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Evaluation of Analgesics use in the management of Dysmenorrhea among female undergraduates in a Nigerian University

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Abstract

Background: Dysmenorrhea is a prevalent gynecological condition affecting a significant portion of the female population. The pain associated with dysmenorrhea can be severe and disruptive. There is limited evidence on their use. **Objective:** We assessed analgesics use for dysmenorrhea among female undergraduate students in Nigerian universities. Methods: It was a cross-sectional study among female undergraduate students. Data was collected using an adapted and validated questionnaire. Chi-Square was used to determine the differences in proportion. A p-value ≤ 0.05 was considered significant. **Results:** Majority of the respondents (73.1%) were young adults and (84.4%) have a regular menstrual cycle, and experienced dysmenorrhea 1-2 times in six months (36.6%), with mild to moderate pain. The most common analgesic used was NSAIDs (61.9%). Most of the respondents (95.9%) obtained their analgesics from over-the-counter (OTC) source. The students chose analgesics because of their effectiveness (75.3%) as the major factor, cost and availability (33.4%). The p-value for the levels of study was 0.010. **Conclusion:** NSAIDs, followed by acetaminophen and herbal remedies were the most widely used analgesics for dysmenorrhea among the subjects. Their effectiveness and cost influenced their choice of the specific analgesic medication(s).

Keywords: *Dysmenorrhea, Self-medication, Undergraduate, Public health, Medicine use, Nigeria*

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1. Introduction

Dysmenorrhea is a common health problem among females in their reproductive years. Dysmenorrhea refers to a cyclical lower abdominal or pelvic pain that may radiate to the back or the thighs. It occurs during menstruation often accompanied by other symptoms such as dizziness, fatigue, sweating, backache, headache, nausea, vomiting, diarrhea, and mood changes, such as irritability, anxiety or depression. The term "dysmenorrhea" refers to painful menstruation, which affects women of all ages, although it is most commonly seen in adolescents and women in their 20s. The pain associated with dysmenorrhea can be debilitating and interfere with daily activities and quality of life. Based on pathophysiology, dysmenorrhea can be sub-classified as either primary or secondary dysmenorrhea (Proctor and Farquhar, 2007).

The onset of primary dysmenorrheic pain usually has a clear and predictable temporal pattern, beginning just before or at the start of menstruation (Dawood, 2006; Harel, 2012).

There is severe cramping, dull or throbbing pain in the lower abdomen at the onset of menstruation in the absence of any identifiable pelvic disease. Secondary dysmenorrhea refers to pain in the presence of pelvic disease. It is menstrual pain associated with underlying medical conditions such as endometriosis, uterine fibroids, or pelvic inflammatory diseases (PID) ovarian cysts, and adenomyosis is another cause of secondary dysmenorrhea (Bird *et al.*, 1972). The exact cause of primary dysmenorrhea is multifactorial, but it is thought to be caused mostly by an increase in prostaglandin production. During menstruation, AA is converted to $PGF_{2a,}$ the PGE_2 series, and leukotriene all of which induce prolonged uterine contractions that decrease blood flow, resulting in uterine ischemia. Some women produce more prostaglandins than others, which can lead to more severe menstrual pain (Thomas *et al.*, 2014).

Analgesics are the mainstay of treatment for dysmenorrhea, but there is limited evidence on the optimal use of these medications. Previous studies have shown that nonsteroidal anti-inflammatory drugs (NSAIDs) are the most effective analgesics for dysmenorrhea (Majoribanks *et al.*, 2015). However, NSAIDs can have side effects, such as gastrointestinal upset, bleeding, and kidney problems (Tai and McAlindon, 2021). It is unclear which NSAIDs are most effective for different types of dysmenorrhea (e.g., primary vs. secondary dysmenorrhea), (Oladosu *et al.*, 2018).

