

Effect of Stretching Exercises on Muscle Cramps for Pregnant Women

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Abstract:

Background: Muscle cramps during pregnancy are a common discomfort characterized by involuntary, painful contractions of muscle groups that usually experienced by approximately half of all expecting pregnant women but the majority of muscle cramps during pregnancy occur in the lower extremities particularly in the calf muscles. **Aim:** To evaluate the effect of stretching exercises program for pregnant women. **Design:** A quasi-experimental design was utilized in carrying out this study. **Setting:** The study was conducted at Governmental Health Center (HC) Benha City in Qalyubia, Egypt. **Sample:** A purposive sample was used; it included 375 pregnant women attended to previous setting for six months. **Tools: (Tool I):** A structured-interviewing questionnaire to assess studied pregnant women's which include **A)** Demographic characteristics, **B)** Knowledge of pregnant women regarding muscle cramps and stretching exercises, and **C)** Reported practice for pregnant women regarding applying stretching exercises, **(Tool II):** Cramp questionnaire chart. **Results:** 48.8% of the studied pregnant women aged from 20- < 30 years old with a mean age of 31.71±5.40 years, 22.7% of the studied women had good knowledge regarding muscle cramps at pre-program phase compared to 69.0% at post-program phase, also shows that 14.4% of the studied pregnant women had good knowledge regarding stretching exercises at pre-program phase compared to 65.3% at post-program phase and practices regarding stretching exercises demonstrates that 20% of the studied pregnant women had satisfactory practices regarding neck stretching exercise at pre-program compared to 85.6% at post-program respectively. With a highly statistical significant difference between the results of post-program compared to pre-program in favor of post-program regarding all domains of the studied pregnant women' practices ($p \leq 0.001$) and 48.0% of studied pregnant women had severe pain at pre-program compared to 14.4% of them at post-program phases. **Conclusion:** Stretching exercises program succeed to decrease muscle cramps pain among pregnant women and there was a highly statistically significant positive correlation between the studied pregnant women's total knowledge score and all practices domains score at pre and post-program phase with $p \leq 0.001$. **Recommendation:** Continuous health educational program about stretching exercises to relieve muscle cramps among pregnant women.

Keywords: Muscle cramps, Pregnant Women, and Stretching exercises.

Introduction

Pregnancy and childbirth are two major events in a woman's life. Pregnancy is mostly viewed from physiological perspectives because of many physical changes that occur throughout pregnancy (Kaur et al., 2021). In the pregnancy, many physiological, anatomical, biochemical and immunological changes and the adaptations happen within the mother, that can lead to

minor discomforts. The wellbeing of antenatal mothers is affected by these minor ailments (Sharma et al., 2021).

During pregnancy, the hormonal and anatomical changes which occur affect the musculoskeletal system in women. These changes may cause various musculoskeletal problems that alter course of the preexisting conditions or predispose to injury. A majority of pregnant women experience

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some degree of musculoskeletal pain during pregnancy (**Mohamed et al., 2021**).

Muscle cramps are a common musculoskeletal condition that is characterized by involuntary painful contractions of the leg muscles including the calf, or foot muscles that occur suddenly at night and maybe episodic. The calves are most commonly involved and attacks are more frequent at night and in the second and third trimester (**Liu et al., 2021**).

Stretching exercises during pregnancy can help to relieve the clients of pregnancy-related muscle cramps, aches and pains. During pregnancy, pregnant women will likely feel nauseous and fatigued. Stretching during pregnancy has been shown to reduce these symptoms. Stretching also helps keep the pregnant women fit and healthy while preparing for labor and postnatal recovery. As exercise professionals, help to know how beneficial exercise can be for the physical and mental health. During pregnancy, we want to ensure that pregnant women remain active while protecting the health of pregnant women and their babies (**Szumilewicz & Santos-Rocha, 2022**).

Community Health Nurse can play a major and vital role in providing anticipatory guidance to foster the women's responsibility for self-care practices, helping to clarify misconceptions and correct any misinformation (**Hassan et al., 2020**). Information to pregnant woman does not require equipment or machinery but an efficient educator maternity nurses and the willingness to listen and follow instructions and their awareness makes pregnancy safer to have safe mother and childbirth. So, maternity nurses have a very important role to play in triaging patients, educating patients and managing minor issues or

conditions, therefore preventing many hospital admissions. Also, all antenatal mothers should possess adequate knowledge on minor ailments and its home management in order to prevent the complication (**El-Khawaga et al., 2019**).

