



**Pregnant Women’s Experiences, Attitudes, and Compliance with Practice of the Mindfetalness
Method**

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Abstract:

Background: “Mindfetalness” method is a woman’s own assessment of fetal movements’ patterns, in a particular way, during a specific time. **Aim:** Evaluate pregnant women’s experiences, attitudes, and compliance with practice of the Mindfetalness method. **Subjects and method: Design:** A cross sectional research design. **Setting:** Antenatal follow-up clinics of Tanta University and El-Menshawhy hospitals, Segar, Saied and Kohafa maternal child health centers Tanta Egypt. **Subjects:** A purposive sample of 150 pregnant women who fulfilled the inclusive criteria. **Tools: Tool (I): A structured interview schedule** of socio-demographic characteristics and obstetrics history. **Tool (II): Experiences with practice of the Mindfetalness method** (general and emotional experiences, compliance, and pregnancy outcomes). **Tool (III): Apgar score scale.** **Tool (IV): Attitudes regarding the Mindfetalness method.** **Results:** The results of the present study revealed that the method helped pregnant women to relax (91.3%), decreased worry about the fetus (90.7%), created a relationship and acquaintance with the fetus (88.7%, 73.3% respectively), 78.7% used the method daily, 72.7% had normal vaginal delivery, 86.0% had full term babies, and 76.7% had an Apgar score of 7–10, 86.0% had positive attitudes toward the Mindfetalness. **Conclusion:** Compliance with practice of the Mindfetalness method improved pregnant women’s general and emotional experiences and attitudes regarding the method, and encourages them to early seek antenatal care to manage any complication. **Recommendations:** Maternity nurses should teach pregnant women about the Mindfetalness method to improve pregnancy outcomes and decrease stillbirth and fetal morbidity and mortality rates.

Key words:

Pregnant women, Mindfetalness, Experiences, Attitudes, Compliances.

Introduction:

Movement of the fetus inside the uterus that is firstly felt by a primigravida woman at about twenty to twenty one weeks of pregnancy, and by

a multigravida woman at the eighteen weeks of pregnancy is known as “Quickening (Mahmood et al. 2022). Feeling of fetal movement is an indication of fetal wellbeing, growing and

development. First fetal movement may be misidentified by the pregnant woman with gases or other abdominal sensations (**Khalil & Shahin 2020**). The pregnant woman is the first person to recognize the movements of her fetus, which can be evaluated by health care providers later on (**Errol et al. 2019**).

Fetal movements develop and increase in frequency until the thirty second week of pregnancy, and do not change from this time until birth. Pregnant women can experience different patterns / types / characteristics / qualities of fetal movements that become prominent in late pregnancy (**Bryant et al. 2022**). They can experience fetal movements as “powerful”, “large”, “slow”, “stretching” or “moving from side to side”. Pregnant women’s experience of fetal movements is also different from one woman to another (**El-Kurdy et al. 2021, Bradford & Maude 2018**).

Many factors can affect pregnant woman’s experiences of fetal movements such as number of deliveries, duration of pregnancy, maternal body weight and position, as well as the wake up’ time of the fetus (**Cooper and Wickham 2013**). Decrease or change in the pattern of fetal movements is estimated to be the main reason of unscheduled antenatal visits among four to sixteen percent of the pregnant women (**Jacob 2019**).

Change in the pattern of fetal movements may be due to lack of oxygen and nutrition

supply to the fetus resulted from improper placental function (**El-Shahawy et al. 2016**). This can result in many adverse maternal and fetal outcomes, such as emergency cesarean section, premature and small for gestational age baby, and stillbirth (**Akselsson et al. 2019, Malm et al. 2014**).

Assessment of fetal movements is one of the critical elements of antenatal follow up visits. It is vital to ensure normal growth and development of the fetus, early detect high risk complications, and prevent perinatal deaths (**Flenady et al. 2022, John et al. 2020**). It can also promote clinicians’ decision making regarding interventions for specific prenatal complications, in order to save fetal and maternal life and to decrease morbidity and mortality rates (**Lavender et al. 2016**).

Many methods were practiced by pregnant women to self-assess fetal movements of their fetuses. These included the “Sadovsky-method”; the “Count-to-ten or kick-counting method or the Cardiff-method”; and the “Mindfetalness method”. In the “Sadovsky-method”, the woman notices the amount of fetal movements daily, but she does not know how many times, and for how long she should count the movements (**Bellussi et al. 2020, Guney & Ucar 2019**).

In the “Count-to-ten” or kick-counting method or the “Cardiff-method”, the pregnant woman notes how long (the duration of time) it takes to recognize ten fetal movements. The

effectiveness of both “Sadovsky-method”, and the “Cardiff-method” was not confirmed to help pregnant woman to detect abnormalities of fetal movements and consequently did not improve or safe pregnancy outcomes (**Jana et al. 2020, Malm et al. 2014**).

Recently, an innovative technique called Mindfetalness method for noting fetal movements’ patterns is recognized. Mindfetalness method is a special kind of mindfulness that helps pregnant woman to focus on a specific target at a specific time (**Rådestad et al. 2021**). Mindfetalness method is an important systematic; subjective experience of pregnant woman’s self-assessment of fetal movements (**Akselsson et al. 2017**).

In the Mindfetalness method, the pregnant woman lies on her side and notices patterns / characteristics of fetal movements (strength and frequency), when the fetus is awake, every day, for fifteen minutes from the twenty eight weeks of pregnancy to full term, but she does not count the movements (**Akselsson et al. 2017**). The Swedish National Board of Health and Welfare addressed that the pregnant woman can practice the Mindfetalness method from the 24 weeks of pregnancy (**Akselsson et al 2020, Lindgren et al. 2020**).

Practicing the Mindfetalness method is an important measurement of the fetus wellbeing. It is a safe, non-expensive, and non-invasive method. It can enhance pregnant women’s

awareness with their fetal movements which are exclusive for each woman, early detect fetal abnormalities, and prevent stillbirth and adverse pregnancy outcomes (**Khumujam & Podder 2019, Mehran et al. 2013**).

Understanding of the pregnant woman’s attitudes towards practice of the Mindfetalness method is crucial, because it is a powerful way to increase knowledge about correct practice of the method. Furthermore, a positive attitude can raise pregnant woman’ perception, and enhances their compliance with practice of the method, while a negative attitude can prohibit their compliance with practice of the method (**Norman et al 2018, Gomez et al. 2017**).

Pregnant women’s compliance with practice of the Mindfetalness method can increase maternal fetal attachment and communication (**Akselsson et al. 2017**). It can also strengthen their mindfulness about patterns / types / characteristics / qualities of fetal movements. Thus, feeling safe, and prevent pre-hospital delay in seeking care for real change in fetal movements, which improves pregnancy outcomes and decreases maternal and fetal mortality and morbidity rates (**Widiasih et al. 2021, Marshall & Myles 2019**).

