

Effect of Women Self Monitoring of Fetal Kicks on Enhancing Their General Health Status

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Abstract This study aimed to investigate the effect of women self monitoring of fetal kicks on enhancing their general health status. **Design:** An experimental study was used. **Setting:** The study was conducted at the antenatal outpatient clinic in Mansoura University Hospital, Egypt. **Subjects:** Two hundred pregnant women were divided into two groups intervention and control group. **Tools:** An interviewing questionnaire schedule, General health questionnaire, Self monitoring daily fetal kicks chart. **Results:** The present study results had revealed that, there was a highly statically significant improvement of the total scores of general health status from pre intervention at 28weeks compared to post intervention at 37weeks of gestation among intervention group (23.45 ± 5.97 at 28 weeks) to (20.73 ± 4.18) at 37 weeks ($P= 0.0001$). Also, there was a highly statically significant improvement regarding normality of fetal kicks and total improvement of self monitoring of fetal kicks among intervention group. **Conclusion:** It was evident from the study findings that the women self monitoring of fetal kicks had significantly improved general health status of pregnant women when compared with women who received only the routine hospital care. This method is cheap, simple, and it could be prescribed to pregnant women as a helpful intervention. Therefore, it is recommended that training program must be designed and implemented to enhance pregnant women daily self monitoring of fetal kicks at antenatal clinics.

Keywords: counting, fetal kicks, general health status, self monitoring

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1. Introduction

Fetal kick counting (FKC) is a method by which a woman quantifies to self monitoring of fetal kicks she feels to evaluate the state of her fetus [1]. FKC is the oldest, as well as the cheapest method of assessment of fetal wellbeing [2]. It was also reported by Lu Y et al., [3] pregnant women start to sense fetal kicks around 18-20 weeks of gestational age. The movements can be occur in various combinations and are widely described as kicks, twists or turned. Additionally the intensity of those kicks is constantly advancing until the 32nd week of gestational age and from then onwards remains at the same level. Also, a healthy fetus usually moves at least 10 times in 12 hours. Kicks are not sensed in 20-40 minutes periods of fetal sleep, both during the day and night. It is essential to remember that those fetal sleep periods should not last longer than 1.5 hours.

Women self monitoring of fetal kick counting is simple and can be done at home. It is inexpensive, as there are no human or material resources needed, but it does intrude on the woman's time. FKC might reduce fetal hazard due to asphyxia by precipitating timely intervention [4].

Furthermore, the daily self monitoring of fetal kicks counting may increase the mother's ability to recognize on time the warning signs and if the fetus is in danger, it will be properly intervened [5,6]. Mothers' self monitoring of fetal kicks may be considered as early detection of fetal distress [7]. If the mothers carefully control the fetal kicks and report on time decrease in fetal kicks to a physician, it is likely to prevent perinatal morbidity and mortality [8].

As soon as the mother perceives fetal kicks, maternal bonding develops with the unborn fetus [2]. Some interventions could increase maternal-fetal bonding; for example training mother to speak to her fetus, touching her fetus from the abdomen, and paying attention to fetal kicks could increase attachment [9]; in some of the conducted studies, mother's attention to fetal kicks has increased maternal-fetal attachment [10].

More than a dozen different methods of fetal kicks monitoring have been devised, which can be broadly divided into two groups, the Sadovsky method which involved counting kicks three times a day, an hour in the morning, an hour at midday and an hour in the evening, and the Cardiff 'Count-to- Ten Kick Chart' method, derived from Pearson and Weaver's daily fetal kicks count [11]. Later modifications of Sadovsky's method involved

shorter kicks -counting times and attempts to establish individualized norms [12].

Maternal perception of fetal kicks is an important screening method for fetal well-being, as decreased fetal kicks is associated with a range of pregnancy pathologies and poor pregnancy outcomes. An understanding of factors that may affect maternal perception could help clinicians to determine the importance of maternal reports of decreased fetal kicks, these factors as amniotic fluid volume, placental location, fetal presentation, fetal gender also, there is maternal factors could influence fetal movements; as maternal smoking, primipara, obesity [13].

General health status (GHS) concerns during pregnancy widely recognize as a significant public health problem. As many as 12% to 13% of childbearing women have likely depression [14], 8% of women may experience posttraumatic stress disorder [15]. By counting (FKC) increase maternal-fetal bonding [16]. Bonding between mother and fetus reduce depression during pregnancy [17]. Other studies reported that the mothers who were more bonding to their fetus have healthier behaviors that will improve their health [18]. Also, maternal-fetal bonding may increase the participation of women in the self-care during pregnancy and this behavior improve the psychological status of the mother [19].

