

## Effect of an Instructional Guideline regarding Physical Measures on Primary Dysmenorrhea among Nursing Students

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### Abstract

**Background:** Physical measures are from one primary goal of alternative medicines and commonly cited as a probable remedy for primary dysmenorrhea. **Aim:** of the present study was to evaluate the effect of an instructional guideline regarding physical measures on primary dysmenorrhea among nursing students. **Design:** A quasi experimental design pre/post-test one group was utilized. **Setting:** This study conducted at technical nursing institution in Benha University Hospital. **Sample:** A purposive sample included 218 nursing students. **Tools:** Four tools were used for data collection: An interviewing questionnaire to collect data related to sample and menstrual characteristics, Verbal multidimensional scoring system, Visual Analogue scale and Likert scale. **Results:** the present study revealed that, there was a highly statistical significant difference between symptoms of primary dysmenorrhea at pre and post- intervention and there was a highly statistically significant relation between studied sample satisfaction and pain intensity of dysmenorrhea at post intervention phase ( $P\text{-value} \leq 0.05$ ). **Conclusion:** Dysmenorrheal symptoms and pain were alleviated after implementation of an instructional guideline regarding physical measures than before implementation. Also there was a highly statistically significant relation between studied sample satisfaction and pain intensity of dysmenorrhea at post intervention phase ( $P\text{-value} \leq 0.05$ ). Therefore, the study hypothesis was supported. **Recommendation:** Physical measures as dysmenorrheal treatment are needed to develop and dissemination of illustrated guideline to control and relief of dysmenorrheal syndrome among nursing students and women in other ages.

**Key words:** Physical measures, Primary dysmenorrhea, Nursing students

### Introduction

The term dysmenorrhea is derived from the Greek word „dys“, meaning difficult, painful, or abnormal, and „rhea“, meaning flow. Uterine contractions occur during all period, but in some female these cramps can be frequent and very intense. These cramps occur during strong contraction of the uterine smooth muscle (Ric, 2020).

Primary dysmenorrhea is painful spasmodic in character and felt mainly in the lower abdomen, but it may radiate to the back and along the thighs. There may be associated

systemic symptoms like nausea, vomiting, diarrhea, headache, fatigue, and dizziness, and in severe cases, syncope (chin, 2021).

Dysmenorrhea is medical condition of pain during menstruation. It is constitute one of frequent reproductive disorders, presenting as either primary or secondary .The pain usually lasts between 8 and 72 hours. Adolescent girls are more likely than older women to primary dysmenorrhea .Because the condition get better with age. Secondary dysmenorrhea tends to be less common in adolescents. (Minale et al.,2020)).

Dysmenorrhea is a condition describing the painful cramps that women feel before or during the menstrual period. While dysmenorrhea is the most common gynecologic complaint affecting adolescent and young women and there has been significant progress in understanding its pathophysiology and managing the symptoms, many young women do not seek medical consultation and remain untreated (Esimai & Esan ,2020)

The prevalence of dysmenorrhea reported in the literature varies substantially. A greater prevalence was

generally observed in young women, with estimates ranging from 67% to 90% for those aged 17–24 years .A recent large Australian study of senior high school girls found that a higher proportion, 93%, of teenagers reported menstrual pain ( Zeev,2020).

Menstrual cramps happen when a chemical called prostaglandin makes the uterus contract (tighten up). The uterus, the muscular organ where a fetus grows, contracts throughout the menstrual cycle. During menstruation, the uterus contracts more strongly. If the uterus contracts too strongly, it can press against nearby blood vessels, cutting off the supply of oxygen to muscle tissue. The feel of pain occurs when part of the muscle briefly loses its supply of oxygen (Polat et al.,2021).

Dysmenorrhea is categorized as primary or secondary, primary dysmenorrhea is common and occurs in absence of organic disease; it usually starts during adolescence and tends to lessen with age and after pregnancy. Pain is thought to result from uterine contractions and ischemia, probably mediated by prostaglandins produced in secretory endometrial (Pilliteri, 2020).

Primary dysmenorrhea defined as a painful menstruation which occurs in absence of demonstrable pelvic disease, also it is menstrual pain that's not a symptom of an gynecologic disorder but is related to the normal process of menstruation. Onset is typically 6 to 12 months after menarche ( Berek & Novak., 2021).

According to (WHO), defines physical measures and activity as any bodily movement produced by skeletal muscles that requires energy expenditure. Physical activity refers to all movement including during leisure time, for transport to get to and from

places, or as part of a person's work. Both moderate- and vigorous-intensity physical activity improve health. People who are insufficiently active have a 20% to 30% increased risk of death compared to people who are sufficiently active (*WHO, 2022*).

physical measures in adolescents which include any average of level of practice and regular exercise can be effective on menstruation, promote circulation in blood vessels that may be able to relieve dysmenorrhea, improves physical fitness, cardio metabolic health, bone health, cognitive outcomes, academic performance and mental health (reduced symptoms of depression) (*Zeev, 2020*).

Physical measures and alternative medicine particularly attracted the attention of professionals and women also. It includes a group of therapeutic resources aiming to decreasing or eliminating pain in a practical and economic way. Health care providers suggest some form of physical measures such as pelvic tilting, walking, yoga and relaxation, may improve blood flow, relax abdominal muscles, reduce pelvic pain and relieve pressure on nerve centers, pelvic organs and the alimentary canal (*Mohammadi et al., 2022*).

Women who exercise show less severe dysmenorrhea and greater positive effects than women who are sedentary. It helps in reducing pain, relieving stress, elevating

mood and improving health. Exercise today is an integral part of normal life for many women. It is clear that there are many health benefits for women who exercise regularly and in moderation. Exercise improves cardiovascular status, increased bone mineral content; improve dysmenorrhea and premenstrual syndrome symptom (*Gluten & Memnun, 2020*).

Physical exercises the changing position of the body can help ease cramps. The simplest technique is assuming the (fetal position), with knees pulled up to the chest while hugging a heating pad or pillow to the abdomen. Like several yoga positions to ease menstrual pain. In the "cat stretch position, the woman rests on hands and knees, slowly arching the back. The pelvic tilt is another popular yoga position, in which the woman lies with knees bent, and then lifts the pelvis and buttocks (*Derseh et al., 2020*).