Significant of the study:

Muscle cramps are one of the common symptoms during pregnancy. About 30%–50% of pregnant women experience muscle cramps especially in the second and third trimester. Almost two-thirds of these women experience muscle cramps twice per week and can occur at any time, particularly at night. In most cases, muscle cramps only last for seconds, but in severe cases, muscle cramps in pregnancy will last for minutes with severe pain (**Liu et al., 2021**).

Pregnant women experience muscle cramps during their pregnancy , often several times per week, with a variable duration ranging from few seconds to several minutes and occurring mostly during the night , the causes for this association remains uncertain , From clinical observation and experience in Egyptian Health Center there is no proper muscle cramps management plan for pregnant women , the plan includes numerous treatment methods for muscle cramps as stretching exercises and detailed information about each exercise (**Dijkstra et al., 2023**).

Aim of the Study:

This study aimed to evaluate the effect of stretching exercises on muscle cramps for pregnant women through the following objectives:

-Assess pregnant women's knowledge about muscle cramps and stretching exercises.

- Assess pregnant women's reported practice about stretching exercises.
- Design and implementing a stretching exercises program for pregnant women.
- Evaluate the effect of the implemented stretching exercises program on pregnant women's knowledge and practice.

Research Hypotheses:

The pregnant women muscle cramps pain will decrease after the implementation of the stretching exercises program than before, knowledge and reported practice about the stretching exercises will be improved after the implementation of the stretching exercises program than before.

Subjects and Methods:

Research design: A quasi-experimental design was utilized in carrying out this study.

Study setting: This study was conducted at Governmental Health Center (HC), Benha city in Qalyubia, Egypt.

Study sample:

Purposive sample for pregnant women was taken from the previously mentioned setting; the studied women would be selected according to certain criteria: pregnant women who are suffering from muscle cramps, and accepted to participate in the study. This sample size was calculated based on the flow rate of pregnant women in the last six months was (6000) pregnant women at time of data collection. The sample size was calculated according to statistical sample equation (Taylor,2014).

$$n = \frac{N}{1 + N(e)^2}$$

N=Total number of pregnant women=6000

e=is coefficient factor=.05

n=sample size=375

Tools of the data collection:

Two tools would be used for data collection:

First Tool: A Structured Interviewing Questionnaire It was designed by the researchers after reviewing a related literature and divided into three parts:

Part (1): Demographic characteristics of studied pregnant women included age, level of education, job, family type and income.

Part (2): Knowledge of pregnant women regarding muscle cramps and stretching exercises as:

A) Muscle cramps included meaning of muscle cramps, types of muscle cramps, locations where muscle cramps occur, symptoms of muscle cramps, causes of muscle cramps, foods that reduce the occurrence of muscle cramps, foods that increase the occurrence of muscle cramps and how to get rid of muscle cramps.

B) Stretching exercises included meaning of stretching exercises, types of stretching exercises, benefits of stretching exercises, appropriate time to perform stretching exercises, instructions to be followed when performing stretching exercises and pregnant women that should avoid stretching exercises during pregnancy

Scoring system for knowledge:

All knowledge variables were weighted according to items included in each question. Each point was given a score (2) when the answer was complete correct answer, a score (1) when the answer was incomplete correct and score (0) when the answer was do not know.

The total score of each section was calculated by summation of its items the total score for the knowledge of each pregnant woman was calculated by the addition of total scores of all sections.

Pregnant women total knowledge score was converted into total percent and graded as the following: Total scores of knowledge = 28.

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-Good when total score of knowledge was $\geq 75\%$ ≥ 22 complete correct answers.

-Average when total score of knowledge was $50\% < 75\%$ $14 < 22$ incomplete correct answers.

-Poor when total score of knowledge was $< 50\%$ < 14 do not know.

First Tool: Part (5) : Reported practice for pregnant women regarding applying stretching exercises such as calf stretches, knee stretching exercise, anterior thigh or quadriceps stretching exercise, shoulder stretching exercise, neck stretching exercise, lower back stretching exercise, back stretch exercise, chest stretch exercise, pelvic stretching exercise, pelvic tilt exercise and butterfly pose

Scoring system of stretching exercises reported practices:

Each item has 2 levels of answers: Done, and not done. These were respectively scored 1, 0. The score of item were summed up and the total divided by the number of the items giving a mean score. These score were converted into a percent score. As well as pregnant women total practice was classified as following:

Total score of practices= 63

Satisfactory when the total score was more than 60% (≥ 38).

Unsatisfactory when the total score was less than 60% (< 38).

Second tool: Cramp questionnaire chart (Basemath, 2014). Modified by the researchers and it was designed to assess level of muscle cramps

during pregnancy, before and after stretching exercise program.

