

Original Article

Prevalence of primary dysmenorrhea and its influence on the daily activities of undergraduate female students in Colombo District, Sri Lanka

SN Madampe¹, MS Weerasooriya¹, WAC Lakshika¹, SDR Kariyawasam¹, RC Fernandopulle² and SPSM Silva³

¹ Undergraduate, Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus

² Professor, Obstetrics & Gynaecology, University of Sri Jayewadenepura

³ Lecturer, Department of Biomedical Sciences, Faculty of Health Sciences, CINEC Campus

sajmini19@gmail.com

Abstract

Primary dysmenorrhea, refers to a prevalent menstrual disorder in women of the reproductive age which may interfere with the normal functioning of day-to-day activities. This study was conducted to determine the prevalence of dysmenorrhea in undergraduates and the associated influence on their usual activities. Ethical approval was obtained for the research from the Ethics Review Committee, CINEC campus. Following validation of the questionnaire, it was circulated on-line to 364 undergraduate female students, aged 18-25 years, across 5 selected non-state universities in Colombo District, Sri Lanka. According to the obtained results, the prevalence of primary dysmenorrhea was 90% (n = 309). Around 42% of the participants reported mild pain associated with primary dysmenorrhea, whereas, 53% reported moderate pain. Furthermore, a small fraction of the participants reported severe pain which affected them to complete their day-to-day activities. Recurrent symptoms associated with primary dysmenorrhea were identified as lower abdominal pain 95%, thigh pain 57%, and back pain 46% from all participants. The Chi-square test showed a significant association between primary dysmenorrhea and family history (p < 0.001). Moreover, frequency of occurrence of pain was significantly associated with duration of menstrual bleeding (no. of days > 5) (p < 0.001). Most of the respondents experience difficulty in sleeping 73% and difficulty in moving 48%. Associated methods of pain relief were consumption of analgesics 74% and bed rest 64%. Despite the significant prevalence of primary dysmenorrhea and corresponding inconveniences, only 19% had visited a specialist for medical advice. It could be concluded that primary dysmenorrhea is a significant issue which impacts day-to-day activities.

Keywords: *Primary dysmenorrhea, menstrual, prevalence*

Introduction

‘Menstruation’, refers to the cyclic, shedding of the uterine lining in females of reproductive age.^[1] Menstrual cycles are the cyclic and rhythmic physiological changes which occur in females and it often spans for about 28 days.^[2, 3] One menstrual cycle is the number of days between the first day of menses (menstrual flow) to the day before the next onset of menses. Menstrual flow or menses averages 4 to 6 days, however the normal range can be 2 to 8 days.^[4] Menstrual issues could be in the form of heavy or scanty menstrual flow, irregular cycles or extremely painful menstrual cramps.^[3]

‘Dysmenorrhea’, refers to a severe painful cramping sensation in the lower abdomen, which may radiate to the back and further to the thighs, that occur before and/or during menstrual bleeding or menses.^[3,5] Furthermore, the painful sensation is often coupled with a handful of other symptoms, such as nervousness, headache, nausea, increased heart rate, general aching, acne/flushing, slight shivering, sleeplessness, diarrhoea and so on.^[5,6] Dysmenorrhea could be differentiated as primary or secondary, where in primary dysmenorrhea the painful sensation occur from contractions in the uterus and are usually more severe during heavy bleeding. On the other hand, secondary dysmenorrhea, refers to menstrual-related pain that accompanies another medical or physical conditions.^[3,7]

Most women of reproductive age suffer from primary dysmenorrhea, which may act as an obstacle to achieve or continue one’s day-to-day activities. However, the amount of pain is different for each individual. For instance, when the pain is mild, it often does not affect daily activities. Whereas, when the pain is more severe it prevents the completion of

daily routines of some women, which force them to seek for over-the-counter or medical treatments.

Dysmenorrhea is a common menstrual issue in young women of the reproductive age that may disturb the normal routine, hence may lead to incomplete tasks. Most women, regardless of age, suffer from at least one menstrual issue that often results in challenges and risks. Dysmenorrhea is a primary cause which results in activity restriction and absenteeism from school [6,8] or university. [5,9,10,11] Unfortunately, often women have no idea or lack critical knowledge of these conditions or issues.