Alternative medicine of primary dysmenorrhea should usually be based on the reduction of the endometrial prostaglandin production or decreasing the endometrial contractions. Treatment for dysmenorrhea aims to relieve pain or symptoms either by affecting the physiological mechanisms behind menstrual pain (such as prostaglandin production) or by relieving symptoms with chemical or alternative therapy (*Michelle & Cynthia., 2021*).

Nurses emphasize, health promotion, wellness enhancing strategies and illness prevention activates as important forms of health care because they assist females in maintain and improve health. Health program aimed to improve a student's level of wellness in all dimensions, health program such as healthy lifestyle, nutrition, exercise, family

relationships and coping with stress and adaptations behaviors (*Ahmed, 2022*).

Nurses are encouraged to check with state boards of nursing regarding the use physical measures as of integrative therapies. The nurse has an important role in conducting school program and educating adolescent girls regarding the different non-medical measures and its effectiveness in controlling menstrual pain perception (*Bonnechère, 2021*).

### Significance of the study

Dysmenorrhea is a common condition that is under diagnosed and under treated that affects most of female adolescents. The leading cause of periodic college/school absenteeism. Dysmenorrhea can decrease productivity, creativity, and work performance due to serious daily stress and social and economic loss (*Venkatraman et al., 2017*).

Around the world the prevalence of dysmenorrhea among adolescent females ranges from 60 to 93 percent many girls report limitations on daily activities, such as missing school, sporting events, and other social activities, because of dysmenorrhea. However, only 15 % of females seek medical advice for menstrual pain, signifying the importance of screening all adolescent females for dysmenorrhea (*Ortiz et al., 2019*).

Primary dysmenorrhea one of the most primogenital puberty age problems with 75% of all Egyptian adolescent girls and 95% of adolescent girls of upper Egypt suffering from primary dysmenorrhea, it negatively influences on girls life (*Hanan et al., 2018*).

Physical measures can be effective in improve dysmenorrhea and the changing position of the body can help ease cramps. The simplest technique is assuming the (fetal position), with knees pulled up to the chest while hugging a heating pad or pillow to the abdomen. Like several yoga positions to ease menstrual pain. In the "cat stretch position, the woman rests on hands and knees, slowly arching the back. The pelvic tilt is another popular yoga position, in which the woman lies with knees bent and then lifts the pelvis and buttocks (*Park et al., 2018*).

Nurses today, using complementary medicine as a modern approach in conjunction with females is turning to alternative medicine. Maternity practitioner nurses providing, safe, competent and care to their clients. In an attempt to offer comfort, pain control and symptom management regarding female with dysmenorrhea symptoms, nurses increasingly offering physical measures as part of their focus on comprehensive female care (*Saritha & Swaraj, 2019*).

### Aim of the Study

The study aimed to evaluate the effect of an instructional guideline regarding physical measures on reducing primary dysmenorrhea among nursing students

### Hypothesis:

Primary dysmenorrhea will be alleviated after implementation of an instructional guideline regarding physical measures than before implementation.

## 1- Materials and Method

### 1.1 Research design:

A quasi experimental design one group (pre / post) study design was utilized .

### 1.2 Setting:

The study was conducted at technical nursing institute in Benha University hospital which found in the third and fourth floors of the physical education building, and each floor contains three halls, each hall includes sixty students. The institute has 750 students in the second year and 630 students in the first year from both sex boys and girls.

### 1.3 Sampling:

#### • Sample type:

A purposive sample was selected from the above-mentioned study setting.

#### • Sample size:

The total sample was including nursing students suffering from primary dysmenorrhea was chosen among nursing students in technical institute in the 1st and 2nd academic levels at Benha University in the academic year (2021,2022). The sample included 218 students with mentioned criteria (80 students at 1st academic levels and 138 at 2nd academic levels).

#### Inclusion criteria:

The studied sample was selected according to the following criteria:

- 1 - Adolescent age (19-21) years.
- 2 - Complain of primary dysmenorrhea
- 3 - Having regular menstrual periods.
- 4 – Not married.

#### Exclusion criteria:

1. Nursing students having genital tract infection.
2. Nursing students who have pelvic disease.
3. Receiving pain relief medication.
4. Having special dietary regime.

#### Sample technique:

The researcher visited the study setting, introduced herself to female students and explained the purpose of the study briefly to those who met the inclusion criteria. This was repeated 2 days weekly from 9 am to 1pm. All students suffer from primary dysmenorrhea with the previous mentioned criteria were included until the predetermined size was collected. Data collection took about nine months from beginning of September 2021 to end May 2022).

### 1.4 Tools of data collection

Four tools were used for data collection.

#### Tool (I): A Structured Interviewing Questionnaire (Appendix I):-

It was designed by the researcher after reviewing related literatures adopted from (Minal., 2020). It was written in simple Arabic language in the form of close and open ended questions. It consists of four parts:

**Part 1:** This part was concerned with demographic data as (age, academic year, residence and anthropometric measurements). Questions (4).

**Part 2:** This part is concerned with menstrual history included characteristics of menstruation of studied sample as (Age of menarche, duration of menstruation, interval of menstruation, regularity of menstruation

and number of pads/day). Questions (5).

**Part 3:** This part was concerned with present history of dysmenorrhea (time of pain, site of pain and measures for reducing dysmenorrheal pain). Questions (3)

**Part 4:** This part was concerned with knowledge about dysmenorrhea (Definition, causes, risk factors, symptoms and complication of dysmenorrhea). Questions (5)

#### Scoring system:-

The answers were scored as the following:

- Correct answers was (2) degree.
- Incorrect and unknown answers will be given (1) degree

#### Total score of Knowledge:-

- Satisfactory knowledge when total knowledge score:  $\geq 60\%$ .
- Unsatisfactory knowledge when total knowledge score:  $< 60\%$ .

