescent girls.
- H_3: There will be a significant association between stress level of adolescent girls and their intensity of pain during menstruation.

MATERIALS AND METHODS

A correlative survey design was used to establish the relationship between dysmenorrhoea and stress. A random population of adolescent girls between the age of 15 years to <20 years studying Pre University Course (PUC) were selected. The setting for the study was pre University Colleges in the state of Karnataka consists of 19 districts.

A probability sampling method of multistage cluster sampling technique was used to select the sample of pre university college girl students. First, six districts were selected by using simple random sampling technique. In the next stage of sampling, two pre university colleges each were selected from the selected six districts. In the third stage all the girls studying PUC in the selected colleges who met the sample selection criteria were selected for the study. The total sample was 1648. Institutional clearance and administrative permission were obtained prior to the conduction of the study. Moreover an informed consent was taken from the participants before data collection. Confidentiality was assured throughout the conduction of the study.

The stress scale developed by Girdano and Everly George was used with some modifications for the study to measure stress. [8] The original scale categorized stressors as psycho-social, bio-ecological and personality causes, but the scale included only psycho- social and personality cause. Modifications for the present study was done mainly in the language. The scale contained 55 items with a minimum score of 55 and a maximum score of 220. The stress levels were: Mild (less than 110), moderate (110 to 142) and severe (above 142). Content validity and reliability (r=0.75, p 0.01) were established. For assessment of dysmenorrhoea, a questionnaire was developed by the investigator. The tool contained items on, age at onset of menarche, regularity of menstrual cycle, type of pain, need for rest during dysmenorrhoea, intensity of pain, consumption of drugs for pain relief, and the common symptoms experienced. The minimum score was '3' and maximum score was '126'. The validity and reliability (r =0.976, $p < 0.01$) was established. The intensity of pain was assessed using a modifies visual analogue pain scale developed. The reliability of the tool was r =0.913, p <0.01.

RESULTS

Relationship between Stress and Dysmenorrhoea
Majority of the adolescent girls under the study had experienced dysmenorrhoea,that is 1448 out of 1648 (87.87%). Only 12.13 percent of the girls did not experience dysmenorrhoea. The mean dysmenorrhoea score among adolescent girls was 20.05 with a standard deviation of 8.69. The mean stress score was 132.25 with a standard deviation of 13.91. Among the 1648 girls under the study, 80 (4.85%) girls experienced mild level of stress, 1198 (72.69%) experienced moderate level of stress and 370 (22.45%) experienced severe stress.

Correlation 'r' was computed to examine the relationship between stress and dysmenorrhoea. The correlation coefficient was found to be 'r' =0.1275. p<0.01 This indicated that there was a positive correlation between the severity of dysmenorrhoea and stress among adolescent girls. That is, as stress increased in these girls, dysmenorrhoea severity also increased. A further analysis was done with dysmenorrhoea scores of those girls who had dysmenorrhoea (n=1468), excluding those who did not have dysmenorrhoea. The 'r ' was found to be r =0.1116, p <0.01.This confirms that as stress increased, dysmenorrhoea severity also increased significantly. Hence the research hypothesis H_1 was accepted.

Relationship between Intensity of Pain during Menstruation and Mean Stress Scores
Dysmenorrhoea pain intensity was measured using a rating scale with'0' to '5'points, where '0' indicated 'no pain' and '5' indicated 'extreme pain'. Hence there were six groups with different intensities of pain. The scores of intensity of pain during menstruation and stress scores of 1648 adolescent girls were used for this analysis. The distribution of means of stress scores in the six groups with pain intensity scores of '0' to '5' seem to indicate that as stress increased, intensity of pain during menstruation also increased. That is, stress means of the group with '0' pain intensity was 129.12 ($\pm$ 13.98) whereas the group with '5' pain intensity had a mean stress score of 135.42 ($\pm$ 13.8).

Table 1. Mean and Standard Deviation of Stress Scores of Adolescent Girls in the Six Groups of Pain Intensity Score
N=1648

Group & Pain Intensity	Number	Stress Mean	Standard Deviation
0	200	129.92	$\pm$ 13.38
1	332	131.26	$\pm$ 13.61
2	297	130.25	$\pm$ 14.07
3	360	132.40	$\pm$ 14.73
4	320	135.02	$\pm$ 12.80
5	139	135.42	$\pm$ 13.80

A further analysis by ANOVA showed that F_ratio was highly significant, $F_{(5,1542)}$ =6.80,p<0.01. This suggested that the six groups differed significantly in their stress means.

Table 2. Summary of ANOVA for Six Groups on Stress Scores

Source of Variation	Sum of Squares	Df	Mean Squares	F
Between Groups	6467.68	5	1293.54	
Within Groups	314760.27	1642	190.18	6.80**
Total	320604.65	1647		

**Significant at 0.01 level.
The differences among means of stress scores were compared with the help of between group t' test.

