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Research Article

Epidemiological Study on Saudi Women with Mild, Moderate and Severe Primary Dysmenorrhea

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ABSTRACT

Introduction: The severity and duration of primary dysmenorrhea vary; most of the previous studies were depending on the individual interpretation, which is most likely changing from one individual to another and from one country to another.

Objectives and Aim: The main aim of this study was to establish a formula to find out "pain sensation scale" for primary dysmenorrhea. Secondary aims were to find out the prevalence of dysmenorrhea in five various regions in the KSA, and the correlation of influence factors for dysmenorrhea such as age, oral contraceptives, and menstruation regularity.

Methodology: This study had established a formula to find a total score for the pain sensation scale depending on the following parameters: Individual estimation for pain severity, pain assessment scale, and type and frequency of medication.

The total score of pain sensation scale would discriminate the primary dysmenorrhea cases for mild (0-4), Moderate (5-7) and severe (8 and above).

Results: The average of pain sensation scale for the whole respondents was 5.96 (SD = 2.27) among a population (n = 994) from five different regions in the KSA. The variations for the average of pain sensation scale between the five regions were not considered as significant ($p > 0.05$). Pain sensation scale showed a significant decrease ($p < 0.001$) in the two age groups (in years) 17-21 and 22-26; and showed significant decrease ($p < 0.001$) for the pain sensation scale with those participants receiving Oral Contraceptives (OC).

Conclusion: A formula was established for "pain sensation scale" to indicate mild, moderate and severe pain of the primary dysmenorrhea. This formula used "pain severity" as respondent interpretation, "Allina health scale" as pain confirmation, and "type of medication(s) multiplied by the frequency" as measurable criteria. The pain sensation scale was found that there was no significant difference between regions and also that age was inversely related to the pain of dysmenorrhea.

Keywords: Primary dysmenorrhea; Pain severity; Pain sensation scale; Pain assessment scale

INTRODUCTION

Dysmenorrhea is defined as cramping pain during menstruation, this pain occurs in the lower abdomen. It is the most common gynecologic problem in women and is divided into primary and secondary dysmenorrhea. Primary dysmenorrhea is painful menstruation in the absence of any concomitant diseases in the pelvis, unlike secondary dysmenorrhea, which is associated with an evident disease [1]. Dysmenorrhea usually begins around the time that menstruation begins and the menstrual bleeding last less than 3 days [2]. The severity and duration of the pain varies; however, it becomes less common as women age. The pain severity varies from mildly irritating to incapacitating, while the pain frequency is accompanied by systemic symptoms such as nausea, vomiting, diarrhea, fatigue, and insomnia [3].

Prevalence rates were discussed in multiple studies showed that the prevalence of dysmenorrhea around the world was varied which could be ranging from 58%-96.3% among university students in different countries [4-6]; this prevalence may increase up to 98.4% [7]. Most of these studies were depending on the individual interpretation, which is most likely changing from one individual to another and from one country to another.

In general, increased severity of dysmenorrhea has been associated with abnormal and heavy menstrual bleeding, changes in intensity and duration of pain (most likely longer menstrual bleeding duration and early onset of pain). These symptoms and endometriosis are suggested underlying pathology (secondary dysmenorrhea). The first-line therapy for primary dysmenorrhea is pain relief. If Non-Steroidal Anti-Inflammatory Drugs (NSAIDS) alone are not sufficient therapy for the treatment of dysmenorrhea, Oral Contraceptive pills (OC) can be combined. Hormonal or oral contraceptives are first-line therapy for secondary dysmenorrhea, which is caused by endometriosis [8,9].

Many women with dysmenorrhea use alternative non-pharmacologic therapies to relieve dysmenorrhea such as topical heat, exercise, and nutritional supplementation; with no evidence-based therapy. Other approaches including extra bed rest or sleep, physical exercise, meditation, aromatic oils, ginger root tea, saltwater, increased calcium intake, and increased vitamin D intake [10].