#### Tool (II): Verbal multidimensional scoring system (VMDS) (Appendix II):-

It was adopted from (Odekar & Hallowell, 2015) and conducted to assess the associated symptoms of dysmenorrhea as the following:

(0) it means no symptoms (1) (symptoms exist only mildly and did not interfere with routine activities ,(2)symptoms exist moderately and interfere with routine activities but were not debilitating (3)symptoms exist severely and are completely debilitating) and taken also in to account the effect on daily activity , systemic symptoms and weather analgesic were required . Questions (4)

#### Scoring system:

- 0 (means no symptoms).
- 1 (means mildly symptoms).
- 2 (means moderately symptoms).
- 3 (means severely symptoms).

#### Tool (III): Visual analog scale: (Appendix III)

It was adopted from (Dones et al., 2013) and conducted to assess pain intensity by nursing students. It was used to examine the degree of pain before and after implementation of an instructional physical measures. The tool included ten points, each point is scored on a scale. Questions (4)

#### Scoring system:

VAS was scored as the following:

- ( 0 ) = No pain
- (1 – 3) = Mild pain
- (4 - 7) = Moderate pain
- (8 -10) = Sever pain

#### Tool (IV): Likert scale: (Appendix V)

It was adopted from (Steven et al., 2016) and conducted to measure satisfaction regarding the use of physical measures on reducing primary dysmenorrhea among nursing students. It consisted of 10 items. Questions (10)

#### Scoring system: each items of scale was scored as the following:-

- 1 = strongly dissatisfied.

- 2 = dissatisfied.
- 3 = neither agree nor disagree satisfied.
- 4 = satisfied.
- 5 = strongly satisfied

Total students satisfaction was classified into two categories as following:

- Satisfactory when total score  $\geq 75$  %.
- Unsatisfactory when total score  $< 75$  %.

#### **Supportive instructional guideline**

It was designed by researcher after reviewing related literatures (Stacey, 2016) using simple Arabic language, which has been divided into two parts:

- *The first part* included knowledge about definition, prevalence, causes, risk factors, complication, symptoms and physiology of primary dysmenorrhea. *The second part* clarified how to reduce the pain of the primary dysmenorrhea through the use of physical measures and certain exercises which help in the movement of the spine and abdomen that can be very helpful in improving pain levels as Cat, Cobra and Fish exercise. The guideline was supported by pictures and information in simple ways, which made it easier for nursing students to understand content and how to implement physical measures to reduce primary dysmenorrhea. It was given to nursing students as a confirmation of knowledge during self-intervention.

#### **Tools validity and reliability**

The content validity of the tools was reviewed by a panel of three experts (one from Obstetrics and Gynecological medicine and two from Obstetrics and Gynecological Nursing) and simple changes in sentence wording were required. The reliability of the tools was done to check its internal consistency. The Cronbach's alpha coefficient for the Knowledge tool I was 0.96, for the tool II (Verbal multidimensional scoring system) was 0.84, for tool III (Visual analog scale) was 0.87 and for tool IV (satisfaction scale) was 0.91.

#### **Ethical Considerations:**

Ethical aspects were considered before implementation of the study as the following:

-The study approval was obtained from scientific research Ethical committee, factuality of nursing Benha University before starting the research.

-An official permission from the selected study setting was obtained to fulfillment the study.

-The aim of the study was explained to each student before applying the tools to gain confidence and trust.

-Informed consent was obtained from each student to participate in the study.

-Self-esteem dignity, and confidentiality of students was ensured throughout the study process, where personal data were not disclosed, and the students were assured that all data would be used only for study purpose.

-The study hadn't any physical, social or psychological risk on students

-The data was collected and treated confidentially and each nursing students was informed about time of visit for

follow up.

-Each nursing students was free to withdraw from the study at any time.

#### **III-Administrative design**

A written official approval to conduct the study obtained from the Dean of Faculty of Nursing to the director of technical nursing institute in order to obtain students agreement to conduct the study after illustrating the title and study purpose and seek cooperation.

#### **Pilot study**

A pilot study was carried out for 10% of the total sample (22 nursing students) to test the clarity and applicability of the tools and to estimate the required time to fulfill the study tools. As there were no modifications on the study tools, the pilot study subjects were included in the study sample.

#### **Field work:**

The researcher attended the study setting two days per week. Data collection was implemented for nine months in coordination with nursing institute director, the study intention and its importance have been clarified to director of nursing institute, teachers and students to gain support and cooperation and help the researcher during data collection. The study was conducted through four phases (preparatory phase, assessment phase, implementation phase and evaluation phase).

#### **Preparatory phase:-**

It is the first phase of the study and it included reviewing current and related literatures. Also, theoretical knowledge of various aspects of the study using books, periodical, articles, magazine and internet to develop the tools for data collection.

The planned program was conducted in the previously mentioned setting through three sessions; the session duration was around 30 minutes. The instructional guideline was designed to cover the following (definition of primary dysmenorrhea, symptoms of primary dysmenorrhea, causes of primary dysmenorrhea and physical measures to alleviate primary dysmenorrhea).

#### **Assessment phase:-**

This phase encompassed interviewing nursing students to collect baseline data at booking visit. The researcher introduced herself at beginning of the interview, greeted each nursing students, explained the aim of the study, schedule planed of visits, and frequency of sessions to study group only to assure adherence to selected interventions. Written consent was taken from each nursing student to participate in the study.

-The researcher distributed structure interviewing questionnaire (pretest) to collect nursing students' knowledge regarding primary dysmenorrhea. The average time required for completion of this questionnaire was around (10-15 minutes).

- Then the researcher distributed, the verbal multidimensional scoring system and Visual analogue scale (pretest) to collect symptoms of dysmenorrhea and assess severity of pain of nursing students. The average time required for completion of the

questionnaire was around (10-15 minutes).

- The interviewing process was carried out 2 days/week starting from 9 am to 1pm. Each nursing student was interviewed individually. The numbers of interviewed nursing student per week was 20-40 nursing students with primary dysmenorrhea. The average time taken for completing each sheet was around 20-30 minutes depending on nursing student's response. Each nursing student was reassured that obtained information were be confidential and used only for the study purpose.