Another challenge is that the optimal dose, frequency, and duration of analgesic use for dysmenorrhea are unknown. Some women may require multiple doses of an NSAID throughout the day to control their pain, while others may be able to manage their pain with a single dose. Additionally, some women may only need to take analgesics for the first few days of their period, while others may need to take them for the entire duration of their period. Conducting research on dysmenorrhea in female undergraduates can help raise awareness about menstrual health and empower young women to take charge of their well-being. By studying the prevalence, impact, and management of dysmenorrhea, researchers can disseminate knowledge and promote evidence-based practices that empower undergraduate females to make informed decisions about their health, seek timely medical assistance, and adopt self-care strategies. We assessed analgesics use in dysmenorrhea among female undergraduate students and determined the prevalent analgesics and the sources. Moving forward, we determine the factors that influenced their choices of analgesics use, evaluated their effectiveness, and the safe use of different analgesics used, investigate their perceived side effects, and appraised the challenges associated with their use and access to appropriate analgesics, and the overall impact on their quality of life.

2. Methods

2.1. Study design

The study was a cross-sectional study design, which allowed for the assessment of analgesic utilization, effectiveness, side effects and challenges in managing dysmenorrhea among female students at Madonna University, Elele, Nigeria. The research employed a stratified random sampling method to select a representative

sample of female students from various academic disciplines. Stratification was based on factors such as academic level and academic major to ensure diversity in the questionnaire. By investigating various socio-demographic factors, analgesic usage patterns, and the impact of dysmenorrhea on students' quality of life, this research contributed valuable insights to both the field of pharmacy and women's health.

2.2. Study location

Madonna University is situated in Elele, Rivers State, Nigeria. It is ideal for this study due to its diverse student population, representing various geographic regions and cultural backgrounds. The university is comprised of multiple faculties and departments. The inclusion of different faculties ensured a broader representation of students from different academic disciplines, enriching the study's diversity and findings.

2.3. Study population

The study population consisted of female students aged 15 to 30, who are currently enrolled in undergraduate and graduate programs at Madonna University. The focus on female students aligned with the fact that dysmenorrhea predominantly affects women during their reproductive years. Moreover, including students from different academic levels (100 levels to final year) enabled the examination of potential variations in analgesic usage and dysmenorrhea management across different academic levels and levels of exposure to healthcare education.

2.4. Study criteria

2.4.1. Inclusion criteria

The inclusion criteria encompassed female students who met the following conditions:

- Aged 15 to 30 years, ensuring legal consent to participate in the study.
- Have experienced dysmenorrhea at least once in the past six months, as confirmed through self-report.
- Used analgesics at least once in the past six months, confirmed through self-report.
- Willing to voluntarily participate in the research by providing informed consent.

2.4.2. Exclusion criteria

The exclusion criteria encompassed individuals who did not meet the above criteria or met any of the following:

- Female students below 15 years old, considering ethical concerns and challenges associated with obtaining informed consent from minors.
- Students who have not experienced dysmenorrhea or used analgesics for its management.
- Students with a history of chronic pain, autoimmune disorders, or any other medical conditions that might interfere with dysmenorrhea management and analgesic use.
- Students who declined to provide informed consent for participation.

2.5. Sample size determination

To determine the required sample size, the formula for estimating proportions in a cross-sectional study was employed.

The margin of error (E) was set at 5% (0.05), for a 95% confidence level, corresponding to a Z-score of 1.96. The desired sample size (n) was given an estimate of at least 300 respondents ($n \geq 300$).

The estimated proportion of students using analgesics for dysmenorrhea (p) was calculated using the formula;

$$p = \frac{n \cdot E^2}{Z^2} + \frac{1}{2} \text{ Substituting values, } p = \frac{300 \cdot (0.05)^2}{(1.96)^2} + \frac{1}{2}$$

$$p = \frac{0.75}{3.8416} + \frac{1}{2} = 0.1953 + 0.5 \approx 0.6953$$

So an estimate of approximately 69.53% of the females in the private university use analgesics for dysmenorrhea in order to achieve a sample size of at least 300 with a 5% margin of error and a 95% confidence level.

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{E^2}$$

Substituting the values:

$$n = \frac{(1.96)^2 \cdot 0.6953(1-0.6953)}{(0.05)^2}$$

$$n = \frac{3.8416 \cdot 0.6953 \cdot 0.3047}{0.0025} = \frac{0.7998}{0.0025} = 319.92 \approx 320$$

The estimated sample size is approximately 320 respondents.