A. Northern Ethiopia

Primary dysmenorrhea is often the cause of recurrent short-term school, university or work absenteeism in young women of reproductive age. A study conducted in Northern Ethiopia, 2014 shows that the prevalence of dysmenorrhea among health science students was 71.8 percent.^[5] In addition, the study concludes that women with a longer duration of menses, long menstrual cycle, positive family history of dysmenorrhea, and who consumes alcohol were more susceptible to dysmenorrhea.^[5]

B. Egypt

A study conducted in Assiut City, Egypt (2010-11) shows that the prevalence of dysmenorrhea among adolescents students was 76.1 percent and most reported the duration of their menstrual cramps lasting 48 hours or less.^[6] In addition, dysmenorrhea was found to be significantly ($p < 0.05$) associated with older age, earlier menarche, longer cycle length and bleed length, heavy bleeding and irregular cycle. Subsequently, the common symptoms among participants reporting cramps during menstruation were nervousness, fatigue, back pain, headache, irritability, dizziness, and depression^[6]. This study had also investigated the impact of dysmenorrhea on academic, sports and social activities and the participants indicated that dysmenorrhea limited their class concentration and participation, sports participation, test-taking skills, homework tasks performance and so on.^[6]

C. Sri Lanka

A study had been conducted to assess the knowledge of and attitudes towards dysmenorrhea among adolescent school girls at a school in the Nugegoda Educational Division in the district of

Colombo, Sri Lanka. Data collection was done by using non-probability convenience sampling and the results indicated that 84% of the participants had dysmenorrhea. Furthermore, a statistically-significant ($p < 0.05$) association was made between pain and poor mental health status.^[12] However, there was no significant association between pain and poor physical health ($p = 0.887$) and poor social health status ($P = 0.395$).^[12] In addition, this study states that despite a plethora of studies on dysmenorrhea from around the globe, there was no literature available on dysmenorrhea in Sri Lanka and had further added that Sri Lanka had a reserved cultural background, and open discussions on dysmenorrhea were extremely uncommon; subsequently, some girls were reluctant to discuss such matters, even with their mothers. The study suggested that health-education sessions are important to raise awareness among students of dysmenorrhea.

In primary dysmenorrhea, the painful cramping sensation in the lower abdomen is caused as a result of contractions in the myometrium (middle layer of the uterine wall) inducing local ischemia (an inadequate blood supply to an organ or part of the body), thus providing increased endometrial synthesis of the stimulant prostaglandins.^[13] In addition, the pain may last somewhere from 8 hours to sometimes 72 hours.^[14] A specific aetiology of primary dysmenorrhea is yet to be determined due to the lack of information. However, it is found out that a combination of several factors, such as, increase in the synthesis and secretion of prostaglandins F_{2a} , increased vasopressin and oxytocin that subsequently enhance the secretion of prostaglandins, and stimulation of the type-C pain fibres.^[15,16]

Many females tend to use different remedies to relieve dysmenorrhea such as self-medication and as a result this could lead to further side effects. It is observed that many females tend to consume excess doses of non-steroidal anti-inflammatory drugs (NSAIDs) to relieve the menstruation pain and this could lead to further outcomes such as heart, kidney and liver failures.^[14]

Menstrual issues often vary from one individual to another, hence our goal is to give society a proper understanding of this. Furthermore, with the bustling lifestyle of the present society,

women either do not pay much attention to these issues or they are unaware of them. The purpose of this study is to increase awareness of dysmenorrhea before facing any difficulties. Furthermore, there is very limited research on prevalence of primary dysmenorrhea in Sri Lankan undergraduate students.

This research is determined to address the important issues and needs of women with dysmenorrhea to improve their quality of life. The purpose of this study, therefore, is to describe women's salient thoughts about women's experiences of dysmenorrhea. Thereby, the data collected from this research would be foundational for the assessment of dysmenorrhea and the development of person-centred interventions to support dysmenorrhea management.

The main benefit to the participants in this research is to be able to know the causes of the menstrual issue, the age at which it is most prevalent, the possible treatments and the challenges that this disorder can cause in daily life.

The aim of this research is to determine the prevalence of dysmenorrhea in women and the impact of this for their daily activities. Hence, the findings of this research may assist women to solve multiple challenges or risks faced by them.

Research Methodology

A. Study Design

A cross-sectional study was conducted from July to September 2021, across five selected non-state universities in Colombo District, Sri Lanka. Ethical approval for the research was obtained from Ethics Review Committee, CINEC Campus.

B. Participants

The inclusion criteria for the participants were undergraduate female students in Colombo District, aged 18 to 25 years. Females that experienced no significant pain associated with primary dysmenorrhea and/or were diagnosed with diseases such as pelvic inflammatory diseases, endometriosis and poly-cystic ovarian syndrome will be excluded from the study.

