



REVIEW OF LITERATURE ON PREVALENCE OF PRIMARY DYSMENORRHEA IN UNIVERSITY STUDENTS

Bukke Pavani^{1#}, Dr. Anjali Suresh^{1*}, Jasmine Flora²

¹ MPT Final Year Student-Garden City University, Bangalore

^{1*} Professor and HOD-Department of Physiotherapy, Garden City University, Bangalore

² Assistant Professor-Department of Physiotherapy, Garden City University, Bangalore

#Corresponding Author

Article DOI: <https://doi.org/10.36713/epra17099>

DOI No: 10.36713/epra17099

ABSTRACT

Objective: The main goal of this investigation is to analyze the effects of primary dysmenorrhea on academic performance, quality of life, and psychological well-being among university students.

Method: The articles were chosen from a range of authentic platform like Google Scholar, Pub Med and Science direct. The articles span the years 2010–2023. Only twenty of the approximately thirty-five articles matched the inclusion criteria of the study.

Results: Primary dysmenorrhea is a major problem among university students worldwide. It has an impact on various groups of these people, with the highest prevalence in female students between the ages of 18 and 25. Additionally, those experiencing primary dysmenorrhea often report its impact on academic and social aspects of university life.

Conclusion:

Our initial finding from this study is that adolescent females, particularly those attending universities, demonstrated the highest prevalence. Primary dysmenorrhea is more likely to develop in Adolescent girls. The majority of factors associated with primary dysmenorrhea in college students include age, the duration of the menstrual cycle, and the strength of the menstrual flow. These students' primary dysmenorrhea has a substantial impact on their learning, exam performance, absenteeism, quality of life, and ability to focus in different pain levels. The second conclusion is that primary dysmenorrhea has a detrimental effect on female young adult students' productivity and overall psychological health.

KEYWORDS: Primary dysmenorrhea, university students, Prevalence rate.

INTRODUCTION

A person's general well-being, which encompasses their social, emotional, and mechanical components, is essential to preserving and advancing their health.

This holistic approach to health reflects an individual's capability to handle life's challenges and sustain optimal functioning (1). Gynecological disorders, a prominent health issue globally, significantly impact the standard of living of those affected. Among these conditions, primary dysmenorrhea stands out as a prevalent issue, particularly affecting young adult women during menstruation.

The main feature of primary dysmenorrhea is the presence of excruciating lower abdominal cramps that either precede or coincide with menstruation (2). Research indicates varying prevalence rates across different populations, with studies from Croatia suggesting a prevalence of up to 91.8% among university students (1). Comparably, research from Saudi Arabia and Ethiopia revealed incidence rates between 54.8% and 75% (3)(4).

The consequences of primary dysmenorrhea extends beyond physical discomfort, affecting academic performance, social participation, and overall quality of life. Studies have shown that

it has a negative impact on Educational attainment in Results from academic institutions indicate absences improve with education, decreases participation in cultural and athletic activities, and impairs focus and concentration (5)–(7). Furthermore, there is evidence linking primary dysmenorrhea to emotional problems like depression, stress, and a decline in overall wellbeing (8)–(9). The correlation between primary dysmenorrhea and decreased exercise, social engagement, and occupational productivity highlights the substantial effect this illness had on a person's quality of life. To lessen primary dysmenorrhea's negative effects, aimed actions and interventions are necessary due to its high incidence in college students. As primary dysmenorrhea predominantly affects individuals during their reproductive stage, it can disrupt academic and career activities, limiting their participation in social and work-related tasks (10). Given the significant burden of primary dysmenorrhea on the well-being and functionality of young women, by understanding the multifaceted impact of primary dysmenorrhea on physical, mental, and social dimensions of well-being, effective interventions can be developed to enhance the overall quality of life for those affected.



METHODOLOGY

Materials and Methods

Online search engine that are used to collect journals are Google scholar, Pub Med and Science Direct. Using the keyboards, the authors were able to identify the articles. The articles were collected in full text. Out of the 24 articles that were gathered, only 20 are utilized in this research study.