#### **Planning phase**

-The program was conducted to determine the effect of applying physical measures on symptoms of primary dysmenorrhea among nursing students. Participants (study group 218 nursing students) were classified into 11 groups, each groups consisted of 15-20 nursing students. To follow COVID 19 precautions the students were assembled in a spacious hall in order to maintain safety and reduce infection, with an emphasis on wearing a mask, maintaining distance and good ventilation of the place. The researcher distributed the mask to some of the students. The researcher and participants attended data collection site two times/week (Sunday and Thursday). The duration of educational program lasted three weeks for each group. The program classified into 3 sessions planned to provide specific information about primary dysmenorrhea. The actual time of each session was 20-30 minutes. These sessions were applied in the lecture hall in technical health institute of nursing at Benha University hospital.

-To keep in contact with nursing students, telephone numbers and detailed addresses were obtained from nursing students to follow nursing students between visits, and to avoid sample loss when nursing students do not attend scheduled visits.

#### **Implementation phase**

-The researcher followed up nursing students and applied program using physical measures technique. 218 nursing students (divided equally into 11 groups) according to academic year ,(the first academic year 80 students classified into four groups each group 20students) and (second academic year 138 nursing

#### **IV- Statistical design**

Data /entry and statistical analysis were done using the Statistical Package for Social Science (SPSS version 22.0). Descriptive statistics included frequencies and percentages, means and standard deviations. Inferential statistics as (Chi-square test, Fisher Exact Test). For all of the statistical tests done, p-value > 0.05 indicated no statistical significant difference, p-value ≤ 0.05 indicated a statistical significant difference, and p-value P ≤ 0.001 indicated a highly statistically significant difference.

#### **Limitation of the study:**

1. The limitation of this study was the difficulty to find the suitable time and place to assemble participants together because of the schedules of study in the college of nursing which filled with theoretical and practical lessons.
2. Suspended some of study participants with chemical

students calcified into seven groups each group 20 students and one group 18 students) attended the educational program through 3 sessions. At the beginning of each sessions, the researcher started by giving a summary about the previous session and explaining the objectives of the new session, using simple Arabic language to suit nursing students level of understanding.

**First session:** included providing nursing students with knowledge about primary dysmenorrhea (definition, prevalence, causes, risk factors, complications, symptoms of dysmenorrhea and factors that increase the risk of developing primary dysmenorrhea).

**Second session:** concerned with simple physical measures used to reduce primary dysmenorrhea (nutrition, warm compresses, alternative medicine and health guidelines that must be followed to reduce the occurrence of primary dysmenorrhea). Visual aid "illustrated pictures" and discussion were used to facilitate understanding.

**Third session:** focused on physical measures that performed by nursing students as Cobra, Cat, Cow, Fish and yoga exercises that may help to cope with heavy cramping, and best for primary dysmenorrhea.

#### **Break phase:**

- The researcher contacted with nursing students by phone to ensure that they followed the booklet and applied physical measures effectively. The researcher provided any required advice or care to nursing students to solve any obstacles during break

#### **Evaluation phase:**

-After one month of implementation of the program, the posttest applied to evaluate nursing student knowledge regarding primary dysmenorrhea through using structure interviewing questioner part 4. The effectiveness of physical measures of an instructional guideline was evaluated through using the same pretest (verbal multidimensional scoring system (VMS) tool, Visual analogue scale and the satisfaction sheet among nursing students. The researcher compared pretest and post test results to evaluate the effectiveness of program implementation.

drug's effectiveness.

#### **Results**

Table (1) illustrates that, more than three quarters (75.2%) of the studied sample had age ranged from 20 ≤ 21years old. Regarding academic year, nearly two thirds (63.3%) of studied sample were at second academic year. Also nearly two thirds (63,8%) of studied sample were from rural areas.

Figure (1) Distribution of studied sample regarding body mass index

Table (2) Illustrates that there was a highly statistical significant difference between symptoms of dysmenorrhea at pre and post- intervention phases. More than two fifth (40.4%) of studied sample had menstrual pain but not interferes with routine activities and unrequired analgesics pre-intervention compared to more than half (55.5%) post- intervention. Also less

than half (42.4%) of studied sample had daily activity affected and analgesics required so that absence from work or schools is unusual pre-intervention compared to nearly one third (34.4%) post- intervention.

Figure (2): Mean and stander deviation of pain intensity of dysmenorrhea at pre- and post-intervention phases.

Table (3) Reveals that more than half (56.4%) of studied sample were strongly satisfied that the program commensurate with the ethics and societal habits and nearly half of them (47.8% - 45.4% ) improve daily activity, control menstrual pain, reduce analgesics and learning modern experience to remove the pain) respectively

Figure (3): Distribution of total studied sample satisfaction regarding the instructional guidelines

about dysmenorrhea.

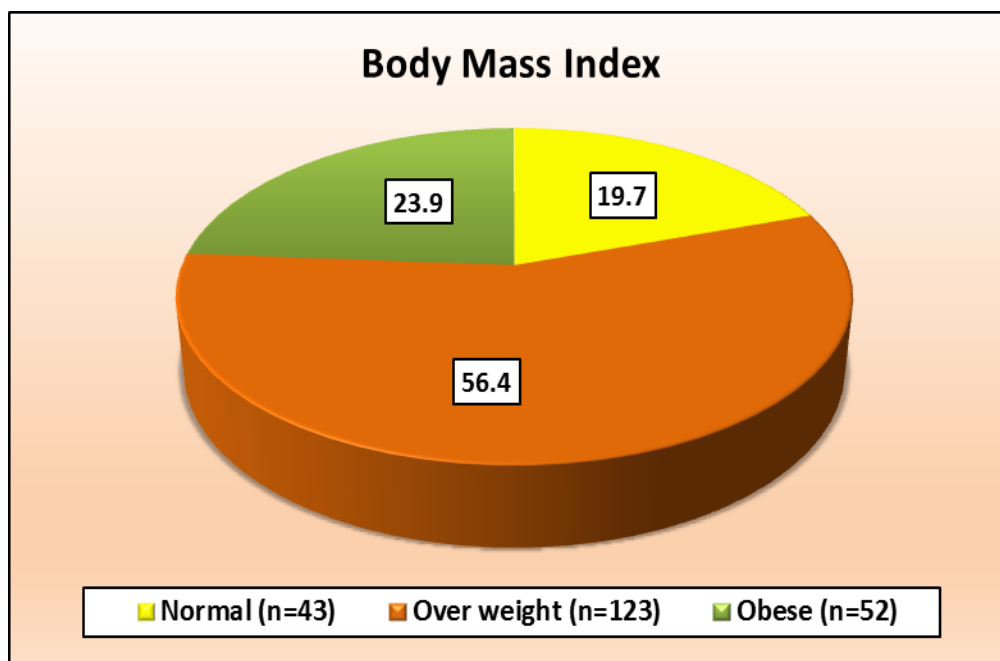
Table (4) Indicates that, there was a highly statistically relation between body mass index and pain intensity of dysmenorrhea at post intervention phase

