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Review Article

### PREVALENCE OF PRIMARY DYSMENORRHEA IN SAUDI ARABIA- A SYSTEMATIC REVIEW

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**Abstract:**

**Background:** Menstruation is a significant occurrence in a woman's life. Many young females who are menstruating experience irregular cycles, heavy bleeding, and painful menstruation. Painful menstruation, or dysmenorrhea as a medical term, is a common gynaecological issue among females, particularly adolescents ones.

**Objectives:** This study aims to summarize current estimations of the prevalence of primary dysmenorrhea and to observe the factors related to dysmenorrhea in Saudi Arabia.

**Methods:** For article selection, the PubMed database and EBSCO Information Services were used. All eligible articles relevant with our topic were used in our review. Other articles that were not eligible to this review were excluded. The data was extracted in a specific format that was reviewed by the group members.

**Conclusion:** Primary dysmenorrhea is a common symptom in females of reproductive age that may go undiagnosed or undertreated due to factors ranging from social environmental to cultural. The prevalence of primary dysmenorrhea in Saudi Arabia ranging between 60.9%- 93.3%, lowest in Jeddah and highest in Najran which is higher than most reported figures world-wide.

**Keywords:** dysmenorrhea, menstrual cycle, Saudi Arabia

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**INTRODUCTION:**

Menstruation is a significant occurrence in a woman's life. Many young females who are menstruating experience irregular cycles, heavy bleeding, and painful menstruation. Painful menstruation, or dysmenorrhea as it is known a medical term, is a common gynecological issue among females, particularly adolescents' young ones [1].

Dysmenorrhea has the highest prevalence of any gynaecological complaint. It is the most common cause of gynaecological morbidity in women of reproductive age, independent of age, nationality, or socioeconomic position [2]. The consequences extend beyond individual women to society, resulting in a significant loss of output each year. According to the World Health Organization, dysmenorrhea is the leading cause of chronic pelvic pain [3, 4].

The reported prevalence of dysmenorrhea is substantial, yet it varies widely, ranging from 45 to 93% of women of reproductive age, with adolescents having the greatest rates [5]. Because it is viewed as a typical part of the menstrual cycle and so tolerable, women do not report it or seek medical attention. Some women (3 to 33%) experience significant pain that renders them immobile for 1 to 3 days each monthly cycle, necessitating absence from school or work [6]. Indeed, dysmenorrhea has a significant impact on women's life, resulting in a restriction of everyday activities, decreased academic performance in teens, and poor sleep quality, as well as negative impacts on mood, creating worry and depression [7].

Historically, many medical and gynaecological texts attributed dysmenorrhoea to mental or psychological disorders, such as worry, emotional instability, a flawed outlook on sex and menstruation, and copying of the mother's attitudes regarding menstruation. However, scientific and clinical research has discovered a physiological cause of dysmenorrhoea: the generation of uterine prostaglandins [8].

The intensity of dysmenorrhoea is significantly linked with menstrual flow duration, younger average menarche, smoking, obesity, and alcohol intake. High levels of stress, as well as sadness, anxiety, and disruption of social networks, can all significantly increase the occurrence of dysmenorrhea [9]. Primary dysmenorrhoea frequently improves in the third decade of a woman's reproductive life and after

childbirth. The relationship between the prognosis of secondary dysmenorrhoea and the severity of the underlying condition is unknown [10].

Dysmenorrhoea treatment seeks to alleviate pain or symptoms by changing the physiological mechanisms underlying menstrual discomfort (such as prostaglandin production) or by easing symptoms. Paracetamol, aspirin, and NSAIDs function by suppressing prostaglandin synthesis by decreasing the activity of cyclo-oxygenase pathways. w8 Oral contraceptives, for example, work by preventing ovulation [11].

**Study Objective:**

This study aims to summarize current estimations of the prevalence of primary dysmenorrhea and to observe the factors related to dysmenorrhea in Saudi Arabia.