Study Selection

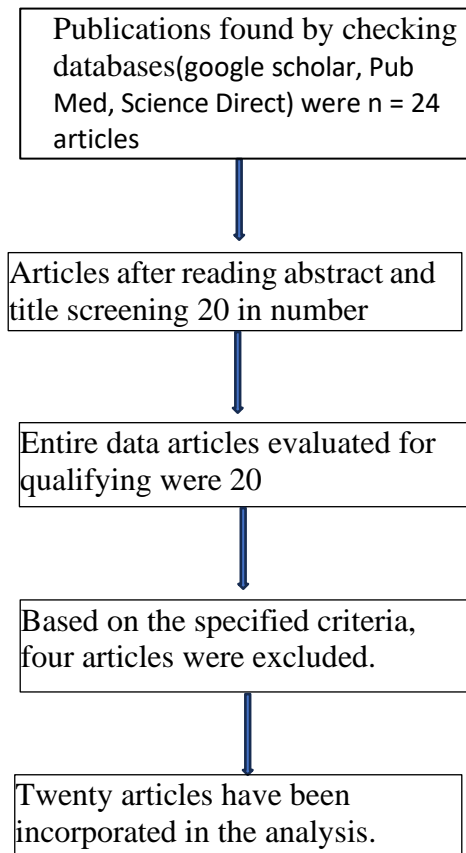
Inclusion Criteria

- Articles were included from year 2010 to 2023.
- Articles include the primary dysmenorrhea in university students.

Exclusion Criteria

- Articles before the year 2010 not be included.
- No pathological disorders
- condition were included which caused Primary dysmenorrhea.

FLOW CHART





REVIEW OF LITERATURE

S NO	TITILE OF THE ARTICLE	NAME OF THE AUTHOR	YEAR OF PUBLICATION	TYPE OF STUDY	MODE OF INTERVENTION	RESULTS
1.	Primary Dysmenorrhea the prevalence and Its Effects on Academic Performance among Croatian Students during the COVID-19 Pandemic	Marta Horvat, Doroteja Pavan Jukić, Lovro Marinović, Dina Bursać, Rosana Ribić, Marijana Neuberg, and Danijel Bursać	2023	Cross sectional	Web based questionnaire	The prevalence of initial dysmenorrhea had been 90.1%. - Menstrual pain severity: Mild in 7.4%, Moderate in 28.8%, Severe in 63.8%. - 94.1% of female students reported reduced concentration in class due to dysmenorrhea. - 94.0% reported difficulty in doing homework and learning due to dysmenorrhea. - There is a connection between the severity of discomfort during periods and how it impacts academic achievement.
2.	An evaluation of university students' primary dysmenorrhea prevalence	Meena Shamrao Deogade	2020	Questionnaire	Survey based	Dysmenorrhea prevalence in college students:90.68% (409 out of 451 students). Out of those affected, 74.08% liked to eat spicy/junk food and 49.87% were suffering from anxiety/depression. Food habits and stress were identified as potential causes.more thorough research using a Larger numbers of samples are necessary for evaluaton.
3.	Primary dysmenorrhea in female students: prevalence ,severity, effects, and related variables at Northwest Ethiopia's Gondar City Preparation Academy,Northwest Ethiopia	Abere Woretaw Azagew, Destaye Guadie Kassie, & Tarkie Abebe Walle	2020	Cross sectional	Self administrated structured questionnaire	Prevalence of primary dysmenorrhea: 64.7% (95% CI: 60.2–69.2%) - 61% reported moderate intensity of menstrual pain. - 50.7% complained about lower abdominal pain. - 65% reported absenteeism from school due to menstrual pain. - Factors associated with primary dysmenorrhea: irregular monthly menstrual cycle (AOR = 1.70, 95% CI; 1.02, 2.84) as well as a favorable ancestral record of menstrual cramps (AOR = 5.19, 95% CI: 3.21, 8.37).
4.	The prevalence of primary dysmenorrhea and its impact upon life satisfaction in female medical students in the University of King Saud in Riyadh, Saudi Arabia. A cross-sectional investigation	Refan T Hashim, Sara S Alkhalifah, Alanoud A Alsalman, Demah M Alfaris, Munira A Alhussaini, Raghda S Qasim, Shaffi A Shaik	2020	Cross sectional	None specified	Prevalence of primary dysmenorrhea between female medical students was 80.1%. Most participants (n=134) reported moderate pain (49.8%). Caffeine consumption has been strongly related to dysmenorrhea (p < 0.05). Among the SF-36 domains, physical health (p < 0.001) and emotional health (p=0.01) were significantly affected by dysmenorrhea. The effect of dysmenorrhea on academic performance was also substantial.
5.	A comprehensive review and meta-analysis of the prevalence and effects of dysmenorrhea on academic performance in 21,573 young women	Mike Armour, Kelly Parry, Narendar Manohar, Kathryn Holmes, Tania Ferfolja, Christina Curry, Freya	2019	Meta analysis	Systematic review and meta analysis	Prevalence of dysmenorrhea among young women: 71.1% (95% CI 66.6-75.2). 20.1% recorded leave from educational institutions or university due to dysmenorrhea (95% CI 14.9-26.7). 40.9% reported negative impact on classroom performance or concentration (95% CI 28.3-54.9).