Furthermore, the nurse is the key person who is most likely to have a relationship with the pregnant woman. Given their important role in counseling, education and support for correct and psychological care during pregnancy, their ability to provide professional support. Also, the nurse enhances pregnant women to self monitoring their fetal kicks daily [20].

1.1. Significance of the Study:

Previous studies as Delaram et al., [21] showed that the women's who self monitoring their fetal kicks daily, reported less depression. Also, Douglas [22] showed that pregnant women who self monitoring their fetal kicks during the third trimester tend to be less anxious about their fetus wellbeing which may lead to positive maternal fetal bonding which consequences reflected upon positive pregnancy outcomes.

Because there is a few studies assessing the relationship between women self monitoring of fetal kicks and women's general health status. Else, general health services in the Egyptian hospitals, have no focused attention on the maternal general health status, so this study was conducted to enhance pregnant women general health status and increase woman awareness about fetal kick count.

1.2. Aim of the Study

This study was aimed to investigate the effect of women self monitoring of fetal kicks on enhancing their general health status

1.3. Study Hypothesis

Women who self monitoring of fetal kicks will be expected to enhance their general health status.

1.4. Operational definitions

Fetal movement: In this study, it refers to the movement of fetal parts.

General health: In this study, it refers is normal emotional, behavioral, and social well-being.

2. Subjects and Method

Study Design: An experimental design was used in the study.

Study Setting: The study was carried out at the antenatal outpatient clinic in Mansoura University Hospital, Egypt.

Study Sample: A purposive sampling was used in the study.

Study Subjects: Two hundred pregnant women who fulfilled the following criteria:

2.1. Inclusion Criteria

- Primipara women at 24 to 36 weeks of gestation.
- Had single intrauterine viable fetus.
- Free from any medical health disorders.

2.2. Exclusion Criteria

- Women who had psychiatric disease.
- Women who had oligohydramnios, polyhydramnios & fetal anomalies.
- A woman who smokes.
- Women who receive program or instructions about fetal kicks counting.

2.3. Sample Size

Calculating sample size for studying effects of (FKC) on the psychological status of the pregnant woman, through DSS research.com sample size calculator software, at 5% α error (95.0% significance) and 20.0 β error (80.0% power of the study), assuming the average Beck scale of depression in the intervention group after the intervention is (13.65 \pm 4.00) and it is (14.95 \pm 4.15) in control [21]. The calculated sample size is 95 in each group; we can add 5.0% for better data quality, so the sample size in each group will be 100 pregnant women.

2.4. Groups' Allocation

Two hundred pregnant women were randomly assigned into two equal groups of hundred by using a closed envelope containing intervention or control group cards. In relation to an *intervention group that* included hundred women, perform daily self monitoring of fetal movement from 28 to 37 weeks of gestation. *The control group* consisted of hundred women who received routine antenatal care.

2.5. Tools for Data Collection

Data were collected through:

Tool I: A Structured Interviewing Questionnaire

Schedule: It was designed by the researchers after reviewing related literatures, it consisted of two parts:

Part I: Covered the data related to pregnant women general characteristics (age, education, occupation & residence).

Part II: Assessing women's knowledge about self monitoring of fetal kicks, which included 20 questions divided into 10 MCQ and 10 true & false, such as (definition of fetal movement, types of fetal kicks, factors influence fetal kicks, starting of quickening etc-----).

2.6. Scoring System for Knowledge

Each correct answer was given a score of (2) and wrong answers a score of (1) respectively. The total score was (40)

Tool II: General health questionnaire (GHQ 28):

It was used to evaluate the psychological status of pregnant women. It was adopted from Goldberg [23]. This instrument is a self-administered questionnaire and is capable to detect minor, non-psychotic psychiatric disorders in general practice. The questionnaire comprises four domains of somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. Each domain consists of seven questions. Domain of somatic symptoms as (been feeling perfectly well and in good health, felt that you are ill, been getting a feeling of pressure in your head and so on), domain of anxiety and insomnia as (last much sleep over worry, had difficulty in staying a sleep once you are off, feeling nervous all the time and so on),domain of social dysfunction as (felt on the whole you were doing things well, been managing to keep yourself busy and occupied and so on), domain of severe depression as(able to enjoy your normal day to day activities, felt that life is entirely hopeless and so on).The questions were to be answered on a Likert scale. The subjects would get 0 points if they chose "not at all", to 3 points for "much more than usual" responses.

