MOTHERS' KNOWLEDGE OF FOETAL MOVEMENTS MONITORING DURING PREGNANCY IN RELATION TO PERINATAL OUTCOME

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ABSTRACT

Over the years, maternal perception of foetal movement has become recognised as a valuable tool for early detection of foetal compromise. Foetal movement is a reliable sign of foetal well-being (Bennett & Brown, 1999:232). Despite being a useful method in attaining clinical foetal monitoring, foetal movement is probably under-utilised, especially in high-risk pregnancy (Nolte, 1998:100). The purpose of this study was to determine the knowledge pregnant mothers have on the monitoring of foetal movement and its effect on perinatal outcome. The findings of the study were used to develop the content of a health education programme that is contextual and relevant to the needs of pregnant mothers. A quantitative research survey design was used to obtain information from pregnant mothers. Simple random probability sampling was used. Ninety-seven (97) pregnant mothers agreed to participate in the study. The results indicated that pregnant women who were able to perceive foetal movement during pregnancy regarded it as important. However, limited information on the importance of foetal movement monitoring in relation to perinatal outcome was displayed. Content on contextual health education for mothers on foetal movement monitoring was proposed.

OPSOMMING

Oor die jare is moederlike waarneming van fetale beweging erken as 'n belangrike instrument in die vroeë identifisering van fetale nood. Fetale beweging is 'n betroubare teken van fetale welsyn (Bennett & Brown, 1999:232). Ten spyte daarvan dat dit 'n nuttige metode is om fetale welsyn klinies te monitor, word die kliniese monitering van foetale beweging te min in hoë risiko-swangerskap gebruik (Nolte, 1998:100). Die doel van dié studie was om die kennisvlakke van swanger moeders te bepaal omtrent die monitering van fetale beweging en die effek daarvan op perinatale uitkoms. Die bevindinge van die studie sal gebruik word om die inhoud van 'n gesondheidsontwikkelingsprogram te ontwikkel wat op swanger moeders gerig is. 'n Kwantitatiewe navorsingstudie om die inligting van die swanger moeders te verkry is gebruik. Eenvoudige waarskynlikheids steekproefneming is gebruik. Sewe-en-negentig (97) swanger moeders het ingestem om aan die studie deel te neem. Die resultate het aangedui dat swanger moeders vir wie dit moontlik was om fetale beweging waar te neem tydens swangerskap, dit as belangrik beskou het. Daar het egter beperkte inligting omtrent die belangrikheid van die monitering van fetale bewegings in verhouding tot perinatale uitkoms na vore gekom. 'n Inligtings- en opleidingsprogram vir swanger moeders met betrekking tot die monitering van fetale beweging is aanbeveel.

INTRODUCTION

Foetal movement counting - often called 'kick counting' - represents a maneuver whereby a mother can help monitor the movements of her unborn baby by counting the number of kicks in a given time period. This is an indicator of foetal health and has been used for over a century (Marnoch, 1992:54; Marzano & Hanlon-Lundberg, 2004).

At week 7 of gestation the little embryo is already squirming about, but because at this point it is so small the mother cannot possibly feel its periodic contortions. By week 16 the mother may feel the first momentous kicks called 'quickening'. By week 20 of gestation most mothers are able to feel the baby's movements and by week 28 the kicks will become stronger and more regular (Babycenter Medical Advisory Board, 1997; Nolte, 1998:100).

Over the years, maternal perception of foetal movement has become recognised as a valuable tool for early detection of foetal compromise. The recording of foetal activity serves as an indirect measure of central nervous system integrity and function (Rayburn, 1990:95; 1995:59), indicating that foetal movements are a reliable sign of foetal well-being (Bennett & Brown, 1999:232). In a study on excessive foetal activity as a worrisome sign, Rayburn, Rayburn and Gabel (1983:163) further clarified that foetal inactivity is strongly suggestive of foetal jeopardy. A change in the normal pattern or number of foetal movements may indicate that the foetus is under stress.

A foetus that had been moving according to its normal pattern but stops moving may be giving a sign that it is not receiving enough oxygen (http://www.stronghealth.com). A sudden increase in foetal movement is a sign of foetal distress, such as in case of cord complications or abruption of the placenta, whereas decreased foetal movements are seen in cases of chronic foetal distress such as pre-eclampsia or hypertension in pregnancy. It is well documented that reduction or cessation of foetal movements reported by pregnant women causes anxiety and concern (Sadovsky & Polishuk, 1977:49).

In spite of being a very useful method, foetal movement is probably an under-utilised maneuver of clinical foetal monitoring, especially in high risk pregnancy (Nolte, 1998:100). Thus, formal counting of foetal movements by pregnant women could identify a foetus which is at risk of compromise, thus allowing for prompt and appropriate action (Olesen & Svare, 2004:818). However, the benefit of this intervention has not been proven adequately.

PROBLEM STATEMENT

According to the Saving Babies Report (DOH, 2002:52), the Limpopo Province is subdivided into six district municipalities with the total of 43 hospitals, and 455 clinics and health centers. Forty (40) hospitals and 281 clinics have functional maternity units at which deliveries take place (DOH, 2002:54). In this report it is documented that the inappropriate response to poor foetal movement (8.2% in Limpopo Province) could be classified as patient-related avoidable factors. It was further pointed out that poor reporting of reduced foetal movements is frequently attributed to patient-related avoidable factors (DOH, 2002:26). Neldam (1980:1222) observed that formal scoring of foetal movement in a low risk population resulted in a significant reduction in perinatal mortality in Sweden in 1979. In the context of this study, it was not clear whether pregnant mothers understood the importance of foetal movement monitoring during pregnancy in relation to the perinatal outcome.