Table (5) Indicates that, there was highly statistically significant relation between pain intensity of dysmenorrhea and age of menarche, interval of menstruation and number of pads/day. While there was statistically significant relation between pain intensity and regularity of menstruation. On other hand there was no statistically significant relation between pain intensity and duration of menstruation.

Table (6) Clarifies that, there was a highly statistically significant relation between studied sample satisfaction and pain intensity of dysmenorrhea at post intervention phase (P-value ≤ 0.05).

**Table (1)** Distribution of the studied sample according to demographic characteristics (n=218).

Demographic characteristics	No	%
<b>Age in years</b>		
19 < 20	54	24.8
20 ≤ 21	164	<b>75.2</b>
<b>Mean ±SD</b>	19.75±0.43	
<b>Academic year</b>		
First year	80	36.7
Second year	138	<b>63.3</b>
<b>Residence</b>		
Rural	139	<b>63.8</b>
Urban	79	36.2



**Fig. (1)** Distribution of studied sample regarding body mass index

**Table (2)** Distribution of studied sample regarding symptoms of dysmenorrhea at pre- and post- intervention phases (n=218).

Symptoms of dysmenorrhea	Pre- intervention		Post- intervention		FET	P value
	No.	%	No.	%		

Menstruation is not painful and daily activity unaffected	0	0.0	8	3.7		
Menstruation is painful but not interferes with routine activities and unrequired Analgesics.	88	<b>40.4</b>	120	<b>55.0</b>		
Daily activity affected, analgesics required and so that absence from work or schools is unusual	92	<b>42.4</b>	75	<b>34.4</b>	25.3€	0.000**
Activity clearly inhibited poor effect of analgesics and other symptoms, e.g. headache, tiredness, nausea and vomiting	38	17.4	15	6.9		

€ Fisher Exact Test; P-value>0.05 (NS);\*P-value ≤0.05 (S); \*\* P-value ≤0.001 (HS).

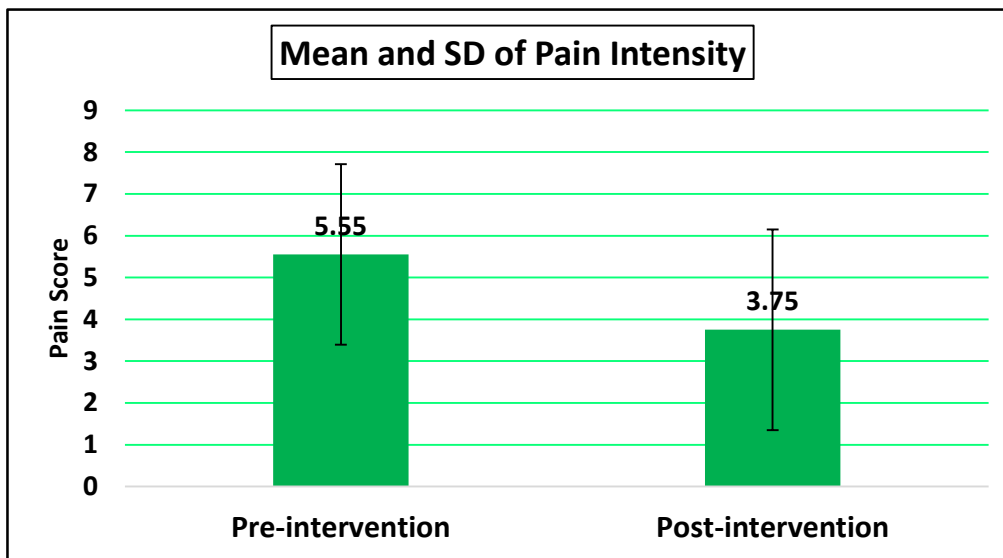


Fig. (2) Mean and stander deviation of pain intensity of dysmenorrhea at pre- and post- intervention phases.

Table (3): Distribution of studied sample regarding satisfaction of physical measures guideline about dysmenorrhea post-intervention (n=218).

Satisfaction items	Strongly dissatisfied		Dissatisfied		Neither agree nor disagree		Satisfied		Strongly satisfied	
	No	%	No	%	No	%	No	%	No	%
Physical measures therapy is effective method to control menstrual pain.	5	2.3	22	10.1	19	8.7	99	<b>45.4</b>	73	33.5
Physical measures are safe method of therapy without any complications	9	4.1	22	10.1	23	10.6	84	<b>38.5</b>	80	36.7
Physical measures are easy to learned with saving time and money	5	2.3	31	14.2	19	8.7	87	<b>39.9</b>	76	34.9
Physical measures will be my first choice to control the menstrual pain	7	3.2	26	11.9	9	4.1	80	36.7	96	<b>44.1</b>
It's good generalization program for girls with dysmenorrhea.	6	2.8	18	8.3	18	8.3	94	<b>43.1</b>	82	37.5
Physical measures program help to change pattern to relieve dysmenorrhea.	8	3.7	25	11.5	18	8.3	90	<b>41.3</b>	77	35.2
Physical measures can improve daily activities during menstruation	5	2.3	28	12.8	13	5.9	104	<b>47.8</b>	68	31.2
Physical measures reduce analgesics intake during dysmenorrhea.	3	1.4	23	10.6	13	6.0	99	<b>45.4</b>	80	36.6
The program commensurate with the ethics and societal habits.	0	0.0	0	0.0	10	4.6	85	39.0	123	<b>56.4</b>
The program helping in learning modern experience to remove the pain	4	1.8	14	6.4	14	6.4	99	<b>45.4</b>	87	40.0