2.7. Scoring System

They were awarded a score of zero to three. Therefore, the maximum score in each section is 21 and the total score of the questionnaire is 84 and a higher score indicates the less general health. According to different studies, the cutoff point of the questionnaire is determined by 22 and the general health of people who have a score above 22 is considered impaired [23].

Tool III: Self monitoring daily fetal kicks chart (count to ten chart): It was designed by the researchers to measure daily fetal kicks. It included date, gestational age, start time, number of fetal kicks, and finish time.

Content validity of the Tools:

These tools were reviewed by five panels of experts in maternal and psychiatric health nursing field to test the content validity. According to expert suggestions and comments modification was considered.

Reliability of the Tool II:

Cronbach's alpha was calculated on a pilot of 20 pregnant women (not included in the study). Its value for both tools was 0.921 and 0.832 respectively, while the test

re-test was ($=0.854$ and 0.871 respectively). These tools are valid and reliable.

Ethical Considerations:

Approval from the head of women health and midwifery department, then approval from an ethics research committee of the faculty of the nursing Mansoura university, else, a letter of approval from the director of outpatient clinics and head of nursing director of Mansoura University Hospital (MUH) was taken to implement this study. Informed consent was obtained from each pregnant woman before intervention. They have been informed of their rights to refuse to participate or withdraw at any time. Study maneuver cannot cause harm to participants. All tools of data collection after statistical analysis had burned to maintain confidentiality of the tools used in the study, also tools of data collection did not touch moral, religious or cultural issues also did not harm the mother's dignity and their rights.

Pilot Study:

A pilot study was conducted on 20 pregnant women in order to test the applicability, practicability and to test the clarity of the questionnaire as well as to estimate the time needed to answer them. According to statistical analysis of pilot study modification was considered, this modification included change open ended question to MCQ and decreased interviewing questionnaire from 30 into 20 questions. These women were excluded from the study sample.

Field work:

- This study was conducted at the previous mention setting in a period from April 2017 to September 2017.
- The researchers attended the clinic at 9:00 am – 1:00 pm, 3 days/ week.
- Firstly the researchers introduced their self to each participant in the study & explained the purpose of the study.
- Then the baseline of all participant women had an ultrasound during antenatal visits to detect the multiple pregnancy and fetal abnormality and basic information were obtained from them.
- Then, they completed a personal information form and general health questionnaire (GHQ 28) in the 28th week of pregnancy.
- The intervention and the control group were allocated by using the simple random method through using the closed envelope containing intervention or control group cards.
- **In the intervention group:** The women had received the program about self monitoring of fetal kicks. The program had four sessions. Each session consuming 15-20 minutes, included 5 pregnant mothers. Methods of teaching (lecture, bedside teaching, group discussion, demonstration, role play, media used lab top, models of mothers and fetuses).
- During the 1st session containing registration, researchers introducing their self, introduction about the study aim.
- In the 2nd and 3rd session firstly the pregnant mothers were instructed about (definition, importance, types, time to assess, factors affecting fetal kicks, how to stimulate FK, how to record FK in giving

chart, normal number of FK count, the correct site to assess their fetal kicks (FK), and when contact with physician.

- In the 4th session, the mother was trained on fetal mother model then self demonstrated how to touch & count their fetal kicks (FK), by Cardiff's method ("Count to ten") as (FKC) once a day, preferably at the same time every day and within 1 to 2 hours after a meal, after dinner is a good time because the fetus is usually more active, or drink juice then take rest and lie on left side, have a clock nearby to observe the time passed, mark down the start time, count any kicks you feel as roll, stretching, a kick, or a "swish" then count until you have felt TEN fetal kicks. Ideally, you want to feel at least 10 movements within 12 hours from 8:00am to 8:00pm. If the fetal not moved you can stimulate by gentle massaging of the abdomen from side to side or dink juice. Each pregnant woman applies how to count fetal kicks on model firstly, then applied on each mother.
- Each pregnant woman was given self administered fetal kicks chart to assess daily fetal kick count (FKC). If the pregnant woman, not educated her companionship check the number of FK in the giving chart per day after taking training.
- At the end of the session an instructional supportive brochure was distributed to all expected mothers.
- To ensure the proper functioning of this task, pregnant women were called once a week. Each woman should count fetal kicks continually from 28th weeks to 37th weeks of gestation.
- The control group obtained the routine hospital care that concentrated on physical complains without giving any information about fetal kicks count.
- At the end of 37th weeks, both groups were

evaluated by using the same format; pregnant women completed the GHQ questionnaire. We asked the women in the control group, whether they have counted the fetal kicks or not and when their response was yes, these women were debarrred.