The diagnosis of dysmenorrhea usually depends on the subject's history towards painful periods that interfere with daily activities. Although "Pain Assessment Scale" by Allina Health for Quality of Life (QOL) [11] during menses to measure the severity of dysmenorrhea, yet it still used to be expressed by the individuals and cannot be relied on. There is no standard method for measuring the severity of dysmenorrhea; since the intensity of pain can be expressed "individually" and cannot be validated, however, in order to discriminate the severity of dysmenorrhea among the general population, this study recruited "pain severity scale", which is also depending on the individual subjects; it is used sort of confirmation. Additionally, the type of medication and frequency of medication should have more weight since it is the only measurable variable to "assess pain sensation".

This study determined the pain severity of dysmenorrhea in various regions of Saudi Arabia and to examine the factors influencing dysmenorrhea.

OBJECTIVES AND AIM

This study was expressed by estimating "pain severity", "Pain Assessment Scale" by Allina Health for Quality of Life (QOL) and type and frequency of medication utilized to overcome menarche pain. Collecting these estimations in one formula to produce the best assessment scale for the sensation of pain of dysmenorrhea. The pain of dysmenorrhea displayed as cramp pain in the lower abdomen, which used to start during the first and second day of the period and last for 2-4 days.

This study aims to find the followings:

1. Prevalence of dysmenorrhea in five various regions in the KSA.
2. Factors influencing dysmenorrhea such as age, oral contraceptives and, menstruation regularity.

3. The most important aim was how to differentiate between mild, moderate and severe cases of primary dysmenorrhea.

METHODOLOGY

Setting

This study divided Saudi Arabia into 5 regions: Central, Western, Southern, Northern, and Eastern, with the largest population in the Western and Central regions. Saudi women (10.2 million) represented 49.2% of the population [12].

Sampling

Direct interviews with some participants and the online survey had been distributed in five regions in the Kingdom of Saudi Arabia for voluntary participation.

Development of the questionnaires

The questionnaire was developed in-house consisted of two main sections:

The first section was about the data the related to the participants, they were asked about age, region, contraceptive use, and regularity of menses.

The second section focused on "evaluation of pain" and the possibility to estimate "pain sensation". The main variable of this study was focused on "severity of the pain", which was depending on individual and personal interpretation. This variable is also subjected to biological variation of the respondents. Pain severity is estimation for the pain by the respondents giving a scale from 0 (with no pain) to 5 as the worst pain severity. Another scale used in this study was "Pain Assessment Scale" by Allina health scale during menses [11]. This was also having a scale focused on the description of the pain and more related to dysmenorrhea that had 0 for "no pain", then 1 as "mild pain" if the pain was barely noticed or the pain was mild but didn't interfere with regular activity, 2 for "moderate pain" described as if interfere with your regular activities, 3 "severe pain", that pain was so bad that you can't do any of your regular activities, and 4 for "worst pain" indicated worst pain could be ever imagine. The only measurable variable to assess pain sensation is the questions about how pain was controlled, which depended on the type of analgesic, 0 (no analgesic), 1 mild analgesic and 2 was strong analgesic, and also depends on the frequency of analgesic intake which used to be coded as the number of frequency 1-3. Physically "pain sensation" used to be expressed on the type of analgesic intake and frequency per day.

STATISTICAL ANALYSIS

The Statistical Package for Social Sciences (SPSS) version 25 was used to analyze the data. Data were entered in excel sheet then coded and transferred to SPSS; frequency and cross-tabulation for the group of age and region were calculated; and also the frequency of factors that influencing primary dysmenorrhea such as the utilization of oral contraceptive intake, and regularity of menstruation. Means were compared using independent samples t-test to determine whether there is statistical evidence for any significantly different.