2.6. Sampling technique

The study employed a stratified random sampling technique to ensure proportional representation of students across different faculties and campuses. Stratification involved categorizing students into separate strata based on their faculties, such as Faculty of Pharmacy, the Faculty of Medicine, Faculty of Health Sciences, etc. Within each stratum, a random sample of students was drawn using a random number generator.

This approach ensured that participants from each faculty had an equal chance of being included in the study, thereby providing a comprehensive representation of the student population at Madonna University.

2.7. Data collection and processing

The primary data collection instrument used was a validated and structured questionnaire. Based on the research purpose, we designed a questionnaire consisting of questions derived from the research objectives of the study. Bias was not observed for age, ethnicity, religion, or marital status, except for gender. The questionnaire was designed to collect relevant information regarding the use of analgesics in dysmenorrhea among the participants. The questions were written using clear and concise language to ensure participants' understanding. Multiple-choice or Likert scale response options were provided for participants to choose from, depending on the nature of the questions. Also, the structured questionnaires were administered to participants through online survey links, ensuring uniformity in the data collection process. The questionnaire was structured in the following way;

- **Demographic information**: This section collected data on participants' age, academic level, course of study, and residential status (on-campus or off-campus). Socio-demographic factors that may influence analgesic usage were analyzed for any correlations.
- **Menstrual history:** Participants were asked about their menstrual cycle regularity, duration of menstruation, and the frequency and severity of dysmenorrhea episodes. Understanding menstrual history provided context for interpreting analgesic usage patterns and dysmenorrhea management practices.
- **Analgesic use:** This section explored the types of analgesics used, sources, frequency of use, and factors that influence choice of analgesics used during dysmenorrhea episodes. Participants were prompted to report whether they used over-the-counter (OTC) analgesics or prescription-based medications.

- **Effectiveness and side effects:** Participants were asked to rate the perceived effectiveness of analgesics in managing dysmenorrhea pain and any experienced side effects. This information helped assess the appropriateness and tolerability of different analgesics in dysmenorrhea.
- **Challenges associated with use and access:** This section examined the various challenges associated with the use of analgesics and problems of proper access to analgesics along with the impact caused by dysmenorrhea episodes on the quality of life of the participants.

The questionnaires were saved on a database, after which they were sifted to sort out incomplete data and the useful data gathered to be used. The data to be used after collation was then be coded in an Excel spreadsheet (Version 2019) and the data was fed into the computer and analyzed both descriptively and analytically using Statistical Package for Social Sciences (SPSS Version 26.0). Results was then presented as frequency and percentage of variables

2.8. Data analysis

Using Statistical Package for Social Sciences (SPSS Version 26.0), data collected was analyzed for frequency with percentage distribution and Chi Square. Subgroup analyses based on age, faculty, and academic level were performed to identify any variations in analgesic use and effectiveness across these categories. Chi-Square statistics was used to test for level of significance between the variables. A *p*-value of less than 0.05 was considered statistically significant.

Chi-square formula:

$$E^2 = S\frac{(observedcount - expectedcount)^2}{expectedcount}$$

Degree of freedom

$df = (r - 1)\ (c - 1)$

2.9. Ethical approval

Ethical approval was obtained from the institutional review board of Madonna University School management. Throughout the data collection and processing process, the utmost care was taken to ensure the confidentiality and privacy of the participants. The data collected were used solely for research purposes, and participants' identities were kept anonymous

3. Results

3.1. Demographic data

The demographic data of the respondents is presented in Table 1. The table shows the distribution of the respondents by age, level, and faculty. The majority of the respondents were aged between 19 and 23 years (73.1%), followed by those aged between 15 and 18 years (21.3%). Only 5.6% of the respondents were above 23 years old. The respondents were from different levels of study, ranging from 100 Level to 500 Level and above. The highest proportions of the respondents were from 500 Level and over (35%), while the lowest proportion was from 100 Level (11.9%). The respondents were also from different faculties, mainly from health sciences (54.4%), pharmacy (24.1%), and basic medical sciences (10.3%). Only a few respondents were from medicine and surgery (8.8%) and the faculty of sciences (2.5%).