2.8. Statistical Analysis

Collected data were coded, computed and analyzed by using SPSS version 20. Data were presented using descriptive statistics in the form of frequencies & percentages (for categorical variables) and mean ± SD (for continuous quantitative variables). Chi square (χ^2) was used for comparison of categorical variables and Student's t test and paired t test were used for comparison of continuous quantitative variables. Pearson's correlation co-efficient (r) was calculated between two continuous quantitative variables. The difference was considered significant at $P \leq 0.05$.

3. Results

Table 1 shows the general characteristics of the studied sample. It was found that the mean age of the studied sample was (20.29 ± 2.94) and (20.76 ± 3.07 years) respectively, more than half of them had secondary education; around two third of studied groups were not working.

Table 2 presents the total mean score of knowledge about women self monitoring of fetal kicks among intervention group at 28 and 37 weeks of gestation. It was found that there was a highly statically significant improvement of the total mean score of knowledge about fetal kicks from (20.14± 0.512) at 28 weeks of gestation to (39.86± 0.550) at 37 weeks of gestation (P=0.001).

Table 1. Frequency distribution among studied sample according to their general characteristics

Character	Items	Intervention group no (100)		Control group no (100)		Significance test
		No	%	No	%	
Age (per year)	< 20	42	42.0	40	40.0	$\chi^2=0.083, P=0.959$
	21 – 30	57	57.0	59	59.0	
	31 – 40	1	1.0	1	1.0	
	Mean ± SD	20.29 ± 2.94		20.76 ± 3.07		t=1.105, P=0.270
Education	Read/write	6	6.0	7	7.0	$\chi^2=1.345, P=0.718$
	Preparatory	1	1.0	3	3.0	
	Secondary	66	66.0	61	61.0	
	University	27	27.0	29	29.0	
Occupation	Working	27	27.0	36	36.0	$\chi^2=1.877, P=0.171$
	Not working	73	73.0	64	64.0	
Residence	Rural	68	68.0	78	78.0	$\chi^2=2.537, P=0.111$
	Urban	32	32.0	22	22.0	

Table 2. Comparing the mean scores of total knowledge about women self monitoring of fetal kicks among intervention group at 28 and 37 weeks of gestation

	At 28 weeks of gestation no (100)		At 37 weeks of gestation no (100)	
	Mean	± SD	Mean	± SD
Total knowledge about fetal kicks	20.14	± 0.512	39.86	± 0.550
Significance test	t=-2.717, P=0.001			

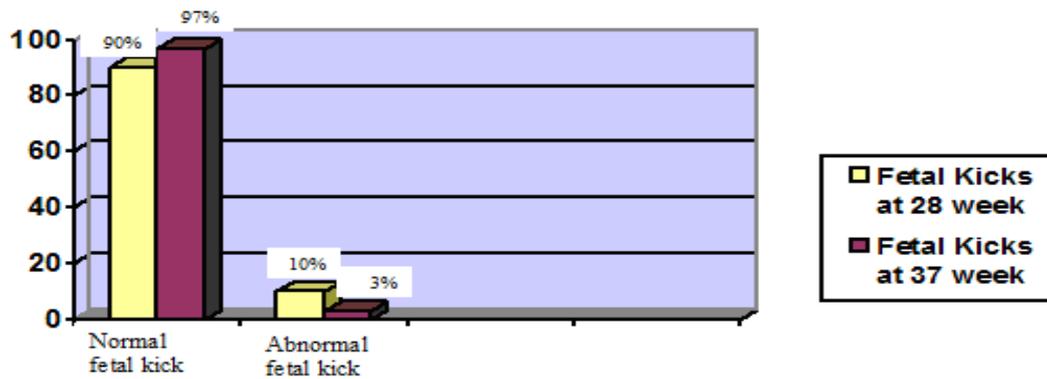


Figure 1. Frequency distribution of studied group regarding normal and abnormal fetal kicks at 28 weeks and 37th weeks of gestation

Table 3. Comparing the mean scores of self monitoring fetal kicks among intervention group at 28 weeks and 37th weeks of gestation

Fetal kicks	Fetal kicks for intervention group no (100)		Significance test
	Mean	± SD	
At 28 weeks	67.33	± 6.14	t=3.52, P=0.001
At 37 weeks	69.05	± 3.07	

Table 4. Comparing the mean scores of general health domains between the studied groups at 28th and 37th of pregnancy