Table -3. 't' Values showing the differences of Means of Stress Between the Six Groups

Pain Intensity Groups	0	1	2	3	4	5
0	-	1.10 (df=530)	0.27 (df=405)	2.02* (df=558)	4.15** (df=518)	3.64** (df=337)
1	-	-	0.94 (df=627)	1.07 (df=690)	3.51** (df=650)	3.01** (df=469)
2	-	-	-	2.01* (df=655)	4.46** (df=615)	3.75** (df=434)
3	-	-	-	-	2.30* (df=678)	2.10* (df=497)
4	-	-	-	-	-	0.29 (df=457)

*Significant at 0.05 level
**Significant at 0.01 level

The difference in mean scores of stress between those who had pain intensity 'zero' and those who had pain intensity '3','4'and '5' were significant (t = 2.02, $p<0.05$, $\underline{t}$ =4.15, p =<0.01 and $\underline{t}$ =3.64, p <0.01). The difference in mean scores of stress between those, who had pain intensity, 'one' and those who had pain intensity '4' and '5' were significant ($\underline{t}$ =3.51 and $\underline{t}$ = 3.01,$p<0.01$). The 't' values computed between the group whose pain intensity was 'two' and those who had pain intensity '3' '4' and '5' were significant ($\underline{t}$ =2.01, p <0.05, $\underline{t}$ =4.46 and $\underline{t}$ =3.75, p <0.01).

The 't' values computed between the group whose pain intensity was '3' and those who had pain intensity '4' and '5' were both significant at 0.05 level, and the difference in mean stress scores between those who had pain intensity '4' and '5' was found not significant. Hence it can be said that there is a significant difference between those who had pain

Association between Stress Level and Intensity of Pain

The adolescent girls were grouped into three groups based on the stress scores obtained by them. All the girls whose stress scores were less than 110 belonged to 'mild' stress level, those who scored 110 to 142 belonged to 'moderate' stress level and those who scored above 142 belonged to 'severe' stress level. For this analysis, all the 1648 adolescent girls were categorized into three groups based on their pain intensity scores, ie,'0 & 1' was considered as 'group 1',''2&3' was considered as 'group II' and those with scores '4&5' were considered as 'group III'.

Table 4. Chi square values showing association between stress level and intensity of pain during menstruation

N = 1648

Pain Intensity Scores	Stress Level					TOTAL
	Mild Less than 110		Moderate 110-142		Severe Above 142	
	N	%	N	%	N	%	
0 & 1	36	6.76	384	72.18	112	21.05	532.00
2 & 3	38	5.78	480	73.06	139	21.15	657.00
4 & 5	6	1.31	334	72.72	119	25.92	459.00

$Chi_{(4)}^{2}$ =20.53,p=<0.01

The chi square value of 20.53(p<0.01) in Table 4 indicated that there was an association between the stress level of the adolescent girls and their intensity of pain. It is also observed that with higher pain (4&5 intensity) fewer (1.13%) girls were in the category of mild stress level where as more (25.92%) were in severe stress level when compared to other two pain

intensity '3 and above', in terms of stress experienced by them. The intensity of pain during menstruation has positive relationship with stress; ie. Those who have high stress scores perceive significantly more intense pain during dysmenorrhoea than those having less stress scores. Hence the research hypothesis H_2 was accepted.

intensity groups, that is, the higher the stress level the higher was the intensity of pain during menstruation. Hence the research hypothesis H_3 was accepted.

DISCUSSION

A large majority (87.87%) of the adolescent girls in the present study reported to have dysmenorrheal, which is an alarming number. Several other studies too have consistently found that a very high proportion of adolescents had dysmenorrhoea. [5,6,7]

Various factors like environmental factors, stress, general ill health, over anxiety, hormonal imbalance, muscular in coordination and uterine malformation are reported to be contributing to the development of primary dysmenorrhoea.

Based on the concept that activity and stress are major personal factors related to dysmenorrhoea, it was felt necessary to explore stress as a factor associated with dysmenorrhoea. Stress and unexpressed emotions can exacerbate the pain during menstruation.

The main focus of the study was to examine the relationship between stress and dysmenorrhoea. It was found that there was a significant relationship between stress and dysmenorrhoea ($\underline{r}$ =0.1116, $\underline{p}$ <0.01).Several studies have shown the association between dysmenorrhoea and stress. [9,10,11]

Besides, premenstrual syndromes were found to be associated with stress. [12,13] Moreover, women who

had severe bleeding experienced more anxiety and pain.

In the present study, it was also found that the intensity of pain during menstruation has positive relationship with stress. Previous studies too reported that there was an association between negative life changes and occurrence of menstrual pain. [14,15] Other psychological symptoms like impaired concentration was reported during premenustral phase. [16]

There were few studies reported the role of physiological and psychological mechanisms of dysmenorrhoea. Apart from stress, nutrition also found to be related to dysmennorhoea. [17] In addition to this, more depressive symptoms was reputed in a study done at Ohio. [18] Likewise, there are several factors associated with dysmenorrhoea. However, the present study, was limited to establish the relationship between stress and dysmenorrhoea.

CONCLUSION

Dysmenorrhoea is a common problem among adolescent girls. Stress and dysmenorrhoea are related and the higher the stress the more is the severity of dysmenorrhoea problem and the intensity of pain during dysmenorrhoea and Vis-à-vis.

Further studies are needed on adolescents' perception and adaptation to specific stressors in order to elucidate developmental issues of risk and resiliency that are unique to these age groups. Such research has important clinical and health policy implications for youth.

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