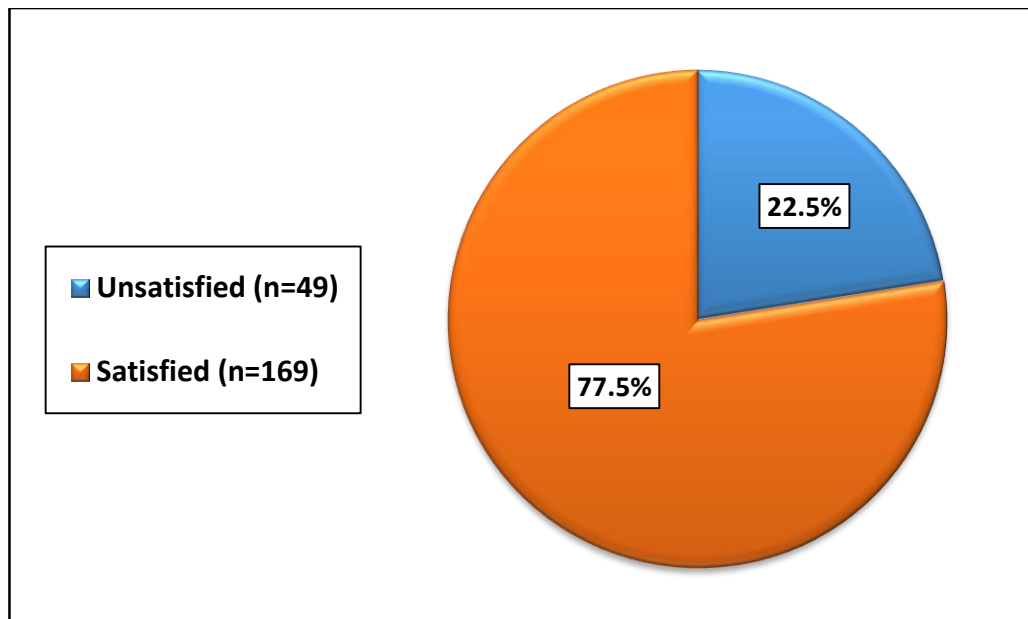


Fig. (3) Distribution of total studied sample satisfaction regarding the instructional guidelines about dysmenorrhea.

Table (4) Statistically relation between body mass index and pain intensity of dysmenorrhea at post intervention phase (n=218).

Body mass index	Pain intensity of dysmenorrhea								FET	p-value
	No pain (n=8)		Mild pain (n=128)		Moderate pain (n=58)		Sever pain (n=24)			
	no	%	no	%	no	%	no	%		
Normal weight (n=43)	7	87.5	31	24.2	3	5.2	2	8.3		
Over weight (n=123)	1	12.5	84	65.6	30	51.7	8	33.3	59.2€	0.000**
Obese (n=52)	0	0.0	13	10.2	25	43.1	14	58.4		

€ Fisher Exact Test; P-value>0.05 (NS);\*P-value ≤0.05 (S); \*\* P-value ≤0.001 (HS).

Table (5) Statistically relation between menstrual history and pain intensity of dysmenorrhea at post intervention phase (n=218).

Menstrual history	Pain intensity of dysmenorrhea								FET	p-value
	No pain (n=8)		Mild pain (n=128)		Moderate pain (n=58)		Sever pain (n=24)			
	no	%	no	%	no	%	no	%		
<b>Age of menarche</b>										
10 < 13 years	0	0.0	23	18.0	43	74.1	13	54.2		
13 < 16 years	8	100.0	98	76.6	4	6.9	5	20.8	104.0€	0.000**
≥ 16 years	0	0.0	7	5.4	11	19.0	6	25.0		
<b>Duration of menstruation</b>										
< 3 days	2	25.0	19	14.8	10	17.2	4	16.7		
3 < 5 days	3	37.5	73	57.0	32	55.2	17	70.8	4.78€	0.56
≥ 5 days	3	37.5	36	28.1	16	27.6	3	12.5		
<b>Interval of menstruation</b>										
≤ 21 days	2	25.0	23	18.0	48	82.8	9	37.5		
21 < 35 days	5	62.5	104	81.2	5	8.6	6	25.0	119.9€	0.000**
≥ 35 days	1	12.5	1	0.8	5	8.6	9	37.5		
<b>Regularity of menstruation</b>										
Regular	6	75.0	94	73.4	28	48.3	11	45.8	14.7€	0.002*
Irregular	2	25.0	34	26.6	30	51.7	13	54.2		
<b>Number of pads/day</b>										
1: 3 pads	6	75.0	100	78.1	29	50.0	3	12.5		
4 : 5 pads	2	25.0	26	20.3	22	37.9	10	41.7	56.7€	0.000**
≥ 6 pads	0	0.0	2	1.6	7	12.1	11	45.8		

€ Fisher Exact Test; P-value>0.05 (NS);\*P-value ≤0.05 (S); \*\* P-value ≤0.001 (HS).



**Table (6)** Statistically relation between studied sample satisfaction and pain intensity of dysmenorrhea at post intervention phase (n=218).

Satisfaction	Pain intensity of dysmenorrhea								FET	p-value
	No pain (n=8)		Mild pain (n=128)		Moderate pain (n=58)		Sever pain (n=24)			
	no	%	no	%	no	%	no	%		
Satisfied (n=169)	8	100.0	122	95.3	33	56.9	6	25.0	74.5€	0.000**
Unsatisfied (n=49)	0	0.0	6	4.7	25	43.1	18	75.0		

€ Fisher Exact Test; P-value>0.05 (NS);\*P-value ≤0.05 (S); \*\* P-value ≤0.001 (HS).