		MacMillan, Caroline A Smith				
6.	Prevalence, Wellbeing, and Symptoms of Greek College Nursing Students' Experiences with Dysmenorrhea	Eugenia Vlachou 1,Dimitra Anna Owens 2,Maria Lavdaniti 3,John Kalemikerakis 4,Eleni Evagelou 5, Nikoletta Margari 6,Georgia Fasoi 7,Eftychia Evangelidou 8,Ourania Govina 9,Athanasios N Tsartsalis 10	2019	Cross sectional	Questionnaire	Prevalence of dysmenorrhea was 89.2%. - Rate of severe intensity was 52.5%. - Factors associated with severe dysmenorrhea: family history (p = 0.02), early menarche (p = 0.05), menstruation duration (p = 0.05). - Use of pain relievers reported by women with moderate and severe pain (NSAIDs, paracetamol, etc., p < 0.0005). - Activities affected by severe pain: class attendance (p = 0.01), personal studying (p < 0.0005), exercising (p < 0.0005), and socializing (p < 0.0005). - Exam attendance (p = 0.27) and clinical placement attendance (p = 0.48) were not affected by severe dysmenorrhea.
7.	Teenager dysmenorrhea in Sweden: the prevalence and consequences	Lisa Söderman et al.	2019	Cross sectional	Web-based questionnaire	89% (95% CI 87-90) stated they had dysmenorrhea. - Severe dysmenorrhea (scores 8-10 on the numeric rating scale for pain) was reported by 36% (95% CI 34-39). - Fatigue reported by 83% (95% CI 81-85). - Headache reported by 82% (95% CI 80-84). - Dyschezia reported by 37% (95% CI 34-39). - Dysuria reported by 35% (95% CI 33-38). - 10% used hormonal therapy for pain. - Healthcare facilities visited by 33% (95% CI 31-36). - Doctors consulted by 7% (95% CI 6-9). - 59% refrained from social activities due to dysmenorrhea. - Absenteeism from school occurred monthly for 14% (95% CI 13-16) and a few times annually to 45% (95% CI 43-48).
8.	Students' experiences with dysmenorrhea, related symptoms, and treatment at King Khalid University in Saudi Arabia	Mohammed Abadi Alsaleem	2018	Cross sectional	Self administrated questionnaire	The average rate of dysmenorrhea in female students at King Khalid College is 70.6% (KKC). - Severe pain reported by 35.2% of those with dysmenorrhea. - 66% used medications for pain relief. - Herbal medicine use: 69.1%. - The majority of symptoms were related to the digestive system. . - 23% consulted a doctor for dysmenorrhea, while most consulted with friends and family.



