

Increasing Awareness of Primigravidas About Fetal Movements During Pregnancy

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Abstract

Background: Fetal movements is a sign to the mother that her fetus is live and in contact with her, it is developed as a simple, inexpensive and easily accessible tool to support the mother in monitoring her fetal well-being and alarming behavior in time to intervene. **Aim of the study:** Increasing awareness of primigravidas about fetal movements during pregnancy. **Setting:** this study conducted at outpatient clinics of El-Dakhla general hospital and Family Health Center at El-Dakhla. **Methods:** A Convenient sample included 100 primigravida mother, a cross-sectional research design was used **Tools:** A structured interview questionnaire to assess maternal perception and knowledge regarding fetal movements. **Results:** The study findings revealed that the majority of mothers shows positive perception and unsatisfactory knowledge regarding fetal movements and also found significant relationship between mother's knowledge and age, educational level and residence. **Conclusion:** The study concluded that most of primigravidas have positive perception toward fetal movements but have unsatisfactory knowledge with significant relationship between mother's knowledge & age, educational level and residence. **Recommendations:** Fetal movements counting should be a basic part of guidelines of antenatal care in all hospitals & all Maternity health centers for continuous education through antenatal classes is very important.

Keywords: *Fetal Movements Counting, Maternal Perception & Maternal Knowledge.*

Introduction

Fetal movements refers to motion of a fetus caused by its own muscle activity. Locomotor activity starts during the late embryological stage and changes in nature throughout development. Muscles begin to move as soon as they are innervated. These first movements are not reflexive, but arise from self-generated nerve impulses originating in the spinal cord. As the nervous system matures, muscles can move in response to stimuli (Vaughan., 2019).

Maternal perceptions of fetal movements are the result of pressure against abdominal wall due to gross fetal movement or limb movement. Monitoring fetal movements is a useful tool to assess fetal well-being (Nandi, & Agarwal, 2019).

Maternal perception of reduced fetal movements (RFM) is associated with adverse pregnancy outcomes including fetal growth restriction, oligohydramnios and stillbirth, these conditions are associated with placental dysfunction which is observed in mother with RFM and has been reported in 15% of pregnancies during the third trimester and around 50% of mother perceive a gradual reduction of fetal movement days before intrauterine death (Heazell, 2018 & Akbarzadeh, et al., 2016).

The normal fetus is active and capable of physical movements, and goes through periods of both rest and sleep. Active and quiet periods of the fetus do not correspond to that mother. Some studies reveals those

fetuses are most active from 9am to 2pm and again from 7pm to 4am (Kintraia, et al., 2017).

A multiparous mother will usually notice the gentle fluttering movements of the fetus at an earlier gestation than a primiparous mother; a multiparous might feel movements as early as 16 weeks whereas a primiparous might not feel anything until 20 to 22 weeks (Flenady, et al., 2019).

Fetal movements provides an important measure of fetal health. More than half of stillbirths are preceded by decreased fetal movements and 25% of mother perceiving decreased fetal movements have poor perinatal outcomes according to most of studies (Bryant, et al., 2019).

The first fetal movements which are felt by the mother are called quickening. One function of these movements is to alert the mother that she has a fetus growing in size and strength in her uterus. Decreased fetal movements can be a warning sign of potential fetal impairment or risk. Most providers recommend that mother monitor fetal movements, especially by the third trimester. This can be accomplished by simply teaching the mother to have a general awareness of the fetus and determine if the fetus is moving less than normal on any given day or about the same as other days using fetal movements count (FMC)(Das, et al., 2019).

The maternity nurses play a crucial role in fetal monitoring and early detection of high risk fetus (Lewis, et al., 2016). The importance of monitoring of fetal movements should be discussed at each antenatal appointment from 20 weeks gestation, so mother should be advised to be aware of their fetus's individual pattern of movements. Mother who are concerned about RFM should not wait until the next day for assessment of fetal wellbeing. It is important that full details of the assessment and management are documented. It is also important to record the advice given about follow-up and when/where to present if a further episode of RFM is perceived (Moon, 2017).

Significance of the study

Maternal counting of fetal movements is an easy, inexpensive and valuable screening tool for fetal well-being that increases maternal-fetal bonding. Prenatal attachment has been defined as "The emotional tie or bond which normally develops between the mother and her unborn child"(Marzouk, & Nabil, 2015).

According to international researches reported that low maternal awareness of fetal activity is associated with an increased risk of still-birth and this also associated with other adverse neonatal outcomes (Cristine, et al., 2014). Maternal reaction to a decrease or increase fetal movements helps in early detection of high risk fetus thus saving fetus's life (McArdle, et al., 2015).

Related to national studies done in Egypt, it was reported that maternal reaction to a decrease or increase in fetal movements helps in the early detection of high-risk fetuses thus saving fetus's life (Belal .GH & Elkazeh, 2017 & Marzouk, & Nabil, 2015). So this study aims to increase awareness of primigravidas regarding fetal movements counting.

Subjects and methods

Aims of the study was to:

Increase awareness of primigravidas about fetal movements during pregnancy and **this achieved through**

- 1- Assessing knowledge and perception of primigravidas regarding fetal movements counting.
- 2- Counseling to increase awareness of primigravidas regarding fetal movements counting.

Research question

Are Primigravidas have enough knowledge and positive attitude regarding fetal movements and its counting ?

Research design

Cross-sectional research design was used in this study.

Study Setting

This study was conducted at El-Dakhla in New Valley governorate from outpatient clinics of two-setting (El –Dakhla general hospital & Family Health Center in El –Dakhla) , El –Dakhla general hospital which consists of three floors, the first floor include outpatient clinics as (Obstetric and Gynecological clinic ,Ophthalmology clinic ,Internal Medicine clinic, Surgery clinic and Children clinic) Intensive care unit, X-ray department, Dialysis department, pharmacy, Blood & Endemic labs, reception section and Administrative offices. The second floor includes inpatient departments as (Internal Medicine department (male and female), Surgery department (male and female), Obstetrics and Gynecology department), operational department for any operation and neonatal care unit and the third floor include pediatric department and nursing accommodation. **Family Health Center in El – Dakhla** which consists of one floor and include many of offices that offers a lot of services such as health office to register births and deaths ,vaccinations office for children, basic care clinic that include (follow up for pregnant women, puerperium following , family planning) ,out patients clinics as (Dental clinic, Children clinic, Gynecological clinics),reception section ,pharmacy , Blood & endemic labs and Administrative offices.

Sample

Convenient sample was used for all primigravidas attending to Family Health Center at El-Dakhla as a result of the low flow of mothers visiting this center. Researchers were forced to extend the data collection from another center at (El – Dakhla general hospital) and the period of data collection extended from six months as determined in the proposal to one year from (August 2018 to September 2019), They were (100) participants.