To predict a measurable pain sensation, it is a must to reduce personal interpretation and the individual biological variations; this study had developed a formula to find a total score for the pain sensation depending on the following parameters:

1. Individual estimation for pain severity, the above scale (0-5).
2. Pain assessment scale by Allina Health scale (0-4).
3. Type of medication and frequency; since this was the only measurable criteria, it was given more weight by multiplying type of medication times the frequency.

The formula established for "pain sensation scale" as:

"Pain severity" + "Allina health scale" + (type of meds x frequency)

The total score for this formula considered the best measurable assessment for pain sensation for primary dysmenorrhea. Normal distribution for the pain sensation was obtained by applying this formula to the same participants in this study with a total number of 994 subjects. It is also worth to mention that pain sensation score would discriminate the primary dysmenorrhea cases for mild (0-4), Moderate (5-7) and severe (8 and above).

Investigators found that if the pain sensation scale within the score of 0-4, considered as a mild case of primary dysmenorrhea; while score 5-7 considered as moderate case and considered score 8 and above as severe case of primary dysmenorrhea. This decision came from if a subject gives a score of (2) for pain severity, then it is confirmed with pain assessment scale by Allina health scale (score 2 also) so that pain may interfere with regular activities, in this case, it can be predicted as a mild case of dysmenorrhea; but if the same subject give a total score of 4 and receiving analgesic which should give more weight as a measurable criteria, so that it could raise the score to 5 or more which should be considered as a moderate case. Similarly, if a subject scored a total of 8 and above would be considered as a severe case of primary dysmenorrhea.

ETHICS APPROVAL

This study was conducted after institutional review board approval from Princess Nora bint Abdulrahman University, with IRB Log. Number: 18-0230. Participation was voluntary and anonymous and participants were assured of the confidentiality of their responses.

RESULTS

The average of pain sensation scale for the whole respondents was 5.96 (SD = 2.27; SE = 0.07), according to the pain sensation scale of this study. The frequency of pain sensation scale showed positive skewness, which was more reliable among the same population (n = 994) as shown in figure 1. It was considered that all respondents were with primary dysmenorrhea, but they were varied in their pain; it was found that 223 (22.4%) had mild pain sensation, 579 (58.2%) were with moderate pain sensation and 192 (19.3%) had severe pain sensation.

Most of the respondents were from the middle region in a total of 708 respondents out of the total respondents 994 showing more than 71% of the participated subjects, the next major respondents were from western region 114 respondents with 11.5%. The variations for the average of pain sensation scale between the five regions were not considered as significant ($p > 0.05$) ranging mean between 5.91 (± 2.18 SD) in the middle region and 6.17 (± 2.63 SD) in the northern region. It was also showed that the variations in percentages of degree of pain as mild, moderate and severe pain, among the five regions were with no significant difference. More detail for data was shown in table 1 including a number of the case, percentage, degree of pain and average of pain sensation for each region.

On the other hand, the age group with 22-26 years represented the major respondents with 487 respondents (49%) then the group

of 17-21 years showing 320 respondents, more than (32%). Pain sensation scale showed significant decrease ($p < 0.001$) in the two age groups (in years) 17-21 and 22-26 with average pain sensation of 6.16 ± 2.4 SD and 6.06 ± 2.2 SD consequently, compared with the two age groups (in years) 27-30 and 31 and above with average pain sensation of 5.64 ± 2.06 SD and 5.23 ± 2.16 SD consequently also. Table 1, showed the prevalence of primary dysmenorrhea as mild, moderate and severe distributed in the identified five regions from the KSA and also according to the age groups (in a year). Figure 2 showed how the pain sensation scale reduces over increasing the age so that it is possible to predict on what age the pain sensation scale would be eliminated.

Since most of the respondents were within the age 17-26 years (more than 81%), where it was not expected that they were married to 888 of the respondents (more than 89%) and were not receiving oral contraceptives; only 106 of the participants (10.7%) were receiving contraceptives. Results showed a significant decrease ($p < 0.001$) for the pain sensation scale with those participants receiving OC with an average of 5.10 (± 2.5 SD) compared with those who were not receiving OC with an average of 6.07 (± 2.21 SD), as shown in table 2. Oral contraceptive reduces the pain sensation and reduces the frequency of pain among subjects receiving oral contraceptives; the difference in respondents with OC intake or without could be seen in the linear plot as a percentage of frequency in figure 3.