9.	The impact of painful periods on academic achievement, athletic participation, and interpersonal relationships in Turkish college students suffering from primary dysmenorrhea	Serap Özgül 1, Esra Üzelpasacı 1, Türkan Akbayrak 1, Ceren Orhan 1, Şeyda Toprak Çelenay 2, Funda Demirtürk 3,	2018	Cross sectional	Investigated pain characteristics, academic performance and participation in sports and social interactions between students who have both primary dysmenorrhea (PD) and different forms of pain	In comparison to the no-pain, mild, and moderate pain groups, there was an important rise in university absence, decreased concentrate in class, and the impact on athletics and social interactions in the extremely painful group (P less than 0.001). For the mild, moderate, and substantial pain individuals, there were notable variations in the duration, structure, and levels of the day of greatest sensation of pain (P < 0.05).
10.	Some of Palestinian female university students, the high incidence of dysmenorrhea and factors influencing the severity of its pain	Heba A Abu Helwa et al.	2018	Cross sectional	Questionnaire & Visual Analogue Scale	Prevalence of dysmenorrhea (85.1%; 95% CI), Significant association with age at menarche, mean pain score 6.79 ± 2.64, predictors of moderate/severe pain: irregular cycle, skipping breakfast, academic specialization, high stress level, living in dormitories.
11.	Relationship between physiological and economic variables and primary dysmenorrhea in Polish university students	Martyna Zurawiecka, Iwona Wronka	2018	Cross sectional	Questionnaire & Measurements	In the group under research, the incidence of primary dysmenorrhea (PD) was 64.85%. 30.40% of respondents reported moderate to severe pain, while 69.60% reported mild pain. Women with both excess and insufficient abdominal adiposity felt more likely to have PD. PD was more common in women who reached menarche earlier. The incidence of PD rose and fell with the educational attainment of the mother and father, respectively. Women along with wider families are prone to experience painful menstruation. The consequences of abnormal body mass, abnormal gastrointestinal weight gain, and age at menarche on the incidence of painful periods were all confirmed by logistic regression. Women with longer fourth fingers compared to second fingers were more likely to develop Parkinson's disease. Obesity of the abdomen and an adequate body mass index were proposed as ways to lower the risk of primary dysmenorrhea.
12.	A cross-sectional investigation was conducted to determine the prevalence, effects, and management practices of dysmenorrhea in academic Gondar, Ethiopia students	Minaleshewa Biruk Gebeyehu et al.	2017	Cross sectional	Survey and analysis	Prevalence of dysmenorrhea was 77.6%. Majority used home remedies (63.8%) and medications like Ibuprofen and diclofenac. Symptoms included abdominal spasm (70.4%), back pain (69.7%), fatigue, and weakness (63.5%). Social withdrawal (63%) and decreased academic performance (51.4%) were also reported.