Sample size

The data collection used by period because there is not any statistics records about number of primigravidas attending to this clinics neither in El – Dakhla general hospital nor in Family Health Center including all Primigravidas at or more than 20 weeks of gestation and Singletons & normal pregnancy with exclusion any mother refused to participate in the study.

Tools of the study

A structured interview questionnaire:- it was designed and implemented by the researcher after reviewing the related journals, books and related publication guidelines, which included three parts:- **The first part**, involved personal data as (mother's age, residence, level of education and occupation and mother's telephone number).

-Current obstetric data and attending antenatal visits as (duration of marriage , date of LMP, gestational age , EDD, schedule of antenatal care follow upetc). **The second part**, assess maternal perception about fetal movements. This part encompassed of 8 questions asked about (is it easy to feel fetal movements , concern about fetal movements, perception of fetal movements first time by weeks, emotional response to feeling fetal first movementsetc.)

The scoring system

Each item scored from 0 score to negative perception and 1 score to positive perception , if mother answer less than five questions from eight, it was scored as below 60% was negative perception and if mother answer equal to or more than five questions from eight, it was considered 60% and above it was positive perception.

The third part, assess maternal knowledge about fetal movements .It comprised of 20 questions to ask about (when should you feel the first fetal movement, what are the methods of fetal movements counting? Does fetal movements are affected by fetus sleeping, maternal weight or mother activity?, what are the sources about fetal movements information? and what action you should take in cases of unusual fetal movements?)

The scoring system

The scoring system was estimated as one for the correct answers and zero for the wrong answers. Then the total score of knowledge is as follow, if mother answer less than twelve question from twenty.it was considered below 60% was unsatisfactory knowledge and if mother answer equal to or more than twelve question, it was considered 60% and above was satisfactory knowledge.

Validity and reliability of the study tools

The validation of the tool was done before actual study work through Jury by panel of 3 experts in the field of maternity and modification were carried out according to the experts' judgments. The reliability of the study tools was assessed in a pilot study by measuring their internal Consistency using Cronbach's alpha method. This turned to be ($\alpha = 0.89$) to study tool.

Administrative design

To carry out the study an official permission was obtained from the director of El –Dakhla general hospital and the director of Family Health Center at El – Dakhla in New Valley governorate. The researcher explained the aim of the study and requesting permission to use the premise for data collection.

Ethical consideration

Research proposal was approved from ethical committee of the Faculty of Nursing. Informed

consent was obtained from mothers who were participated in the study, after explaining the nature and purpose of the study. There was no any risk for the mother during conduction of the study. The study was followed common ethical principles in clinical research. Confidentiality and anonymity would be assured and the participating mothers had the right to refuse participation or withdraw from the study without any rational.

Pilot study

A pilot study was carried out on 10% of the study sample .They were (10 mothers) to test the clarity and applicability of the tool as well as to estimate the time needed to answer it. It also helped to test feasibility and suitability of the study setting. The data obtained from the sample of pilot study were included in the total study sample because no modifications were done.

Procedure of the study

Data collection phase

Data were collected through interviewed all primigravidas from 20 weeks of gestation attending at F.H.C and El –Dakhla general hospital after explanation the nature of the study and obtained their consent to be included in the study. The researcher informed the participant that their participation is voluntary. Confidentiality and anonymity of subjects were assured.

Each mother was interviewed separately to fulfill the tool and assess the mother's knowledge & perception. Data were collected in two day by week (Monday and Wednesday) at Family Health Center and one day (Saturday) in outpatient clinic at El- Dakhla general hospital because the follow up of pregnancy and vaccination of pregnant mothers taken in this days, the researcher started from 9 am to 12 pm and data collection took about 30 minutes for each mother and started from (August 2018 to September 2019).

Counseling

- The mothers counseled about scientific knowledge regarding fetal movements counting and guided by arabic brochure was designed based on National and International review and included pictures for illiterate mothers.
- This brochure instruct the mother about how to count fetal movements and what are the right action taken if reducing or unusual F.M was happen and the importance and factors affecting fetal movements.
- Instruct the mother to determine a fetal kick count once a day after 28 weeks of pregnancy as a way to monitor your fetus's health.
- Ask the mother to lie in a position that is comfortable for you, in which you can relax and still feel your fetus's movements well.

- Keep in mind that you still need to be able to write while in this position.
- Instruct that the ideal position is to lay on your side especially left side, with your head propped up comfortably with a pillow. This should help you feel the kicks more firmly.
 - Placed your hand on abdomen and identify when the fetus is most active. Each fetus has a time when it is most active, such as after you have eaten a meal, drank a beverage that contained sugar, after being very active, or just during certain times of the day. When you have figured out and when your fetus is the most active, use that time to chart the fetal kick counts.
 - Ask the mother to get a notebook or a chart. This is important to record the time it takes the fetus to move. It is a good idea to keep a record of all the movements of your fetus in one notebook or binder to make it easily accessible and accepted by most of mothers when I saw them in other follow up visits.
 - Before you start counting the kicks, write down what week of pregnancy you are in, the day as well as the starting time of the kicks.
 - Note how long it took to reach ten movements. The fetus should have moved at least ten times.
 - Example of how to note the fetal kicks:-
 - WEEK 29

- Sunday, 9/27, 9:00pm, XXXXXXXXXXXX, 11:00pm, 2 hrs.
- Monday, 9/28, 9:15pm, XXXXXXXXXXXX, 10:45pm, 1 hr. 30 minutes
- Tuesday, 9/29, 9:00pm, XXXXXXXXXXXX, 11:45pm, 1 hr. 45 minutes

Note:- XXXXXXXXXXXX refer to mother's mark for each fetal movement recorded by mother in her note through the day.

- If you did not feel the fetus move ten times, try eating or drinking something to see if it gets the fetus to move and try tracking the movements at a later time if the fetus doesn't seem to be very active.
- If, after eating, drinking, or monitoring fetal activity at a later time, the fetus still doesn't move at least ten times, you should contact your health care provider immediately.

Statistical analysis

Data entry and data analysis were done using statistical package for the social science (SPSS) version 20 and Excel 2016 program. Data were presented as number, percentage means and standard deviation. Chi-square test was used to compare between qualitative variables. P-value considered statistically significant when $p < 0.05$.