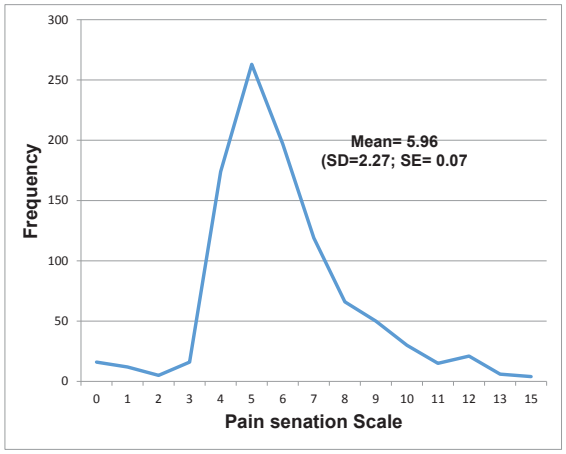

Figure 1: Frequency of all respondents (n = 994) according to pain sensation scale, with a mean value of 5.96.

Most of the participants were having regular menstruation with 632 respondents (63.6%), while 263 of the respondents (26.5%) with irregular menstruation; the rest data 99 respondents (10%) either they were not certain (doubt) or didn't know. The pain sensation scale with those respondents with regular menstruation had an average of 5.87 (± 2.23 SD) compared with those who were with irregular menstruation with an average of 6.12 (± 2.31 SD), which almost similar finding with those who are uncertain had an average of 6.14 (± 2.39 SD).

DISCUSSION

Three studies from Saudi Arabia showed, one from western region with prevalence of 60.9% [14], one more from northern region with prevalence of 74.4% (n = 256) [15], and another one from eastern region with 85.7% (n = 370) [16]. Another two studies from Kuwait [17] and Oman [18] had shown a prevalence with 85.6 % and 94% respectively. These studies were randomly selected however, the prevalence of these studies showed that the variation still occured within the same country and as around countries even if they were with almost similar lifestyles and behavior. This variation had been explained earlier due to individual interpretation and biological variation.

In comparison between the five mentioned regions in the Kingdom of Saudi Arabia, the mean of the pain sensation scale was ranging from 5.91 in the middle region compared with 6.04 in eastern and western regions, and 6.16 and 6.17 in the southern and western regions respectively, where there was no significant difference between regions considering the average of the whole respondents was 5.96 (± 2.27 SD) as illustrated in table 1.

Several studies indicated the degree for the pain of dysmenorrhea as mild-moderate and severe; however, none of these studies had included confirmation assessment neither utilizing analgesic(s) strength as a measurable criterion. Most if not all previous studies were indicated the degree for pain dysmenorrhea according to the respondents' interpretations. In this study, although the respondents were asked about the severity of pain, yet it was followed with another question regarding pain assessment scale by Allina health scale "sort

Table 1: Prevalence of primary dysmenorrhea (all cases, mild, moderate and severe) among five regions in Saudi Arabia; and also illustrated age group distribution according to primary dysmenorrhea severity.