Score of general health domains at 28 weeks	Intervention group no (100)		Control group no (100)		Significance test
	Mean	± SD	Mean	± SD	
Somatic symptoms	7.61	± 1.87	7.51	± 1.93	t=0.372, P0.711
Anxiety & Insomnia	7.65	± 2.61	7.63	± 2.64	t=0.054, P0.957
Social dysfunction	7.12	± 2.09	7.00	± 1.94	t=0.420, P0.657
Severe depression	1.07	± 1.35	1.16	± 1.50	t=0.446, P0.656
Total scale score	23.45	± 5.97	23.30	± 5.98	t=0.177, P0.858
Score of general health domains at 37 weeks	Mean	± SD	Mean	± SD	Significance test
Somatic symptoms	7.70	± 1.35	8.13	± 1.82	t=2.067, P0.040
Anxiety & Insomnia	5.09	± 2.33	5.80	± 2.56	t=1.99, P0.048
Social dysfunction	7.28	± 1.86	7.81	± 1.67	t=2.11, P0.036
Severe depression	0.68	± 0.98	1.88	± 1.69	t=6.122, P0.000
Total scale score	20.73	± 4.20	23.17	± 4.30	t=4.951, P0.001

Table 5. Comparing the total mean scores of general health between the studied groups at 28 weeks and 37th weeks of pregnancy

Groups	Total scale score of general health at 28 weeks)		Total scale score of general health at 37 weeks)		Significance test
	Mean	± SD	Mean	± SD	
Intervention group	23.45	± 5.97	20.73	± 4.18	t=6.974, P0.001
Control group	23.30	± 5.98	23.14	± 4.63	t=2.709, P0.08
Paired t test	t=0.177, P0.858		t=2.261, P0.025		

Table 6. Relationship between fetal kicks and general health scale among intervention group at 28 weeks and 37th weeks of pregnancy

	Intervention group at 28 weeks no (100)		Intervention group at 37 weeks no (100)	
	Mean	± SD	Mean	± SD
Total general health scale	23.48	± 5.96	20.73	± 4.20
Total fetal kicks	67.33	± 6.14	69.05	± 3.07
Significance test	t=55.38, P=0.001		t=98.06, P=0.001	

Figure 1: Illustrates that there was a highly significant improvement regarding normality of fetal kicks among intervention group at 28 weeks and 37th weeks of gestation.

Table 3 shows the total mean score of fetal kicks among intervention group at 28 weeks and 37th weeks of pregnancy. It was found that there was a highly statically

significant difference in total number of fetal kicks count ($P=0.001$).

Table 4 shows the score of general health domains at 28 weeks and 37 weeks of gestation among the studied groups. It was found that there was no statistically significant difference in total score of both groups at 28 weeks of gestation ($P= 0.858$). While it was found that there were statistically significant difference in total score at 37 weeks of gestation (20.73 ± 4.18) in the intervention group compared to (23.14 ± 4.63) in the control group ($P= 0.001$). In which the intervention group had improvement in general health scale.

Table 5 shows that there was a highly statically significant improvement of the total scores of general health from 28 weeks to 37 weeks of gestation among intervention group (23.45 ± 5.97) at 28 weeks compared to (20.73 ± 4.18) at 37 weeks ($P= 0.001$). Also, it was found that there was a statically significant difference between intervention and control group at 37 weeks of gestation (20.73 ± 4.18 , 23.1 ± 4.634 respectively) ($P= 0.025$), while there was no statically significant change of general health at 28 weeks & 37 weeks of gestation among the control group ($P= 0.858$).

Table 6 shows the relationship between fetal kicks and general health scale among intervention group at 28 weeks and 37th weeks of pregnancy. It was found that there was a highly statically significant improvement general health scale from 28 to 37 weeks. ($P=0.001$).

4. Discussion

The aim of the present study was to investigate the effect of women self monitoring of fetal kicks on enhancing their general health status was achieved within the framework of the present study. The present study revealed that a highly statically significant positive reaction between fetal kicks at 28 weeks compared to 37 weeks among the intervention group, also there was a highly statically significant improvement general health scale from 28 to 37 weeks of gestation. So the research hypothesis, women who self monitoring of fetal kicks will be expected to enhance their general health status was accepted.

Concerning to general characteristics of the studied sample. The current study findings represent that there's no significant relation between intervention and control group regarding socio-demographic characteristics this is due to both groups were from the same rural area, so there's a similarity between both groups and homogenous of the sample.

Regard to women's knowledge. The present study results showed that there was significant improvement of knowledge at 37 weeks of gestation which was reflected upon their positive general health status at 37 weeks of gestation which. The present study results were in agreement with Prabavathy & Dash [24] who assess the knowledge of fetal movements count among antenatal mothers in Puducherry and reported that half of mothers had poor knowledge of fetal movements count around one third of them had the average knowledge and only 13.3% of the mothers are having good knowledge of fetal movements count. Also the present study finding were

supported by Bhargava et al. [25] who study the effect of structured teaching program on knowledge regarding self assessment of the daily fetal movement count, among normal and high risk primigravida mothers at Red Cross Hospital, and reported that structured teaching program was effective in increasing the knowledge regarding self assessment of daily fetal movement counts, among normal and high risk primigravida mothers.