Results

Table (1): Distribution of the studied mothers according to their personal data

	No. (100)	%
Mother's age: (years)		
20 – 24	52	52.0
25 – 29	44	44.0
30 – 35	4	4.0
Mean \pm SD	27.83 \pm 9.11	
Residence:		
Rural	50	50.0
Urban	50	50.0
Educational level:		
Illiterate	5	5.0
Read & write	1	1.0
Basic education	2	2.0
Secondary	50	50.0
University	42	42.0

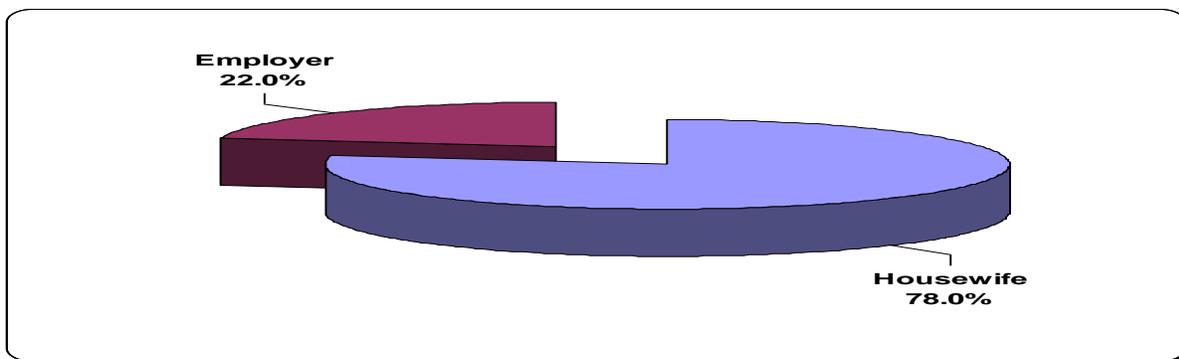


Figure (1):-Distribution of studied mothers according to their Occupation.

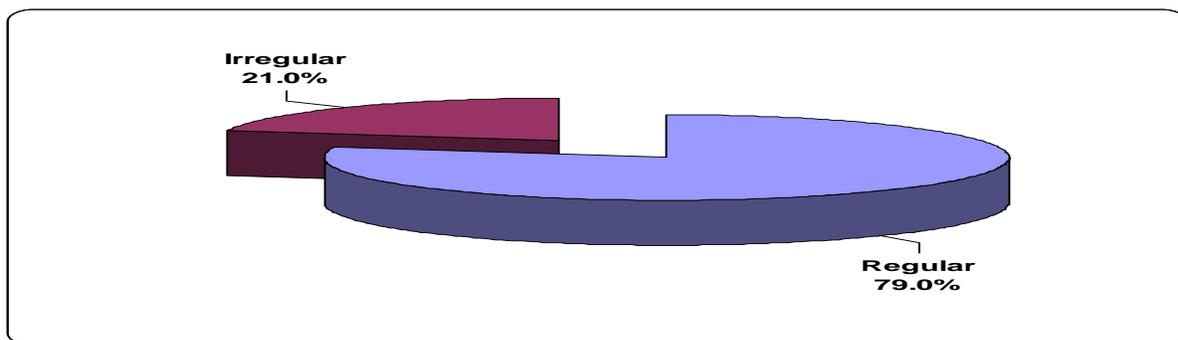


Figure (2):- Distribution of studied mothers according to Pattern of antenatal care.

Table (2):- The distribution of the studied mothers according to their perception of fetal movements.

Perception of fetal Movement	No. (100)	%
It is easy to feel fetal movements:		
Yes	98	98.0
No	2	2.0
Concern about your fetal movements:		
Yes	96	96.0
No	4	4.0
Concern if your fetal movements was excessive:		
Yes	12	12.0
No	88	88.0
Concern if your fetal movements was reduced:		
Yes	22	22.0
No	78	78.0
Perception of fetal movements first time: (weeks)		
< 20	35	37.6
≥ 20	58	62.4
First fetal movements perceived:		
Gentle	83	83.0
Strong	17	17.0
Emotional response to feeling fetal first movements:		
Negative	6	6.0
Positive	86	86.0
Neutral	8	8.0
Perception of the type of first fetal action:		
Limbs	33	33.0
Whole body	7	7.0
Don't know	60	60.0

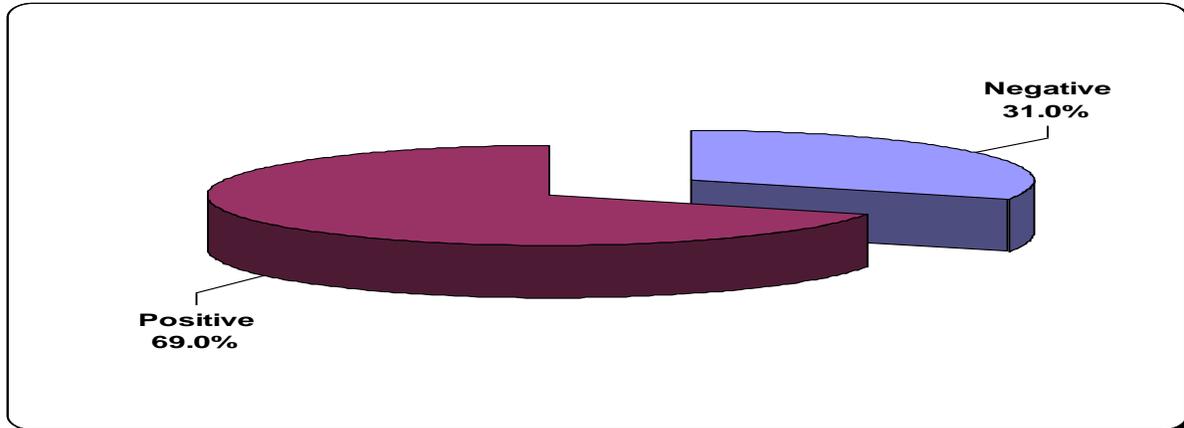


Figure (3): Distribution of the studied mothers according to their total perception score regarding fetal movements.