**METHODS:****Study design**

A systematic review of the current evidence on primary dysmenorrhea in Saudi Arabia is considered a robust way of identifying and synthesizing the peer reviewed articles for evidence in this area to define a cohesive empirical research agenda that builds on prior knowledge. This review included qualitative evidence only to produce an interpretation. Further, a synthesis of qualitative data aimed to generate findings that are meaningful, relevant and appropriate to individuals, to inform a research agenda and ultimately to more effectively practices on primary dysmenorrhea in Saudi Arabia. The review used methods of qualitative synthesis to combine, integrate and interpret, where possible, the evidence from the included papers.

The review aims to move beyond the aggregation of available data to provide further interpretive insights into primary dysmenorrhea in Saudi Arabia and define where future research can add to what is known.

**Study eligibility criteria**

The review included qualitative peer-appraised studies. Qualitative data from mixed methods-studies were screened for inclusion and included if the qualitative element is pertinent. Included studies were

limited to Saudi Arabia. All peer-reviewed articles published in English, reporting prevalence and risk factors of primary dysmenorrhea from patient, family, healthcare worker perspective and healthcare delivery system were included.

To be included for the review, the studies should have been published from January 2002 up to August 2022 to ensure the currency of the work while enabling a broad view of the emerging issues to be identified.

### **Study participants**

The review included all studies that report on primary dysmenorrhea in Saudi Arabia from the perspective of all patient categories (adults and children), family and health workers that come across in the studies on primary dysmenorrhea in Saudi Arabia.

### **Study Inclusion and Exclusion criteria**

The articles were selected based on the relevance to the project, English language and geographical restriction to Saudi Arabia were considered. All other articles which do not have one of these topics as their primary end, or repeated studies, and reviews studies were excluded. The reviewers excluded any studies not available in English, conference abstracts, books or grey literature and editorial comments. Studies reporting only qualitative data were excluded.

### **Search strategy**

A systematic search strategy was developed using a combination of Medical Subject Headings (MeSH) and controlled vocabulary to identify peer-reviewed articles on primary dysmenorrhea in Saudi Arabia. The databases PubMed/MEDLINE, Scopus/Embase (Elsevier), EbscoHost, and Google Scholar.

### **Selection of study**

The ENTREQ guidelines [11] for reporting qualitative systematic reviews was used to demonstrate the selection processes and results. All retrieved studies were initially be imported into Endnote library to assist removing duplicates. After removing the duplicates, the Endnote library were shared between the two reviewers to independently screen the articles by title and abstract, guided by the eligibility criteria. The studies which the two reviewers would have agreed on were subjected to the full-text review. A

third reviewer adjudicated any discrepancies between the two reviewers. The two reviewers independently reviewed the full text of all eligible studies. In the case where there are differences between the two reviewers, consensus was sought through discussion on the differences with the third reviewer. Finally, the full texts of all relevant studies found to meet the inclusion criteria were retained for the final framework synthesis.

### **Data extraction**

Data was independently extracted by two reviewers from eligible studies onto a customised data extraction form and populated with variables pertaining to the study population and phenomena of interest. Double checking and verification of extracted articles were done by the third review author. Study characteristics that were extracted included name of the first author and year of publication, data collection period and region in which the study was conducted. Specific study details including the study design, study population, sample size, sampling procedures and data collection procedures then be captured. Prevalence and risk factors of primary dysmenorrhea in Saudi population were systematically identified.

### **Data synthesis and analysis**

No software was utilized to analyze the data. The reviewers sorted the data by theme and present the themes in the form of an analysis table (chart). The columns and rows of the table reflect the studies, and related themes and will enable us to compare findings of the studies across different themes and subthemes.

### **Mapping and interpretation**

The reviewers used charts to define the identified concepts and map the range and nature of the phenomena. The review explored associations between the themes to help clarify the findings. The review mapped and interpreted findings in line with the review objectives and emerging themes.

### **RESULTS:**

Figure 1 shows the selection and identification of studies. The search of the mentioned databases returned a total of 314 studies that were included for title screening. 213 of them were included for abstract screening, which lead to the exclusion of 67 articles.