It consists of five items about muscle cramps:- Frequency of muscle cramps as it occurs two times a day, or three times a day, or more than three times a day, duration of muscle cramps: continue less than five minutes, or for five minutes, or more than

five minutes, level of pain: mild pain, or moderate pain, or severe pain, leg temperature: warm leg, or cold leg, or moist leg and discomfort (sensation of discomfort, or painful, or intolerable).

Scoring system:

Each item has 3 levels of answers, these were respectively scored 1, 2, 3. The score of item were summed-up and the total divided by the number of items giving a mean score. These score were converted into a percent score. As well as pregnant women total experience of muscle cramps was classified as following:

-Total score of muscle cramps=12

-Mild muscle cramps=1:3

-Moderate muscle cramps=4:7

-Severe muscle cramps=8:12

Tool reliability:

Reliability was calculated by Cronbach's alpha coefficient test, and the internal consistency of knowledge assessment sheet was $\alpha=0.86$ and reported practices sheet was $\alpha=0.83$ and it ranged from 0.71 to 0.86 in the ten sections.

Tool validity:

All tools for data collection were tested for its content validity by 5 experts in community health nursing specialty Faculty of Nursing-Benha University who reviewed the tool for clarity, relevance, completeness, applicability and required modification was carried out.

Ethical consideration:

Written approval was obtained from Scientific Research Ethical Committee, Faculty of Nursing at Benha University before starting the study, the aim of the study was explained to each pregnant woman before applying the tools to gain their confidence and trust, an oral consent was obtained from each pregnant woman to participate in the study and withdraw when she needs without obligation, the study has

physical, social, or psychological risk on the Participants the data were collected and treated confidentially.

Pilot Study:

The pilot study was conducted on 10% of the total sample (37 pregnant women) to test the clarity, arrangement, feasibility and applicability of the tools as well as the estimation of the time needed to fill the questions and to make sure that items were understood. No modifications were done and pilot sample was included in the study sample.

Administrative Approval:

An official approval directed to manager of Health Center at Benha City to conduct this study was obtained from Dean of Faculty of Nursing, then before starting the data collection. Researchers interviewed each study participant and obtained an informed oral consent before starting the data collection.

Preparatory phase:

During this phase the researchers had reviewed the national and international advanced literature, and then design tools of data collection, finally, the researchers had conducted the pilot study to ascertain content validity of the tools.

Program development:

The researchers implemented the stretching exercises program through (4) phases as the following:

-Assessment phase: In this phase, assessed knowledge, practices of the pregnant women through collection and analysis of the baseline data from the filled tools. In this phase the researchers did the pre-test.

-Planning phase: the researchers identified the important need for target group, set priorities of needs, goals and objectives were developed.

-implementation phase: The actual implemented work was carried out over a period of 6 months from the beginning of march 2024 up to the end august 2024, the data was collected from pregnant women in the previous selected setting through interview of them after taking their acceptance to participate in the study. The aim of the study was explained to the pregnant women in a simple way. Question of knowledge and practices about muscle cramps and stretching exercises were taken pre and post stretching exercises program. The researchers was attended the previous mentioned study setting for two days per week (Sundays and Tuesdays) because in these days pregnant women became to Health Center for follow up (from 9 am to 12 pm) as the researchers took about 8 pregnant women in

the day, 64 pregnant women in the month as through six months the researchers could take the studied pregnant women sample (375). After taking the legal aspect of ethics in research. Stretching exercises program for pregnant women divided into seven sessions (4 theoretical and 3 practical). The duration of each session was 15-45 minutes, including periods of discussion pretest and posttest. The pregnant women were present all the time of the program sessions. The duration of each session was variable; according to its contents as well as the pregnant women were response which included general and specific objectives:

General objective:

By the end of the educational program, pregnant women having muscle cramps who conducted at the Health Centre at Benha city in Qalyubia Governmental will be able to discuss knowledge and practices about muscle cramps and stretching exercises and able to perform stretching exercises.

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Specific objectives:

- Define muscle cramps.
 - List types of muscle cramps.
 - Discuss causes of muscle cramps.
 - Enumerate signs and symptoms of muscle cramps.
 - Identify risk group of muscle cramps.
 - Recognize complications of muscle cramps.
 - Enumerate methods of preventing of muscle cramps.
 - Identify treatment of muscle cramps.
 - Define stretching exercises.
 - List types of stretching exercises.
 - Discuss benefits of stretching exercises.
 - Discuss methods of performing stretching exercises.
 - Demonstrate how to perform calf stretches, Hamstring stretch, and Quadriceps stretch.
 - Demonstrate how to perform shoulder stretch, Neck stretch, lower back stretch exercises, back stretch exercises and torso rotation exercise.
 - Demonstrate how to perform chest stretch exercise, pelvic stretching exercises, pelvic tilt exercises, and butterfly exercises.
- First session:** this session at the beginning of the first session, an orientation to the program, definition of muscle cramps, types of muscle cramps, causes of muscle cramps, signs and symptoms of muscle cramps. Taking into consideration the use of simple language according to the education level.
- Discussion motivation and reinforcement during session started by summary about previous session and objectives of the new topics.
- Second session:** this session covered risk groups of muscle cramps, complications of muscle cramps, methods of preventing muscle cramps, and treatment of muscle cramps.

