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The Impact of Dysmenorrhea on Academic Performance among Female Nursing Students at King Abdulaziz University

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Abstract: ***Background:*** *Dysmenorrhea is a painful menstrual cramp of uterine origin. It is the most common gynecologic complaints in adolescence and young women. Dysmenorrhea has an adverse effect on daily life and academic performance, causing recurrent short-term class/faculty absenteeism among university female students. Therefore, this study aimed to assess the impact of dysmenorrhea on academic performance among female nursing students at King Abdulaziz University (KAU).*
Methods: *Cross-sectional study was conducted in Faculty of Nursing at KAU in Jeddah, Saudi Arabia. Purposive sampling technique was used to enroll 194 Bachelor nursing students out of 340. Data were collected using a self-administered questionnaire, which was designed for this research. The questionnaire was anonymously which completed by each participant who were consented to participate in the study. Descriptive and analytical statistics were conducted.*
Results: *The results from present study showed that the prevalence of dysmenorrhea was reported by (n=194, 57%) of Bachelor nursing students. The majority of participated nursing students (n = 117, 60.4%) reported that they had moderate menstrual pain while (n = 42, 21.6%) reported that their menstrual pain was severe. The study revealed that severity of pain among dysmenorrheal nursing students had effect negatively on their academic performances ($p<0.05$). The result also showed that statistical significance was found among severity of pain and class/faculty absentees, loss of concentration in class and during exam, inability to complete the assignments and inability to participate in extra-activities ($p<0.05$).*
Conclusion and Recommendations: *This study confirmed the negative impact of dysmenorrhea on academic performance of nursing students. The results were provide an evidence supported for the important on developing effective educational interventions targeting on pain management and focusing on building and sustaining self-care management among nursing students.*
Keywords: *Dysmenorrhea, Menstrual pain, Academic Performance, Nursing students.*

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I. Introduction

Dysmenorrhea is one of the most common gynaecological disorders among women of reproductive age (Pejčić, & Janković et al., 2016). Women may experience some kind of discomfort pain before or during their menstruation that could prevent them from performing their ordinary daily activities (Grandi et al., 2012). This kind of pain is called painful menstruation, menstrual pain, or dysmenorrhea (Potur et al, 2014).

According to the International Association for the Study of Pain (IASP), in Global Year Against Pain in Women, it was reported that (40–90%) of reproductive-aged women are affected by dysmenorrhea. Approximately (10–20%) of affected females described their menstrual pain as severe and distressing (Berkley, 2013). Various large, longitudinal studies on young dysmenorrheal women have estimated that (10- 15%) of all working or studying women experience severe monthly menstrual pain, which impacts negatively on their normal daily functions at work, home, or school (IASP, 2018). In addition, the absenteeism rate due to dysmenorrheawas estimated to be about one to three days during each menstrual period, as reported in the critical review by Iacovides, et al., (2015).

Dysmenorrhea is one of the most important issues in women's health generally or on nursing students specifically. It may have a negative impact on their social relationships, psychological status, and school or work activities. Nursing students are the future nurses in clinical practice. Therefore, promoting positive health outcomes among nursing students with dysmenorrhea is crucial. It is important to highlight the impact of

dysmenorrhea on nurse's academic performance. Professional nurses can use such information to develop an effective educational program for dysmenorrhea and to provide appropriate diagnosis and treatment. Conducting a research study on dysmenorrhea among nursing students is important and justified. Hence, this study conducted to assess the impact of dysmenorrhea on academic performance among female nursing students at King Abdulaziz University (KAU).

II. Methods

This study was a quantitative, descriptive, cross sectional study. It was conducted at the Faculty of Nursing, KAU, from 1st of March up to end of April for the academic year (2017-2018). Two Ethical Approval was obtained, one from the Faculty of Nursing and another one was from the Faculty of Medicine, KAU (Reference Number: 180-18). Purposive sampling technique was used, included all Bachelor female nursing students who have dysmenorrhea and willing to participate.

