

IMPACT AND MANAGEMENT PRACTICE OF PRIMARY DYSMENORRHEA AMONG FEMALE UNDERGRADUATES OF COLLEGE OF HEALTH SCIENCES, NNAMDI AZIKIWE UNIVERSITY, NNEWI CAMPUS

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Abstract

Background of study: After menarche many adolescent girls face different gynecological problems. Of these, primary dysmenorrhea is one of the most common. It presents as cramping pain in the lower abdominal during menstruation. These can have significant impacts on Academics and an overall effect on QoL. Because of these concerns, the questions about its impact and management are raised so as to determine better ways to cope with the condition. **Aims and Objective:** The aim of the study was to determine the impact and management practice of primary dysmenorrhea among female undergraduates in College of Health Sciences, Nnamdi Azikiwe on University, Nnewi Campus and determine what interactions exist among age and family history with certain variables. **Method:** A descriptive cross-sectional study was conducted among 362 randomly selected female undergraduates of College of Health Sciences. The instruments used were WALIDD score, Visual Analogue scale and a validated questionnaire adapted from a survey from similar research to assess the impact and management practice of participants. Data obtained were summarized into descriptive statistics of mean, frequency and standard deviation; Spearman's rank order correlation and Mann-Whitney U test were used for hypothesis. **Result:** Results showed that 270 participants (95%) had some degree of dysmenorrhea, there was significant negative impact on their academics (78.1%), there was significant negative relationship between Age and experience of Physiological and Psychological symptoms ($r=-0.125$, $p=0.040$). There was no significant relationship between Age and academic impact of dysmenorrhea ($r=0.091$, $p=0.134$). **Conclusion:** The study showed a high prevalence of primary dysmenorrhea, a great number of students took medications without prescriptions, and only a few used alternative methods in managing dysmenorrhea. There was a significant association of family history with pain intensity of dysmenorrhea. Findings suggest alternative methods of pain management such as Aerobic exercises, Transcutaneous Electrical Nerve Stimulation, Kinesiotape and others.

Key Words: Dysmenorrhea, Impact, Pain intensity, Management Practice, Female undergraduates.

Introduction

Dysmenorrhea is one of the most common gynecological conditions that most females of child-bearing age suffer from during menstruation ((Mendiratta & Lentz, 2022). Although it is a common condition, it is usually undertreated or overlooked as many women believe it to be a natural process. Primary dysmenorrhea can be defined as cramping pain in the lower abdomen occurring just before or during menstruation, in the absence of other diseases such as endometriosis (Gutman et al., 2022). Primary dysmenorrhea may be accompanied with sweating, headache, nausea, vomiting, diarrhea and tremulousness (De Sanctis et al., 2015). Women with primary dysmenorrhea have increased production of prostaglandin, resulting in increased uterine tone and stronger, more powerful contractions (Shreemal & Gupta, 2019). A diagnostic evaluation is unnecessary in women with typical symptoms and no risk factors for secondary causes.

The prevalence of dysmenorrhea captures the proportion of persons who experience it at or during a particular time period. The exact prevalence is difficult to estimate, as it is variably reported. Though from a systematic review, the worldwide prevalence of Primary dysmenorrhea ranges from 45 to 95% of women of reproductive age, where 2 to 29% experience severe pain (Mendiratta & Lentz, 2022; Bernardi et al., 2017). A study done among Hispanic female adolescents found that 3 months prior to the study 85% of the adolescents reported experiencing dysmenorrhea (Banikarim et al., 2000). A study done among 356 Naples professional institute adolescent (Balbi et al., 2000) and Nigeria college students in the urban area of Ile-Ife, Osun (Esimai & Esan, 2010), found the prevalence of Primary dysmenorrhea as 82.30% and 62.5%, respectively. In Nigeria, a study from Eastern Nigeria reported a 25% prevalence of dysmenorrhea, with 25% of them having debility severe enough to prevent them from attending school (Nwankwo et al., 2010). Other Nigerian studies reported much higher prevalence at 72.3% and 77.8%, respectively (Akinyotu et al., 2017)

Dysmenorrhea is a common cause of frequent short-term work, reading disfunction and school absenteeism, in female adolescents (Minaleshewa et al., 2017). Approximately 10–15% of females experience monthly menstrual pain severe enough to stop normal daily functions at work, home, or school (Kural et al., 2015) as well as reducing young women's capacities to concentrate, participate, and apply test-taking skills, thereby adversely impacting on overall grades (Armour et al., 2019)