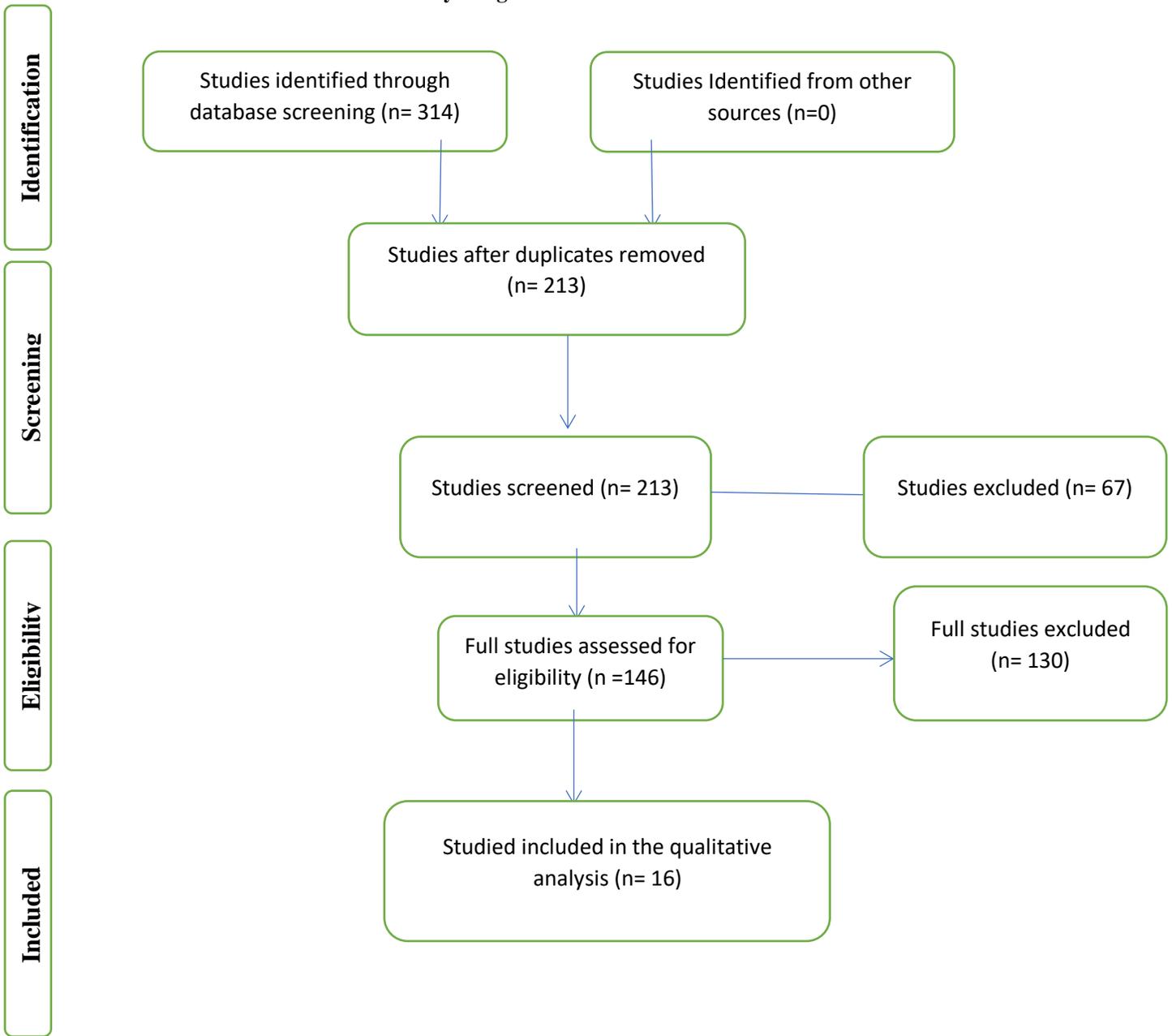
The remaining 146 publications full-texts were reviewed. The full-text revision led to the exclusion of 130 studies due to difference in study objectives, and 16 were enrolled for final data extraction (**Table 1**).

According to table (1), the prevalence of primary dysmenorrhea in Saudi Arabia ranging between 60.9%- 93.3%, lowest in Jeddah [15] and highest in Najran [20]. Regarding severity of dysmenorrhea, highest proportion of females reported severe dysmenorrhea symptoms was 44.8% in Makkah [26] and lowest severe symptoms was 8.4% in Dammam [16], moderate symptoms were reported as 21% - 81.4% lowest in Dammam and highest in Najran [19, 20].