The researchers developed an anonymous, self-administered structured questionnaire in English language. It was developed based on a comprehensive review of the relevant updated literature. Face and content validity of the questionnaire were evaluated by four experts in women and nursing field. Reliability was assessed with Cronbach's α and was found to be 0.50. The questionnaire consists of 53 questions divided into six parts which are: Socio-demographic data, personal habits/life style, menstrual history, obstetrical history, dysmenorrhea experience and assessment and the impact of dysmenorrhea on academic performance. The questionnaire included the "Verbal Multidimensional Scoring System (VMS)" to assess the severity of dysmenorrhea. The academic performance was assessed according to four domains which are classroom performance, exam performance, assignments performance, and extra-curricular activities. The present study defined dysmenorrhea as menstrual pain in the lower abdomen, with or without gynaecological pathology disorder. The pain may be associated with nausea, vomiting, diarrhoea, headache, dizziness, backache, and leg pain. The beginning of pain might start within 12 hours or less of the onset of men-struation and could last for eight to 72 hours (Allen et al., 2012; Omidvar et al., 2015).

The Questionnaire was distributed to the target students after explained the aim and participants criteria and get the consent. Data was analysed using Statistical Package for Social Sciences (SPSS) Windows, version 24.0. Chi square test of independence was used to assess the association between the variables. At a confidence interval of 95%, statistical significance was assumed at $p < 0.05$.

III. Results

In this study, a total of 194 nursing students have been included out of 340 students. The majority of the participants (n= 189, 97.4%) were between 19 and 24 years-old, and a similar percentage (97.9%) were single and lived with family (n= 183, 94.8%). Two thirds of the participants (n= 121, 64.7%) were from the western region of the Kingdom. Participants were from varied academic levels, from second, third, and fourth year, with the following percentages respectively: (n= 64, 33.0%; n= 79, 40.7%; and n= 51, 26.3%). The socio-demographic data of the participants is shown in **Table 1**.

Table 1: Socio-Demographic Data

Items	**Descriptive Statistics**	
	n	%
Age group		
Less than 19 Years	4	2.1
19 – 24 Years	189	97.4
Above 24 Years	1	0.5
Marital Status		
Single	190	97.9
Married	4	2.1
Residency		
With family	183	94.8
Dormitory	6	3.1
Alone	4	2.1
Origin Region		
North	9	4.8
South	21	11.2
East	24	12.8
West	121	64.7
Central	12	6.5
Academic Year		
Second	64	33.0
Third	79	40.7
Fourth	51	26.3

It is illustrated in **Table 2**, that more than half of the participants (n= 117, 60.4%) reported they suffered in their menstruation from moderate dysmenorrhea and (n= 42, 21.6%) from severe.

Table 2 Dysmenorrhea severity

Severity of dysmenorrhea	Descriptive Statistics	
	n	%
Mild	35	18.0
Moderate	117	60.4
Severe	42	21.6

The distribution of the severity of dysmenorrhea among academic performance was presented in **Table 3**. Based on the result of the Chi-Square and Spearman tests, there was a counterproductive association between academic performance and the severity of dysmenorrhea. In other words, if the severity of dysmenorrhea increases, the academic performance will decrease. While no significant association between the severity of dysmenorrhea and assignment performance (r = -0.115, n= 194, p= 0.110).

Table 3: Distribution of severity of dysmenorrhea with academic performance.

Academic Performance		Severity of Dysmenorrhea			Spearman	P – Value
		Mild n (%)	Moderate n (%)	Severe n (%)		
Performance at Class room	Low	1 (0.5)	15 (7.7)	7 (3.6)	**-0.268**	0.000*****
	Moderate	20 (10.3)	72 (37.1)	33 (17.0)		
	High	14 (7.2)	30 (15.5)	2 (1.0)		
Performance at Exam Period	Low	1 (0.5)	2 (1.0)	2 (1.0)	**-0.267**	0.000*****
	Moderate	10 (5.2)	55 (28.4)	29 (14.9)		
	High	24 (12.4)	60 (30.9)	11 (5.7)		
Performance at Assignments	Low	-	1 (0.5)	2 (1.0)	**-0.115**	0.110
	Moderate	15 (7.7)	40 (20.6)	22 (11.3)		
	High	20 (10.3)	76 (39.2)	18 (9.3)		
Performance at Extracurricular	Low	12 (6.2)	63 (32.6)	23 (11.9)	**-0.179**	0.013*****
	Moderate	13 (6.7)	44 (22.8)	18 (9.3)		
	High	10 (5.2)	9 (4.7)	1 (0.5)		
Performance in General	Low	-	5 (2.6)	7 (3.6)	**-0.340**	0.000******
	Moderate	17 (8.8)	83 (42.8)	31 (16.0)		
	High	18 (18.0)	29 (14.9)	4 (2.1)		

* Significant correlation at < 0.05 level (2-taild)

Table 4 presents the relationship between classroom performance and the severity of dysmenorrhea, which was investigated by the Spearman and Chi-Square tests. It was found that there was a significant relationship with a negative correlation effect between the severity of dysmenorrhea and class performance, except for decreasing participation in class and getting a warning letter due to absenteeism (r = -0.091, n = 194, p= 0.145 and r = 0.037, n = 194, p= 0.489) respectively.