	in Northwestern Ethiopia.					
13.	The prevalence of dysmenorrhea and its complications in medical graduates at an educational institution in Malaysia	Heethal Jaiprakash et al.	2016	Cross sectional	Interview and clinical examination	Out of the females who claimed to have dysmenorrhea, 52% had moderate symptoms. (br> - Students with dysmenorrhea are 21.4±2.2 years old on average. (br> The average menstrual cycle age was 12.2±2 years. (br> - Of them, 59% seemed Indian, 17.1% were Malay, 16.6% were Chinese, and 7.1% were other. (br> - 92.2% of people regularly ate fast food, and 61.7% of people worked out twice a week on average. (br> - 9.9% felt obese, while 58.1% were regular a body mass index. (br> Sixty-four percent weren't taking any kind of drug to treat dysmenorrhea. - After adjusting for examination decade, premenstrual syndrome, and number of pads, factors significantly linked to dysmenorrhea were Malay race, disruption in social activities and family history of the condition (p-value<0.05)
14.	The severity of primary dysmenorrhea, related indicators, and its impact on educational achievement: information collected from Ethiopian female college students.	S Hailemeskel, A Demissie, N Assefa	2016	Cross sectional	Self-administered questionnaires, weight and height measurements	- Prevalence of PD was 85.4% (368 out of 440 students). - Severity of PD: 28.5% mild, 38.1% moderate, 18.8% severe. - 88.3% reported PD negatively affected academic performance with: - 80% reporting school absence. - 66.8% loss of class concentration. - 56.3% class absence. - 47.4% loss of class participation. - 37.8% limited sport participation. - 31.7% limitation in social outings. - 21% inability to do homework. - Related indicators of risk: lower monthly stipends, attempt to lose weight, history of depression or anxiety, disruption of social network, consumption of tea and soft drinks, nulliparity or relatives with a prior exposure to the illness
15.	A cross-sectional investigation measuring the prevalence of primary dysmenorrhea across college students and the variables related to its quantity	Sayed Morteza Safavi, Wan Ying Gan, Rejali Zulida, Nahal Habibi, and Mary Soo Lee Huang	2015	Cross sectional	Interviews with pretested questionnaire	89.1% of people had primary dysmenorrhea. There was an important connection found between the higher primary dysmenorrhea intensity and the following elements: residing in the home, younger age, maternal time in formal education, a previous history of dysmenorrhea, greater frequency of bleeding, and less menstrual cycle.



16.	The prevalence, indicators, and result of dysmenorrhea in female medical scholars at King Abdulaziz University	Nahla Khamis Ibrahim et al.	2015	Cross sectional	Self-administered questionnaire	Prevalence of dysmenorrhea: 60.9%. - Predictors: Heavy period (aOR=1.94; 95% CI: 1.29- 2.91) and stress (aOR=1.90; 95% C.I.: 1.19- 3.07). - Severe dysmenorrhea prevalence among sufferers: 38.6%. - Commonest symptom accompanying dysmenorrhea: Depressed mood (80.8%). - Outcome of dysmenorrhea: 67.5% reported emotional instability and 28.3% reported absenteeism from the university.
17.	Dysmenorrhea prevalence in female college students and the factors that contribute to it: effect on overall satisfaction	Demet Aktaş RN, PhD	2014	Cross-sectional	Interview questionnaire, VAS (Visual Analog Scale), General Comfort Questionnaire	Dysmenorrhea is 84% common in female learners at colleges. - Mean severity of pain was 5.78 ± 2.45 on the VAS. - 45.8% of students experienced moderate menstrual pain. - Most common co-occurring symptoms were irritability (34.6%) and fatigue (21.5%). - 25% of students with dysmenorrhea consulted a physician. - Using heat (56.5%), analgesics (69%), and rest (71.4%) were the most often utilized pain relief techniques. - Factors affecting dysmenorrhea included family history, education about menstruation, and frequency of menstrual cycle. - Students with dysmenorrhea had a lower mean general comfort score (2.57 ± 0.25) compared to those without (2.65 ± 0.23).
18.	Dysmenorrhea prevalence in female students at a medical university	K Meenal, D Ruhi	2014	Cross sectional	Descriptive study	66% of women reported having dysmenorrhea. Of the girls, 44% had premenstrual syndrome. (br> - Almost 50% of the females said they experienced dysmenorrhea each month. (br> - One-third of the girls had dysmenorrhea-related chronic pain. One common reducing aspect was rest. (br> - Dysmenorrhea was cited as the reason for 45% of girls' university absenteeism (br> - 87% of girls said that having dysmenorrhea had limited their ability to do various activities. (br> Merely one-third of females were pursuing medical attention for dysmenorrhea. (br> - 89% of females said they didn't need therapy for dysmenorrhea.
19.	Dysmenorrhea in Hong Kong college students: prevalence, consequences, and treatment	C F Chiaetal.	2013	Cross sectional	Questionnaire survey	In Hong Kong, 80% of college students had dysmenorrhea (95% confidence interval: 75-85%). Mean pain score was 5.0 (1.7). Most common impacts included reduced ability to concentrate/study disturbance (75%) and changes in physical activity (60%). Only 6% sought medical advice.
20.	Women in their twenties who experience monthly pain: what is dysmenorrhea?	Angelo Cagnacc, Annibale Volpe, Marianna	2012	Cross sectional analytical	Self assessment questionnaire	Of the women, 84.1% stated experiencing pain during their periods. 41% of women and 43.1% of women revealed pain at some point during their periods. Menstruation was