Else, Refaat [26] who study the effect of counseling intervention on women's knowledge, practices of fetal well-being among primigravida, showed that the level of a woman's knowledge increased after application of the intervention as compared with before. Moreover the current study results were inconsistent with Sujatha et al, [27] who study the effectiveness of structured teaching program among primigravida women. Antenatal care and knowledge, showed that a significant difference in the level of knowledge on antenatal care after structured teaching program (87.0%).

Furthermore, concerning total score general health status, it was observed that significant improvement of pregnant woman self monitoring of fetal kicks at 28 and 37 weeks of gestation. The present study findings showed that there was a highly statically significant improvement of the total scores of general health at 37 weeks of gestation among intervention group while there was no change of general health at 37 weeks of gestation among the control group. Additionally a high significantly was observed between 28 weeks and 37 weeks among intervention group about FKC and woman's general health status domain.

The current study results were in agreement with Delaram et al., [21] who study the effects of fetal movement counting on the psychological health of the mother in the third trimester in Chinese Business and showed that the mothers who counted the fetal movements, reported less depression at 37 weeks of gestation after the counting of fetal movements compared to 28 weeks. The agreement between study findings and the previous study may be related to the effect of counting fetal movement that gives an overview about the fetal health condition, especially in primipara and increasing maternal fetal bonding so pregnant woman feels of healthy without fear or stress about the fetal health condition and pass the pregnancy journey without emotional distress or complain.

Regarding to domains of general health scale as anxiety & insomnia, social dysfunction and depression score at (37 Ws), the present study results revealed that there were significant improvement of all domains of general health in the intervention group than the control group. The present study results were in the same line with Saastad et al., [28] who study the effect of fetal movement counting on perinatal outcomes and reported that less emotional connection with their fetus show less healthy behaviors and higher levels of anxiety and depression and these problems can lead to pregnancy complications. Else, the current study results were in agreement with Delaram et al., [21] who reported that the fetal movement counting decrease anxiety and reassured mothers.

Else, in the same line in fact feeling of less anxiety and depression give a feeling of well being that reflect on her fetus, the cornerstone of attachment takes form when the

mother realizes that become pregnant and increase to reach the highest peak during the third trimester and continue after delivery [29,30,31]. Furthermore, the current study result was supported by Smith et al., [32] who study unexplained antepartum stillbirth: the consequence of placental aging and reported that the mothers receive feedback about the health of the fetus, their stress and anxiety were significantly reduced. Furthermore, the results of study were parallel with Rowland et al., [33] who auscultation of the fetal heart in early pregnancy and reported that hearing fetal heart rates reduce anxiety and keep the mother enjoyable.

Also, the present study result was in agreement with Malm [34] who study fetal movements in late pregnancy and reported that women who used self-assessment methods for monitoring fetal movements felt calm and relaxed when observing the movements of their babies. Else, Douglas [22] showed that pregnant women who monitor their babies' movements via fetal movement counting during the third trimester tend to be less anxious about their babies' wellbeing than other pregnant women.

Moreover, the current study, findings were supported by a study done by Nosratiet al [35] who reported that paternal-fetal attachment therapy as counting FM was found to be effective in improving the mother's psychological health. Also the present study results were in the same line with Akbarzadeh et al., [36] who study the effect of learning attachment behaviors on anxiety and maternal fetal attachment in first pregnant women and reported that educating the attachment behaviors as count fetal movement can increase maternal fetal attachment and reduce women's anxiety in their first pregnancy.

While the current study, findings were in disagreement with Mangesi et al., [4] who study fetal movement counting on fetal wellbeing and reported that fetal movement counting may cause anxiety to women. Differences in results may be due to differences in methodology such as the population studied and sampling also may be women were not provided with adequate information about the rationale for counting or the significance of decreased fetal activity.

Finally, counting of fetal kicks can be indirectly indicator or a sign of fetal health condition through be alert to the dangers during pregnancy. In addition, prenatal care is a good opportunity to assess and improve the mother's general health state, and interventions during this time are important for providing support and improving maternal health.

It was evident from the present study that woman's knowledge concerning self monitoring of fetal kicks significantly improved at 37 weeks of pregnancy, post intervention, so the present study findings directed our attention towards the importance of self monitoring of fetal kicks program which consequently had reflected upon better fetal wellbeing and pregnancy outcomes.