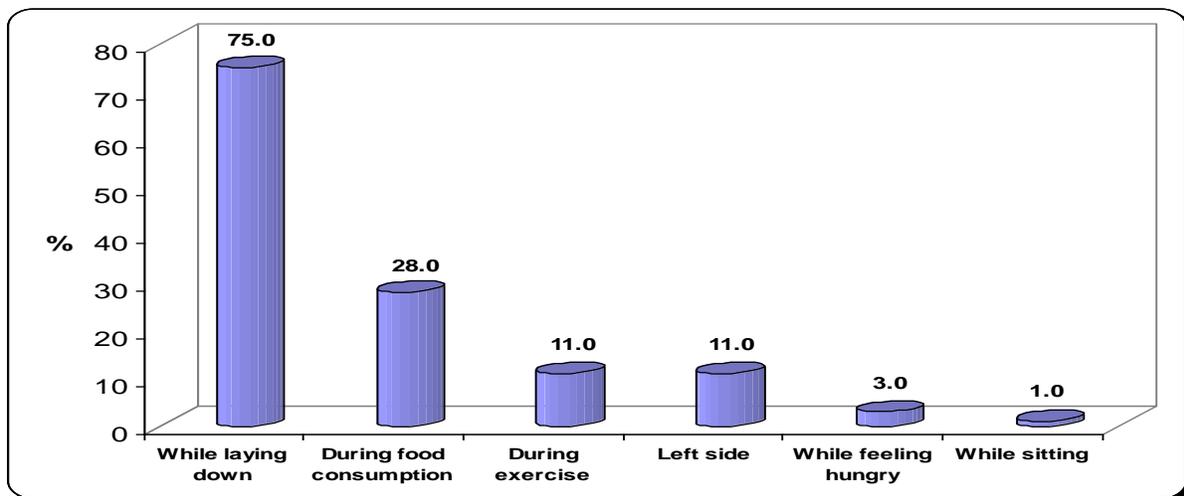


Figure (4): Distribution of the studied mothers according to position of increased perception of fetal movements.

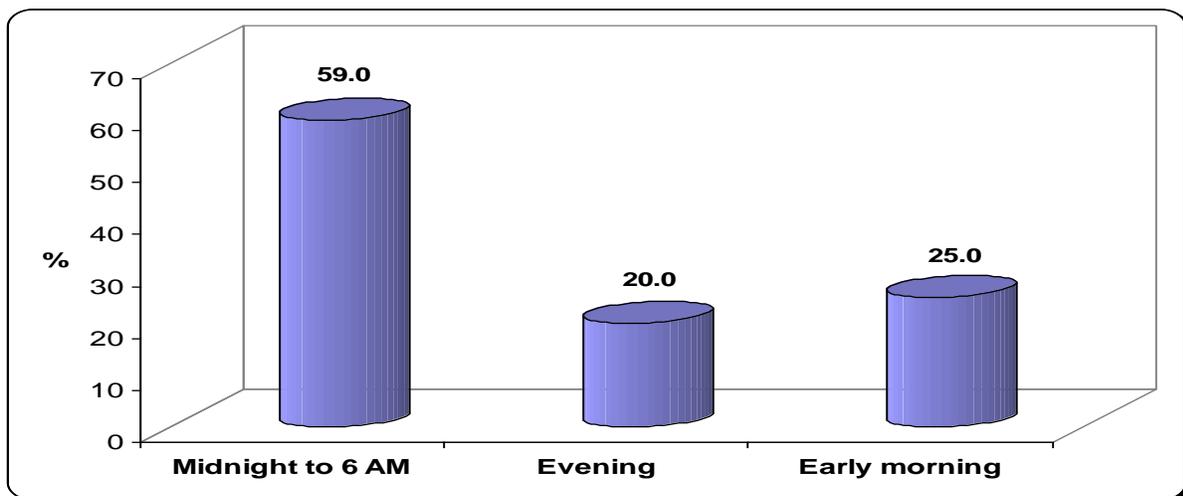


Figure (5):-Distribution of the studied mothers according to the best time of the day to feel fetal movements.

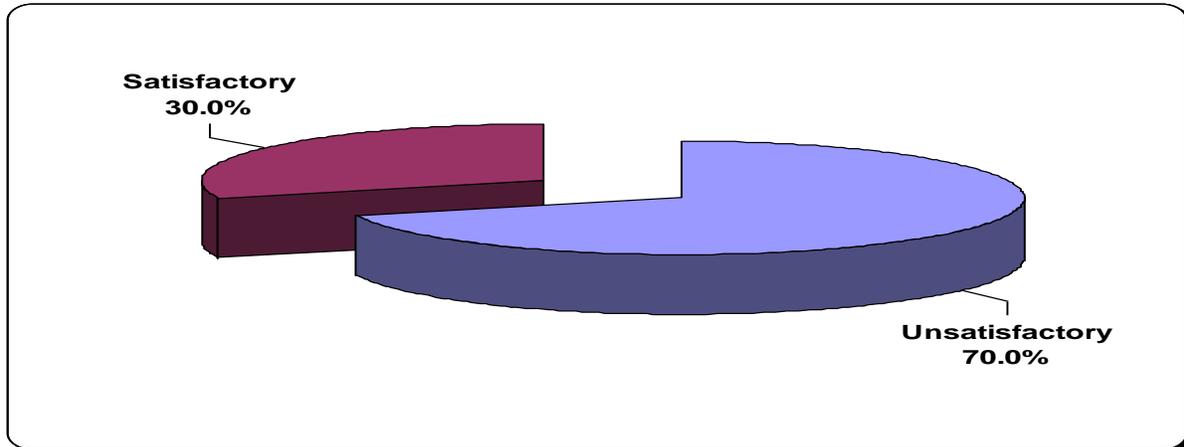


Figure (6):-Distribution of the studied mothers according to their total knowledge score regarding fetal movements.

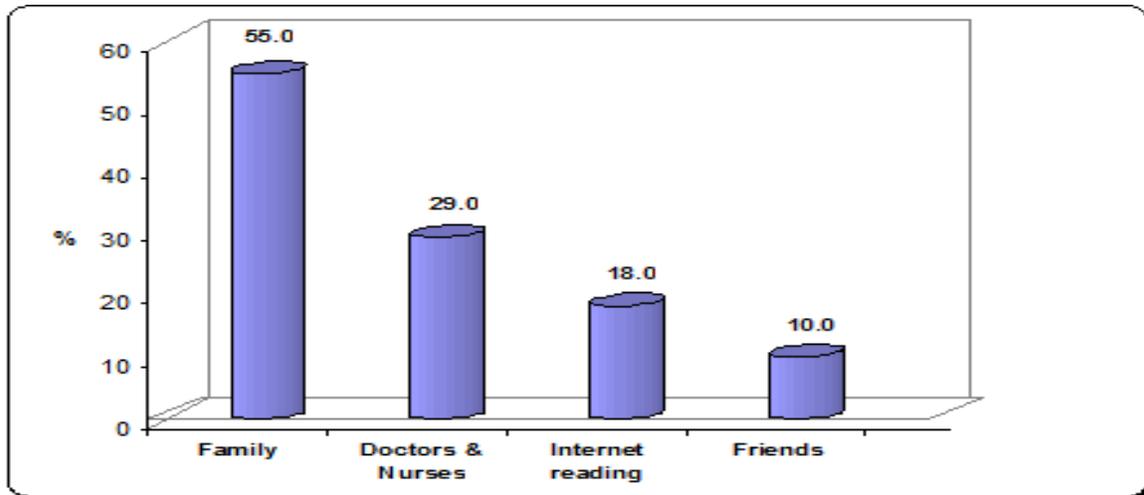


Figure (7):-Distribution of studied mothers according to their source of information about fetal movements.