Nurses play a crucial role in evaluation of the pregnant woman’s experiences, attitudes, and compliance with practice of the Mindfetalness method, teaching the method, discussing the findings, relieving maternal stress and anxiety,

and helping her in taking suitable decision regarding her pregnancy. Scarce researches exist regarding evaluation of the pregnant women's experiences, attitudes, and compliance with practice of the Mindfetalness method (**Ramadan et al. 2018, Mikamo & Nakatsuka 2015**).

Significance of the study

Perinatal mortality is defined by World Health Organization (WHO) as number of deaths per 1,000 total births during the perinatal period from 22 completed weeks (154 days) of pregnancy, and during childbirth, and the first week after delivery. Additionally, neonatal mortality is death of the newborn baby during the first 28 days of life (**Khalil & Shahin 2020, Mikamo & Nakatsuka 2015**).

Globally, it is estimated that about 6.3 million of perinatal deaths occur each year, 80% of them occur during pregnancy, and 99% occur in developing countries. There is no registration of perinatal mortality in Egypt, but neonatal mortality rate was 10.3 deaths per 1,000 live births in 2020 (**United Nations - World Population Prospects 2021, Bellussi et al 2020, Mikamo & Nakatsuka 2015**).

Inadequate assessment of fetal movements during pregnancy is one of the major causes of perinatal mortality. Mindfetalness method is a golden tool of assessment of fetal movements that can reduce the incidence of perinatal morbidity and mortality. Little is known in this regard. So, it is too important to explore this area of research

(**Sterpu et al.2020, Murray et al. 2019, O'Neill & Thorp 2012**).

Aim of the study:

The aim of this study was to evaluate pregnant women's experiences, attitudes, and compliance with practice of the Mindfetalness method.

Research question:

What are the pregnant women's experiences, attitudes, and compliance with practice of the Mindfetalness method?

Subjects and method:

Design:

A cross-sectional research design was used to conduct this study.

Setting:

The study was conducted at the antenatal follow up clinics of two hospitals (Tanta University hospital affiliated to Ministry of High education and Scientific Research and El-Menshawey General Hospital affiliated to Ministry of Health and Population), as well as three Maternal Child Health (M.C.H.) centers (Segar, Saied and Kohafa).

Subjects:

A purposive sample of 150 pregnant women was selected from the previously mentioned settings according to the following inclusive criteria of the study: Age 18-38 years, primigravida or multigravida, at least 20 weeks' gestation, singleton pregnancy, and can read and write.

They were selected according to pregnant women's attendance at each setting during the last

six months that was as follows: Tanta University Hospitals and El-Menshawey General Hospital (177 and 330 respectively), and Segar, Saied and Kohafa Maternal Child Health (M.C.H.) centers (433, 220, and 350 respectively). So, the selected pregnant women were as follows: (17, and 33 respectively) from Tanta University Hospital and El-Menshawey General Hospital, as well as, (43, 22, and 35 respectively) from Segar Saied and Kohafa Maternal Child Health (M.C.H.) centers.

The sample size and power analysis were calculated using Epi-Info software statistical package created by World Health Organization and Center for Disease Control and Prevention, Atlanta, Georgia, USA version 2002. Calculation of the sample size was estimated at 95% confidence limit. So, the sample size is determined to be ($n = >131$). This number was increased to 150 to improve quality of data of the study.

Tools of data collection:

To achieve the aim of this study, four tools were used as follows:

Tool (I):

Socio-demographic characteristics and obstetrics history interview schedule. It was developed by the researchers after reviewing recent related literatures (**El-Kurdy et al. 2021, Akselsson et al. 2020**). and comprised two parts:

Part (1): Socio-demographic characteristics of the study subjects included age, marital status,

residence, educational levels, employment, and monthly family income.

Part (2): Obstetrics history of the study subjects included gravidity, parity, gestational period in weeks, time of first antenatal visit, place of antenatal care, number of antenatal visits, if this pregnancy was planned, and smoking during pregnancy.

Tool (II):

A structured interview schedule of pregnant women's experiences with practice of the Mindfetalness method was adapted by the researchers from related literatures (**Akselsson et al. 2017, Gomez et al. 2017 Akselsson et al. 2020, Rådestad et al. 2021**). It was used to collect data about experiences, compliance, and pregnancy outcomes among the studied pregnant women who practiced the Mindfetalness method. It comprised four parts:

Part (1): Pregnant women's general experiences with practice of the Mindfetalness method included a question of: What was your general experience of practicing the Mindfetalness method? The studied pregnant women answered this question by the following five statements: It (helped me to relax, decreased worry about my fetus, created a relationship between me and my fetus, increased my awareness of the fetus, and created acquaintance with my fetus.

Part (2): Pregnant women's emotional experience with practice of the Mindfetalness method included a question of: What was your

emotional experience of practicing the Mindfetalness method? The studied pregnant women answered this question by using a three point Likert scale (agree, sometimes, and disagree) for the following seven statements: I felt (calm, relaxed, mindfulness, focus, worry, irritable, and tense). The scoring system of pregnant women's emotional experience was as follows: for the items calm, relaxed, mindfulness, focus: Emotional experience was scored as (2) if woman's response was agree, (1) if it was sometimes and (zero) if it was disagree, and the scores were reverted for the items worry, irritable, and tense. The scores were added up and the total score ranged from 0 to 14. The total score level of pregnant woman's emotional experience was calculated as follows: Good emotional experience with practice of the Mindfetalness method $\geq 60\%$, and bad emotional experience $< 60\%$.

Part (3): Pregnant women's compliance with practice of the Mindfetalness method included the following questions: What was the frequency of your practice of the mindfetalness method? (Daily or every other day) and what was the duration of your practice of the method (10-15 minutes or 16-20 minutes), as well as How many times did you go to the antenatal clinics when you practiced the Mindfetalness method? (Number of unscheduled visits the pregnant woman had due to change in the pattern or characteristics of the fetal movements or inability to feel the fetal movements).

Part (4): Pregnancy outcomes among the studied pregnant women who practiced the Mindfetalness method included five items; three items related to the woman, which are: Presence of complications during pregnancy and during labor that were answered by "yes" or "no", and type of labor (normal vaginal delivery or cesarean section). This part also included assessment of fetal outcomes using items relate to the newborn condition (full term, small size baby, and admission to incubator).