In managing primary dysmenorrhea, physical exercise and positioning such as walking and prone position have been found effective (Ayşe Çuvadar & Elnaz Karamelikli, 2024). The use of drug therapy, such as simple analgesic, nonsteroidal anti-inflammatory drugs (NSAID), and antispasmodics, have also been reported to be effective (Zaman et al., 2023). In addition, combined estrogen/progestin oral contraceptives have been effective among adolescents and young adults who do not respond to treatment with NSAIDs for three menstrual cycles (Harel, 2012). Recently, continuous low-level heat has been reported to be effective in treating primary dysmenorrhea and may be as effective as medication (Ke et al., 2012). Some nonpharmacological treatment such as herbal, dietary therapies, yoga, meditation, and acupuncture have been used to lessen the effects of dysmenorrhea (Minaleshewa et al., 2017).

Management of primary dysmenorrhea has been seen by many health professionals as simple and can be self-managed. With the widespread availability of over-the-counter NSAIDs, it is

often assumed that women are treating themselves adequately. However, this is not always the case as many women may not seek guidance to identify self-management treatments to alleviate pain (Chéileachair et al., 2022). Similarly, adolescents do not consistently use effective treatment regimens for primary dysmenorrhea (Cherenack et al., 2023). According to Itani et al. (2022), despite the effect that primary dysmenorrhea has on women and young girls, many fail to report it in health care encounters even when their daily activities are restricted.

In adolescents, moderate to severe pain that affects lifestyle and does not respond to pharmacological treatment requires professional attention and appropriate diagnosis of possible underlying pelvic disease.

Statement of the Problem

Primary dysmenorrhea is the most common gynecologic complaint amongst adolescent and young adult females. It is often under looked, underdiagnosed and under treated. Its symptom may be moderate to severe but either way, greatly affects the quality of life of women (Minaleshewa et al., 2017). Dysmenorrhea is a cause of frequent short-term work, reading dysfunction and school absenteeism, in adolescents (Hailemeskel et al., 2016). Even though primary dysmenorrhea is not a real threat of life but can affect the QoL of females and in case of severity it might lead to disability and inefficiency. Moreover, dysmenorrhea can cause mental problems in some of the females resulting in their loneliness and reduced participation in different school activities (Minaleshewa et al., 2017).

It appears to be so common among many female students in College of Health Sciences, Nnamdi Azikiwe University that it may stop normal daily functions at school as well as reducing their capacities to concentrate in the classroom, carryout assignments, participate in group or individual projects, and apply test-taking skills, thereby adversely impacting on overall grades. It could also be observed that issues such as mood swing, misplaced aggression, irritation and isolation are common among students experiencing dysmenorrhea which together could contribute to a significant level of negative impact on their academic performance. These pose a problem for research and raise the question of the impact and management practices by female undergraduates of College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus.

Research Questions

What is the prevalence of primary dysmenorrhea among female undergraduates in College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus?

1. What is the impact of primary dysmenorrhea among female undergraduates in College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus?
2. What methods do female undergraduates in College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus use in management of primary dysmenorrhea?

Methods

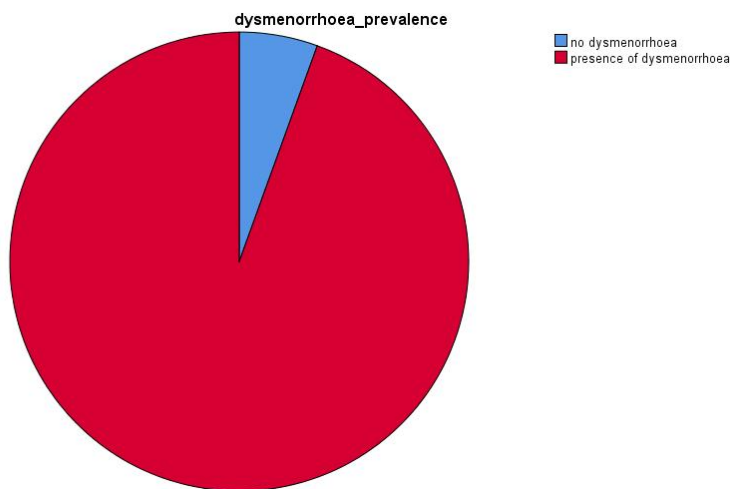
A descriptive cross-sectional survey design was employed for this study. All apparently healthy female undergraduates of College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus. Female undergraduates with primary dysmenorrhea between the ages of 18 to 30 years with no history of conception and female undergraduates from the departments of Medical