Third session: this session covered definition of stretching exercises and types of stretching exercises.

Fourth session: this session covered benefits of stretching exercises and methods of performing stretching exercises.

Fifth session: this session covered how to apply calf stretches, hamstring stretch, and quadriceps stretch.

Sixth session: this session covered how to perform shoulder stretch, neck stretch, lower back stretch exercises, back stretch exercises, and torso rotation exercise.

Seventh session: this session covered how to perform chest stretch exercise, pelvic stretching exercises, pelvic tilt exercises, and butterfly exercises.

Evaluation phase:

The effectiveness of the stretching exercises program was evaluated after implementation using the same format of tools which use during the assessment phase and the researchers evaluate pregnant women's knowledge and stretching exercises practices post-program from the last session and during Health Center follow up or via telephone in case of late. Finally, the researchers compared pretest and posttest results of the study group to evaluate the effectiveness of the program implementation.

Statistical analysis:

Prior to automated input, data were checked. Data tabulation and analysis were done using SPSS version 22 (Statistical Package for Social Sciences). The use of descriptive statistics was used (e.g., mean, standard deviations, frequencies, and percentages). Chi-square tests and Pearson correlation coefficients were applied for all of the statistical tests done as:

-P-value > 0.05 which indicated no statistically significant difference.

-P-value ≤ 0.05 indicated a statistically significant difference.

-P-value ≤ 0.001 indicated a highly statistically significant difference.

Results:

Table (1): Shows demographic characteristics of the studied pregnant women. It was clarified that 48.8% of the studied pregnant women aged from 20- < 30 years old with a mean age of 31.71 ± 5.40 years. 47.5% of the studied pregnant women had secondary education. Regarding occupation, 68.8% of them were house wife. 63.2% of the studied pregnant women belong to the nuclear family and 48.3% of them had enough monthly income.

Figure (1) illustrates that, 18.7% of the studied pregnant women had good total knowledge score at pre-program compared to 65.8% at post-program phases. As well as, 48.3% of studied women had poor total knowledge score at pre-program compared to 13.1% at post-program phases.

Table (2): demonstrates that 33.6% and 26.7% of the studied pregnant women had

satisfactory practices regarding shoulder stretching exercise and chest stretching exercise and 93.8%, 85% of the studied pregnant women had unsatisfactory practices regarding butterfly pose and pelvic exercise respectively at pre-program compared to 83.6%, 80.0% and 23.8%, 25% at post-program

respectively. With a highly statistical significant difference between the results of post-program compared to pre-program in favor of post-program regarding all domains of the studied pregnant women' practices ($p \leq 0.001$).

Figure (2) displays that, 48.0% of studied women had severe pain at pre-program compared to 14.4% of them at post-program phases. As well as, 16.5% of studied women mild pain score at pre-program compared to 50.7% of them at post-program phases.

Table (3): Shows that, there was a highly statistically significant positive correlation between the studied women' total knowledge score and all practices domains score at pre and post-program phase with $p \leq 0.001$.

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Table (1): Frequency distribution of the studied pregnant women according to their demographic characteristic (n=375)

Demographic data	No.	%
Age (years)		
20- < 30	183	48.8
30- < 40	158	42.1
≥ 40	34	9.1
Mean ±SD	31.71±5.40	
Educational level		
Not read or write	30	8.0
Basic education	64	17.1
Secondary education	178	47.5
University education or more	103	27.5
Occupation		
Working	117	31.2
House wife	258	68.8
Family type		
Nuclear	237	63.2
Extended	138	36.8
Income		
Enough and save	25	6.7
Enough	181	48.3
Not enough	169	45.0