Table 4: Distribution of severity of dysmenorrhea with class performance.

Class Performance		Severity of Dysmenorrhea			Spearman	P – Value
		Mild n (%)	Moderate n (%)	Severe n (%)		
Reduced concentration	Never	5 (2.6)	8 (4.1)	1 (0.5)	**-0.270**	0.000******
	Sometime	23 (11.9)	65 (33.7)	17 (8.8)		
	Always	6 (3.1)	44 (22.8)	24 (12.4)		
Faculty absenteeism	Never	17 (8.8)	34 (17.5)	3 (1.5)	**-0.332**	0.000******
	Sometime	18 (9.3)	71 (36.6)	30 (15.5)		
	Always	-	12 (6.2)	9 (4.6)		
Class absenteeism	Never	14 (7.2)	22 (11.3)	3 (1.5)	**-0.279**	0.000******
	Sometime	19 (9.8)	81 (41.8)	29 (14.9)		
	Always	2 (1.0)	14 (7.2)	10 (5.2)		

Clinical practice absenteeism	Never	16 (8.3)	58 (30.1)	13 (6.7)	**-0.152**	0.026*****
	Sometime	16 (8.3)	52 (26.9)	20 (10.4)		
	Always	2 (1.0)	7 (3.6)	9 (4.7)		
Difficulty in remembering	Never	14 (7.3)	39 (20.2)	8 (4.1)	**-0.167**	0.023*****
	Sometime	18 (9.3)	64 (33.2)	27 (14.0)		
	Always	2 (1.0)	14 (7.3)	7 (3.6)		
Decreased participation	Never	7 (3.7)	14 (7.3)	1 (0.5)	**-0.091**	0.145
	Sometime	14 (7.3)	53 (27.7)	22 (11.5)		
	Always	14 (7.3)	47 (24.6)	19 (9.9)		
Having warning letter	Never	27 (14.1)	79 (41.4)	32 (16.8)	**0.037**	0.489
	Sometime	5 (2.6)	30 (15.7)	7 (3.7)		
	Always	3 (1.6)	7 (3.7)	1 (0.5)		

*Significant correlation at < 0.05 level (2-taild)

Table 5 presents the relationship between the severity of dysmenorrhea and exam performance, which was investigated by the Spearman and Chi-Square tests. There was a significant relationship with a negative correlation effect between the severity of dysmenorrhea and exam performance, except for getting a warning letter due to a low score in an exam (r = 0.057, n = 194, p= 0.806).

Table 5: Distribution of severity of dysmenorrhea with exam performance.

Exam Performance		**Severity of Dysmenorrhea**			**Spearman**	**P – Value**
		Mild n (%)	**Moderate n (%)**	**Severe n (%)**		
Not able to study for exam	Never	13 (6.8)	14 (7.3)	3 (1.6)	**-0.244**	0.001*****
	Sometime	16 (8.3)	73 (38.0)	22 (11.5)		
	Always	6 (3.1)	29 (15.1)	16 (8.3)		
Slow in writing exam	Never	18 (9.3)	32 (16.6)	8 (4.1)	**-0.244**	0.001*****
	Sometime	13 (6.7)	59 (30.6)	19 (9.8)		
	Always	4 (2.1)	25 (13.0)	15 (7.8)		
Lack of concentration	Never	9 (4.7)	5 (2.6)	3 (1.6)	**-0.206**	0.003*****
	Sometime	20 (10.4)	68 (35.2)	22 (11.4)		
	Always	5 (2.6)	44 (22.8)	17 (8.8)		
Absenteeism on exam day	Never	29 (15.1)	95 (49.5)	25 (13.0)	**-0.174**	0.019*****
	Sometime	6 (3.1)	21 (10.9)	16 (8.3)		
	Always	-	-	-		
Low score in exam	Never	21 (10.8)	45 (23.2)	12 (6.2)	**-0.222**	0.001*****
	Sometime	14 (7.2)	69 (35.6)	26 (13.4)		
	Always	-	3 (1.5)	4 (2.1)		
Having warning letter	Never	27 (14.0)	101 (52.3)	35 (18.1)	**0.057**	0.806
	Sometime	7 (3.6)	14 (7.3)	3 (1.6)		
	Always	1 (0.5)	2 (1.0)	3 (1.6)		

* Significant correlation at < 0.05 level (2-taild)

Based on the Spearman and Chi-Square tests, there was a significant relationship with a negative correlation effect between the severity of dysmenorrhea and submitting the assignment by the due date but not completed (r = -0.134, n = 194, p= 0.048). The relationship between the severity of dysmenorrhea and assignment performance is illustrated in **Table 6.**

*

Table 6: Distribution of Severity of dysmenorrhea with assignments performance.