Tool III:

The Apgar score test was also used to assist fetal outcomes. It was adopted by the researchers from relevant literatures (**Ricci et al. 2021, Akselsson 2020, Murray et al. 2019**) to determine the overall physical condition of the newborn immediately after birth process (in the first minute). It included five categories, which are the **Appearance** (skin color), **Pulse** (heart rate), **Grimace** response (reflexes), **Activity** (muscle tone), and **Respiration** (breathing rate and effort). These categories were measured on a scale of 0 to 2, with 2 being the best score. Then, they were added up. The total Apgar scores ranged from 0 to 10; where ten is the highest score possible. A baby who has a score of 7 or above is considered in a good health, while a lower score means that the baby may need some immediate medical care, such as suctioning of the airways or oxygen to help breathe better.

Tool (IV):

Pregnant women's attitudes regarding practice of the Mindfetalness method was adapted by the researchers from relevant literatures (**Akselsson et al. 2017, Mikamo & Nakatsuka 2015, Malm et al. 2014**). It included a question of: What is your attitude regarding practice of the Mindfetalness method? The studied pregnant women answered this question by a three point Likert scale (agree, neutral, and disagree) for nine statements. These included five for positive attitudes and four for negative attitudes. The positive attitudes' statements were: When I practice the Mindfetalness method "I feel that the method built a relationship with my baby, I get to know my baby better, practice of the method provide me with a good support, and I feel safe and I am not so worry any more. The negative attitudes' statements were: I have no time to practice the method (Lack of time), there is no need to practice the method, I don't like structured methods, and I don't feel anything when I practice the method.

The scoring system of pregnant women's attitudes was as follows: The positive statement was scored as (2) if women's response was agree, (1) if it was neutral and (zero) if it was disagree, while the scores were reverted for the negative statement. The scores were added up and the total score ranged from 0 to 16. The total score level of pregnant women's attitudes was calculated as follows: Positive attitudes towards practice of the

Mindfetalness method $\geq 60\%$, and negative attitudes $< 60\%$.

Method

1. An official permission to carry out the study, and approval of the ethical committee of the Faculty of Nursing Tanta University were obtained.
2. The purpose of the study was explained to all the studied pregnant women to get their informed consent. Pregnant women confidentiality of information, and right to withdraw from the study at any time if desired were respected. They were also informed that the nature of the study will not cause any harm and/or pain.
3. The study tools were developed, adapted or adopted by the researchers after reviewing recent related literatures. They were tested for content and construct validity by five experts in the field of maternal and neonatal health nursing. The tools' reliability was tested using Cronbach's alpha to measure the internal consistency.
4. A pilot study was carried out one month before the actual data collection; on 10% (15) pregnant women from the previously mentioned study settings and they were excluded from the actual study sample. The purposes of the pilot study were to ascertain the feasibility and applicability of the tools, and to detect any problems peculiar to clarity of the statements that might interfere

with the process of data collection. Few words and statements were modified. Then, the tools were made ready to collect the actual study data.

5. Actual study (field work):

a. Assessment and planning phase:

- The first interview of the researchers' with the studied pregnant women at the previously mentioned study settings was in a routine antenatal visit. The researchers explained the aim of the study for the pregnant women who fulfilled the inclusion criteria of the study to have their informed consent to participate in the study. **Tool I parts (1 and 2)** were used by the researchers to collect data about socio-demographic characteristics, and Obstetrics history of the studied pregnant women. Then, the researchers handed in a brochure that explains to the pregnant women how to practice the Mindfetalness method. The brochure was developed by the researchers in the Arabic language for easy understanding of the studied pregnant women.

b. Implementation phase:

- The study included 150 pregnant women from the previously mentioned study settings. They were instructed to lie down on their left sides (to avoid Vena cava syndrome) and to focus upon fetal movements for 15 minutes, daily, when the fetus is awake. They were also taught to monitor the pattern / character, strength and frequency of the fetal

movements (not to count the fetal movements) and to seek medical care if they felt change in their pattern. They were also advised to read the brochure they had at the first interview for further help. Additionally, the recruited pregnant women were followed up by the researchers in the subsequent antenatal visits and through an arranged follow up telephone calls, and social media; WhatsApp and Facebook, and were attended by the researchers during their delivery to find-out their pregnancy outcomes.

c. Evaluation phase:

- **Tool II parts (1, 2, 3 and 4)** were used to assess the pregnant women's general and emotional experiences, their compliance with practice of the Mindfetalness method, as well as their pregnancy outcomes among the studied pregnant women and their newborn babies.
 - **Tool III** (The Apgar score test) was used to assess pregnancy outcomes (overall physical condition) of the newborn immediately after birth.
 - **Tool IV** was used to assess pregnant women's attitudes regarding the Mindfetalness method.
 - The study data were collected in six months from June to November 2021.
6. The collected data were organized, and statistically analyzed using SPSS version 19 (Statistical Package for Social Studies)

created by IBM, Illinois, Chicago, USA. For numerical values the range mean and standard deviations were calculated. For categorical variable the number and percentage were calculated and differences between subcategories were tested by Fisher's or Monte Carlo exact test. The level of significant was adopted at $p < 0.05$. Then, the study results were tabulated to evaluate pregnant women's experiences, attitudes, and compliance with practice of the Mindfetalness method.

Results:

Table (1): Shows the studied pregnant women's socio-demographic characteristics. It revealed that concerning their age, almost two thirds (66%) of them were 20 to > 25 years old, with a range= 18-33, and mean \pm SD (23.15 ± 2.9). The table also presents that most (94%) of the studied pregnant women were married, 80.7% were urban, nearly three quarters (72%) had secondary school education, and working, and 66.7% of them had insufficient family income.

Table (2): Displays the studied pregnant women's obstetrics history. It identifies that 62.7% were primigravida, 71.3% were nullipara, 50.7% their gestational period was 25 – 30 with range = 20-32, and mean \pm SD (24.89 ± 2.59). The table also presents that slightly more than four fifths (84.0%) had their first antenatal visit during the first trimester, and (11.3%, 22.0%, 28.7%, 12.7% and 23.3% respectively) had their antenatal care

at Tanta University Hospitals, El-Menshawey General Hospital, Segar, Saied and Kohafa M.C.H. centers respectively. The table also displays that number of antenatal care follow up visits of the studied pregnant women were 4-5 visits, 2-3 visits, and 6-7 visits (40.7%, 32.7%, and 18.7% respectively), nearly three quarters (70.0%) had planned pregnancy, and 8.0% were smokers.

Figure (1): Verifies the studied pregnant women's general experience with practice of the Mindfetalness method. It clarifies that the method helped them to relax (91.3%), decreased their worry about the fetus (90.7%), and created a relationship, and acquaintance with the fetus (88.7%, 73.3% respectively), as well as increased their awareness about the fetus (70.0%).