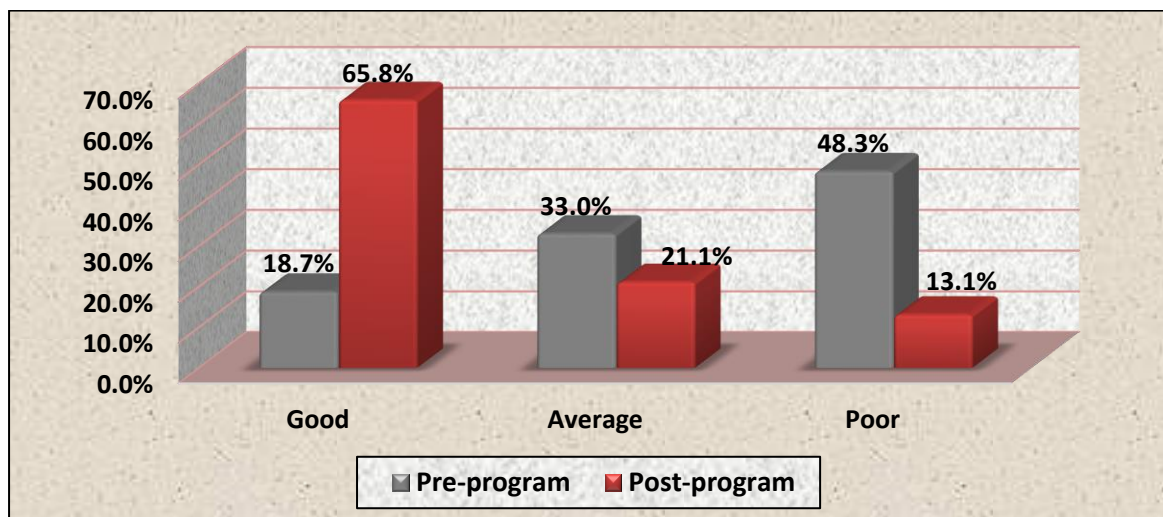


Figure (1): Percentage distribution of the studied pregnant women regarding their total knowledge about muscle cramps and stretching exercises score at Pre and Post- program phases (n=375).

Table (2): Frequency distribution of the studied pregnant women' total practices regarding stretching exercises at Pre and Post-program phases (n=375).

Practices domains	Pre-program		Post-program		X ²	P value
	No	%	No	%		
Calf muscle stretching exercise (n=250)						
Satisfactory	49	19.6	207	82.8	199.8	0.000**
Unsatisfactory	201	80.4	43	17.2		
Knee stretching exercise (n=90)						
Satisfactory	22	24.4	74	82.2	60.3	0.000**
Unsatisfactory	68	75.6	16	17.8		
Anterior thigh or quadriceps stretching exercise (n=140)						
Satisfactory	24	17.1	114	81.4	115.7	0.000**
Unsatisfactory	116	82.9	26	18.6		
Shoulder stretching exercise (n=110)						
Satisfactory	37	33.6	92	83.6	56.6	0.000**
Unsatisfactory	73	66.4	18	16.4		
Neck stretching exercise (n=90)						
Satisfactory	18	20.0	77	85.6	77.5	0.000**
Unsatisfactory	72	80.0	13	14.4		
Back stretching exercise (n=50)						
Satisfactory	9	18.0	39	78.0	36.0	0.000**
Unsatisfactory	41	82.0	11	22.0		
Torso rotation exercise (n=30)						
Satisfactory	6	20.0	23	76.7	19.2	0.000**
Unsatisfactory	24	80.0	7	23.3		
Chest stretching exercise (n=30)						
Satisfactory	8	26.7	24	80.0	17.1	0.000**
Unsatisfactory	22	73.3	6	20.0		
Pelvic exercise (n=40)						
Satisfactory	6	15.0	30	75.0	29.0	0.000**
Unsatisfactory	34	85.0	10	25.0		
Butterfly pose (n=80)						
Satisfactory	5	6.2	61	76.2	80.8	0.000**
Unsatisfactory	75	93.8	19	23.8		