Rehabilitation, Medical Laboratory Sciences, Medical Radiography, Environmental Health Sciences, Anatomy, Physiology and 200 level students of Medicine were included in this study. The sample size of 334 female undergraduates was estimated using the Taro Yamane formula. Ethical approval for this study was sought and obtained from the Ethical Review Committee of Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Nnewi Campus before commencement of this study. The instruments for data collections are the Visual Analogue scale for determining the level of pain, the working ability, location, intensity, days of pain, dysmenorrhea [WALIDD] score and the IMD Questionnaire which consists of 4 sections. The study and the screening procedure were explained to the participants and their informed consent was obtained before commencement of data collection. The WALIDD score was first administered online through the use of Google forms to find out the prevalence of primary dysmenorrhea. The consent of the participants to conduct further studies if they met the inclusion criteria was acquired on the last page of the WALIDD score administered. Each participant's contact address was also collected. The questionnaire was then administered to those who met the criteria. Questionnaires for this study was self-administered and administered with the help of research assistants. The questionnaire was distributed physically and through social media, using Google Forms, at the leisure of the participants. Distribution of WALIDD score was made faster and possible through the course representatives of each level who forwarded them to the female students in their respective classes, the online questionnaire was sent to each participant as a WhatsApp direct message while the physical questionnaire was distributed to the participants who preferred the physical administration of questionnaires by going to their respective lodges during the weekend as this was a more convenient time for them. Each participant was given 10-15 minutes to complete the questions. The report of this study gotten through Google forms was written according to the Checklist for Reporting Results of Internet E-Surveys guidelines (Eysenbach, 2004). The data collected was compiled and summarized by adopting appropriate statistical techniques and inferences: Frequency and percentage were used for describing degree of dysmenorrhea, Mean and standard deviation was used for descriptive statistics.

Results

Research Question 1

What is the prevalence of primary dysmenorrhea among female undergraduates in College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus?



Data in figure 1 show that there is 94.5% prevalence of dysmenorrhea amongst the participants while 5.5% of participants had no dysmenorrhea. The second Instrument on severity and impact of dysmenorrhea (VAS score) was sent out to the 342 participants and recorded a 79% return rate. It recorded 14.6% of mild dysmenorrhea, 53.5% of moderate dysmenorrhea and 31.9% of severe dysmenorrhea.

Research Question 2

What is the impact of primary dysmenorrhea among female undergraduates in College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus?

Table 1. Impact of dysmenorrhea on the academic performance of Students of College of Health Sciences

Symptom	Strongly disagree	Disagree	Agree	Strongly agree
It makes me absent from school	20(7.4)	71(26.3)	102(37.8)	47(17.4)
It makes it difficult for me to concentrate in class.	6(2.2)	24(8.9)	132(48.9)	79(29.3)
It makes me fall asleep in class	31(11.5)	112(41.5)	68(25.2)	31(11.5)
I submit incomplete homework	53(19.6)	143(53)	27(10.0)	18(6.7)
I find it difficult to read	12(4.4)	28(10.4)	138(51.1)	63(23.3)
I find it difficult to go for postings and attend practical	17(6.3)	57(21.1)	101(37.4)	67(24.8)

Data in Table 1 shows majority of the participants (55.2) reported to be absent from school, most of the participants (74.4) found it difficult to read, 16.7% submitted incomplete homework due to dysmenorrhea. Majority of the participants (78.1) had negative impact on their academics.

Research Question 3

What methods do female undergraduates in College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus use in management of primary dysmenorrhea?

Table 2 . Participants response/management practice of dysmenorrhea.

Item	Response	Frequency	Percentage
If yes, how many hours do you take rest	<6	102	37.8
	6-8	55	20.4
	8-10	22	8.1
	>10	22	8.1
Have you consulted doctor for dysmenorrhea?	No	237	87.8
	Yes	33	12.2
Have you been prescribed medications for dysmenorrhea?	No	195	72.2
	Yes	75	27.8
If yes, mention the name of the drug and frequency	NSAIDs	56	20.7
	Anticholinergic	7	2.6
	Acetaminophen	7	2.6
	Hormonal	1	.4
	Antibiotics	1	.4
Do you take medicines without prescription for dysmenorrhea?	No	148	54.8
	Yes	122	45.2
If yes, mention the name of the drug and frequency	Acetaminophen	32	11.9
	Folic acid	1	.4
Measures taken to get relieve from abdominal pain (tick all that apply)	Hot app/cold pack	109	40.4
	Bed rest/sleep	204	75.6
Do you perform any exercises?	No	188	69.6
	Yes	81	30.0
If yes, what type of exercises	Yoga	35	13.0
	Meditation	13	4.8
	Breathing exercises	34	12.6
Action taken for dysmenorrhea during class hours (mcq)	Inform friends	36	13.3
	Manage by self	193	71.5
	Ask permission	60	22.2
	Other	15	5.6