Table (3): Illustrates the studied pregnant women's emotional experience with practice of the Mindfetalness method. It proves that slightly more than four fifths (80.8%) were calm, 76.0% focus, 74.0% mindfulness, and 70.8% relaxed. On the other hand, 15.3% were both worry and irritable and 9.3% tense.

Figure (2): Shows total emotional experience of the studied pregnant women. It notifies that 87% of them had good emotional experience and 13% had bad emotional experience.

Table (4): Typifies the studied pregnant women's compliance with practice of the Mindfetalness method. It ascertains that 78.7% complied with practice of the Mindfetalness method daily, and

21.3% every other day. Regarding duration of practice of the method, 76.7% practiced the method in a period ranged from 10 – 15 minutes, and 23.3% from 16-20 minutes.

Figure (3): Epitomizes the studied pregnant women's total compliance with practice (regular using) of the Mindfetalness method. It spectacles that 80.0% of them had good compliance, 13.3% had fair compliance, and 6.7% had poor compliance with practice of the Mindfetalness method.

Figure (4): Exemplifies pregnant women's unscheduled physician visits due to change in the pattern of fetal movements or inability to feel the fetal movements when they practiced the Mindfetalness method. It informs that 77.3% of them visited the physician one time, and 22.7% visited the physician two times, due to their inability to feel the fetal movements.

Table (5): Explains pregnancy outcomes among the studied pregnant women who practiced the Mindfetalness method. It describes that 76.0% of them had no complications during pregnancy, 91.3% had no complications during labor, and 72.7% had normal vaginal delivery. The table also clarifies that 86.0% of their newborn babies were full term, and 76.7% had an Apgar score of 7 – 10.

Table (6): Establishes the studied pregnant women's attitudes regarding practice of the Mindfetalness method. It confirms that the majority of the studied pregnant women revealed

that practice of the method was useful and provided them with a good support, they felt safe and didn't become too worry any more, the method built a relationship with their babies, and they got to know their babies better (90.7%, 80.0%, 77.4%, and 74.7% respectively). On the other hand, some of the studied pregnant women established that they lacked the time to practice the method, no need for the method, they didn't like structured methods, and or they didn't feel anything (18.0%, 13.3%, 12.7%, and 0.7% respectively).

Figure (5): Represents the studied pregnant women's total attitudes regarding practice of the Mindfetalness method. It declares that most (86.0%) of them had positive attitudes regarding the Mindfetalness method and 14% had negative attitude.

Table (7): Defines relation between pregnancy outcomes and compliance with practice of the Mindfetalness method among the studied pregnant women. It expresses that there were no significant relations between pregnancy outcomes (complications during pregnancy, complications during labor, type of labor, fetal Apgar score, full term baby, and baby admission to Neonatal Intensive Care Unit [NICU] neonatal intensive care unit) among the studied pregnant women and their compliance with practice of the Mindfetalness method ($p= 1.00$, $p= 1.00$, $p= 0.66$, $p= 0.55$, $p= 0.16$, and $p= 0.44$ respectively).

Additionally, correlations were analyzed between socio-demographic characteristics of the studied pregnant women and both their attitudes and complications during pregnancy. The results

revealed that there were no significant relations between socio-demographic characteristics and both attitudes of the studied pregnant women and complications during pregnancy.

Table (1): Socio-demographic characteristics of the studied pregnant women (n=150).

Socio-demographic characteristics	Number (n=150)	%
Age in years:		
< 20	13	8.7
20 - < 25	99	66.0
25 - < 30	33	22.0
≥ 30	5	3.3
Range= 18-33, Mean ± SD= 23.15 ± 2.91		
Marital status:		
Married	141	94.0
Divorced	7	4.7
Widow	2	1.3
Residence:		
Urban	121	80.7
Rural	29	19.3
Educational levels:		
Read and write	13	8.7
Primary	8	5.3
Secondary	108	72.0
University	21	14.0
Employment:		
Working	108	72.0
Not working	42	28.0
Monthly family income:		
Not enough	100	66.7
Enough	41	27.3
Enough and saving	9	6.0

Table (2): Obstetrics history of the studied pregnant women (n=150).

Obstetrics history	(n=150)	%
Gravida		
1	94	62.7
2	43	28.7
3	13	8.6
Parity:		
Nulliparous	107	71.3
1	31	20.7
2	4	2.7
>2	8	5.3
Gestational period in weeks:		
20 - > 25	71	47.3
25 – 30	76	50.7
≥ 30	3	2.0
Range= 20-32, Mean \pm SD= 24.89 \pm 2.59		
Time of first antenatal visit:		
First trimester	126	84.0
Second trimester	16	10.7
Third trimester	8	5.3
Place of antenatal care:		
Tanta University Hospitals	17	11.3
El-Menshawy General Hospital	33	22.0
Segar M.C.H. center	43	28.7
Saied M.C.H. center	22	12.7
Kohafa M.C.H. center	35	23.3
Number of antenatal care visits:		
2-3	49	32.7
4-5	61	40.7
6-7	28	18.7
8-9	12	8.0
Is your pregnancy planned?		
Yes	105	70.0
No	45	30.0
Do you smoke during pregnancy?		
Yes	12	8.0
No	88	99.2

Figure (1): The studied pregnant women's general experience with practice of the Mindfetalness method (n=150).