## DISCUSSION

The menstrual period is a natural phenomenon that occurs throughout the reproductive age of most women. Most females experience some degree of pain and discomfort related to menstrual period, (dysmenorrhea) which was important impacts on the activities and disturb productivity at home or at school performance and attendance (*Parker et al., 2021*).

Physical measure from one primary goal of alternative medicines is to relieve people from depending mostly on modern drug usage and support them manage the life naturally. Now many people move towards the use of alternative therapy for prevention of diseases and solve day to day the health related problem (*Tarrasch, 2019*).

**Demographic characteristics** can play a major role in determining primary dysmenorrhea among nursing students. Regarding age of studied sample, the finding of present study revealed that more than three quarters of studied sample age ranged from 20≤21years with mean age 19.75±0.43 This result agreed with *Mool et al., (2021)*; who studied "the characteristics and prevalence of dysmenorrhea among girls in India" and showed that; the average age of the participants was ranging from 17 to 21 years. More than half of studied sample was in the age range of 19 to 21 years and three quarters of the sample was from rural areas. Also those findings of present study agreed with *Arafa et al., (2019)*; who studied "Prevalence of dysmenorrhea and premenstrual syndrome among girls in Egypt" and reported that; in a cross-sectional study among the Egyptian adolescent girls of Upper Egypt the age ranged from 13- 21 years and more than half of the study sample were from rural areas of Upper Egypt. This may be due to that studied nursing students were selected in range of (19-21) years old.

**Regarding the anthropometric measurements** of the studied sample, the present study showed

that studied sample had mean height of 161.26±2.68, mean weight of 73.27±7.61 and body mass index (BMI) mean were 28.12 ± 2.54.

This result was supported with *Howida & Tawheda., (2019)*; who studied the "Effect of home remedy to relieve primary dysmenorrhea in Egypt" and showed that, the BMI of the sample showed that less than quarter of studied sample had normal weight. While nearly two thirds of the students in the sample were overweight. Also, only minority of the students in the sample were obese with the mean of BMI was (27.8 ± 3.5), this agreement may be due to the presence of

both studied sample at the same community. While the results of present study contradicted with *Madhubala & Jyoti., (2020)*; who studied "the relation between menstrual dysmenorrhea and body mass index among Nursing students in India" and reported that ; more than one third of the studied sample had severe body underweight (starvation ), less than one quarter were underweight and more than one third had normal body mass index, with no indicates for overweight or obese body mass index, This may be due to differences of nutritional culture and nutritional knowledge between India's and Egypt's communities among girls.

### Dysmenorrheal symptoms of the studied sample:

The results of the present study showed that there was a highly statistical significant difference between symptoms of dysmenorrhea at pre and post- intervention phases. In the same context more than two fifth of studied sample had menstrual pain but not interferes with routine activities and unrequired analgesics pre-intervention compared to more than half of them post-intervention. Also less than half of studied sample had daily activity affected and analgesics required so, that absence from work or schools is unusual pre-intervention compared to nearly one third post-intervention. This may be due to the severity of the systemic symptoms accompanying dysmenorrhea diminished significantly after application of physical measures according to the multidimensional scoring system.

These results were supported by *Shahla et al., (2021)*; who studied "the effects of physical measures on the severity of primary dysmenorrhea in Iran" and showed that; the mean severity of systemic symptoms of participants before and after physical measures is shown differences.

Also the findings of present study agreed with, *Ali & Heidari., (2020)*; who studied "The effect of physical measures on the severity of systemic symptoms associated with dysmenorrhea in Iran" and clarified that; severity of the systemic symptoms associated with dysmenorrhea was assessed with a verbal multidimensional scoring system before and during physical measures intervention. And revealed that; the group applying physical measures, had symptoms significantly reduced compared with before the intervention .

Dysmenorrhea among nursing students has substantially compromised the overall quality of life of sufferers almost like a chronic illness. Feel of disturbance, depression, and pain, have a negative effect on the degree of the verbal multidimensional scoring system.

### Intensity of dysmenorrheal pain of the studied sample:

The current study results clarified that there was a highly statistical significant difference between intensity of dysmenorrheal pain at pre and post-intervention phases. More than one quarter of studied sample had mild pain of dysmenorrhea at pre-intervention compared to nearly two thirds post-intervention. Also more than half of them had moderate pain of dysmenorrhea at Pre- intervention compared to more than only one quarter at post- intervention. This may be due to the positive effect of physical measures on dysmenorrheal pain intensity.

This results supported by *Jennifer ., (2019)*; who studied "*the effect of physical measures on a primary dysmenorrheal pain degree in California*" and reported that; there was a statistically significant decrease in dysmenorrheal pain score measured by visual analog scale (VAS) immediately after the intervention. In addition, *Mahboobeh et al., (2019)*; who studied that "*The effect of acupuncture at third liver point on the anxiety level in patients with primary dysmenorrhea Iran*" dysmenorrhea was assessed according to VAS for pain intensity and showed there was an immediate positive effect of physical measures on symptoms and pain for a female with primary dysmenorrhea.

Also the findings of present study agreed with *Mingxiao et al., (2019)*; who studied "*physical measures as pain relief in females with primary dysmenorrhea in China*" and showed that; the menstrual pain intensity in the experimental group was reduced from  $6.38 \pm 1.28$  to  $2.54 \pm 1.41$  respectively, after intervention with the physical measures.

While the current study results contradicted with *Sadat et al., (2018)*; who studied "*the effect of physical measures on primary dysmenorrhea in Iraqi*" and showed that; Pain severity up to 3 hours after giving physical measures were slightly decreased. There was no difference observed of pain in the study and control group before and after an intervention.

### Satisfaction of studied sample of physical measures guideline at post intervention:

The result of the present study revealed that more than half of studied sample were strongly satisfied that the program commensurate with the ethics and societal habits and nearly half of them had improved daily activity, control menstrual pain, reduced analgesics and learning modern experience to remove the pain) respectively.