Primary dysmenorrhea also had a significant impact on the students' academic performance where a higher proportion of students suffering from primary dysmenorrhea showed negative effects on their attendance, concentration, study time, and participation in class [12, 13, 15- 20, 22]

A study found that (23%) reported consulting a doctor for their dysmenorrheal while most of them consulted with friends and family [13], whereas another study reported that 55.8% of the students mentioned that they got pain relief by using non-steroidal anti-inflammatory drugs [16].

The included studies had different study designs.



**Table 1: Author, country, year of publication, methodology and outcome:**

Author, Publishing Year	Study region	Methodology	Outcome
Hashim, Refan T et al. (2020) [12].	Riyadh	Between September 2017 and May 2018, 376 female medical students from King Saud University student campus and King Khalid University Hospital (KKUH) in Riyadh, Saudi Arabia, participated in a cross-sectional study. The study employed a non-random, sequential sampling technique.	Primary dysmenorrhea was found in 80.1% of female medical students, with the majority of participants reporting moderate pain (49.8%). Primary dysmenorrhea was significantly associated with caffeine consumption. Primary dysmenorrhea also had a significant impact on students' academic performance, with a higher proportion of students experiencing negative effects on their attendance, concentration, study time, and participation in class.
Alsalem, Mohammed Abadi. (2018) [13]	Abha	This cross-sectional study was carried out at KKU's college of health science in Saudi Arabia. A total of 197 students aged 18 to 23 were included in the sample. Data was gathered using a self-administered questionnaire.	More than two-thirds of the girls (70.6%) reported dysmenorrhea. 35.2 percent of respondents reported severe pain. (66%) reported using medications for pain relief, and (69.1%) reported using herbal medicine for pain relief. Less than one-quarter of respondents (23%) reported consulting a doctor for their dysmenorrhea, with the majority seeking advice from friends and family.
Bakhsh, Hanadi et al. (2022) [14]	Riyadh	A systematic random sampling technique was used to recruit 1199 participants for a cross-sectional survey study. An electronic questionnaire was used to conduct the study among Saudi women of reproductive age between the ages of 18 and 45.	The observed dysmenorrhea in the study; (92.3%) women had non-pathological dysmenorrhea (primary)
Ibrahim, Nahla Khamis et al. (2015) [15]	Jeddah	A cross-sectional study was carried out on 435 medical students from KAU in Jeddah who were chosen using a stratified random sample method. To collect personal and socio-demographic information, a pre-constructed, validated, self-administered questionnaire was used. Menstrual history, stress, and smoking habits were also recorded. The "Visual Analogue Scale (VAS)" was used to grade the severity of dysmenorrhea.	Dysmenorrhea was found in 60.9% of women. The first predictor of dysmenorrhea was a heavy period, followed by stress. The prevalence of severe dysmenorrhea was 38.6% among the patients. The most common symptom associated with dysmenorrhea (80.8%) was depression. In terms of the outcome of dysmenorrhea, 67.5% of sufferers reported emotional instability, while 28.3% reported university absenteeism.
Rafique, Nazish, and Mona H Al-Sheikh. (2018) [16]	Dammam	A cross-sectional study was performed on 370 female students from Imam Abdulrahman Bin Faisal University (aged 18-25 years). The students completed a pre-tested dysmenorrhea questionnaire. The subjects' weight and	85.7% of students had PD, with 12.7% having mild, 65.6% having moderate, and 8.4% having severe dysmenorrhea. In total, 54.5% of students reported that dysmenorrhea interferes with their daily activities. In contrast, 55.8% of students said they got