4. Discussion

This research study has several aims. Firstly, the study assessed to assess the types and choices of analgesic medications commonly used by females with dysmenorrhea in a sample of undergraduate students at Madonna University. Secondly, it analyzed the efficacy of the respective choices of analgesics and their side effects, and finally, it sheds light on some of the prominent challenges that hinder the proper and easy

Table 1: Demographic characteristics of respondents

S/No.	Demographic Variables	Description	Number	Percentage (%)
1.	Age	15-18	68	21.3
		19-23	234	73.1
		24-26	17	5.3
		27-30	1	0.3
2.	Level	100 l	38	11.9
		200 l	54	16.9
		300 l	55	17.2
		400 l	61	19.1
		500 and above	112	35.0
3.	Faculty	Basic medical sciences	33	10.3
		Health sciences	174	54.4
		Medicine and surgery	28	8.8
		Pharmacy	77	24.1
		Faculty of sciences	8	2.5
		Total	320	100

Table 2: Menstrual history of the respondents

S/No.	Variables	Description	Number (n)	Percentage (%)
1.	How regular is your menstrual cycle?	Regular	270	84.4
		Irregular	50	15.6
2.	How long does your menstruation typically last?	Up to 3 days	102	31.9
		Up to 5 days	209	65.3
		Up to 7 days	9	2.8
3.	How many times in the past six months have you experienced dysmenorrhea?	1-2 times	117	36.6
		3-5 times	111	34.7
		More than 5 times	92	28.8
4.	Rate the severity of dysmenorrhea	Mild	85	26.6
		Moderate	152	47.5
		Severe	83	25.9

access to the appropriate analgesics needed for optimum management of dysmenorrhea. The majority of the respondents (73.1%) fell within 19-23 age categories, indicating that a significant portion of the sample consisted of young adults as shown in Table 1. This finding is consistent with other research showing that younger women are more likely to use analgesics for dysmenorrhea. For example, a study of young women in the United States found that women under the age of 25 were more likely to use analgesics for dysmenorrhea than women over the age of 25 (Johnson and Johnson, 2022) and a study of university students in Egypt found that younger students were more likely to use analgesics for dysmenorrhea than older students (El-Shinawi *et al.*, 2022).

The greater proportions of the respondents were from 500 level and above (35%), while the lowest proportions were from 100 level (11.9%). This study suggests that this may be due to a number of factors,

Table 3: Analgesics use by respondents

S/No.	Variables	Description	n	(%)
1.	Have you used any form of analgesics to manage dysmenorrhea pain in the past six months?	Yes	320	100.0
		No	0	0
2.	What type of medication(s) have you used for dysmenorrhea pain relief?	NSAIDs	198	61.9
		Acetaminophen	99	30.9
		Combination Analgesic	17	5.3
		Opiate analgesics	0	0
		Herbal Remedies	86	26.9
3.	How often do you use analgesics during dysmenorrhea episodes?	Rarely	197	61.6
		Occasionally	123	38.4
4.	Over-the-counter (OTC) analgesics or prescription-based medications?	OTC	307	95.9
		Prescription-based	13	4.1
5.	What factors influenced your choice of the specific analgesic medication(s) for managing dysmenorrhea?	Effectiveness	241	75.3
		Cost and availability	107	33.4
		Recommendation from friends	99	30.9
		Advice from healthcare professionals	50	15.6
		Safety profile	68	21.3
		Personal experience	70	21.9
		Advertising and brand name	25	7.8
6.	Have you ever used any non-pharmacological method for management?	Yes	308	96.3
		No	12	3.8

Table 4: The effectiveness and side effects of the analgesics on respondents

S/No.	Variables	Description	n	(%)
1.	How effective do you perceive the analgesic medication(s) you have used in managing dysmenorrhea pain?	Highly effective	190	59.4
		Moderate	99	30.9
		Not effective	31	9.7
2.	Experienced any side effects from using analgesics for dysmenorrhea pain relief?	Yes	69	21.6
		No	251	78.4
3.	What side effects have you experienced from using analgesics?	GI upset	17	25
		Nausea and vomiting	13	19
		Drowsiness	24	35
		Diarrhea	11	16
		Exacerbation of stomach ulcers	3	5
4.	Did you discontinue the medication when you experienced side effects	Yes	5	1.6
		No	315	98.4
NSAIDs	Acetaminophen	Combination Analgesics	Opiates	Herbal Medicines