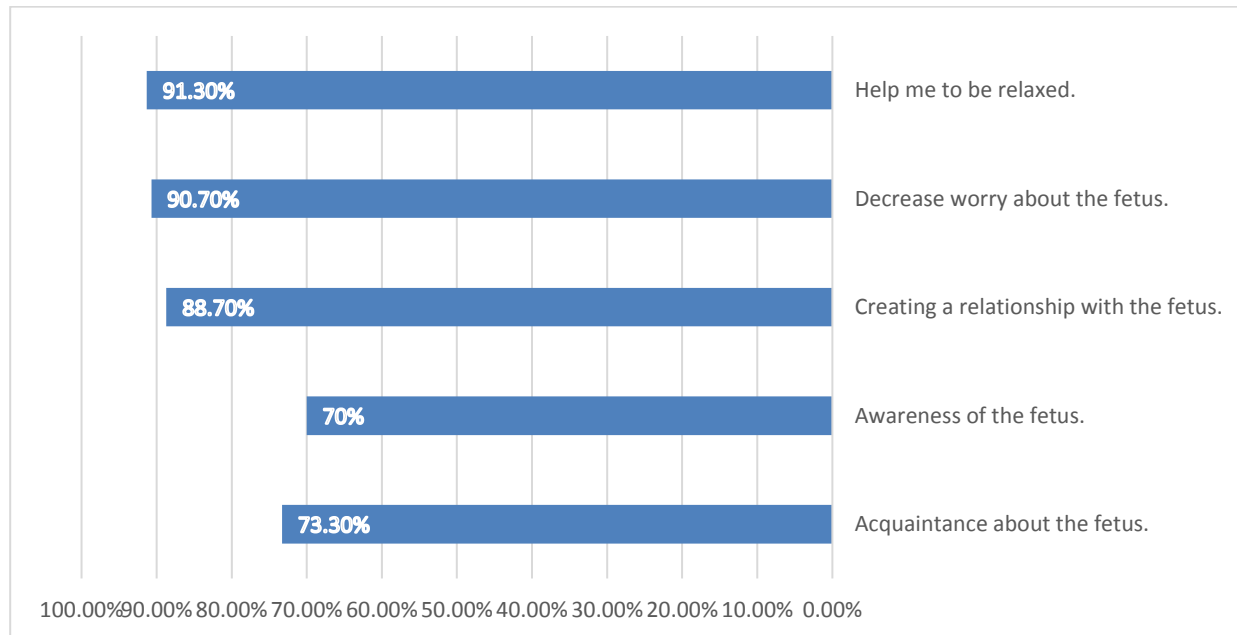


Table (3): The studied pregnant women's emotional experience with practice of the Mindfetalness method (n=150).

Emotional experience	Disagree		Sometimes		Agree	
	N	%	n	%	n	%
I felt calm	13	8.7	16	10.7	121	80.8
I felt worry	107	71.4	20	13.3	23	15.3
I felt relaxed	22	14.7	22	14.7	106	70.8
I felt irritable	111	74.0	16	10.7	23	15.3
I felt mindfulness	24	16.0	15	10.0	111	74.0
I felt focus	17	11.3	19	12.7	114	76.0
I felt tense	126	84.0	10	6.7	14	9.3

Figure (2): The studied pregnant women's total emotional experience with practice of the Mindfetalness method (n=150).

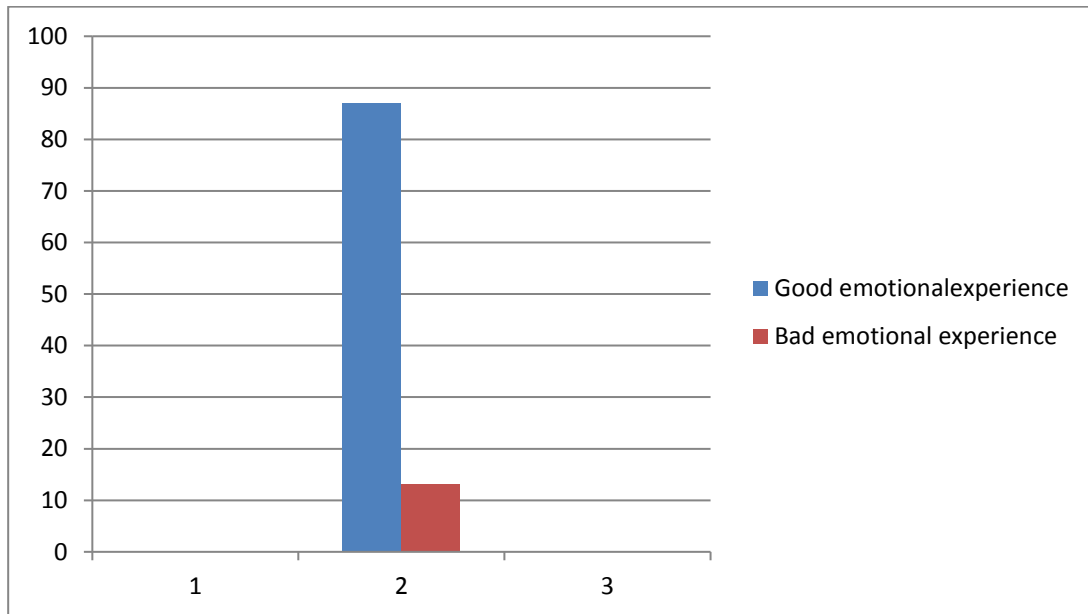


Table (4): The studied pregnant women's compliance with practice of the Mindfetalness method (n=150).

Compliance	n=150)	%
Frequency of using the mindfetalness method.		
Daily	118	78.7
Every other day	32	21.3
Duration of using the mindfetalness method.		
10-15 minutes	115	76.7
16-20	35	23.3

Figure (3): The studied pregnant women's total compliance with practice of the Mindfetalness method (n=150).

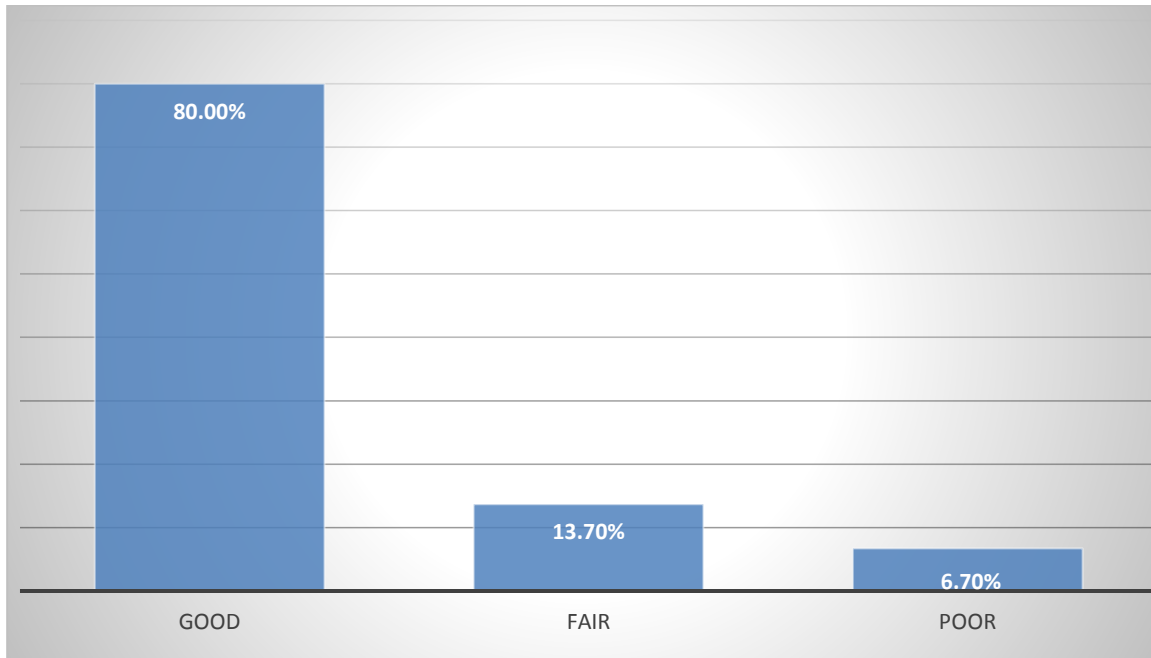


Figure (4): The studied pregnant women's unscheduled physician visits due to change in the pattern of fetal movements, or inability to feel the fetal movements when they practiced the Mindfetalness method (n=150).