Of those who reported to take adequate rest during menstruation, majority of them 37.8% rested for less than 6 hours, majority of the participants have not consulted a doctor for dysmenorrhea and 71.5% reported the action taken for dysmenorrhea during class hours to be managed by self (Table 2)

Discussion of Findings

The result of this study showed a high prevalence rate of dysmenorrhea (94.5%). This was similar with what was obtained in other studies (Ako et al., 2022 and Ameade et al., 2018) that

recorded a high prevalence of primary dysmenorrhea among women of child bearing age, in contrast, some studies carried out on female undergraduates at Obafemi Awolowo University, Ile-Ife, Nigeria (Titilayo et al., 2010) reported lower prevalence rate of dysmenorrhea. The extreme variations in these prevalence estimates may be due to the use of different population size and the absence of a universally accepted method of defining dysmenorrhea. This may also be because of the impact of different cultures on the perception of pain, some tend to think that dysmenorrhea is normal and is an inevitable part of womanhood (Karout et al., 2021). Majority of the participants scored their pain to be moderate to severe while a smaller population reported theirs as mild. This is similar to a Cameroonian study (Ako et al., 2022) whose findings were also reported to be moderate to severe. Though there was a great difference in pain severity score of some studies like an Egyptian prevalence study where the majority reported their pain as mild (Nesreen AA et al., 2018). The most likely explanation to this variation is that, perception and expression of pain is influenced by genetics, psychological, developmental, familial, social and cultural factors (Ameade et al., 2018), another factor include variability of pain threshold in participants of different studies. The result revealed that during dysmenorrhea, students will face a tremendous negative impact in their educational performance. Among the impacts of dysmenorrhea, absenteeism from school, poor concentration, difficulty reading, and inability to go for postings and attend practical were the most frequent in this study. This is in agreement with similar studies reported from Nigeria (Armour et al., 2019; Ezebialu et al., 2021), which shows that there has been an increased number of absenteeism, negative academic outcomes and decreased normal daily functions. Majority of the sufferers however never failed to submit a complete homework; this may be because of the strict educational system of Nigerian Universities as lecturers would never consider dysmenorrhea as a pardonable excuse for not turning in homework. This could also be because scores are attached to the homework and they do not want to lose them. The disadvantage of this is that the participants may not be turning in their best work as pain hinders their full capacity to function. Hence, the participants end up turning in homework just for the sake of it than to actually submit a well-researched and thoroughly done work.

Conclusion

The following conclusions were drawn from the findings of the study:

1. There is an alarmingly high prevalence of primary dysmenorrhea among female undergraduates of College of Health Science, Nnamdi Azikiwe University, Nnewi Campus.
2. Dysmenorrhea has a tremendous negative impact on the academics of female undergraduates especially regarding school attendance and reading abilities
3. A significant number of the participants took medications without prescriptions, a small number of the participants used alternative methods for the management of dysmenorrhea.

Recommendation

1. Participants should consider alternative pain managements such as Aerobic exercises, Transcutaneous Electrical Nerve Stimulation, Kinesio tapes and others.
2. University institutions should make inclusive laws to accommodate students with severe dysmenorrhea such as e-learning and leniency when they miss certain deadlines for example: failure to submit homework at stipulated date due to the pain.

3. Moreover, it is essential for primary healthcare practitioners and the student government to provide counseling services and discussion groups for students with Primary dysmenorrhea in order to optimize its treatment outcomes.