C. Sample Size

According to the obtained information from the 5 non-state universities, the total female student population is 7000 in the 5 universities. Stratified random sampling technique is used to select the participants for the research. The sample size was calculated according to the sample size determination equation published by the division of the National Education Association.^[16] Krejcie and Morgan of University of Minnesota, Duluth, have published a reference table with calculated sample sizes for different populations using the above equation.^[16] This reference table was used to calculate the sample size for this research. According to the reference table the sample size for the research is 364 undergraduate female students, aged 18- 25 years.

D. Study Instruments

A self-administered, structured questionnaire with questions related to general menstruation (menarche, duration of menses, regularity and duration of menstrual cycle), dysmenorrhea (painful menstruation) and pain score (mild, moderate and severe) was used as the study instrument in this research to collect the data. In addition, the questionnaire was formulated as a 'Google Form' in English, Sinhala and Tamil.

E. Data Analysis

The obtained data was compiled, analysed and evaluated using the IBM SPSS statistics software version 21 to enhance the quality of data.

Results and discussion

Baseline Characteristics

In this survey, out of 364 participants, the average age of the participants was 21.5 years, ranging from 18 to 25 years. Around 37.3% were in the age range of 18 to 21 years and 52.4% were between age ranges of 21 and 25 years. Of the 364 participants, a large proportion (n = 309, 90%) suffered from primary dysmenorrhea, out of which around 42.6% fell within the age ranges of 18 to 21 years, and 57.3% within 22 to 25 years. In terms of ethnic distribution, 96% were Sinhalese, Tamil and Muslim ethnicities each contributed to 1.43% and the rest accounted for other ethnicities.

A. Menstrual Characteristics Associated with Primary Dysmenorrhea

a) Menarche and Menstrual Cycle

The average age of menarche was 12 years, ranging from 10 to 14 years. In terms of the frequency of the menstrual cycles, 89.6% had regular menstrual cycles, whereas, 10.3% had irregular cycles.

b) Length of Menstrual Cycle

A large proportion of the students had menstrual cycle duration of 28 to 35 days (n = 279, 85.6%) which is considered as normal. Since a very small proportion had cycle length of less than 21 days (n = 279, 9.31%) or more than 35 days (n = 279, 5.01%) any associations between cycle length and primary dysmenorrhea was omitted.

c) Menstrual Flow

A significant proportion of participants reported a menstrual flow that lasted around 5-7 days (n = 279, 54.12%) or 2-4 days (n = 279, 43.36%), whereas, only a fraction reported a menstrual flow more than 7 days (n = 279, 2.50%).

d) Intensity of Pain

Around 42.29% (n = 279) of the participants reported mild pain associated with primary dysmenorrhea, whereas, 53.4% reported moderate pain. Furthermore, a small fraction of the participants (n = 279, 4.3%) reported severe pain that disabled one complete one's day-to-day activities

e) Frequency of Pain

Around, 66.6% (n = 279) intermittently experienced pain associated with primary dysmenorrhea, whereas, the rest (33.3%, n = 279) of the participants experienced pain and/or discomfort on regular basis.

f) Family History

The Chi-square test showed a significant association between primary dysmenorrhea and family history (p < 0.001).

g) Symptoms Associated with Primary Dysmenorrhea

Table 1 denotes the main symptoms associated with primary dysmenorrhea.

Table I - Symptoms Associated with Primary Dysmenorrhea

Symptoms	No. of responses	% (n = 279)
Lower abdominal pain	265	94.98
Thigh pain	158	56.63
Back pain	129	46.23
Decreased Concentration	105	37.63
Headache	69	24.73
Loss of appetite	65	23.39
Fever	41	14.69
Nausea, vomiting and diarrhoea	40	14.33
Dizziness	33	11.82

h) Associated discomforts and their affect on the day-to-day activities.

According to the obtained results it was observed that primary dysmenorrhea affected the day-to-day activities of the undergraduate students. The table II denotes the associated discomforts of dysmenorrhea.

Table II - Associated discomforts and their affect on the day-to-day activities.

Variables	No. of responses	% (n = 279)
Trouble falling and/or staying asleep	203	72.75
Poor concentration at class	154	55.19
Limit the ability to move around	133	47.67
Feel depressed/ upset/ sad	88	31.54
Absent from class	70	25.08
Poor personal relationship	42	15.05

i) *Methods used to relieve the pain and/or discomfort due to primary dysmenorrhea.*

The different methods used to relieve the pain and/or discomfort due to primary dysmenorrhea is depicted in figure 1.