Region	All Cases, n (%)	Mild Cases, n (%)	Moderate Cases, n (%)	Severe Cases, n (%)	Mean of Pain Sens. ± SE
Middle	708 (71.2%)	165 (74%)	411 (71%)	132 (68.8%)	5.91 ± 0.08
Northern	42 (4.2%)	9 (4%)	25 (4.3%)	8 (4.2%)	6.17 ± 0.41
Southern	79 (7.9)	18 (8.1%)	41 (7.1%)	20 (10.4)	6.16 ± 0.31
Eastern	51 (5.1%)	12 (5.4%)	30 (5.2%)	9 (4.7%)	6.04 ± 0.35
Western	114 (11.5)	19 (8.5%)	72 (12.4%)	23 (12%)	6.04 ± 0.21
Total	994 (100%)	223 (22.4%)	579 (58.2%)	192 (19.3%)	
Group of Age					
17-21	320 (32.2%)	69 (30.9%)	184 (31.8%)	67 (34.9%)	6.16 ± 0.13
22-26	487 (49%)	96 (43%)	288 (49.7%)	103 (53.6%)	6.06 ± 0.10
27-30	75 (7.5%)	18 (8.1%)	48 (8.3%)	9 (4.7%)	5.64 ± 0.24
31 and more	112 (11.3%)	40 (17.9%)	59 (10.2%)	13 (6.8%)	5.23 ± 0.20
Total	994 (100%)	223 (22.4%)	579 (58.2%)	192 (19.3%)	

of confirmation" then another question about medication type (whether if it was regular analgesic or strong) and also was asked about the frequency of medication. According to the answers of the respondents, the participants were assigned to a degree for the pain of dysmenorrhea depending on the total score for pain sensation scale to be mild, moderate and severe. The results of this study indicated that 22.4% (n = 223) of the respondents were with mild pain of dysmenorrhea, 58.2% (579) with moderate pain of dysmenorrhea and 19.3% (192) [13,14,16,19,20]. These five studies were selected randomly that reported mild, moderate and severe pain, some of them used Visual Analogue Scale (VAS) as a parameter or direct interpretation for the pain severity. The results (as a percentage) of the studies as such:

Mild Pain	Moderate Pain	Severe pain	Reference
21.1	41.4	37.5	Ref. 13
27.1	60.7	12.1	Ref. 14
29.2	36.6	34.2	Ref. 19
12.7	65.6	8.4	Ref. 16 *
28	43	29	Ref. 20
23.62	49.46	24.24	Average
22.4	58.2	19.3	This study

*The other 13.3 were with no pain.

The average of the five studies compared with the results of this study were very reliable and comparable to this study; however, a meta-analysis study should be conducted to verify the most appropriate scale to verify the degree of menarche. A study showed the degree for the pain of dysmenorrhea according to the verbal description so that mild pain is that inhibited normal activities; moderate pain is required analgesics and severe pain used to be with vegetative symptoms (headache, fatigue, vomiting and diarrhea) [21].

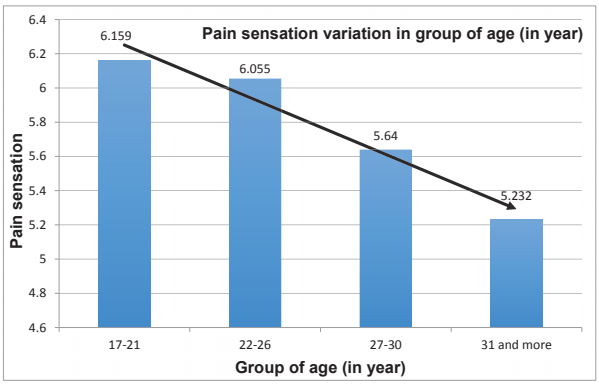

Figure 2: Presenting the average of pain sensation distributed in age group.

The results for age were similar to all previous studies that primary dysmenorrhea may recover over increasing age [22]. The results of this study showed that the average of pain sensation scale for the age group of 17-22 and 23-26 more severe compared with the other older groups with significant difference ($p < 0.001$). Figure 2 showed decrement of the pain sensation scale to assess menarche when the age is increasing. It was found that age could influence the pain associated with other illnesses [23]. A similar profile for the age decrement was obtained with another study indicated that age was inversely related to the pain of dysmenorrhea [24].