Table (3): Action should be taken in case of unusual fetal movements

	No. (100)	%
Right action:		
Timely contact with a health care provider	6	6.0
Laying down after having a warm bath	3	3.0
Eating sugary meals	2	2.0
Drinking fresh cold juice	1	1.0
Monitoring the movements	0	0.0
Wrong action:		
Lake of the contact with a health care provider and Waiting the next antenatal appointment	70	70.0
Trying to rationalize the unusual movements	6	6.0
Not doing anything	12	12.0

Table (4): Relation between personal data of the studied mothers and the level of knowledge about fetal movements.

	Knowledge level				P-value
	Unsatisfactory		Satisfactory		
	No.	%	No.	%	
Mother's age: (years)					
< 25	43	82.7	9	17.3	0.004*
≥ 25	27	56.3	21	43.8	
Educational level:					
Secondary or less	48	82.8	10	17.2	0.001*
University	22	52.4	20	47.6	
Occupation:					
Housewife	58	74.4	20	25.6	0.073
Employer	12	54.5	10	45.5	

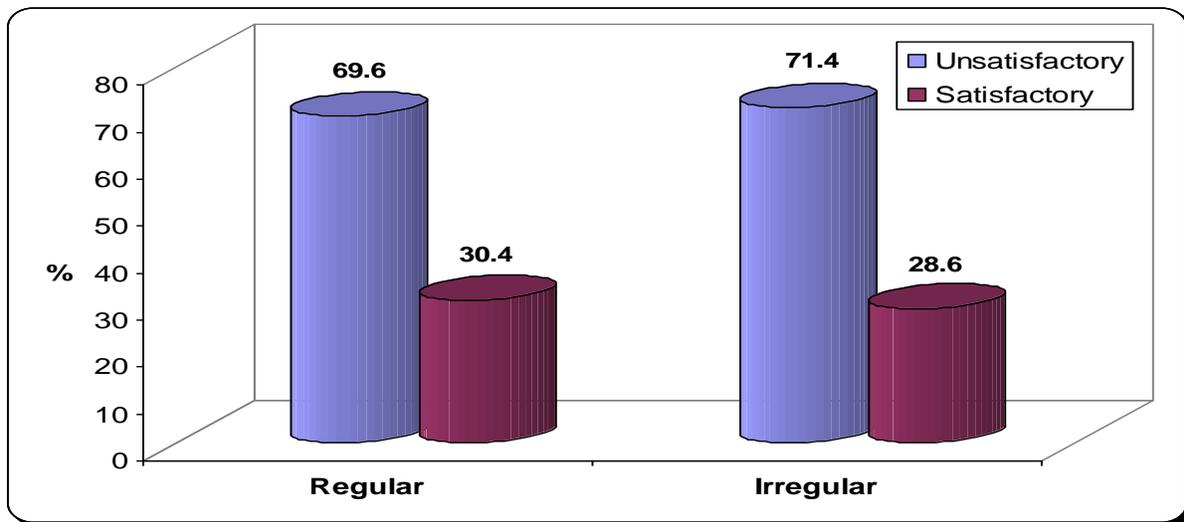


Figure (8): The correlation between Pattern of antenatal care and the level of knowledge.

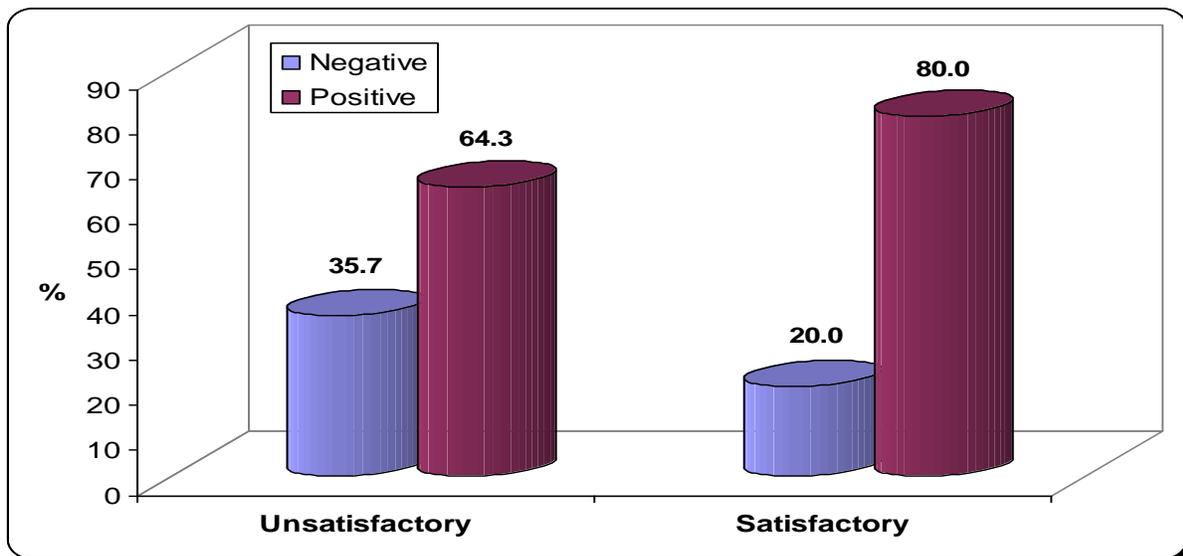


Figure (9): Relation between mother's perception and knowledge regarding fetal movements

Table (1): Illustrates personal data of participating mothers, their mean age of (27.83 ± 9.11 years). Half of them were living in rural areas and half of studied mothers having secondary education.

Figure (1): Shows the distribution of studied mothers according to their Occupation, which reveals that most of the studied mothers (72%) were housewife.

Figure (2): Illustrates the distribution of studied mothers according to their pattern of antenatal care. It reveals that more than three quarters of studied mothers (79.0%) have regular antenatal follow up and (21.0%) follow antenatal care but irregularly.

Table (2): Demonstrates the distribution of the studied mothers according to their perception of fetal movements. It was noticed that majority of studied mothers have strong concern and easy to feel fetal movements (96% & 98% respectively), about less than one quarter of them were not concerned if the fetal movements was excessive or reduced (12% & 22% respectively) and more than half of studied mothers felt the first fetal movement equal to or more than 20 weeks of gestation. Concerning to the sensation of first movements most of them (83%) described that their first fetal movement was a gentle movements with positive response to their fetus's movements (86%), but more than half of studied mothers don't know the type of movements (60%) while only one third of them sense a limb movements.

Figure (3): Distribution of the studied mothers according to their total perception score regarding fetal movements. It was noticed that about two third of the studied mothers (69%) exhibited positive perception regarding fetal movements compared to only about one third (31%) of them had negative perception.