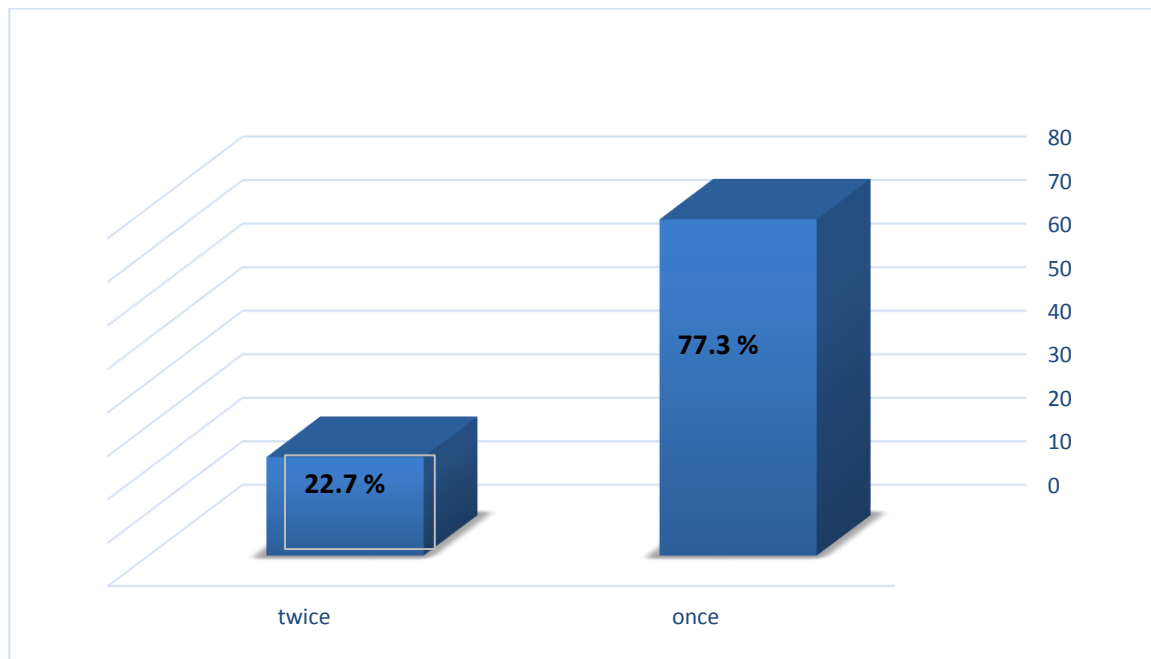


Table (5): Pregnancy outcomes among the studied pregnant women who practiced the Mindfetalness method (n=150).

Pregnancy outcomes	Number (n=150)	%
Maternal outcomes		
Complications during pregnancy		
Yes	36	24.0
No	114	76.0
Complications during labor		
Yes	13	8.7
No	137	91.3
Type of labor		
Normal vaginal	109	72.7
Cesarean	41	27.3
Fetal outcomes		
Newborn condition: More than one answer*		
Full term	129	86.0
Small size baby	12	8.0
Admission to incubator	15	10.0
Apgar score test		
0-6	17	23.3
7-10	83	76.7

Table (6): The studied pregnant women's attitudes regarding practice of the Mindfetalness method (n=150).

Attitudes	Agree		Neutral		Disagree	
	N	%	N	%	N	%
Positive attitude:						
I feel that the method built a relationship with my baby.	116	77.4	17	11.3	17	11.3
I get to know my baby better.	112	74.7	20	13.3	18	12.0
Practice of the method provided me with a good support.	136	90.7	10	6.7	4	2.6
I feel safe and I do not so worry any more when I practiced the method.	120	80.0	25	16.7	5	3.3
Negative attitude:						
I have no time to practice the method (Lack of time).	27	18.0	15	10.0	108	72.0
There is no need to practice the method.	20	13.3	23	15.3	107	71.4
I don't like structured methods.	19	12.7	17	11.3	114	76.0
I don't feel anything.	1	0.7	13	8.6	136	90.7

Figure (5): The studied pregnant women's total attitudes regarding practice of the Mindfetalness method (n=150).

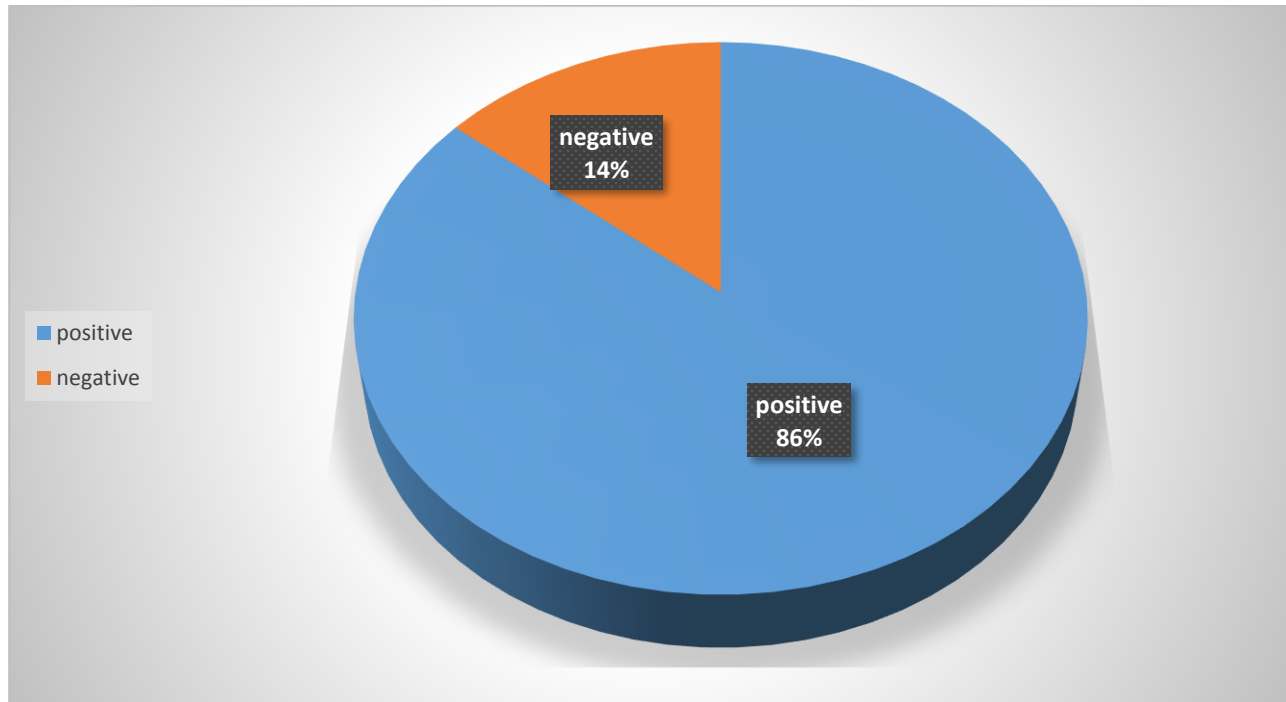


Table (7): Relation between pregnancy outcomes and compliance with practice of the Mindfetalness method among the studied pregnant women (n=150).