		height were measured, and their BMI was calculated. Subjects were classified into four groups based on their BMI (underweight [UW], normal weight, overweight and obese [OB]).	pain relief from nonsteroidal anti-inflammatory drugs.
<b>Alateeq, D., Binsuwaidan, L., Alazwari, L. et al. (2022) [17]</b>	Riyadh	On a self-administered online questionnaire, all participants (N = 487) in the cross-sectional study provided sociodemographic information, menstrual and medical history, and completed the Patient Health Questionnaire (PHQ-9) scale and (working ability, location, intensity, days of pain, dysmenorrhea) scale.	30.8% of the students reported severe dysmenorrhea requiring medical attention and pain relievers or herbs. Younger age, earlier menarche, pain relievers and herbs used for menstrual pain, a doctor visit for menstrual pain, and depression were all significant predictors of severe dysmenorrhea. Furthermore, having a later menarche age, a regular menstrual cycle, and a longer duration were significant protective factors of depression.
<b>KANNAN, LATHA S., et al. (2020) [18]</b>	Dammam	A cross-sectional study was used, and stratified random sampling was used to select 292 female medical sciences students from MACHS. Personal and socio-demographic information from the selected female medical sciences students was collected using a semi-structured and self-administered questionnaire. Menstrual history, stress, and smoking habits were also gathered.	Dysmenorrhea was found in 73.28% of female medical sciences students. Concerning the signs and symptoms of dysmenorrhea, abdominal pain was the most common symptom reported by 73.28% of respondents, and it was found to be statistically significant (p0.05). Sleep disturbance was identified as the most common symptom of dysmenorrhea by 64% of respondents.
<b>Al-Dabal, Badria Khalid, et al. (2014) [19].</b>	Dammam	Dammam University's Art and Science Colleges undertook a cross-sectional study. Stratified random sampling with proportionate allocation was used to select 924 students. The participants filled out a self-administered questionnaire that assessed their socio-demographic and menstrual characteristics. In addition, weight and height were measured, and the BMI was calculated.	35% of university students suffered from severe dysmenorrhea, and nearly 21% suffered from moderate to severe Premenstrual Syndrome (PMS). Positive family history was found to be the most common risk factor for dysmenorrhea (67.9%), followed by physical inactivity (52.6%) and irregular menstruation (30.8%). Analgesics were used by approximately 57% of students to relieve symptoms of dysmenorrhea. PMS, family history, and the onset of dysmenorrhea within the first three years of menarche were the most important predictors of dysmenorrhea.
<b>Alshahrani, M. S. (2020) [20]</b>	Najran	Najran University conducted a descriptive, cross-sectional study. Students from health colleges in Najran, Saudi Arabia, took part in the study. A self-administered questionnaire designed for this study was used to collect data. There were 194 students who responded.	Dysmenorrhea was found in 93.3% of students, with 136 (70.1%) reporting regular cycles and 158 (81.4%) reporting a moderate level of menstruation. Abdominal pain and fatigue were the most common symptoms of moderate and severe dysmenorrhea. The condition had a significant impact on college attendance and was linked to fatigue, low mood and mood change, rage, nausea, and loss of appetite.