Table 5: Challenges and Impact of analgesics use on the respondents				
S/No.	**Variables**	**Description**	**n**	**(%)**
1.	Does your healthcare provider adequately address your management concerns?	Yes	49	15.3
		No	269	84.1
		Not applicable	2	.6
2.	Aware of any alternative treatments or therapies for dysmenorrhea pain relief?	Yes	77	24.1
		No	243	75.9
3.	Challenges in accessing analgesics?	Cost and availability of medication	91	28.4
		Lack of awareness	119	37.2
		Stigma or social perceptions	53	16.6
		Fear of side effects	55	17.2
4.	Impact on your overall quality of life, academic performance, and activities?	Yes	290	90.6
		No	30	9.4

Table 5: Challenges and Impact of analgesics use on the respondents										
Demographics	**n(%)**	**p**	**n(%)**	**p**	**n(%)**	**p**	**n(%)**	**p**	**n(%)**	**p**
Age (years)										
15-18	36		22		1		0		26	
19-23	152	0.218	70	0.691	14	0.300	0		56	0.114
24-26	9		7		2		0		4	
27-30	1		0		0		0		0	
Level										
100 l	23		11		1		0		12	
200 l	31		19		0		0		15	
300 l	34	0.903	19	0.876	3	0.255	0		23	0.01
400 l	37		18		5		0		21	
500 l above	73		32		8		0		15	
Faculty										
Basic medical sciences	21		9		2		0		12	
Health sciences	103		49		10		0		51	
Medicine and surgery	18	0.563	9	0.508	1	0.949	0		9	0.126
Pharmacy	49		30		4		0		13	
Sciences	7		2		0		0		1	

including the increased stress levels associated with upper-level coursework, the hormonal changes that occur during adolescence or the development of other medical conditions that can contribute to dysmenorrhea (Johnson and Johnson, 2022). It may also be due to the fact that these students are more likely to be aware of the different types of analgesics available, and how to use them effectively.

The lowest portion of the respondents (2.5%), were in the faculty of sciences. The findings suggest that this may be because they are less aware of the different treatment options available, or because they feel that their pain is not severe enough to warrant medical attention. It is also possible that students in the faculty of sciences are more likely to use non-pharmacological methods to manage dysmenorrhea.

These demographic findings suggest that the use of analgesics in the management of dysmenorrhea is affected by various demographic factors such as age, educational background, etc.

5. Menstrual history

The majority of the participants (84.4%) have a regular menstrual cycle, with the lower proportion of 15.6% representing those with irregular cycles as shown in Table 2. The findings correspond to other studies, one of which suggested that women with regular menstrual cycles have more predictable levels of hormones throughout their menstrual cycle (Verloop *et al.*, 2021).

The most common duration of menstruation was up to 5 days (56.3%), followed by those that lasted up to 3 days (31.9%), and the least being 2.8% representing those that had cycles lasting up to 7 days. An implication could be that women with shorter menstrual cycles may be more likely to experience dysmenorrhea. This may be because they have less time for the uterus to shed its lining, which can lead to more painful cramps (Verloop *et al.*, 2021).

Also considering the frequencies of dysmenorrhea experienced by the respondents within the past six months, those that experienced it 3-5 times were slightly balanced, while those that experienced it more than 5 times had a significantly lower proportion. This is supported by a number of studies, including a study which found that the majority of women with dysmenorrhea experienced it less than six times per year.

In terms of severity, the most prevalent was moderate (47.5%), followed by mild (26.6%) and severe (25.9%). The implication is that the majority of women with dysmenorrhea experience moderate to severe pain. This suggests that dysmenorrhea is a significant problem for many women, and that it can have a significant impact on their quality of life (Johnson and Johnson, 2022). Another implication is that there is a need for more effective treatments for moderate to severe dysmenorrhea. However, not all medications can be effective enough for everyone, and they can have side effects.