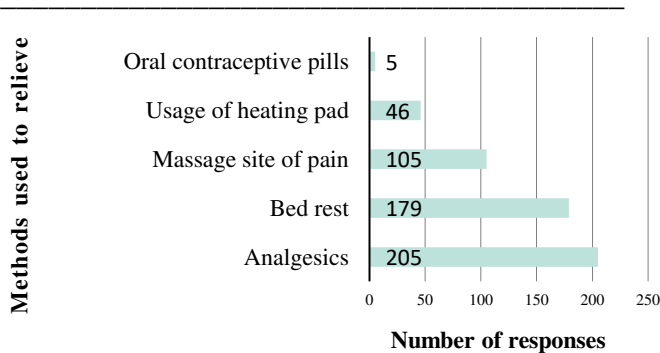


Fig. 1 Methods used to relieve the pain and/or discomfort due to primary dysmenorrhea.

j) *Medical Advice*

As per the data collected, only a minor fraction of participants who experienced primary dysmenorrhea ($n = 279$, 18.27%) had received some form of medical advice. However, a significant portion of the participants around 38.7% ($n = 279$) reported disregarding any of the discomforts associated with primary dysmenorrhea, hence had not received any medical advice. Furthermore, around 73% ($n = 279$) reported using some form of medication to subside the pain and/or discomfort caused due to primary dysmenorrhea, however, for around 8% the pain still lingered, disabling a smooth flow of daily activities for the participants.

Conclusion

Prevalence of primary dysmenorrhea was 90% ($n = 309$), out of which around 42% of the students reported mild pain, while 58% reported severe to extremely severe pain. Furthermore, recurrent symptoms associated with primary dysmenorrhea were identified as lower abdominal pain 95%, thigh pain 57% and back pain 46% from all participants. The Chi-square test showed a significant association between primary dysmenorrhea and family history ($p < 0.001$). Moreover, frequency of occurrence of pain was significantly associated with duration of

menstrual bleeding (No. of days > 5) ($p < 0.001$). In addition, most of the respondents experienced difficulty in sleeping 73% and difficulty in moving 48%. Consequently, to relieve the pain, many prefer the consumption of analgesics 74%, while, some prefer bed rest 64%. Despite, the significant prevalence of primary dysmenorrhea and corresponding inconveniences, only 19% had visited a specialist for medical advice. It could be concluded that primary dysmenorrhea is a significant issue which impacts day-to-day activities of female undergraduate students in Colombo District, Sri Lanka.

Declaration

A. Study Limitations

This study was restricted to undergraduate female students from non-state universities in Colombo District, Sri Lanka. Therefore, this research could be extended by recruiting participants in other districts and state universities, as well. In addition, the research could be extended by analysing the impact of primary dysmenorrhea on the academic activities of students.

B. Acknowledgement

The authors extend their gratitude to Senior Prof. Menik Hettihewa, Dean, Faculty of Health Sciences, for her guidance and support to conduct this research. Furthermore, the authors also appreciate CINEC Campus, Sri Lanka, for providing an opportunity to expand their knowledge and gain experience in conducting scientific research. Lastly, the participants of this study need to be acknowledged for their valuable information and involvement in the study.

C. Funding sources if any

None

D. Conflicts of Interest

The authors report no conflicts of interest in this work.

E. Ethical Approval

Ethical approval for the was obtained for the research from Ethics Review Committee, CINEC Campus.

F. Informed Consent

All the information used in this study was obtained through participants that had given their consent (the participants that selected the option 'yes' under consent) to participate in the study and/or use their personal information for the study.