Variables	Good		Fair		Test/p
	n	%	N	%	
Complications during pregnancy					1.00
No	110	93.2	30	93.8	
Yes	8	6.7	2	6.3	
Complications during labor					1.00
No	108	91.5	29	90.6	
Yes	10	8.5	3	9.4	
Type of labor					0.66
Normal vaginal	87	73.7	22	68.8	
Cesarean	31	26.3	10	31.3	
Fetal Apgar score					0.55
4-7	51	43.2	16	50.0	
8-10	67	56.8	16	50.0	
Full term baby					0.16
Small for date	14	11.9	7	21.9	
Admission to incubator	104	88.1	25	78.1	
Baby admitted to NICU					0.44
No	99	83.9	25	78.1	
Yes	19	16.1	7	21.9	

Discussion:

Experience of fetal movements' sensation is very important for pregnant women. Ongoing fetal movements' sensations serve as a reassuring reminder of fetal wellbeing. Mindfetalness is considered as a shift away from a quantitative recording of fetal movements to a qualitative understanding of fetal movements' patterns (Herrera et al. 2016, Widiasih et al. 2021). Therefore, **this study was undertaken to** determine pregnant women's experiences, attitudes, and compliance with practice of the Mindfetalness method.

The results of the present study revealed that regarding the **socio-demographic characteristics**, almost two-thirds of the studied pregnant women were 20 to > 25 years old, the majority of them were married, four-fifths were living in urban communities and nearly three quarters had secondary school education and working.

These results disagree with (Akselsson et al. 2020) who conducted a cluster-randomized controlled trial to evaluate the effect of the Mindfetalness on women's awareness of fetal movements, and pregnancy outcomes. They noticed that almost two fifths of the studied participants were 30-34 years old, more than one half of them were living in urban areas, and had

university education, and more than three quarters of them were employers.

In relation to **obstetric history**, the present study represents that less than two thirds of the studies pregnant women were primigravida and less than their quarters were nulliparous and have planned pregnancy, one half of them their gestational period was 25 – 30 weeks, slightly more than four fifths had their first antenatal visit during the first trimester, and two fifths had antenatal care visits 4-5 times.

These findings contradict with (Akselsson et al., 2020) who reported that more than one half of the studied participant was multigravida and multipara, their gestational weeks were 32-36, and the vast majority of them had their first antenatal visit during the first trimester and went for antenatal follow-up visits 8-11 times. From the researchers' point of view this disagreement between the current and previous study may be due to different characteristics of the study sample and study setting.

Moreover, this finding disagrees with (Lindgren et al. 2020) who conducted a cluster randomized controlled trial to evaluate a decrease in cesarean section and labor induction among pregnant women at 67 Swedish maternity clinics by allocating

them to either the Mindfetalness method to increase their awareness of fetal movements or to the routine care. The results of their study pointed out that the majority of the participants were multigravida and multipara. This contradiction from the researcher's point of view may be due to different characteristics of the study sample and location.

The current study illuminates that in relation to the studied pregnant women's' **general experience regarding practice of the Mindfetalness method**, the majority of them clarified that the method helped them to relax, decreased their worry about the fetus, and created a relationship with the fetus, nearly three quarters added that practice of the method increased their acquaintance with, and awareness of the fetus.

This result is strongly on line with the result of (Malm et al. 2014) who studied the experiences of 40 pregnant women used two different self-assessment methods (the Mindfetalness and the count-to-ten) for monitoring fetal movements. They reported that 37.5% of the studied women preferred the Mindfetalness method and all of them felt safe, comfortable, and connected with their fetuses. These findings are also similar to (Akselsson et al. 2017), findings. They

examined women's attitudes, experiences who and compliance in using Mindfetalness and indicated that this method can help the woman and her family members to strengthen their rapport with the fetus. Several studies agreed that pregnant women communicate well with their unborn baby when they focus on fetal movements' pattern. (Rådestad et al. 2021) confirmed that the midwives in their study expressed that practicing Mindfetalness encouraged the women's attachment to their fetuses. Moreover, (Akselsson et al. 2020) revealed that practicing Mindfetalness created positive experiences and strengthened maternal fetal attachment.

Contradiction is found between the findings of the present study and that of (Saastad et al. 2011) who did not find differences in the experience of relationship with the fetus among the studied pregnant women. From the researchers' point of view, using either quantitative or qualitative method to assess fetal movements can enhance pregnant women's experiences, and awareness regarding the health of their fetuses, and positively influences their relationship. Consecutively, this can promote early postpartum maternal and fetal attachment, as well as maternal and fetal wellbeing, and mental health (Akselsson et

al. 2020, Sterpu et al. 2020, Lindgren 2020).

This study declares that regarding the **emotional experience** of the studied pregnant women during the practice of the Mindfetalness method, slightly more than four fifths were calm, about three quarters were focused, mindfulness, and relaxed, while, about one-tenth were anxious, irritable and tense.

These results are consistent with the results of (Malm et al. 2014) who reported that most women in their study felt calm, relaxed, mentally present and focused during practice of the Mindfetalness method. The findings of the current study are also congruent with the findings of (Hayes et al. 2022, El-Kurdy et al. 2021, Mohapatra et al. 2021, Akselsson et al. 2020, El-Sayed et al. 2018, Ahmed 2016, and Akbarzadeh et al. 2011). They stated that teaching attachment behaviors to pregnant women as using different methods of maternal assessment of fetal movements as the Mindfetalness method reduced their level of anxiety.

On the other hand, (Mangesi et al., 2015) outlined that maternal assessment of fetal movements using counting method caused anxiety, and (Al Amri and Smith 2022) found that counting did not affect

maternal psychological or emotional status. This inconsistency can be deduced as the practice of Mindfetalness focuses upon what the woman feels, while fetal counting focuses upon numerical values of fetal movements that can make them feel some degree of anxiety.