Figure (4): Shows the distribution of the studied mothers according to time of increased perception of fetal movements. It reveals that the most of the studied mothers (75%) feeling with best time of increase fetal movements while laying down, followed by (28%) of them during food consumption, (11%) on left side and (11%) during exercise while only (1%) of them when sitting.

Figure (5): Shows the distribution of the studied mothers according to the best time of the day to feel fetal movements. It was observed that the most of the studied mothers (59%) perceive fetal movements from midnight to early morning, (20%) of them perceive fetal movements at the evening including bedtime and (25%) perceive it best in the early morning

Figure (6): Distribution of the studied mothers according to their total knowledge score regarding fetal movements. It was noticed that two third of the studied mothers (70%) exhibited unsatisfactory knowledge regarding fetal movements compared to

only one third (30%) of them had satisfactory knowledge.

Figure (7): Shows the distribution of studied mothers according to their source of information about fetal movements. The figure reveals that about more than half of the studied mothers (55%) mentioned that family as the source of information regarding fetal movements while (29%) of them mentioned doctors and nurses and a few numbers of studied mothers mentioned that internet reading and friends as the source of information regarding fetal movements (18% & 10% respectively).

Table (3): Displays the right and wrong action taken by studied mothers in cases of reduced fetal movements. The first part (right action) indicates that only (12%) of the studied mothers were taken the right response by different ways as illustrated in table and the most of studied mothers (88%) un aware with the right action if fetal movements was reduced.

Table (4): Shows the correlation between personal data of the studied mothers and the level of knowledge about fetal movements. It illustrates that there was a significant relationship between mothers's age and educational level with the level of mothers's knowledge about fetal movements with P-Value (0.004*, 0.001* & 0.009* respectively) and no significant relations for mothers's occupation.

Figure (8): Illustrates that about two third (69.6%) of studied mothers that had regular pattern of antenatal care but had unsatisfactory level of knowledge.

Figure (9): Relation between mothers's perception and knowledge was regarding fetal movements. It revealed that the most of studied mothers (80%) had positive perception regarding fetal movements had satisfactory level of knowledge with no significant relation between mothers's perception and knowledge.

Discussion

Fetal movements assessment is widely used as a method of routine surveillance of the well-being of unborn fetus, It reduces the risk of stillbirth, fetal growth restriction, fetal distress and perinatal mortality. Furthermore, the maternal-fetal attachment is increased by fetal movements' perception **Winje, (2016)**. Prevalence of decreased fetal movements perception in third trimester has been reported as 4-15% in various studies **Nandi & Agarwal, (2019)**. So, the aim of the present study is to increasing awareness of primigravidas about fetal movements during pregnancy.

The finding of actual study revealed that the mean age of studied mothers was 27.83 ± 9.11 , the majority of mothers were house wife and half of them had a secondary education with the mean of gestational age was 26.76 ± 2.62 which in harmony with the study finding of **Güney & Uçar, (2018)** who perform his

study to determine the effect of fetal movements counting on maternal–fetal attachment, in Malatya, eastern Turkey, who reported that the mean age of the pregnant mothers was 27.62 years, more than three – quarters of them were unemployed and the mean week of pregnancy was found to be 29.58.

Regarding the perception of the fetal movements the present study pointed that the most of mothers perceive fetal movements easily, this finding on the same line with **Berndl & Colleagues, (2019)** who applied his study to assess how doing as an educator in fetal movements monitoring at the IWK Health Centre, Canada and found that the most of pregnant mothers were able to feel fetal movements easily, this confirm the fact that the primigravidas can feel fetal movements easily at getting 20-25 weeks of gestation in line with gestational age in our study with mean age 26.76 ± 2.62 .

The finding in the actual study revealed that the majority of mothers were not expressed concern about any variations in the fetal movements either increase or decrease fetal movements. This confirm the fact that most pregnant mothers feel fetal movements at first time later around the 18th–20th gestational week and the difference in movements between fetuses and how the movements are perceived by pregnant mothers are probably the most important reasons for declaring that there is a variation in what is regarded as a normal pattern of movements, This fact makes it problematic to define what decreased fetal movements really mean (**Georgsson, et al., 2016**).

The results of the present study pointed that most of the mothers perceived their fetus's first action as gentle, but they could not describe the type or sensation of the first action. This result similar to those of **Belal & Elkazeh, (2017)** who performed his study to determine the maternal perception and antenatal advice regarding fetal movements at Al-Gharbyia Governorate, Tanta City, Egypt concluded that half of them described their first fetal movement as a gentle movement. While, **Raynes –Greenow, et al., (2013)** who performed his study to examine maternal perception of fetal movements using a qualitative framework in Sydney, Australia indicated that mothers able to perceive and describe their baby's action included specific limb descriptions and the whole body descriptions. In my opinion this difference may be due to weight between foreigners and Egyptians, It has been suggested that perception of fetal movements decrease in obese mothers.

Concerning emotional response to feel their first fetus's movement, most mothers in the present study expressed positive emotional response, in my point of view., this may be attributable that this pregnancy was planned and desirable being primiparous

mothers. This result is in accordance with that of **Delaram, & Colleagues, (2018)** who apply study to determine the effects of fetal movements counting on maternal-fetal attachment in Shahrekord, Iran which reported that most of mothers expressed enjoyment feeling with the fetus move that reflect positive emotion.

Regarding the time of increased perception of fetal movements, the existing study mentioned that the perception of fetal movements increased during the night and early morning and when the mothers laying down position. This result is in line with **Kintraia, et al., (2017)** who reveals that fetus is most active from 9am to 2pm and again from 7pm to 4am (at night).

On the other hand ,ultrasound and chrono-biological studies have independently reported a diurnal fetal movements pattern characterized by increased fetal movements in the evening and greater likelihood of quiescence in the morning as described by **Bradford, et al., (2019)** who done his study to describe maternally perceived fetal movements strength, frequency, and pattern in late pregnancy in mothers with subsequent normal outcomes in NewZealand, which refer to that the mothers were more likely to perceive moderate or strong fetal movements when sitting quietly compared with other activities. Also **Sheikh, & Colleagues, (2014)** who done his study to assess maternal perception of fetal movements types and its association with maternal factors in normal pregnancies with good pregnancy outcome, revealed that more than have of mothers reported perceiving weak fetal movements at night and in a recumbent position but only third of mothers perceiving movements in sitting position. The discrimination between results may be due to habits or life style of mothers.

The finding of the actual study revealed that about two third of mothers with total knowledge score regarding fetal movements exhibited unsatisfactory knowledge regarding fetal movements, this finding on the same line with **Prabavathy & Dash, (2017)**, who conducted his study to assess the level of mother's knowledge on fetal movements count in a selected hospital at Puducherry, India. The result showed that the majority of the antenatal mothers are having poor knowledge of fetal movements count.