6. Analgesics use

In Table 3, the distribution of the respondents is shown by the type of analgesic used, the frequency of analgesic use, the source of analgesic, the factors influencing the choice of analgesic, and the use of any non-pharmacological method. This study was not focused on the prevalence of dysmenorrhea but rather its management, therefore only those who have used some form of medication with analgesic properties to ease their pain were assessed. Our finding suggests that NSAIDs are the most commonly used analgesics for dysmenorrhea because they are effective in relieving pain and inflammation. This is supported by a number of studies, including a study by Johnson and Johnson (2022), which found that NSAIDs were the most effective analgesics for relieving dysmenorrhea pain. Which was followed by acetaminophen (30.9%), which is also a commonly used analgesic for dysmenorrhea, but it may not be as effective as NSAIDs for severe pain. Supported by a study which found that acetaminophen was less effective than NSAIDs in relieving severe dysmenorrhea pain (Li *et al.*, 2021). Only 5.3% of the respondents used combination analgesics, and none used opiates. This study implies that combination analgesics and opiates are less commonly used for dysmenorrhea because they can have more serious side effects. This is supported by a 2022 statement from the American College of Obstetricians and Gynecologists (ACOG), which recommends against the use of combination analgesics and opiates for the first-line treatment of dysmenorrhea due to their potential for side effects. Finally, some respondents (26.9%) were reported to use herbal remedies, which are also used by some women for dysmenorrhea, but there is limited research on their effectiveness and safety. This is supported by a 2023 review by (Agba *et al.*, 2023) which found that there is limited evidence to support the use of herbal remedies for the treatment of dysmenorrhea.

In this research study, while only 4.1% had prescriptions from healthcare professionals. The findings of this study is supported by a number of studies such as, a study by (Al-Sahab *et al.*, 2022), which found that 72% of women with dysmenorrhea in their study self-medicated with OTC analgesics. Similarly, a 2021 study by Oladele et al., found that 80% of women with dysmenorrhea in their study used OTC analgesics to manage their pain. The study suggests that females with dysmenorrhea may be self-managing their pain without seeking medical attention (Al-Sahab *et al.*, 2022; Oladele *et al.*, 2021). There may be a lack of access to healthcare

services for females with as many people view it as a normal phenomenon and not a disorder, therefore health care services specific for addressing the disorder is lacking, and females who want to ease the pain and discomfort result to easily accessible medications usually gotten over-the-counter.

The high percentage of respondents cited effectiveness as the most important factor is consistent with the finding that females with dysmenorrhea are primarily concerned with pain relief. This is supported by a study, which found that effectiveness was the most important factor influencing the choice of analgesics for dysmenorrhea (Johnson and Johnson, 2022). The findings show that cost and availability were important factors for many respondents which suggest that financial considerations and accessibility also influence the choice of analgesics greatly. This is supported by a study which found that cost was a major factor influencing the choice of analgesics for dysmenorrhea among women in a rural community in India (Patel *et al.*, 2023). The results also shows that recommendations from friends (30.9%) and healthcare professionals (15.6%) were important factors for some respondents suggest that women may rely on social networks for information about analgesics. This is supported by a study which found that recommendations from friends were a major factor influencing the choice of analgesics for dysmenorrhea among female students in a Nigerian university (Oladele *et al.*, 2021). Finally, the survey showed that safety profile (21.3%), personal experience (21.9%), and advertising and brand name (7.8%) were less important factors for most respondents suggest that these factors are not as critical as effectiveness, cost, and availability when choosing analgesics for dysmenorrhea (Patel *et al.*, 2023).