These results were supported by *Chen and Chen ., (2022)*; who studied about "*the effects of physical measures on primary dysmenorrhea in China*" and reported that; physical measures reduced the pain and anxiety typical of dysmenorrhea. Thirty-one of the participants reported that physical measures were helpful, and the majorities were satisfied with physical measures in terms of its providing pain relief and psychological support during dysmenorrhea.

As well as the present study finding was in agreement with *Samantha .,(2021)* ; who studied "*the effectiveness of physical measures intervention on pain*

*and quality of life of female with primary dysmenorrhea in Germany*" and found that; physical measures significantly elevates the level of satisfaction and improved the physical component quality of life.

This may be due to dysmenorrheal symptoms during menstruation among students, have a negative effect on the degree of satisfaction. Also exhausted, tiredness and stress have a strong relation with elevating the parameter of pain and decrease the level of satisfaction. According to the degree of satisfaction after physical measures intervention among study sample, the results showed that; using of physical measures as a non- pharmacological treatment elevated the level of satisfaction among the studied sample and this ensure the positive effect of physical measurers in students satisfaction.

**Regarding the relation between the body mass index** among studied sample and degree of pain, there was a highly statistically relation between body mass index and pain intensity of

dysmenorrhea at post intervention. This finding was emphasized by *Batool et al., (2018)*; who

studied "*the severity of dysmenorrheal and its relationship with body mass index among adolescent females in Iran*" and explained that; the frequency of dysmenorrhea in nurses with a higher body mass index and obesity was more than other participants. Also, the present *study finding supported by Solomon et al., (2021)*; who reported that; students on BMI borders (overweight and obese) were associated with primary dysmenorrheal pain.

On other hand the results of the present study contradicted with *Madhubala and Jyoti ., (2020)*; who recommended that; all girls with severe dysmenorrhea had body mass index  $< 16.5$  (overweight) and all girls with no dysmenorrhea had normal body weight.

### Relation between pain intensity of dysmenorrhea and menstrual history:

Regarding relation between menstrual history and intensity of pain of studied

sample post intervention. The current results displayed that, there was highly statistically significant relation between pain intensity of dysmenorrhea and age of menarche, interval of menstruation and number of pads/day. While there was statistically significant relation between pain intensity and regularity of menstruation. On the other hand there was no statistically significant relation between pain intensity and duration of dysmenorrhea.

These results were agreed with. *Tulika ., (2018)* ; who studied "*the menstrual characteristics and prevalence of dysmenorrhea in Georgia*" and reported that; the majority of girls were in the reference category of 12-14 years for the age of menarche have a low level of pain, the age of menarche is an important factor can affect the level of pain. In the same context , *Solomon et al., (2021)* ; in previous mentioned study who found that; age at menarche was positively associated with primary dysmenorrhea, menarche at age  $>16$  years was associated with an increase in primary dysmenorrheal symptoms. In the researcher point of view this could be due to the fact that girls who attend menarche early have

longer exposure to uterine prostaglandins, leading to higher prevalence and experience of dysmenorrhea which increase pain tolerance and low pain level with the time.

While also *Dimtreos and Ertan ., (2021)*; in previous mentioned study who found that; risk factors for dysmenorrhea include early age at menarche (less than 12 years ) that; Girls who achieve menarche earlier than their peers are at greater risk for depression and anxiety , which may reflect these girls entering puberty before fully understanding what is happening to bodies.

#### **Relation between studied sample satisfaction and pain intensity of dysmenorrhea at post intervention phase:**

The result of the current study clarified that, there was a highly statistically significant relation between studied sample satisfaction and pain intensity of dysmenorrhea at post intervention phase.

The current results were supported with *Shahla et al., (2021)*; who studied " and reported that; self-intervention of physical measures by the participants has a long-term and accumulative effect in relieving primary dysmenorrheal pain and increase the level of satisfaction among the sample. They showed that physical measures have an immediate pain-relieving effect and feel of comfort and satisfaction. As well as *Prentice (2019)*; conducted to find out" *the effect of physical measures intervention on symptoms of primary dysmenorrhea among students in, India*" and showed that more than three-quarters of experimental participants reported physical measures were helpful and the majority was satisfied with physical measures intervention. This result may be due to the positive and immediate effect of physical measures on sympathetic and the parasympathetic nervous system, that work as the sedative to decrease stress hormones, the adrenocorticotrophic hormone which elevates sensation of relaxation, pleasure, satisfaction and decreases the degree of pain.

In the view of the above mentioned findings, hypothesis which stated that "dysmenorrheal symptoms and pain will be alleviated after implementation of an instructional guideline regarding physical measures than before implementation" was supported.

#### **CONCLUSION**

Based on the findings of the current study, it was concluded that total knowledge score regarding dysmenorrhea among studied sample was significantly improved post intervention than pre intervention. Additionally there was a highly statistically significant difference between symptoms of dysmenorrhea at pre and post intervention phases, mean and standard deviation of pain intensity decreased post intervention than pre intervention. Also, Dysmenorrheal symptoms and pain were alleviated after implementation of an instructional guideline regarding physical measures than before implementation. Also there was a highly statistically significant relation between studied sample satisfaction and pain intensity of dysmenorrhea at post intervention phase .Therefore, the study hypothesis was

supported.

#### **RECOMMENDATION**

**Based on the finding of the current study, the following recommendation can be suggested:**

1. Developing and dissemination of illustrated guideline included physical measures regarding to primary dysmenorrheal among nursing students.
2. Educational program for nursing students to raise knowledge about dysmenorrheal should be a priority to ensure early diagnosis.
3. Emphasis on the importance of applications for physical measures among nursing students with dysmenorrhea through workshops and awareness sessions.

#### **Recommendations for further studies**

1. Replication of the study on a large probability sample is recommended to achieve more generalization.
2. Providing training programs for nurses to upgrade knowledge and improve performance regarding physical measures of dysmenorrhea.

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