Also consistent with **Olagbuji, et al., (2014)** who apply his study to determine maternal knowledge, behavior, and concerns about abnormal fetal movements in the third trimester of pregnancy at Nigeria who reported that more than two third of mothers had no knowledge of normal parameters of fetal activity or did not recall being told that movements frequency and strength should increase in the third trimester. The unsatisfactory knowledge and poor perception behavior among respondents in New

Valley governorate reflect the need for a guideline, particularly during antenatal care on information and management of abnormal fetal movements in our setting to prevent avoidable stillbirth.

The current findings related to sources of information showed that more than half of information from family followed by one third of studied mothers informed from doctors and nurses, this result was consistent with **Smyth, et al., (2016)** who done his study to develop a better understanding of events, facilitators and barriers to presentation with reduced fetal movements at North-West of England, when mothers were asked to specify sources of information on perception of fetal movements or fetal movements counting, the majority of them reported they frequently consulted by family members or friends and prioritized views of their mothers, sisters or friends who were or had been pregnant.

On the other hand **Georgsson, et al., (2016)** who apply his study to examine what pregnant mothers who present with decreased fetal movements at Stockholm in Sweden, showed that mothers want to communicate to health care professionals and to other mothers in the same situation reported that pregnant mothers advised to search for information from specialist sources as consult health care for decreased fetal movements as a primary priority for source of information.

Also inconsistent with **McArdlea, et al., (2015)** who done his study to investigate pregnant mothers's perceptions of information about foetal movements and preferences for receiving information in metropolitan maternity hospital at New York, found that the majority of mothers favor information from health professionals, mainly from a midwife. Midwives are well-placed to partner with pregnant mothers and give them unbiased and evidenced based information enabling them to make decisions and choices regarding their health and well-being. In my point of view, I think that if health professionals in our study empower mothers with knowledge about their health and well-being about fetal movements counting in each antenatal visit, this prevents mothers to resort to internet, family or friends and had trustful information that enable them to make choices which improve pregnancy.

As regard to the action taken in case of unusual fetal movements in the present study, the majority of the mothers made the wrong action. This result agrees with **Berndl, et al., (2019)** who applied his study to assess how doing as an educator in fetal movements monitoring at the IWK Health Centre, Canada, and found that approximately half of mothers significant delays or lack of contact with a health care provider, and in the same line with **Belal & Elkazeh, (2017)** who applied his study to determine the

maternal perception and antenatal advice regarding fetal movements at Tanta City in Al-Gharbyia Governorate, Egypt, found that only 12% of the mothers made the right action in case of unusual fetal movements.

On the other hand, the Royal College of Obstetricians and Gynecologists' guidelines in the United Kingdom recommended that mothers who are concerned about reduced fetal movements should not wait until the next day for assessment (**Royal College of Obstetricians & Gynecologists., 2016**). Also the Australian and New- Zealand Stillbirth Alliance (**ANZSA**) guidelines giving all pregnant mothers advice about fetal movements, namely that it is normal to experience at least ten movements in 2 hours and advising mothers not to wait until the next day if they notice decreased or absent fetal movements (**Preston SMK., et al., 2010**). In my opinion the wrong action taken may be related to the fact that about half of mothers in our study received wrong information and advices about fetal movements from their families and friends, and also because there were not any antenatal advice discussed about fetal movements.

The result of current study indicate that there was a statistically significant correlation between the total of knowledge score regarding fetal movements and the educational level & age of the studied mothers and no significant relation for mothers's occupation this result similar to those in **Belal & Elkazeh, (2017)** who applied his study to determine the maternal perception and antenatal advice regarding fetal movements at Tanta City in Al-Gharbyia Governorate, Egypt.

Despite the result of the present study revealed that all of studied mothers follow antenatal care and most of them had regular follow up but the most of them had unsatisfactory knowledge. This related to negative role of nurses and obstetricians toward fetal movements count.

In current research, almost of participants did not know any of fetal movements counting methods. After counseling, most of the study mothers reported that they paid more attention to fetal movements during the day and had a good feeling towards these movements that increase in the perception of fetal movements after teaching them" count to ten" method. This implies that increasing primiparous knowledge through training during pregnancy enhances their sensitivity and positive attitude or perception regarding the fetal movements. By following participants after labour no one of them had stillbirth or died baby that confirm that" count to ten" is successful method and give good results and associated with a substantial reduction in the risk of late stillbirth.

Conclusion

Results of the present study concluded that the most of the studied mothers have positive perception but unsatisfactory knowledge regarding fetal movements and most of them made the wrong action in case of unusual fetal movements and no one of them know any method of fetal movements counting. There was a significant relationship between level of knowledge regarding fetal movements and mother's age, level of education and residence.

Recommendation

In the light of the findings of the present study, the researcher suggested the following recommendations:

- Fetal movements counting should be a basic part of guidelines of antenatal care in all hospitals & all Maternity health centers for continuous education through antenatal classes, pamphlet and mass media is very important.
- Increase attention to primigravidas by health care provider through refreshing courses and in-service training rather than internet or asking their families or relatives.
- Further studies are needed in this field on large numbers of primigravidas in New Valley to increase knowledge and practices regarding fetal movements mothers.

Limitation of the study

lack of primigravidas at El-Dakhla in New Vally governorate due to the habits and customs of the governorate, which people follow the most seasons of marriage at Eid Al-Adha, that obligate me to extend the period of data collection from six months to one year from August 2018 to September 2019).