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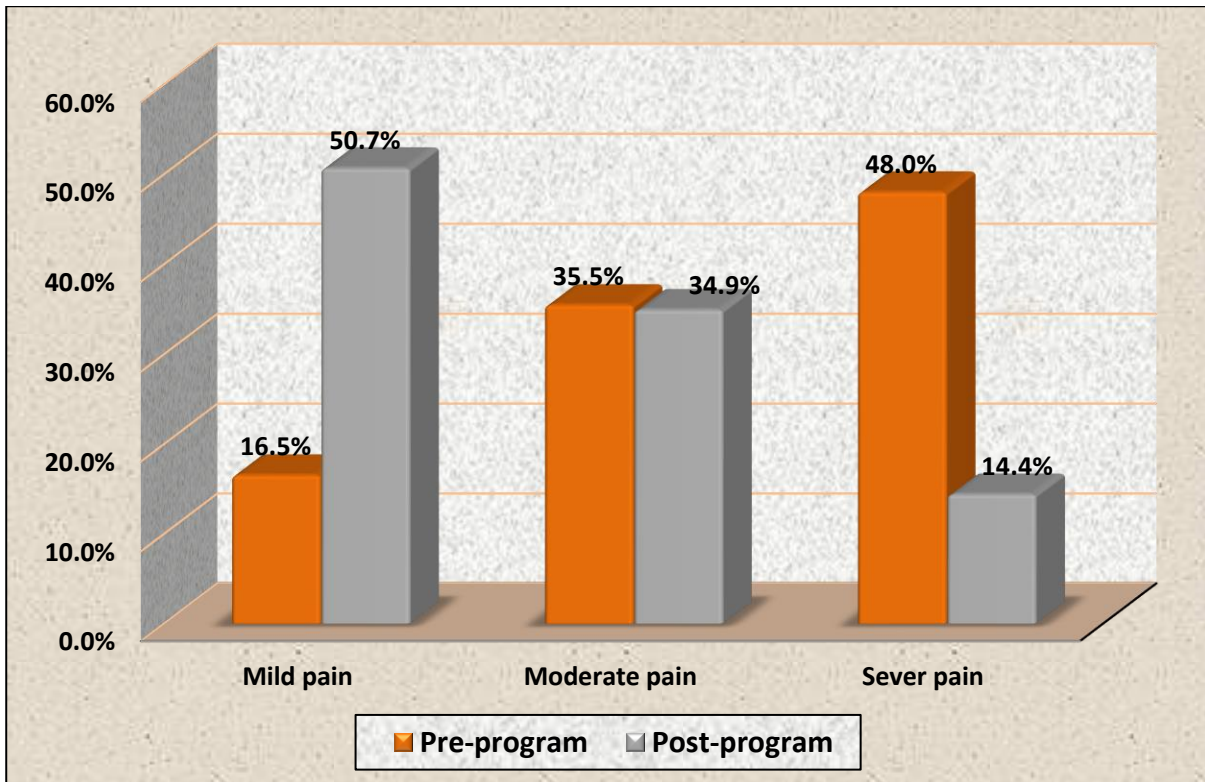


Figure (2): Percentage distribution of studied women regarding their degree of pain at Pre and Post-program phases (n=375).

Table (3): Correlation matrix between studied pregnant women ' total knowledge and total practices score at Pre and Post-program phases (n=375).

Total practice score	Total Knowledge			
	Pre-program		Post-program	
	r	P value	r	P value
Calf muscle stretching exercise	0.470	0.000**	0.504	0.000**
Knee stretching exercise	0.510	0.000**	0.605	0.000**
Anterior thigh or quadriceps extension exercise	0.489	0.000**	0.537	0.000**
Shoulder extension exercise	0.499	0.000**	0.601	0.000**
Neck extension exercise	0.604	0.000**	0.684	0.000**
Back stretching exercise	0.487	0.000**	0.492	0.000**
Torso rotation exercise	0.504	0.000**	0.539	0.000**
Chest stretching exercise	0.584	0.000**	0.590	0.000**
Pelvic stretching exercise	0.412	0.000**	0.522	0.000**
Butterfly pose (Foot exercise)	0.466	0.000**	0.541	0.000**

Discussion:

During the period of pregnancy, pregnant women will undergo a lot of normal physical and hormonal changes. These changes cause the non-harmful minor discomforts during pregnancy such as: nausea, vomiting, back pain, varicosities and muscle cramps. Muscle cramp is serious minor discomfort. It is strong painful contraction or tightening that come on suddenly, and lasts from second to several minutes. About 30%–50% of pregnant women experience muscle cramps twice a week. Muscle cramps may cause severe pain and sleep disturbance, hinder performance of daily activities and may lengthen the duration of pregnancy and the type of childbirth (**Liu et al., 2021**).

Muscle cramps, sometimes called a charlie horse, during pregnancy are one of the common discomforts experienced by approximately half of all expecting mothers. The majority of muscle cramps during pregnancy occur in the lower extremities, particularly in the calves. Muscle cramps may start at the second trimester and get worse as the pregnancy progresses. Muscle cramps may be aggravated by the pressure the expanding uterus puts on the blood vessels that return blood from the legs to the heart and the nerves leading from the trunk to the legs. Also, it may be due to nutritional deficiencies (vitamins E and D) or electrolyte imbalances (eg. magnesium, calcium and sodium). While these cramps can occur during the day, it'll probably notice them most at night (**Araújo et al., 2020**).