<b>Alsuwaidan, Salem, et al. (2019) [21]</b>	Riyadh	The study developed a formula for calculating a total score for the pain sensation scale based on the following parameters: individual pain severity estimation, pain assessment scale, and type and frequency of medication. The total pain sensation scale score would differentiate mild (0-4), moderate (5-7), and severe primary dysmenorrhea cases (8 and above)	The average pain sensation scale for all respondents was 5.96 across five different regions in the Kingdom of Saudi Arabia. The differences in the average pain sensation scale between the five regions were not deemed significant. The pain sensation scale showed a significant decrease in the two age groups (in years) 17-21 and 22-26, as well as a significant decrease in those participants receiving oral contraceptives (OC).
<b>Abd El-Mawgod, Mohamed M., Arwa S. Alshaibany, and Aeshah M. Al-Anazi. (2016) [22]</b>	Arar	During the academic year 2015-2016, a cross-sectional descriptive study of 344 secondary school students was conducted in four secondary schools for girls in Arar city. All participants were given a self-administered questionnaire about menstruation, elucidating variations in menstrual patterns, a history of dysmenorrhea, and school absenteeism.	Dysmenorrhea was found in 74.4% of women (mild=21.1%, moderate=41.4%, and severe=37.5%). A family history of dysmenorrhea was reported by 65.6% of the girls, and fatigue was the most commonly associated symptom (79.7%). The majority of dysmenorrhea participants reported activity limitations. Eighteen percent saw a school physician, and 57.8% were given herbal drinks to help with dysmenorrhea symptoms.
<b>Alghamdi, Fawziya, Ahlam Al-Zahrani, and Hawa Alabdulaziz. (2019) [23]</b>	Jeddah	KAU's Faculty of Nursing conducted a cross-sectional study on 194 dysmenorrhea undergraduate female nursing students. To collect relevant data, self-administered questionnaires were used, which were then analysed using SPSS version 24.	The study discovered that a heavy menstrual flow worsens dysmenorrhea, whereas exercising three times per week improves dysmenorrhea. The severity of dysmenorrhea was found to be associated with feelings of inferiority, sleep disturbances, depressed mood, decreased social activities, and conflicts with others.
<b>Dahlawi, Hanan, et al. (2021) [24]</b>	Riyadh	A cross-sectional study was conducted at Princess Nourah Bint Abdulrahman University in Riyadh, involving 500 female students from various colleges. Participants' data on sociodemographic and menstrual characteristics, pain characteristics, and the effects of pain on academic performance parameters were gathered using a structured, self-administered questionnaire. A visual analogue scale was used to assess menstrual pain.	PD was found in 92% of people (57.6% had moderate-to-severe pain). Reduced physical activity, low concentration, submitting incomplete homework, reduced concentration, and falling asleep during lectures were all significant predictors of PD. PD was correlated with poor academic performance, including absenteeism, reduced concentration, reduced physical activity, submitting incomplete homework, impaired relationships with friends, receiving low exam grades, and falling asleep during lectures.
<b>Abdel-Salam, Doaa M., et al. (2018) [25]</b>	Jouf	A cross-sectional study was conducted at Jouf University on 366 female students using a multistage proportionate sampling method. A self-administered, anonymous, pre-designed questionnaire was used. Statistics were collected using descriptive and analytical methods.	Dysmenorrhea affected nearly 88% of the students (mild 8.7%, moderate 57.3%, and severe 34%). Cycle irregularity, heaviness of menstrual flow, and longer cycle length were all significant predictors of dysmenorrhea. Two-thirds of the students used herbs to relieve dysmenorrhea symptoms. The most common associated symptoms were fatigue, emotional disturbances, abdominal distension, nausea, vomiting, and sleep disturbances. 87% of

			students reported that dysmenorrhea had an impact on their daily activities.
<b>Aljahgali, I., et al. (2022) [26]</b>	Makkah	From September to October 2021, a cross-sectional study of Umm Al-Qura undergraduate female students aged 18 to 30 years was conducted. Data was collected from 412 participants via an online questionnaire that included student socio-demographic information, dysmenorrhea clinical information, student perception of dysmenorrhea, and healthcare seeking.	During their menstrual cycle, 90.5 percent of women experienced dysmenorrhea. The severity of dysmenorrhea ranged from severe (44.8%) to moderate (47.2%) to mild (8.0%). Home remedies (44.2%) were the most frequently reported self-care practises for dysmenorrhea, followed by ignoring the pain (23.6%) and self-medication (23.3%). Only 54 (14.55%) students sought medical attention for dysmenorrhea. A total of 53.1 percent of students had a favourable perception of dysmenorrhea.
<b>Ismail, Samantha, et al. (2016) [27]</b>	Riyadh	Using a validated and modified questionnaire, a descriptive survey research design study was conducted. Menstrual pain severity, history, and absenteeism were all collected through questionnaires. During lectures, 100 undergraduate nursing students were recruited by personal invitation.	Menstrual pain was reported by 92% of women. The majority of nursing students (27% had moderate grade 5 - 6 menstrual pain) and 38% did not take pain medication for it. Menstrual pain caused 9% and 30% of lecture and 30% of collage absenteeism, respectively.

## DISCUSSION:

The current study discusses the prevalence of primary dysmenorrhea in Saudi Arabian females. The prevalence of primary dysmenorrhea in Saudi Arabia ranging between 60.9% - 93.3%, lowest in Jeddah [15] and highest in Najran [20].

In females of reproductive age, the prevalence of primary dysmenorrhea ranges from 45% to 95%, with 2% to 29% experiencing severe pain [28, 29]. This variation in rates may be explained by differences in the methodologies used to assess primary dysmenorrhea, the population chosen, age groups, ethnicity, and pain perception differences between communities. Younger women (24 years) were found to have a higher prevalence (70% to 90%) [30- 32].