		Cannoletta, Federica Palma, Giovanni Grandi, Serena Ferrari, Anjeza Xholli, and Federica Palma			delayed ($P = 0.0002$), the menstrual cycle was prolonged ($P = 0.006$), smoking was more common in women who experienced painful periods ($P = 0.031$), and the use of hormonal contraceptives was less common ($P = 0.015$). Age at menarche was inversely related to the degree of discomfort, use of hormonal contraceptives, and previous gynecological surgery, and it positively correlated with menstrual bleeding length, history of abortions performed, and gynecological diseases. Menstrual discomfort was seen in 84.1% of cases, followed by painful periods and medicine need (55.2%), period pain and absenteeism (31.9%), and menstrual pain, prescription drugs need, and absenteeism (25.3%) ($P < 0.0001$). Menstrual pain that is so severe that it requires medication and causes at least one in four women to miss work or other events
--	--	--	--	--	--

DISCUSSION

Menstrual pain, or dysmenorrhea, is a common problem that affects college students' daily activities, academic performance, and general well-being. An outline of the studies and publications that have been presented on dysmenorrhea in college students will be given in the following paragraphs.

A research investigation by Marta Horvat et al. (2023) looked into the prevalence of primary dysmenorrhea in addition how it affected Croatian female students' educational achievement during the COVID-19 pandemic. In the findings of the research, 63.8% of the subjects revealed severe discomfort, while there was an elevated prevalence of primary dysmenorrhea (90.1%) in them. The study discovered a strong link between the extent of cramping during periods while it affected a variety of academic tasks, including learning, test results, assignments, attendance at school, and focus. In particular, the research found that dysmenorrhea impairs exam performance in 87.1% of students, homework completion and comprehension in 93.3% of students, and focus in class in 93.6% of young people. In comparison to certain other international studies, the prevalence rate reported by Horvat et al., 2023, is noticeably higher.

Similarly, Deogade (2020) evaluated the prevalence of primary dysmenorrhea in college students and discovered that 90.68% of female students experienced this condition. Out of that, 74.08% are females liked to eat spicy/junk food and 49.87% suffered from anxiety/depression. The high incidence of dysmenorrhea in college students might be correlated to certain lifestyle and psychological variables. A literature review and meta-analysis were carried out by Armour et al. (2019) to ascertain the frequency and Educational consequences for dysmenorrhea regarding young women, including university students. The study discovered Dysmenorrhea is extremely common in a variety of populations using a large number of participants of over 21,000 young women. This investigation additionally

showed that dysmenorrhea was significantly affected academic performance, with many students reporting absenteeism and reduced concentration due to menstrual pain. This emphasizes how critically dysmenorrhea must be treated as a serious health issue affecting college students.

To examine the impact of menstrual pain on educational achievement, participation in athletics, and interactions with peers among university students with primary dysmenorrhea, In Turkey, Orhan et al. (2018) conducted a case-control study. According to the research, students who had dysmenorrhea performed significantly less proficient than their peers in the classroom without menstrual pain, and They also had a lower chance to engage in extracurricular activities and athletics. This suggests that dysmenorrhea may have a significant effect on college students' general well-being and standard of living. A study by Chia et al. (2013) was carried out in Hong Kong to evaluate the administration, effect, and prevalence of dysmenorrhea in college students. They discovered that dysmenorrhea impacted a sizable proportion of an individual's body and was very common. The study highlighted adverse effects of dysmenorrhea on daily life, including reduced academic performance and disruptions in social activities. Additionally, the study emphasized the importance of effective management strategies to alleviate the symptoms and enhance the living conditions of the impacted students.