Assignment Performance		**Severity of Dysmenorrhea**			**Spearman**	**P – Value**
		Mild n (%)	**Moderate n (%)**	**Severe n (%)**		
Submitting in due date	Never	7 (3.6)	15 (7.7)	14 (7.2)	**-0.065**	0.350
	Sometime	17 (8.8)	51 (26.3)	15 (7.7)		
	Always	11 (5.7)	51 (26.3)	13 (6.7)		
Delay in submitting	Never	19 (9.8)	68 (35.1)	21 (10.8)	**-0.044**	0.469
	Sometime	16 (8.2)	46 (23.7)	19 (9.8)		
	Always	-	3 (1.5)	2 (1.0)		
Submitting incomplete	Never	20 (10.3)	74 (38.1)	17 (8.8)	**-0.134**	0.048*****
	Sometime	15 (7.7)	41 (21.1)	22 (11.3)		
	Always	-	2 (1.0)	3 (1.5)		

Significant correlation at < 0.05 level (2-taild)

The Spearman and Chi-Square tests were used to investigate the relationship between the severity of dysmenorrhea and participating in extracurricular activities. As presented in **Table 7**, there was a significant association between the severity of dysmenorrhea and participating in extracurricular activities, but of a negative value, which means if the severity of dysmenorrhea increases, participation into extracurricular activities will decrease ($r = -0.243$, $n = 194$, $p \leq 0.001$).

Table7: Distribution of Severity of dysmenorrhea with extracurricular performance.

Extracurricular Performance	Activities	Severity of Dysmenorrhea			Spearman	P – Value
		Mild n (%)	Moderate n (%)	Severe n (%)		
Lack of interest in extra classes	Never	7 (3.6)	8 (4.1)	-	**-0.108**	0.067
	Sometime	16 (8.3)	53 (27.5)	24 (12.4)		
	Always	12 (6.2)	55 (28.5)	18 (9.3)		
Not able to participate	Never	8 (4.2)	4 (2.1)	1 (0.5)	**-0.243**	0.000**
	Sometime	20 (10.4)	56 (29.2)	19 (9.9)		
	Always	7 (3.6)	55 (28.6)	22 (11.5)		

* Significant correlation at < 0.05 level (2-taild)

IV. Discussion

The current study results showed that 194 (57%) out of 340 of the nursing students have dysmenorrhea. It revealed that more the half of the study participants complain of dysmenorrhea. This rate is slightly low when compared to results in other national or international published studies (Ibrahim et al., 2015; Ismaile et al., 2016;Abu Helwa et al., 2018; Emem & Elzeblawy, 2017; Chia et al., 2013; Mayer et al., 2013), however, the result of the current study is still within the range (40% -90%) which reported by IASP in Global Year Against Pain in Women (Berkley, 2013). The reasons why the prevalence of the current study varies slightly from other studies could be due to the difference in the standard definition of dysmenorrhea and may also be due to the varying responses of participants in the different studies. Moreover, the results of these studies also vary according to the culture of countries, patterns of life, genetic factors, stress, and the ability to tolerate pain. In addition, the design of the studies varies according to the different research designs. The methods of selecting the samples and data collections are also factors that led to the discrepancy that emerged in the interpretation of the results of the study compared with other similar researches.

Considering the severity of dysmenorrhea, the result in the present study revealed that the majority of nursing students suffered from moderate dysmenorrhea, while about one quarter suffered from severe dysmenorrhea, and few complained of mild menstrual pain. This result is consistent with other studies, which found that more than half of their study's participants had moderate pain (Amead et al., 2018; Gangwar et al., 2014; Mayer et al., 2013).