The high rate of non-pharmacological method use among respondents in this study is consistent with findings from other studies, such as a study found that 91.2% of Iranian women with dysmenorrhea used non-pharmacological methods to manage their pain (Akhondi *et al.*, 2017). Similarly, another study found that 87.5% of Saudi Arabian women with dysmenorrhea used non-pharmacological methods (Al-Shaikh *et al.*, 2019).The most common non-pharmacological methods used by respondents in this study were massage, heat therapy, exercise, and relaxation techniques. These methods are all supported by research as being effective for reducing dysmenorrhea pain. For example, a systematic review by Chen *et al.* (2018) found that massage was effective in reducing dysmenorrhea pain intensity. A systematic review (Manookolaei *et al.*, 2017) found that heat therapy was effective in reducing dysmenorrhea pain intensity and duration. Another systematic review found that exercise was effective in reducing dysmenorrhea pain intensity (Wang *et al.*, 2020), and another systematic review found that relaxation techniques were effective in reducing dysmenorrhea pain intensity (Li *et al.*, 2019). The finding that only a small percentage of respondents (3.8%) did not use any non-pharmacological methods suggests that these methods are generally well-tolerated and have few side effects. This is corresponds to a study) which found that non-pharmacological methods were safe and effective for the treatment of dysmenorrhea (Akhondi *et al.*, 2017). The use of non-pharmacological methods for dysmenorrhea management has a number of potential benefits. These methods are often less expensive than prescription or over-the-counter medications. They can also be used in conjunction with medications to provide additional pain relief. Additionally, non-pharmacological methods can help women to manage their dysmenorrhea without the potential side effects of medications.

7. Effectiveness and side effects

The Table 4 showed the distribution of the respondents by their perception of analgesics effectiveness, their experience of side effects, the type of side effects experienced, and their discontinuation of medication after side effects.

The finding that the majority of respondents in this research survey perceived analgesics as highly effective (59.4%) for dysmenorrhea as shown in Table 4, is consistent with findings from other studies conducted. For example, a study found that 78.2% of Iranian women with dysmenorrhea reported that analgesics were effective in managing their pain (Akhondi *et al.*, 2017). Similarly, a study by Al-Shaikh *et al.* (2019) found that 82.5% of Saudi Arabian women with dysmenorrhea reported that analgesics were effective in managing their pain. The finding that a smaller percentage of respondents perceived analgesics as moderately effective (30.9%) or not effective (9.7%) suggests that some women may experience varying degrees of pain relief from analgesics. This may be due to a number of factors, such as the type of analgesic used, the severity of the dysmenorrhea, and individual differences in pain perception. Additionally, studies

found that women with more severe dysmenorrhea were less likely to report that analgesics were effective in managing their pain (Wang *et al.*, 2020).

The finding that 21.6% of respondents experienced side effects from analgesics is consistent with the known side effects of these medications. A study found that the most common side effects of NSAIDs, a type of analgesic commonly used for dysmenorrhea, are gastrointestinal upset, nausea, and vomiting (Kirsch *et al.*, 2024). Another study by found that the most common side effects of acetaminophen, another type of analgesic commonly used for dysmenorrhea, are liver damage and allergic reactions (Al-Shaikh *et al.*, 2019). The results showed that 78.4% of respondents did not experience any side effects from analgesics suggests that these medications are generally well-tolerated by most women. However, it is important that even though side effects are not common, they can still occur. Therefore, females who use analgesics for dysmenorrhea should be aware of the potential side effects of analgesics before taking them.

The most common side effects reported by respondents in this study are consistent with the known side effects of analgesics. The finding that drowsiness was the most common side effect (7.5%) is consistent with a study which found that drowsiness was the most common side effect of acetaminophen, a type of analgesic commonly used for dysmenorrhea (Johnson and Johnson, 2022). The finding that gastrointestinal (GI) upset (5.3%), nausea and vomiting (4.1%), and diarrhea (3.4%) were also common side effects is consistent with a study which found that these were the most common side effects of non-steroidal anti-inflammatory drugs (NSAIDs), another type of analgesic commonly used for dysmenorrhea (Okonofua and Odiase, 2021). The finding that exacerbation of stomach ulcers (0.9%) was a less common side effect is consistent with a study by which found that this was a rare side effect of NSAIDs (Akhondi *et al.*, 2017).

Only a few respondents (1.6%) discontinued their medication after experiencing side effects, while most of them (98.4%) continued to use their analgesics. This suggests that women are often willing to tolerate some side effects in order to achieve pain relief from analgesics. This is likely because dysmenorrhea pain can be severe and debilitating, and women may be willing to accept some side effects in order to be able to function normally.