References

- Akinyotu, O., Bello, F., & Odubamowo, K. (2017). Dysmenorrhea among female students at a Teaching Hospital in South-Western Nigeria. *Tropical Journal of Obstetrics and Gynaecology*, 34(2), 129. https://doi.org/10.4103/tjog.tjog_10_17
- Ako, T. W., Obichemti, E. T., Florent, F. Y., & Pierre, W. (2022). Primary Dysmenorrhea; Prevalence, Treatment Practices and Impact among High School Students in 2 Secondary Schools in Bafoussam. *Open Journal of Obstetrics and Gynecology*, 12(08), 731–759. <https://doi.org/10.4236/ojog.2022.128064>
- Ameade, E. P. K., Amalba, A., & Mohammed, B. S. (2018). Prevalence of dysmenorrhea among University students in Northern Ghana; its impact and management strategies. *BMC Women's Health*, 18(1). <https://doi.org/10.1186/s12905-018-0532-1>
- Armour, M., Parry, K., Al-Dabbas, M. A., Curry, C., Holmes, K., MacMillan, F., Ferfolja, T., & Smith, C. A. (2019). Self-care strategies and sources of knowledge on menstruation in 12,526 young women with dysmenorrhea: A systematic review and meta-analysis. *PLOS ONE*, 14(7), e0220103. <https://doi.org/10.1371/journal.pone.0220103>
- Ayşe Çuvadar, & Elnaz Karamelikli. (2024). Examination of the effects of primary dysmenorrhea on daily life of young women and treatment approaches. *Çağdaş Tıp Dergisi*, 21(1), 48–54. <https://doi.org/10.23950/jcmk/14275>
- Balbi, C., Musone, R., Menditto, A., Di Prisco, L., Cassese, E., D'Ajello, M., Ambrosio, D., & Cardone, A. (2000). Influence of menstrual factors and dietary habits on menstrual pain in adolescence age. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 91(2), 143–148. [https://doi.org/10.1016/s0301-2115\(99\)00277-8](https://doi.org/10.1016/s0301-2115(99)00277-8)
- Banikarim, C., Chacko, M. R., & Kelder, S. H. (2000). Prevalence and Impact of Dysmenorrhea on Hispanic Female Adolescents. *Archives of Pediatrics & Adolescent Medicine*, 154(12), 1226. <https://doi.org/10.1001/archpedi.154.12.1226>
- Bernardi, M., Lazzeri, L., Perelli, F., Reis, F. M., & Petraglia, F. (2017). Dysmenorrhea and related disorders. *F1000Research*, 6(6), 1645. <https://doi.org/10.12688/f1000research.11682.1>
- Chéileachair, F. N., McGuire, B. E., & Durand, H. (2022). Coping with dysmenorrhea: a qualitative analysis of period pain management among students who menstruate. *BMC Women's Health*, 22(1), 1–11. <https://doi.org/10.1186/s12905-022-01988-4>
- De Sanctis, V., Soliman, A., Bernasconi, S., Bianchin, L., Bona, G., Bozzola, M., Buzi, F., De Sanctis, C., Tonini, G., Rigon, F., & Perissinotto, E. (2015). Primary Dysmenorrhea in Adolescents: Prevalence, Impact and Recent Knowledge. *Pediatric Endocrinology Reviews: PER*, 13(2), 512–520. <https://pubmed.ncbi.nlm.nih.gov/26841639/>
- Durain, D. (2004). Primary Dysmenorrhea: Assessment and Management Update. *Journal of Midwifery & Women's Health*, 49(6), 520–528. <https://doi.org/10.1016/j.jmwh.2004.08.013>
- Esimai, O., & Esan, Goo. (2010). Awareness of menstrual abnormality amongst college students in urban area of Ile-Ife, Osun State, Nigeria. *Indian Journal of Community Medicine*, 35(1), 63. <https://doi.org/10.4103/0970-0218.62559>
- Eysenbach, G. (2004). Improving the quality of Web surveys: The checklist for reporting results of internet E-Surveys (CHERRIES). *Journal of Medical Internet Research*, 6(3), e34. <https://doi.org/10.2196/jmir.6.3.e34>
- Ezebialu, I., Ezenyeaku, C., & Umeobika, J. (2021). Prevalence of Dysmenorrhea and its Contribution to School Absenteeism Among Nigerian Undergraduate Students. *Annals of Health Research*, 59–66. <https://doi.org/10.30442/ahr.0701-07-116>
- Gutman, G., Nunez, A. T., & Fisher, M. (2022). *Dysmenorrhea in adolescents. Current problems in pediatric and adolescent health care*, (pp. 101–108).
- 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. *International Journal of Women's Health*, Volume 8, 489–496. <https://doi.org/10.2147/ijwh.s112768>