The present study showed that the severity of dysmenorrhea had a significant negative association with nursing students' academic performance in general and with class, exam, and extra-curriculum performance specifically. However, there is evidence that health and academic performance can be bidirectional, and students who suffered from chronic health conditions have lower academic performance (Ickovics et al., 2013). On other hand, healthy students attain higher levels of education (National Center for Chronic Disease Prevention and Health Promotion, 2014). In contrast to the current study, two cross-sectional studies in Saudi Arabia showed that the majority of their participants complained of severe dysmenorrhea (Ibrahim et al., 2015; Shaji, 2014). It can be concluded that moderately painful dysmenorrhea prevailed in most of these studies. Moreover, these studies confirmed the fact that dysmenorrhea severity varies among different females, and this variation could be due to the various pain scales used to measure the severity of dysmenorrhea in these studies, which may play a role in the variation of the percentage of the results.

The present study showed a significant effect of severe dysmenorrhea on class performance. However, more than half of the nursing students reported that dysmenorrhea sometime causes a lack of concentration, absence from the faculty, skipping classes, and difficulty remembering lectures. Moreover, more than one third of the students reported being absent from clinical practice, and about half of the nursing students reported low participation during lectures due to dysmenorrhea. This result is in line with other studies by Amead et al. (2018), Ghanghoriya et al. (2018), and Hailemeske et al. (2016), which confirmed the negative impact of dysmenorrhea on attending, concentrating, and participating in the class. Contrarily, in India and China, studies found a low percentage of study participants reduced their attendance in the faculty or class due to dysmenorrhea (Gangwar et al., 2014; Chia et al., 2013). This may be related to cultural differences regarding individuals' reactions to the pain and management methods used by the students or services provided by the university.

Furthermore, an analysis of the present study found a significant effect between the severity of dysmenorrhea and exam performance. The impact of dysmenorrhea on exams was associated with a decreased ability to study, a slow writing speed, low score, and reduced concentration during the exam. A similar pattern of results was obtained in Derseh et al. (2017) study, which reported a high statistical significance between the severity of pain and a lack of focus on the exam. Moreover, an inability to answer questions and a low score in exams were reported among 820 Iranian dysmenorrheal participants in Rakhshaee, (2014) study. In the present study, the majority of nursing students had never missed an exam or got a warning letter due to absenteeism because of dysmenorrhea. This may be related to the fact that the students are aware of the strict rules at KAU regarding skipping exams. Kamel et al., (2017) study showed a similar conclusion when the majority of their participants reported never missing an exam because of dysmenorrhea, which may be related to the fact that the participants were studying at a government institute that imposes strict rules regarding attendance in class and exams.

In the present study, one third of nursing students have submitted incomplete homework due to dysmenorrhea, and this relation was statistically significant. A similar finding was found in Hailemeske et al., (2016) study as the dysmenorrheal participants complained of an inability to do homework due to dysmenorrhea. This could be explained by the students' difficulty concentrating and inability to write. In the current study, it was found that extracurricular activities were decreased due to dysmenorrhea. This is consistent with Janula and Suguna (2017) study which reported that more than half of the nursing students were affected negatively in their extracurricular activities due to menstrual pain. This correlation could be explained by the association between severe dysmenorrhea and its negative impact on psychological and physical health, such as a depressed mood and reduction of social activities.

V. Conclusion and Recommendations

Dysmenorrhea is a common gynaecological problem among nursing students and it has a detrimental impact on their academic performance. In the current study, a high proportion of nursing students had dysmenorrhea. The results of the present study are consistent with national and international studies. Worldwide, the prevalence of dysmenorrhea and its characteristics varies widely according to the use of different criteria for the definition of dysmenorrhea, whether any pain interrupts daily activities, and different assessment methods used in different studies. Moreover, culture, lifestyle, genetics, and the degree of personal stress are all potential reasons for variations in dysmenorrhea prevalence. The severity of dysmenorrhea had a negative impact on students' academic performance, such as absenteeism from faculty or classes, lack of concentration, inability to complete the assignments, and inability to participate in extra activities. This study confirmed the negative impact of dysmenorrhea on the academic performance of nursing students. The results provide evidence to support the importance of developing effective educational interventions targeting pain management and focusing on building and sustaining self-care management among nursing students.

The findings of this study have some limitations. The sample was collected from a single institution, which may not be generalizable to wider nursing faculties in Saudi Arabia. The impact of dysmenorrhea on academic performance was informed according to reports from the nursing students; therefore, recall bias cannot be excluded. Assessing the impact of academic performance at one time may not be sufficient. It can be recommended that dysmenorrhea assessment preferably be ongoing to understand when pain typically emerges in some of the nursing students.

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