References

1. Akbarzadeh M., Rafiee B., Asadi N., & Zare N., (2016): Comparative Effect of Attachment and Relaxation Training on Perception of Fetal Movement and Mother's Anxiety in Primiparous Women: A Randomized Controlled Study. Iran. Trends in Medical Research ;(2)11,62-68.
2. Berndt A., O'Connell C., & McLeod N., (2019): Fetal movement monitoring: How are we doing as educators? Canada. J Obstet & Gynaecol Can, (1), 35, 22-28.
3. Bradford B., Cronin R., McKinlay C., Thompson J., Mitchell E., Stone P., & McCowan L., (2019): A diurnal fetal movement pattern: Findings from a cross-sectional study of maternally perceived fetal movements in the third trimester of pregnancy, NewZealand. PLOS ONE,(6) 14,1-15 .
4. Bryant J., Jamil R., & Jennifer Thistle J., (2019): Fetal Movement, Stat Pearls. available at (<http://creativecommons.org/licenses/by/4.0/>). Bookshelf ID: NBK470566 PMID: 29262129.
5. Belal G., & Elkazeh E., (2017): Maternal Perception and Antenatal Advice regarding Fetal Movements in Al-Gharbyia Governorate, Egypt. IOSR Journal of Nursing and Health Science (IOSR-JNHS) (6)2,107-119.AI-
6. Cristine M., lindgren H., Rubertsson C., Hildingsson I., & Radastad I., (2014): Predicting poor perinatal outcome in women who present with decreased fetal movements. Sexual & Reproductive health care. 5, 31-35(WWW.Schcjournal.org).
7. Das R., Jana N., Arora N., & Sengupta S., (2019): Ultrasound assessment of fetal hearing response to vibroacoustic stimulation. J Matern Fetal Neonatal Med;33(14)33:2326-2332. doi: 10.1080/14767058.2018.1548600.
8. Delaram M., Jafar-zaDeh L., & Shams S., (2018): The Effects of Fetal Movements Counting on Maternal-Fetal Attachment: A Randomized Controlled Trial. Shahrekord, Iran. Journal of Clinical and Diagnostic Research, (12)5, 28-31.
9. 9-Flenady V., Ellwood D., Bradford B., Coory M., Middleton P., Gardener G., Radestad I., Homer C., Davies-Tuck M., Forster D., Gordon A., Groom K., Crowther C., Walker S., Foord C., Warland J., Murphy M., Said J., Boyle F., O'Donoghue K., Cronin R., Sexton J., Weller M., & McCowan L., (2019): Beyond the headlines: Fetal movement awareness is an important stillbirth prevention strategy. Women Birth.;32(1):1-2.
10. Georgsson S., Linde A., Nilsson R., Pettersson K., & Rådestad I., (2016): To be taken seriously and receive rapid and adequate care – Women requests when they consult health care for reduced fetal movements', Sweden. Midwifery (40),102-108.
11. Guney E., & Ucar T., (2018): Effect of the fetal movement count on maternal-fetal attachment, Turkey. Japan journal of Nursing Science ,(16)1,71-76 <https://doi.org/10.1111/jjns.12214> .
12. Heazell A., Budd J., Li M., Cronin R., Bradford B., McCowan L., Mitchell E.,

- Stacey T., Martin B., Roberts D., Thompson J., (2018): Alterations in maternally perceived fetal movement and their association with late stillbirth: findings from the Midland and North of England stillbirth. case-control study. *BMJ open*. (8) 7.
13. **Kintraia P., Zarnadze M., Kintraia N., & Kashakashvili I., (2017):** Development of daily rhythmicity in heart rate and locomotors activity in the human fetus. *Journal of Circadian Rhythms*.3; 2005PMC107992 Wikipedia, (1) 3.
 14. **Lai J., Niamh C., Nowlan N., Vaidyanathan R., Caroline J., Shaw C., & Lees C., (2016):** Fetal movements as a predictor of health. *Acta Obstetricia & Gynecologica Scandinavica*, London . (95) 968-975. Available At <https://doi.org/10.1111/aogs.12944>
 15. **Lewis C., Hill M., & Chitty L., (2016):** Women's Experiences and Preferences for Service Delivery of Non-Invasive Prenatal Testing for Aneuploidy in a Public Health Setting: The United Kingdom. A Mixed Methods Study. *PLoS One*, 11, e0153147.
 16. **Marzouk T., & Nabil H., (2015):** Effect of a training program about maternal fetal attachment skills on prenatal attachment among primigravida women. Mansoura city ,Egypt. *IOSR journal of nursing and health science*, 4(1), 2320-1940.
 17. **McArdle A., Flenady V., Toohill J., Gamble J., & Creedy D., (2015):** How pregnant women learn about fetal movements: Sources and preferences for information. *New York. Women and Birth*, 28, 54-55. Available at <http://dx.doi.org/10.1016/j.wombi.10.002>.
 18. **McCarthy C., Donoghue K., & Meaney S., (2016):** Perinatal outcomes of reduced fetal movements: a cohort study, New Zealand. *BMC Pregnancy and Childbirth*, 16-196.
 19. **Moon S., (2017):** Reduced fetal movements. National Institute of Clinical Excellence Antenatal care for uncomplicated pregnancies. CG62, (Updated January 2017).
 20. **Nandi N., & Agarwal R., (2019):** Prospective study of maternal perception of decreased fetal movement in third trimester and evaluation of its correlation with perinatal compromise. India, *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, (2) 8:687-691. DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20190306>.
 21. **Olagbuji B., Igarumah S., Akintayo A., Olofinbiyi B., Aduloju P., & Alao O., (2014):** Maternal understanding of fetal movement in third trimester: A means for fetal monitoring and reducing stillbirth. *Nigerian Journal of Clinical Practice*, (17), 4.
 22. **Prabavathy M., & Dash M., (2017):** Assess the knowledge of fetal movements count among antenatal mothers in RGGWCH, Puducherry, India. *Innovational Journal of Nursing and Healthcare (IJNH)*. 2 (4), 169-171.
 23. **Preston S., Mahomad K., & Chadha, Y., (2010):** For the Australian and New Zealand Stillbirth Alliance (ANZSA) .Clinical Practice Guideline for the Management of Women who Reported Decreased Fetal Movements.
 24. **Raynes-Greenow C., Gordon A., Li Q., & Hyett J., (2013):** A cross-sectional study of maternal perception of fetal movements and antenatal advice in a general pregnant population, using a qualitative framework. Sydney, *BMC Pregnancy and Childbirth*, (13) 32, doi: 10.1186/1471-2393-13-32.
 25. **Royal College of Obstetricians & Gynecologists., (2016):** Reduced Fetal Movements. Retrieved from <http://www.nice.org.uk/womens-health/clinical-guidance/reduced-fetal-movements-green-tops-57> available at 13/7/2016.
 26. **Sheikh M., Hantoushzadeh S., & Shariat M., (2014):** Maternal perception of decreased fetal movements from maternal and fetal perspectives ,a cohort study. *BMC Pregnancy and Childbirth*, (14) 286. Available At (<http://www.biomedcentral.com/1471-2393/14/28>)
 27. **Smyth R., Taylor W., Heazell A., Furber C., Whitworth M., & Lavender T., (2016):** Women's and clinicians perspectives of presentation with reduced fetal movements: a qualitative study *BMC Pregnancy Childbirth*. North-West of England, 16: 280.
 28. **Vaughan., (2019):** The development of cerebral connections during the first 20-45 weeks' gestation. *Seminars in Fetal and Neonatal Medicine*, (11) 6, 415-422 . available at (<https://en.wikipedia.org/wiki>)
 29. **Winje B., Wojcieszek A., & Gonzalez-Angulo L., (2016):** Interventions to enhance maternal awareness of decreased fetal movement: a systematic review. *BJOG* 2016, 123:886-898.