The use of Oral Contraceptive (OC) (or hormonal contraceptive specifically) had the advantage to overcome the pain of dysmenorrhea [25], they had shown that pain of dysmenorrhea could be relieved with the utilization of oral contraceptives; also could be recurred after quitting OC, and the longer duration of the OC would slower the pain recurred. Another study with more conservative, that the effect of OC may be dependent on the nature and severity of the dysmenorrhea [26]. The finding of this study that respondents that utilizing OC had a lower average of pain sensation scale that was significant ($p < 0.001$) compared with the average of the respondent with no intake for OC.

It was found in this study that there was no big difference in the respondents whether with regular or irregular menstruation neither those who are not certain about the regularity of their menstruation. This was contradictory the results of other studies when they concluded that students with irregular menstruation were significantly severe pain of dysmenorrhea compared with those with regular menstruation [27].

CONCLUSION

Most of the previous studies were indicated the degree for pain dysmenorrhea according to the respondent's interpretations and biological variation. This study had included confirmation assessment and utilizing analgesic strength as a measure. A formula was established for "pain sensation scale" to indicate mild, moderate and severe pain of the primary dysmenorrhea. This formula used "pain severity" as respondent interpretation, "Allina health scale" as pain confirmation, and "type of medication(s) multiplied by the frequency" as measurable criteria.

The pain sensation scale to assess menarche was found that there was no significant difference between regions considering the average of the whole respondents was 5.96 and also that age was inversely related to the pain of dysmenorrhea. More finding in this study that

Table 2: Factors affecting primary dysmenorrhea including Oral Contraceptive (OC) intake, menstruation regularity.

OC intake	**All** Cases n (%)	**Mild** Cases n (%)	**Moderate** cases n (%)	**Severe** Cases n (%)	**Mean of Pain Sens.** ± SE
No OC	888 (89.3%)	184 (82.5%)	522 (90.2%)	182 (94.8%)	6.07 ± 0.07
Yes	106 (10.7%)	39 (17.5%)	57 (9.8%)	10 (5.2%)	5.10 ± 0.24
Total	994 (100%)	223 (100%)	579 (100%)	192 (100%)	
Menstruation					
Not Regular	263 (26.5%)	52 (23.3%)	156 (26.9%)	55 (28.6%)	6.12 ± 0.14
Regular	632 (63.6%)	147 (65.9%)	372 (64.2%)	113 (58.9%)	5.87 ± 0.09
Sometimes	99 (10%)	24 (10.8%)	51 (8.8%)	24 (12.5%)	6.14 ± 0.24
Total	994 (100%)	223 (100%)	579 (100%)	192 (100%)	

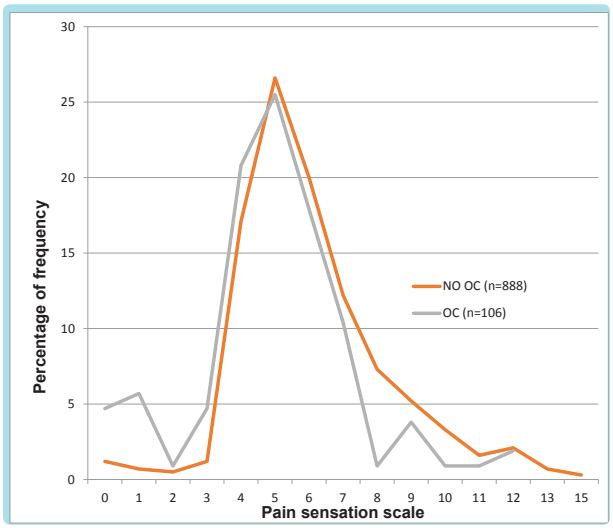

Figure 3: A linear relationship between respondents receiving Oral Contraceptives (OC) (n =106) and repondents without OC (n = 888).

respondents that utilizing OC had lower average of pain sensation scale which was significant ($p < 0.001$), compared with the average of respondent were no OC intake; however, there was no big difference in the respondents whether with regular or irregular menstruation neither those who are not certain about the regularity of their menstruation.

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