- Harel, Z. (2012). Dysmenorrhea in adolescents and young adults: an update on pharmacological treatments and management strategies. *Expert Opinion on Pharmacotherapy*, 13(15), 2157–2170. <https://doi.org/10.1517/14656566.2012.725045>
- Itani, R., Soubra, L., Karout, S., Rahme, D., Karout, L., & Khojah, H. M. J. (2022). Primary Dysmenorrhea: Pathophysiology, Diagnosis, and Treatment Updates. *Korean Journal of Family Medicine*, 43(2), 101–108. <https://doi.org/10.4082/kjfm.21.0103>
- Karout, S., Soubra, L., Rahme, D., Karout, L., Khojah, H. M. J., & Itani, R. (2021). Prevalence, risk factors, and management practices of primary dysmenorrhea among young females. *BMC Women's Health*, 21(1). <https://doi.org/10.1186/s12905-021-01532-w>
- Ke, Y.-M., Ou, M.-C., Ho, C.-K., Lin, Y.-S., Liu, H.-Y., & Chang, W.-A. (2012). Effects of Somatothermal Far-Infrared Ray on Primary Dysmenorrhea: A Pilot Study. *Evidence-Based Complementary and Alternative Medicine*, 2012, 1–8. <https://doi.org/10.1155/2012/240314>
- Kural, M., Noor, N. N., Pandit, D., Joshi, T., & Patil, A. (2015). Menstrual characteristics and prevalence of dysmenorrhea in college going girls. *Journal of Family Medicine and Primary Care*, 4(3), 426–431. <https://doi.org/10.4103/2249-4863.161345>
- Mendiratta, V., & Lentz, G. M. (2022). Primary and secondary dysmenorrhea, premenstrual syndrome, and premenstrual dysphoric disorder. *Elsevier EBooks*, 768-780.e4. <https://doi.org/10.1016/b978-0-323-65399-2.00044-9>
- Minaleshewa, B. G., Mekuria, A. B., Tefera, Y. G., Andarge, D. A., Debay, Y. B., Bejiga, G. S., & Gebresillassie, B. M. (2017). Prevalence, Impact, and Management Practice of Dysmenorrhea among University of Gondar Students, Northwestern Ethiopia: A Cross-Sectional Study. *International Journal of Reproductive Medicine*, 2017, 1–8. <https://doi.org/10.1155/2017/3208276>
- Nesreen AA, S., Ahmed E, A., Hamada A Abd El, W., Ashraf S, F., & Gaber K, H. (2018). Epidemiology of Dysmenorrhea among University Students in Egypt. *International Journal of Women's Health and Wellness*, 4(1). <https://doi.org/10.23937/2474-1353/1510073>
- Nwankwo, T. O., Aniebue, U. U., & Aniebue, P. N. (2010). Menstrual Disorders in Adolescent School Girls in Enugu, Nigeria. *Journal of Pediatric and Adolescent Gynecology*, 23(6), 358–363. <https://doi.org/10.1016/j.jpjg.2010.04.001>
- Shreemal, P., & Gupta, Y. (2019). Primary dysmenorrhea & its homoeopathic therapeutics. ~ 77 ~ *International Journal of Homoeopathic Sciences*, 3(2), 77–79. <https://www.homoeopathicjournal.com/articles/78/3-2-20-943.pdf>
- Tangchai, K., Titapant, V., & Boriboonhirunsarn, D. (2004). Dysmenorrhea in Thai adolescents: prevalence, impact and knowledge of treatment. *Journal of the Medical Association of Thailand = Chotmaihet Thangphaet*, 87 Suppl 3, S69-73. <https://pubmed.ncbi.nlm.nih.gov/21218593/>
- Titilayo, A., Agunbiade, O. M., Banjo, O., & Lawani, A. (2010). Menstrual discomfort and its influence on daily academic activities and psychosocial relationship among undergraduate female students in Nigeria. *Tanzania Journal of Health Research*, 11(4). <https://doi.org/10.4314/thrb.v11i4.50173>
- Zaman, A. Y., Alameen, A. M., Alreefi, M. M., Kashkari, S. T., Alnajdi, S. A., Shararah, A. A., Alzolaibani, S. M., & Mahrous, F. A. (2023). Comparison of herbal medicines and pain relief medications in the treatment of primary dysmenorrhoea among female medical students at Taibah University. *Journal of Taibah University Medical Sciences*, 18(3), 455–460. <https://doi.org/10.1016/j.jtumed.2022.10.015>