This study's findings are higher than those of previous studies in Debre Tabor, Ethiopia (62.3% [33]) and Chandigarh, India (61.33% [34]). The current study's findings were higher than those of previous studies in Canada (60%), Japan (46.5% and 54.4%), Tbilisi, Georgia (52.07%), and Southern India (45%) [35-39]. The variation is due to the assessment tool, data collection method (such as cell phone interviews), clinical assessment (such as ultrasound and laboratory

tests), and sample size used. Iran (89.1%), Turkey (72.7%), Debre Birhan University (85.4%), and University of Gondar Ethiopia (77.6%), Mansoura, Egypt (75%), Pakistan (78%), Iran (73.2%), and Saveetha University (70.4%) reported higher findings [36, 40- 45]. This is attributable to the study setting, the age of study participants, and the fact that most studies did not distinguish between primary and secondary dysmenorrhea.

The severity of dysmenorrhea varies between studies as well. highest proportion of females reported severe dysmenorrhea symptoms was 44.8% in Makkah [26] and lowest severe symptoms was 8.4% in Dammam [16], moderate symptoms were reported as 21% - 81.4% lowest in Dammam and highest in Najran [19, 20]. According to other international studies, more than half of the women had moderate dysmenorrhea [46- 49]. In contrast, the severity of dysmenorrhea has been reported to be 14.8% in Egypt, which is lower than the proportion of participants in the current study [50].

Even though the pathophysiology of dysmenorrhea is not fully understood, current evidence suggests that the pathogenesis of dysmenorrhea is due to increased

secretion of prostaglandin F<sub>2</sub> (PGF<sub>2</sub>) and prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) in the uterus during endometrial sloughing. These prostaglandins are involved in increasing myometrial contractions and vasoconstriction, which leads to uterine ischemia and the production of anaerobic metabolites. This causes pain fibre hypersensitization and, eventually, pelvic pain [28].

In our study, we showed that dysmenorrhea was significantly associated with menstruation-related symptoms, which impacted on the lives of and academic performance of affected students. Dysmenorrhea was also significantly associated with loss of concentration, crying, mood change, anger, nausea and loss of appetite. These findings are consistent with those of other studies [51- 54].

The primary goal of primary dysmenorrhea treatment is to provide adequate pain relief to dysmenorrheic females, allowing them to perform their usual activities, improving their QOL, and decreasing academic or work-related absenteeism [55]. Pharmacological and non-pharmacological complementary and alternative therapies are both potential treatments for primary dysmenorrhea NSAIDs and hormonal contraceptives are recommended as first-line treatments for primary dysmenorrhea because they inhibit the production of prostaglandins, which are directly related to menstrual pain and its associated systemic symptoms [56].

In some Middle East countries, such as Palestine, approximately 58% of dysmenorrheal students with moderate/severe pain chose medications to alleviate painful menstruation symptoms. Similar findings were obtained in an Iranian study.[57] In an Indian study, only a small proportion of girls (25.5%) sought pharmacological management, while the majority used herbal and other nonpharmacological approaches to reduce pain.[58] Herbal medicine was also found to be prevalent in the current study, with different herbs and home remedies such as cinnamon and anise tea. In most published studies, dysmenorrheal female students seek herbal remedies [59, 60].

Moreover, clinician-patient shared decision-making is critical to the optimal management of primary dysmenorrhea in order to optimise treatment efficacy and ensure patient satisfaction and adherence. To provide patient-centered care, dysmenorrheic females

should be educated about dysmenorrhea, its treatment options, and potential side effects, allowing them to make an informed decision. Clinicians should take into account the patient's preference, desire for contraception, potential side effects, and contraindications to hormonal therapy [41].

### CONCLUSION:

Primary dysmenorrhea is a common symptom in females of reproductive age that may go undiagnosed or undertreated due to factors ranging from social environmental to cultural. The prevalence of primary dysmenorrhea in Saudi Arabia ranging between 60.9%- 93.3%, lowest in Jeddah and highest in Najran which is higher than most reported figures worldwide. Because of its wide range of physical and psychological symptoms, it has a negative impact on Quality of life , resulting in decreased attendance at work and school. This condition is primarily treated with pain relief, either pharmacologically or through alternative modalities.

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