It was also, significantly enhanced their general health status at 37 weeks of pregnancy and stress on the importance of burshore about self monitor of fetal kick to be distributed among all pregnant women during their 1st attending visit to enhance their general health status to be distributed by all nurses, so that the present study aimed was achieved.

5. Conclusion

It was evident from the present study findings that women self monitoring of fetal kicks had significantly improved general health status post intervention compared with pre intervention regarding anxiety, insomnia, social dysfunction also depression when compared with women who received only the routine hospital care. Also, it was concluded from the present study that 10% abnormal fetal kicks at 28 weeks was improved at 37 weeks to be 3%, self monitoring of fetal kicks method is cheap and its execution is simple, and it could be prescribed to pregnant women as a helpful intervention.

6. Recommendations

- Training program must be designed and implemented to enhance pregnant women daily self monitoring of fetal kicks at antenatal clinics.
- Design burshour to be distributed among all pregnant women during their antenatal visit to increase their awareness regarding self monitoring of fetal kicks.

Future Research

Investigate the effects of counting fetal kicks on general health status among high risk pregnant women.

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References

- [1] Rincy K., & Nalini S. (2014). The effect of fetal movement counting on maternal-fetal attachment and maternal worries among Primigravidae. *Asian J. Nur. Edu. & Research*; 4(2): 224-227.
- [2] Wdowiarcz K, PadołaO, MajcherM , Orzel A, & Semczuk A (2017). Fetal movement monitoring as a still valid fetal well-being assessment method. *MEDtube Science* (1) 12-15.
- [3] Lu Y, Yang T, Luo H et al. (2016). Visualization and quantitation of fetal movements by real-time three-dimensional ultrasound with live xPlane imaging in the first trimester of pregnancy. *Croat Med J*; 57: 474-481.
- [4] Mangesi L, Hofmeyr GJ, Smith V, & Smyth RM. (2015). Fetal movement counting for assessment of fetal wellbeing. *Cochrane Database Syst Rev*. 15; (10).
- [5] Raynes-Greenow CH, Gordon A, Li Q & Hyett JA (2013). A cross-sectional study of maternal perception of fetal movements and antenatal advice in a general pregnant population, using a qualitative framework. *BMC Pregnancy Childbirth.*; 13: 32.
- [6] Copel JA & Bahtiyar MO. (2014). A practical approach to fetal growth restriction. *Obstet Gynecol*; 123(5): 1057-69.
- [7] Mohr A, Tsur A, Kalter A, Brenner A, Gindes I & Weisz, B (2016). Reduced fetal movement: factors affecting maternal perception. *The Journal of Maternal-Fetal & Neonatal Medicine*; 29(8): 1318-21.
- [8] Tveit JV, Saastad E, Stray-Pedersen B, Bordahl PE, Flenady V, Fretts R, et al., (2009). Reduction of late stillbirth with the