References

1. Reed BG, Carr BR. The normal menstrual cycle and the control of ovulation. [Updated 2018 Aug 5]. In: Feingold KR, Anawalt B, Boyce A, et al., editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK279054/>
2. Fehring RJ, Schneider M, Raviele K. Variability in the phases of the menstrual cycle. *J Obs, Gyn Neo Nurs* [Internet]. 2006 May [cited 2021 Jan 25]; 35(3): 313-442. Available from: <https://doi.org/10.1111/j.1552-6909.2006.00051.x>
3. Begum M, Das S, H.K. Sharma HK. Menstrual disorders: Causes and natural remedies. *J Pharm Chem Biol Sci* [Internet]. 2016 Aug [cited 2021 Jan 15]; 4(2):307-320. Available from: https://www.researchgate.net/publication/307572071_Menstrual_Disorders_Causes_and_Natural_Remedies
4. Barriga-Pooley P, Brantes-Glavic S. Normal menstrual cycle [Internet]. IntechOpen; 2018 Dec [cited: 2021 Jan 20]. Available from: <https://www.intechopen.com/profiles/250273/patricio-barriga>
5. Yesuf TA, Eshete NA, Sisay EA. Dysmenorrhea among university health science students, Northern Ethiopia: Impact and associated factors. *Int J Reprod Med* [Internet]. 2018 Jan [cited 2021 Jan 05]; Volume 2018, Article ID 9730328, 5 pages. Available from: <https://doi.org/10.1155/2018/9730328>
6. Mohamed EM. Epidemiology of dysmenorrhea among adolescent students in Assiut City, Egypt. *Life Sci J* [Internet]. 2012 [cited 2021 Jan 20]; 9(1):348-353. (ISSN: 1097-8135). Available from: <http://www.lifesciencesite.com>.
7. Aksu H, Özsoy S. Primary dysmenorrhea and herbals. *J Health Commun* [Internet]. 2016 July [cited: 2021 Jan 10]; 1(3): 3. Available from: <https://healthcare-communications.imedpub.com/primary-dysmenorrhea-and-herbals.php?aid=9868> DOI: 10.4172/2472-1654.100023
8. Acheampong K, Bafffour-Awuah D, Ganu D, Appiah S, Pan X, Kaminga A, et al. Prevalence and predictors of dysmenorrhea, its effect, and coping mechanisms among adolescents in Shai Osudoku District, Ghana. *Obst Gynec Int* [Internet]. 2019 May [cited: 2021 Jan 10]; Available from: <https://europepmc.org/article/PMC/PMC6545782> DOI: 10.1155/2019/5834159. PMID: 31236112. PMCID: PMC6545782
9. Helwal HAA, Mitaeb AA, Al-Hamshri S, Sweileh WM. Prevalence of dysmenorrhea and predictors of its pain intensity among Palestinian female university students. *BMC Women's Health* [Internet]. 2018 Jan [cited: 2021 Jan 12]; 18(1):11. Available from: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-018-0516-1> DOI 10.1186/s12905-018-0516-1
10. Hailemeskel S, Demissie A, Assefa N. Primary dysmenorrhea magnitude, associated risk factors, and its effect on academic performance: evidence from female university students in Ethiopia. *Int J Women's Health* [Internet]. 2016 Sep [2021 Jan 13]; 2016(8): 489-496. Available from: <https://www.dovepress.com/primary-dysmenorrhea-magnitude-associated-risk-factors-and-its-effect-peer-reviewed-article-IJWH> DOI: <https://doi.org/10.2147/IJWH.S112768>
11. Unsal A, Ayranci U, Tozun M, Arslan G, Calik E. Prevalence of dysmenorrhea and its effect on quality of life among a group of female university students. *Upsala J Med Scis* [Internet]. 2010 Jan [cited: 2021 Jan 16]; 115(2): 138-145. Available from: <https://doi.org/10.3109/03009730903457218> DOI: 10.3109/03009730903457218
12. Hapuarachchige SMSKW, and Suresh TS. Knowledge and attitudes towards dysmenorrhea among adolescent girls in an urban school in Sri Lanka. *Nursing and Health Sciences* [Internet]. 2012 Aug [cited: 2021 Jan 10]; 15, 58-64. DOI: 10.1111/j.1442-2018.2012.00736.x
13. Fenakel K, Lurie S. The use of calcium channel blockers in obstetrics and gynecology; a review. *Euro J Obst Gynec Reprod Bio* [Internet]. 1990 Dec [cited: 2021 Jan 19]; 37(3): 199-203. Available from:

- <https://www.sciencedirect.com/science/article/abs/pii/S02822439090025V>
14. Habibi N, Huang MSL, Gan WY, Zulida R, Safavi SM. Prevalence of primary dysmenorrhea and factors associated with its intensity among undergraduate students: A cross-sectional study. *Pain Management Nurs* [Internet]. 2015 Dec [cited: 2021 Feb 10]; 16(6): 855-861. Available from:
<https://www.sciencedirect.com/science/article/pii/S1524904215001022> DOI:
<https://doi.org/10.1016/j.pmn.2015.07.001>
 15. Montoya JS, Cabezza AH, Rojas OM, Navarrete RC, Keever MA. Menstrual disorders in adolescents. *Boletin Medico del Hospital Infantil de Mexico* [Internet]. 2012 [cited 2021 Feb 18]; 69(1): 60-72.
 16. Sheila Rani KG. Dysmenorrhea (primary and secondary). *Gynaec Today* [Internet]. 2012 [cited 2021 Feb 18].
 17. Krejcie RV, Morgan DW. Determining sample size for research activities. *Sage J* [Internet]. 1970 Sep [cited 2021 Feb 12]; 30(3): 607-610. Available from:
<https://doi.org/10.1177/001316447>