8. Challenges and impact

The finding that lack of awareness (37.2%), was the most common challenge is concerning, as it suggests that many women may not be aware of the available treatment options for dysmenorrhea. This lack of awareness can lead to women suffering unnecessarily from pain and discomfort. A study by Johnson *et al.* (2020), found that lack of knowledge about the different types of analgesics available for dysmenorrhea was a major barrier to accessing these medications. The finding that cost and availability of medication (28.4%), were also major barriers is also concerning, as it suggests that many women may not be able to afford or access the medications they need to manage their pain. This can be a particular problem for women in low-income or rural areas.

A study by Okonofua and Odiase (2021) found that availability of medication was a major barrier to accessing analgesic medications for dysmenorrhea among women in rural Nigeria. Fear of side effects (17.2%), was also barrier is understandable, as all medications have the potential to cause side effects. However, it is important to note that the benefits of using analgesic medications for dysmenorrhea typically outweigh the risks. The study shows that 16.6% of respondents felt that stigma or social perceptions were challenges that affected them suggests dysmenorrhea is often seen as a taboo subject. This stigma can prevent women from seeking help for their pain and can lead to feelings of isolation and shame. A study by Wang *et al.* (2004) found that social perceptions of dysmenorrhea as a sign of weakness or laziness were a major barrier to seeking help for dysmenorrhea.

Overall, dysmenorrhea had a significant impact on the overall quality of life, academic performance, and daily activities of the respondents 90.6% of them, is consistent with the findings of other studies. A study by Orhan *et al.* (2018) found that dysmenorrhea had a significant negative impact on academic performance. Dysmenorrhea can be a debilitating condition that can interfere with a woman's ability to function at home, school, or work.

Data revealed that age, academic level and academic discipline (faculty), were not significant determinants of choice of analgesics used in dysmenorrhea. These data correlate well with literature reports in various

ways. A cross-sectional study on prevalence, severity, and socio-demographic correlates of dysmenorrhea among female students in Benin, revealed that socio-demographic factors such as age, marital status, parity, and body mass index (BMI)were not significantly associated with the use of any particular type of analgesic for dysmenorrhea ($p>0.05$) in consonance with this study (Vodouhe *et al.*, 2020). A study on the prevalence, severity, and impact of dysmenorrhea on academic performance dysmenorrhea in a tertiary institution in Ghana showed that there was no significant association between socio-demographic factors (age, academic level, academic discipline, duration of menstruation, cycle length, and premenstrual symptoms) and the type of dysmenorrhea experienced ($p > 0.05$) (Ameade *et al.*, 2018).

Another study also showed that age, academic level, and academic discipline were not significantly associated with the use of any particular type of analgesic for dysmenorrhea. The type of residence and level of physical activity were not significantly associated with the use of any particular type of analgesic for dysmenorrhea (Kamel *et al.*, 2017).

The variations in these data may not be unconnected with the environments and profiles of the respondents. What is very clear is that the demographic data do not have an impact on the choice of analgesics used in the management of dysmenorrhea.

9. Limitations of the study

First, the data were collected exclusively from female university students. In rural areas, where only a small percentage of people have the opportunity to attend college, the current study's results have limited statistical power and cannot be generalized to all adolescents in the study area, potentially overestimating the result. Secondly, the research work relied on self-reported data. While this can provide valuable insights into women's experiences, it is also subject to recall bias and may not be as accurate as objective measures of pain. Also, the research was focused on short-term outcomes. This can limit our understanding of the long-term course of dysmenorrhea and the effectiveness of different treatments. Lastly, because our study employed a quantitative methodology, it is imperative that future researchers investigate this topic further by providing more illuminating qualitative insights.

10. Conclusion

NSAIDs followed by acetaminophen and herbal remedies were the most widely used analgesics for dysmenorrhea. The duration of menstruation for majority of the respondents is an average of three to five days, and they predominantly experience moderate to severe pains during their period. Most of the respondents have experienced dysmenorrheal twice in the past six months. Drowsiness, nausea, and vomiting were the predominant side effects encountered. The effectiveness and cost of the medications influenced their choice of the specific analgesic medication(s) for managing dysmenorrheal. Majority of them agreed that the use of analgesics impacts their overall quality of life, academic performance, and other activities. Their level of study significantly affected the use of herbal remedies for managing dysmenorrhea.

Conflict of interest

The authors have none to declare

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