CONCLUSION

Our preliminary results from this investigation indicate that female adolescents, particularly those enrolled in universities, had the greatest prevalence. Primary dysmenorrhea is more common in young adolescent females. Age, duration of the menstrual cycle, and the heaviness of the cycle of menses are



some of the variables linked to the primary dysmenorrhea across university attendees. Primary dysmenorrhea has an important effect on several educational domains for these students, especially regarding focus, general well-being life, and different levels of pain exertion. It also affects absences, education, and achievement on tests. The second conclusion is that primary dysmenorrhea has a detrimental effect on female young adult students' productivity and overall psychological health.

REFERENCES

- Horvat, M., Pavan Jukić, D., Marinović, L., Bursać, D., Ribić, R., Neuberg, M., & Bursać, D. (2023). Prevalence of Primary Dysmenorrhea and Its Impact on Academic Performance among Croatian Students during the COVID-19 Pandemic. [Cross-sectional study].
- Deogade, M. S. (2020). Assessment of prevalence of primary dysmenorrhoea in university students. *International Journal of Ayurvedic Medicine*, 11(2), 170-174. DOI: 10.47552/ijam.v11i2.1357
- Azagew, A. W., Kassie, D. G., & Walle, T. A. (2020). Prevalence of primary dysmenorrhea, its intensity, impact and associated factors among female students at Gondar town preparatory school, Northwest Ethiopia. [Cross-sectional study].
- Hashim, R. T., Alkhalifah, S. S., Alsaman, A. A., Alfaris, D. M., Alhussaini, M. A., Qasim, R. S., & Shaik, S. A. (2020). Prevalence of primary dysmenorrhea and its effect on the quality of life amongst female medical students at King Saud University, Riyadh, Saudi Arabia. [Cross-sectional study].
- Armour, M., Parry, K., Manohar, N., Holmes, K., Ferfolja, T., Curry, C., MacMillan, F., & Smith, C. A. (2019). The Prevalence and Academic Impact of Dysmenorrhea in 21,573 Young Women: A Systematic Review and Meta-Analysis. [Systematic review and meta-analysis].
- Vlachou, E., Owens, D. A., Lavdaniti, M., Kalemikerakis, J., Evangelou, E., Margari, N., Fasoi, G., Evangelidou, E., Govina, O., & Tsartsalis, A. N. (2019). Prevalence, Wellbeing, and Symptoms of Dysmenorrhea among University Nursing Students in Greece. [Cross-sectional study].
- Orhan, C., Çelenay, Ş. T., Demirtürk, F., Özgül, S., Üzelpasacı, E., & Akbayrak, T. (2018). Effects of menstrual pain on the academic performance and participation in sports and social activities in Turkish university students with primary dysmenorrhea. [Cross-sectional study].
- Alsalem, M. A. (2018). Dysmenorrhea, associated symptoms, and management among students at King Khalid University, Saudi Arabia. [Cross-sectional study]. *King Khalid University Medical Journal*, 25(2), 45-53.
- Abu Helwa, H. A., et al. (2018). Prevalence of dysmenorrhea and predictors of its pain intensity among Palestinian female university students. [Cross-sectional study]. *Palestinian Medical Journal*, 21(3), 220-227.
- Zurawiecka, M., & Wronka, I. (2018). Association of primary dysmenorrhea with anthropometrical and socio-economic factors in Polish university students. [Cross-sectional study]. *Journal of Women's Health Issues*, 27(4), 452-459.