The current study addressed that concerning the studied pregnant women's **compliance with practice of the Mindfetalness method**, more than three-quarters used the Mindfetalness method daily in a period ranged from 10 – 15 minutes, and visited the physician due to their inability to feel fetal movements. Regarding the total compliance with practice of the Mindfetalness method, three-quarters of the studied pregnant women had high compliance with practice of the Mindfetalness method.

These results agree with the results of (Akselsson et al. 2017, Malm et al. 2014) who confirmed that three quarters of the studied women practiced the Mindfetalness method daily for 15 minutes, and more than four fifths comply with practice of the method. In addition, (Lindgren H et al. 2020) findings support the present study findings. They stated that the Mindfetalness method increased percentage of the pregnant women who pursue antenatal care follow up

visits due to change in the fetal movements in fetal movements. Increasing maternal awareness of fetal movements' pattern and history can improve pregnancy outcome, as early seeking of antenatal care can help early detection and managements of any complication.

Inconsistency, (**El-Kurdy et al. 2021, Khalil & Shahin 2020, Samutri & Endriyani 2020**) reported high fetal movements counting compliance among their studies subjects Additionally, (**Koshida et al., 2021**), concluded in their study that informing pregnant women about self-assessment of fetal movements enhanced their health care seeking behavior and prevented delayed in seeking medical help after the perception of decrease fetal movements, which might reduce stillbirths..

Regarding **pregnancy outcomes**, the finding of the present study indicated that more than three quarters of the studied pregnant women who practiced the Mindfetalness method had no complications during pregnancy, the majority had no complications during labor, and less than three quarters had normal vaginal delivery and little number of small size babies.

These findings are similar to (**Akselsson A et al. 2020, Lindgren H et al. 2020**), findings. They mentioned that practice of

the Mindfetalness method decreased the incidence of caesarean section, induction of labor and infants born small gestational age.

This may be due to that practice of the Mindfetalness method has positive effect on pregnancy. It can reduce perceived stress, and prevent increase of cortisol, while increase progesterone. This can activate oxytocin; making the women feels calm and safe, as well as has an optimum effect on contractions during labor (**Bellussi et al. 2020, Herrera et al. 2016, Malm et al. 2014**).

One other explanation is that the practice of Mindfetalness has a protective effect on fear of childbirth, as (**Shapiro et al. 2006**) suggested that Mindfulness leads to a shift in perspective and help the individual to cope with fear, and pain by creating another perspective. When certain thoughts and emotions arise, the person can be with them instead of being controlled by them. The effect of Mindfetalness could be explained in the same way as it resembles Mindfulness. So, during practice of the Mindfetalness pregnant women think of their unborn baby from another perspective and thus make it easier for them to cope with the fear of childbirth.

However, these findings of this study disagree with (**Norman et al. 2018**), who

implemented a stepped-wedge, cluster-randomized trial to increase maternal awareness of fetal movements, and reported that there was significantly higher incidence in caesarean sections. A large Australasian trial, "My Baby's Movements" also contradicted this study. It reported that promotion of fetal movements' awareness did not result in any change in caesarean birth rate.

The current study also confirms that, more than three quarters of the newborn babies of the studied pregnant women had an Apgar score of 7 – 10, the majority of them were full term and didn't need admission to incubator. These findings correspond with the findings of (Akselsson A et al. 2020) They found a lower percentage of newborn having an Apgar score of less than 10 after birth and of babies born small for gestational age don't admitted to incubator in the Mindfetalness group. They also added that early attachment between mother and fetus has a positive effect on short and long-term baby outcomes. (Hayes et al. 2022), also concluded in their study that encouraging awareness of fetal movements may reduce NICU admissions and Apgar scores <7 at five minutes of age and may be associated with reduced adverse neonatal outcomes and

interventions in labor. In the same context, (Saastad et al. 2011) indicated that low awareness of the fetal movements is associated with adverse neonatal outcomes such as low birth weight. They explained that during practice of the Mindfetalness method, the woman lies down on her left side, so the blood flow is at its best in the uterus for 15 minutes a day until the birth. Therefore, this can enhance fetal growth. Contradict to benefits of left side position, several studies confirmed an association between supine position and reduced birth weight (Robertson et al. 2020, Anderson et al. 2019).

The findings of the present study verify that majority of the studied pregnant women described their **attitudes regarding practice of the Mindfetalness** method as; the method was useful, provided them with a good support, and they felt safe and unworried. On the other hand, less than one-fifth of the studied pregnant women established that they lacked the time to practice the method, didn't felt the need to practice the Mindfetalness method, and they didn't like structured method. Besides that, most of the studied pregnant women had positive total attitudes regarding the Mindfetalness method, while fourteen percent of them had negative attitudes.

These findings strongly agree with (Akselsson et al. 2020, Akselsson et al. 2017, Malm et al. 2014) they displayed positive attitudes of the participants in their studies regarding the Mindfetalness method. On the other hand, several studies confirmed positive attitudes regarding assessment of fetal movements by the counting method (Lindgren et al. 2020, Gomez et al. 2017). Meanwhile, the pregnant women face the challenge to choose between assessment of fetal wellbeing using advanced technology or self-methods as assessment of fetal movements by practicing the Mindfetalness or counting. In this regard, it is better to trust maternal sense of fetal movements using different self-methods of assessment. This increase pregnant women's confidence; improve their knowledge awareness, and attitudes, as well as their experience of pregnancy, birth and parenting (Khalil & Shahin 2020).

Conclusion:

The Mindfetalness method is useful for reassuring pregnant women and decreasing worry about their fetuses, as well as improving maternal fetal relations, and commitment with antenatal follow up visits. Compliance with practice of the Mindfetalness method is useful for improving pregnant women's general and

emotional experiences and attitudes regarding the method. It increased their awareness regarding patterns/characteristics of the fetal movements, and encourages them to early seek antenatal care and unscheduled visits to the health care settings, especially if they noticed any deviation in the normal pattern of their fetal movements. Consequently, it helped them to early detect and manage any complication. Thus, practice of the Mindfetalness method is important to improve the overall health of the pregnant women and their newborn babies, as well as to decrease stillbirth and maternal and neonatal morbidity and mortality rates.

Recommendations:

Maternity nurses should teach pregnant women about practice of the Mindfetalness method to improve maternal and fetal wellbeing, and pregnancy outcomes, as well as to decrease stillbirth and fetal morbidity and mortality rates. It is also important to include the Mindfetalness method in different nursing curriculums to prepare nursing students for future practice. Further research should be done on a large sample size and with different research methods to ensure effectiveness of the method and generalization of the research results. Additionally, comparison between the effect

of practicing the Mindfetalness method and other non-invasive methods of assessment of fetal movements should be carried out.

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