Regarding to demographic characteristics: of the studied pregnant women, the present study illustrated that less than one-half of the studied pregnant women was in age group 20- < 30 years old with a mean age of 31.71±5.40 years, less than three quarters of them were housewives. Regarding the educational level, less than half of them had secondary education, less than three quarters of

the studied sample belonged to nuclear family and less than half of them had enough monthly income.

These results were consistent with **Ramadan et al., (2019)** who studied "Lifestyle Intervention for Reducing Leg Cramps among Pregnant Women" this study was conducted in outpatient clinic at obstetric and gynecological department affiliated at Benha Teaching Hospital (n=212) showed that about half of studied women had age ranged from (20-< 30) years of age. less than half of them had a secondary education and more half of the studied pregnant women were housewives.

In the same context, **EL-Sarkawy et al., (2020)** in a study entitled "Effectiveness of Self-istructional Module on Knowledge and Remedial practices Regarding Selected Minor Ailments Among Primigravida" this study was conducted at obstetrics and gynecological outpatient clinic in Benha university hospital (n=120) found that more than half of the studied pregnant women were housewives and about half of the studied pregnant women had enough income and more than half of the studied pregnant women belonged to nuclear family.

From the researchers' point of view, this similarity in results related to majority of participants were housewives even graduate from secondary school depend on community health nurse advice. So this emphasizes the significant role of community health nurse in affecting knowledge and practices of pregnant women regarding minor ailments as muscle cramps positively or negatively.

Percentage distribution of the studied pregnant women regarding their total knowledge about muscle cramps and stretching exercises score at Pre and Post- program phases illustrates that, less than one quarter of the studied pregnant women had good total knowledge score at pre-program compared to more than two thirds at post-program phases.

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As well as, about half of studied women had poor total knowledge score at pre-program compared to less than one quarter at post-program phases.

The result of the current study was supported by (Anwar et al., 2022) who conducted "Traditional methods utilized to relieve minor discomfort during the third trimester of pregnancy "this study was conducted at maternal and health centers at Helwan city (n=75) reported that, less than one quarter of the studied pregnant women had good total knowledge score about muscle cramps and stretching exercises at pre-program compared to more than two thirds at post-program phases. From the researchers point of view, this ensured that pregnant women who had good knowledge will affect their practices positively. This mean improvement of knowledge could lead to improvement of practice.

Regarding frequency distribution of the studied pregnant women' total reported practices regarding stretching exercises at Pre and Post-program phases demonstrates that more than one quarter of the studied pregnant women had satisfactory practices regarding shoulder stretching exercise and chest stretching exercise and more than three quarters of the studied pregnant women had unsatisfactory practices regarding butterfly pose and pelvic exercise respectively at pre-program compared to more than two thirds at post-program respectively. With a highly statistical significant difference between the results of post-program compared to pre-program in favor of post-program regarding all domains of the studied pregnant women' practices ($p \leq 0.001$).

In addition Abd El-haliem et al., (2019) who conducted "Utilization of Self-Care Practice Guideline on Relieving Mino Discomfort (Ailments) Among New Pregnant Woman " this study was conducted at the

antenatal clinic of Mansoura university Hospital in Mansora city (n=120) found that more than one quarter of the studied pregnant women had satisfactory practices regarding shoulder stretching exercise and chest stretching exercise and more than three quarters of the studied pregnant women had unsatisfactory practices regarding butterfly pose and pelvic exercise respectively at pre-program compared to more than two thirds at post-program respectively. According Kaur and Gagandeep, (2019) who conducted "assessment of the knowledge and expressed practices regarding self-management of minor ailments among antenatal mothers, India" this study was conducted in antenatal health centers (n=60) the study demonstrated that the majority of antenatal mothers more than three quarters had an average level of practices, whereas, about one quarter of antenatal mothers had a weak level of practices. Very few had a good level of practice concerning minor ailments of pregnancy and their remedies measures.

From the researchers point of view, knowledge is a vital element to enable pregnant women to be aware of their health status during their pregnancies. Pregnant women`s empowerment with knowledge allows them to identify and express their health needs, encourage them to ask for treatment and support without hesitation and improve their practices and make effective decisions about their own health.

Percentage distribution of studied pregnant women regarding their degree of pain at Pre and Post-program phases displayed that, about half of studied pregnant women had severe pain at pre-program compared to less than one quarter of them at post-program phases. As well as, less than one quarter of studied women mild pain score at pre-program compared to about half of them at post-program phases.