- introduction of fetal movement information and guidelines - a clinical quality improvement. *BMC Pregnancy, Childbirth*; 9(32): 1-10.
- [9] Toosi M, Akbarzadeh A, Zare N & Sharif F (2011). Effect of attachment training on anxiety and attachment behaviors of first-time mothers; *journal of hayat*, 17(3): 69-79.
- [10] Nishikawa N & Sakaki bara H (2013): Effect of the nursing intervention program using abdominal palpation of Leopold's maneuvers on maternal fetal attachment. *Reproductive health*; 10: 12-8.
- [11] Froen JF (2004). A kick from within--fetal movement counting and the cancelled progress in antenatal care. *J Perinat Med.*; 32(1): 13-24.
- [12] Bradford, B (2014). Maternal perception of fetal movements: A thesis submitted to the Victoria University of Wellington in fulfillment of the requirements for the degree of Master of Midwifery Victoria University of Wellington.
- [13] Sheikh M, Hantoushzadeh S, & Shariat M (2014). Maternal perception of decreased fetal movements from maternal and fetal perspectives, a cohort study *BMC Pregnancy Childbirth* ; 14: 286.
- [14] Bennett, H. A., Einarson, A., Taddio, A., Koren, G., & Einarson, T. R. (2004). Prevalence of depression during pregnancy: *Systematic review. Obstetrics & Gynecology*, 103; 698-709.
- [15] Seng J, D'Andrea W, & Ford J (2014). Complex Mental Health Sequelae of Psychological Trauma Among Women in Prenatal Care. *Psychol Trauma*; 6(1): 41-49.
- [16] Davachi A, Khoramroodi R, Shahpoorian F & Haghani H. (2011). Fetal touching! Does it improve maternal fetal or newborn attachment? *Journal of Iran Nursing*; 13: 16-44.
- [17] Muller M, Gawlik S. (2015). Role of perinatal depression, anxiety and maternal fetal bonding during pregnancy. *Arch. Womens Ment Health*; 18(2): 187-95. 23.
- [18] Alhusen, J. L., Hayat, M. J., & Gross, D. (2013). A longitudinal study of maternal attachment and infant developmental outcomes. *Arch Womens Ment Health*, 16(6), 521-529.
- [19] Dubber, S., Reck, C., Müller, M., & Gawlik, S. (2015). Postpartum bonding: The role of perinatal depression, anxiety and maternal-fetal bonding during pregnancy. *Arch Womens Ment Health*, 18(2), 187-195.
- [20] Taavoni S, Ahadi M, Ganji T & Hosseini F (2008). Comparison of maternal fetal attachment between primigravidas and multigravidas women with past history of fetal or neonatal death. *IJN*; 21(53): 53-61.
- [21] Delaram M, Jafar-Zadeh, L, Shams S & Reza (2016). The effects of fetal movement counting on mental health of mother in third trimester—A Randomized Controlled Trial, *Chinese Business*. 15(3): 149-154.
- [22] Douglas, (2012). www.thestar.com/life/2012/06/18/fetal_movement_counting_reduces_maternal_anxiety_study.html.
- [23] Goldberg DP & Hillier VF (1979). A scaled version of the General Health Questionnaire. *Psychol Med.*; 9(1): 139-45.
- [24] Prabavathy & Dash (2017). Assess the knowledge of fetal movements counts among antenatal mothers in Puducherry. *IJNH*, 2 (4), 169-171.
- [25] Bhargava S, Singh S & Biswal A. (2014): Effect of structured teaching programme on knowledge regarding self assessment of daily fetal movement count, among normal and high risk primigravida mothers at Red Cross Hospital, Bhopal. *Int. J. Adv. Nur. Management* 2(4):205-209.
- [26] Refaat A (2016): Effect of counseling intervention on women's knowledge, practices and lifestyle of fetal well-being among Primigravidae. *International Journal of Nursing Science*, 6(4): 87-93.
- [27] Sujatha V, Radhiga C, Sudha R, Devika K, Buela priyadarshni, Shalini R (2013). Effectiveness, structured teaching programme Primigravid women. Antenatal care and knowledge. *Obstetrics and Gynecological Nursing*, Sri Venkateswara, India. www.mcmed.us/journal/ijner
- [28] Saastad, E., Winje, B. A., Israel, P., & Froen, J. F. (2012). Fetal movement counting—Maternal concern and experiences: *A multicenter, randomized, controlled trial. Birth*, 39(1), 10-20.
- [29] Perry D, Ettinger A, Mendelson T & Le H. (2011). Prenatal depression predicts postpartum maternal attachment in low-income latina mothers with infants. *Infant Behavior and Development*; 34:339-50.
- [30] Eswi A & Khalil A. (2012). Prenatal attachment and fetal health locus of control among low risk and high risk pregnant women. *World Applied Sciences* ; 18(4): 462-71.
- [31] Mehran P, Simbar M, Shams J & Tehrani F. (2013). History of perinatal loss and maternal- fetal attachment behaviors. *Women and Birth*; 26(3):185-89.
- [32] Smith R, Maiti K., & Aitken R.J. (2013). Unexplained antepartum stillbirth: A consequence of placental aging? *Journal of Science Direct*, 34, 310- 313.
- [33] Rowland J, Heazell A, Melvin C & Hill S. (2011). Auscultation of the fetal heart in early pregnancy. *Arch Gynecol Obstet.*; 283 (1): 9-11.
- [34] Malm M.C. (2016). Fetal movements in late pregnancy. Categorization, self-assessment, and prenatal attachment in relation to women's experiences. *Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine* 1171. 73 pp. Uppsala: Acta Universitatis Upsaliensis. ISBN 978-91-554-9446-9.
- [35] Nosrati, A, Mirzakhani, K, Golmakani, N, Asghari, S & Esmaeili, H (2017). Effect of Paternal-Fetal Attachment on Maternal-Mental Health: Mazandaran university medical science; 27(152):50-62.
- [36] Akbarzadeh, M, Toosi, M, Zare, N & Sharif, F. (2011). Effect of learning attachment behaviors on anxiety and maternal fetal attachment in first pregnant women. *Evidence based care journal*; 2(1): 21-34.