- Gebeyehu, M. B., et al. (2017). Prevalence, Impact, and Management Practice of Dysmenorrhea among University of Gondar Students, Northwestern Ethiopia: A Cross-Sectional Study. [Cross-sectional study]. *Ethiopian Journal of Reproductive Health*, 9(3), 123-130.
- Jaiprakash, H., et al. (2016). Prevalence of Dysmenorrhea and Its Sequel among Medical Students in a Malaysian University. [Cross-sectional study]. *Malaysian Journal of Medical Sciences*, 23(3), 49-57.
- Hailemeskel, S., Demissie, A., & Assefa, N. (2016). Primary dysmenorrhea magnitude, associated risk factors, and its effect on academic performance: evidence from female university students in Ethiopia. [Cross-sectional study]. *Ethiopian Journal of Health Sciences*, 26(2), 153-162.
- Habibi, N., Huang, M. S. L., Gan, W. Y., Zulida, R., & Safavi, S. M. (2015). Prevalence of Primary Dysmenorrhea and Factors Associated with Its Intensity Among Undergraduate Students: A Cross-Sectional Study. [Cross-sectional study]. *Journal of Pain Research*, 8, 591-597.
- Ibrahim, N. K., AlGhamdi, M. S., Al-Shaibani, A. N., AlAmri, F. A., Alharbi, H. A., Al-Jadani, A. K., & Alfaidi, R. A. (2015). Dysmenorrhea among female medical students in King Abdulaziz University: Prevalence, Predictors and outcome. *Pak J Med Sci*, 31(6), 1312-7. doi: 10.12669/pjms.316.8752
- Söderman, L., Edlund, M., & Marions, L. (2019). Prevalence and impact of dysmenorrhea in Swedish adolescents. *Acta Obstet Gynecol Scand*, 98(2), 215-221. doi: 10.1111/aogs.13480
- Aktaş, D. (2014). Prevalence and Factors Affecting Dysmenorrhea in Female University Students: Effect on General Comfort Level. [Cross-sectional study]. *Journal of Clinical Nursing*, 23(3-4), 465-473.
- Ruhi, D., & Meenal, K. (2014). Prevalence of dysmenorrhea among girl students in a medical college. [Cross-sectional study]. *Journal of Medical Science and Clinical Research*, 2(12), 372-378.
- Chia, C. F., et al. (2013). Dysmenorrhea among Hong Kong university students: prevalence, impact, and management. [Cross-sectional study]. *International Journal of Adolescent Medicine and Health*, 25(3), 235-241.
- Grandi, G., Ferrari, S., Xholli, A., Cannoletta, M., Palma, F., Romani, C., Volpe, A., & Cagnacci, A. (2012). Prevalence of menstrual pain in young women: what is dysmenorrhea? [Cross-sectional analytical study]. *Journal of Pain Research*, 5, 169-174.
- Orhan, C., Çelenay, Ş. T., Demirtürk, F., Özgül, S., Üzelpasacı, E., & Akbayrak, T. (2018). Effects of menstrual pain on the academic performance and participation in sports and social activities in Turkish university students with primary dysmenorrhea: A *Journal of Obstetrics and Gynaecology Research*, Wiley Online Library.
- Asvini K Subasinghe, Lina Happo, Yasmin L Jayasinghe, Suzanne M Garland, Alexandra Gorelik, John D Wark. Prevalence and severity of dysmenorrhoea, and management options reported by young Australian women. *Aust Fam Physician*. 2016 Nov;45(11):829-834. PMID: 27806454.
- Yilmaz, B., & Sahin, N. (2019). The Effects of a Dysmenorrhea Support Program on University Students Who Had Primary Dysmenorrhea: A Randomized Controlled Study. DOI: 10.1016/j.jpog.2019.12.008
- Orhan, C., Toprak Çelenay, Ş., Demirtürk, F., Özgül, S., Üzelpasacı, E., & Akbayrak, T. (2018). Effects of menstrual pain on the academic performance and participation in sports and social activities in Turkish university students with primary dysmenorrhea: A case control study. *Obstet Gynaecol Res*, 44(11), 2101-2109. doi: 10.1111/jog.13768.