Additionally, the result of the current study was supported by Anwar et al., (2022)

reported that about half of them had severe muscle cramps pain pre-program compared to less than one quarter at post-program phase. Moreover, more than half of them suffered from muscle cramps for period of times more than 5 minutes pre-program, compared to less than one quarter at post-program phase and less than one quarter of studied pregnant women had mild pain score at pre-program compared to about half of them at post-program phases

Concerning the correlation matrix between studied pregnant women ' total knowledge and total practices score at Pre and Post-program phases Shows that, there was a highly statistically significant positive correlation between the studied women' total knowledge score and all practices domains score at pre and post-program phase with $p \leq 0.001$.

This result was consistent with **EL-Refaey, et al., (2020)** in study entitled "The Effect of Tailored Psycho-Educational Program on Pregnant women`s Anxeity and Knowledge about Self-care Management Regarding minor discomforts" this study was conducted at obstetrics and gynecological outpatient clinic in Benha university hospital (n=59) who indicated that there is a positive correlation matrix between the pregnant women`s total knowledge, stretching exercises practices and total anxiety scale pre- and post-program. Furthermore **EL-Sarkawy et al., (2020)** in a study entitled "Effectiveness of Self-istructional Module on Knowledge and Remedial practices Regarding Selected Minor Ailments Among Primigravida" this study was conducted at obstetrics and gynecological outpatient clinic in Benha university hospital (n=120) showed that there was a highly positive statistical correlation between total knowledge and total healthy practices regarding minor ailments including muscle cramps at the post-program phase ($P \leq 0.001$).

Conclusion:

Stretching exercises program succeed to decrease muscle cramps pain among pregnant women and there was a highly statistical significant difference between the results of post-program compared to pre-program in favor of post-program regarding all items of studied pregnant women's knowledge and there was a highly statistically significant positive correlation between the studied pregnant women' total knowledge score and all practices domains score at pre and post-program phase with $p \leq 0.001$.

Recommendations:

Continuous health educational program about stretching exercises to relieve muscle cramps among pregnant women for community health nurses at Health Centers and continuous enhancing awareness of pregnant women regarding stretching exercises program.

Further studies:

- Replication of the study on a large representative probability sample is highly recommended in different Health centers to achieve more generalization of the results.
- A similar study can be conducted as a longitudinal study.

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تأثير تمارين التمدد على التقلصات العضلية للسيدات الحوامل

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تعد التقلصات العضلية أثناء الحمل مشكلة شائعة وهي تتميز بانقباضات مفاجئة ومكثفة ومؤلمة ولا ارادية للعضلات تعاني ما يصل إلى ٣٠٪ إلى ٥٠٪ من السيدات الحوامل من التقلصات العضلية، خاصة في الثلث الثاني والثالث من الحمل. و تقريبا ثلثي هؤلاء السيدات تحدث لهم التقلصات العضلية مرتين في الأسبوع وفي أي وقت، وخاصة عند النوم. لذلك هدفت هذه الدراسة إلى تقييم تأثير تمارين التمدد على التقلصات العضلية للسيدات الحوامل وأجريت هذه الدراسة في المركز الطبي بمدينة بنها محافظة القليوبية. وقد تم اخذ عينة عرضية مكونة من ٣٧٥ من السيدات الحوامل المصابات بالتقلصات العضلية اللواتي تم قبولهن في مكان الدراسة المذكور أعلاه لمدة ستة أشهر وفقا لمعايير الشمول والإستبعاد. حيث كشفت النتائج أن لدي حوالي ثلث العينة المدروسة معلومات جيدة عن التقلصات العضلية وتمارين التمدد في مرحلة ما قبل البرنامج وأكثر من ثلثي العينة المدروسة في مرحلة ما بعد البرنامج، وأقل من ربع العينة المدروسة لديها مستوى مرضى من ممارسة تمارين التمدد في مرحلة ما قبل البرنامج وأكثر من ثلثي العينة المدروسة في مرحلة ما بعد البرنامج. لذلك كان تنفيذ برنامج تمارين التمدد فعالا في تحسين معلومات وممارسات السيدات الحوامل فيما يتعلق بالتقلصات العضلية، حيث كان هناك فرق كبير إحصائيا بين نتائج ما بعد البرنامج مقارنة بمعلومات وممارسات السيدات الحوامل فيما يتعلق بالتقلصات العضلية قبل البرنامج لذلك تم دعم فرضية الدراسة وتم تحقيق الهدف من الدراسة. وأوصت الدراسة ممرضات صحة المجتمع ببرنامج تعليمي مستمر عن تمارين التمدد لتخفيف التقلصات العضلية بين السيدات الحوامل في المراكز الصحية وتعزيز الوعي المستمر للسيدات الحوامل فيما يتعلق ببرنامج تمارين التمدد.