RESEARCH QUESTION

What knowledge do mothers have on the foetal movement monitoring during pregnancy in relation to perinatal outcome?

PURPOSE

The purpose of this study was to determine the knowledge pregnant mothers have on the foetal movement monitoring in relation to perinatal outcome at certain clinics of Polokwane municipality. The findings of the study were used to develop the content of a health education programme that is contextual and relevant to the needs of the pregnant mothers.

OBJECTIVES

- To determine the knowledge of mothers of foe-

tal movement monitoring during pregnancy in relation to perinatal outcome.

- To develop health education programme content that is responsive to the needs of mothers.

DEFINITION OF TERMS

Knowledge: This is the awareness and understanding of facts, truth or information gained from experience (http:www.thefreedictionary.com). In the context of this study knowledge shall refer to the ability to feel, interpret and report the decrease, absence or sudden increase of foetal movements.

Foetal Movement Monitoring: This refers to the counting and recording of foetal movements. It is a very appropriate and cost-effective means of monitoring foetal well-being and it does not require any expensive equipment (Cronjé & Grobler, 2003:681). In this study foetal movement monitoring shall refer to a common way for mothers to assess the foetal movement by doing kick counts.

Perinatal Outcome: This is the outcome of a child's life during the four or five months before birth and the first month thereafter (Cronjé & Grobler, 2003:695). In this study perinatal outcome shall refer to the importance of foetal movement monitoring in relation to fetal well-being.

RESEARCH DESIGN AND METHOD

A quantitative research approach was undertaken. The survey design was used to obtain information from pregnant mothers. This design was chosen for this study because the survey collected participants' information on knowledge of foetal movement monitoring in relation to perinatal outcome. Data were collected through self-administered questionnaires (Polit & Hungler, 1993:48).

Population and Sampling

The study population consisted of all pregnant mothers who were attending antenatal care at three clinics of the Polokwane municipality. Simple random probability sampling was used to ensure that all participants had equal chance of being included in the study (Polit & Hungler, 1993:48). At each clinic, the sampling was conducted as follows: 100 pieces of paper of which 65 were blank and 35 were numbered 1-35 were put in a box. All mothers who picked a paper with a number were included in the sample. One-hundred-and-five (105) mothers from three clinics were recruited to the study. Only ninety-seven (97) agreed to participate in the study. Two clinics had 32 participants each and one clinic had 33. The clinics had equal numbers of papers.

Data Collection

The statements in questions were used to obtain data of a subjective nature (De Vos, 2002:182). The constructed statements in the questionnaires consisted of 22 questions that were divided into five (5) parts, namely the:

- biographical characteristics
- perceptions of foetal movements by the mother
- knowledge on foetal heart monitoring in relation to perinatal outcome
- home coping skills during foetal monitoring
- mother's informational support.

Pre-Testing

The questionnaires were pre-tested amongst six (6) mothers from each clinic and these mothers were excluded from the main study. Pre-testing was done to ensure that questions were phrased correctly and refinements of the questions were done.

Administration of Questionnaires

The process of data collection occurred over a period of three months from February to April 2004. The researchers visited the clinics and sampled mothers. The appointments for questionnaire completion at home were secured with the mothers within two days of contact. The researchers visited pregnant mothers at their homes and assisted them with the filling of questionnaires. This process took place in a quiet room to ensure confidentiality and privacy. It took 20-30 minutes for the questionnaire to be completed because these were translated into the local language (Northern Sotho) to facilitate understanding.

Data Analysis

Descriptive statistical analyses were used, including frequencies and percentages of participants according to the selected characteristics (Polit & Hungler, 1993:275).

Validity and Reliability

Probability sampling was used to ensure inclusion of every member of the study population. The study was contextualised, only those mothers attending the three clinics were included. No person other than the researchers collected the data. The researchers pre-tested the questionnaires and the same results achieved during pre-testing were also achieved for the actual study.

Ethical Considerations

Ethical considerations were based on the DENOSA Ethical Standards for Nurse Researchers (Democratic Nurses Association of South Africa, 1998:2.3.2-2.3.4). The quality of the research was ensured by adhering to the highest possible standards of research through accountability and ability of executing the research process. Permission to sample the pregnant mothers was obtained from the clinic supervisor. Each pregnant mother was provided with sufficient and understandable information regarding her participation. Confidentiality and anonymity was ensured by protecting the participants' identity, privacy, self worth and dignity. The right to self-determination was upheld by obtaining informed consent from the participants. There was no victimisation of participants who refused to participate in the research, or who withdrew during the course of the study. The researcher established ongoing rapport with mothers over a sustained period of time - the significance of such a relationship in gaining trust, facilitating data collection and enriching data has been appraised by Muller (1995:69).

The moral impact of the study

Foetal movement as experienced by mothers is a valuable indicator of foetal wellbeing. These foetal movements monitoring further serve as an indirect measure of central nervous system integrity and function (Christensen & Rayburn, 1999:607). The subjective foetal movement monitoring as perceived by mothers appears to be an accurate reflection of foetal activity and are necessary integral part of obstetric care. It is a cost-effective tool which is pertinent to a developing country such as South Africa. Monitoring can be effective if the mothers are seen as partners in the care of their babies.

RESULTS AND DISCUSSION

Ninety seven (97) mothers who attended antenatal care at three (3) clinics in the Polokwane municipality participated in the study. The results are summarised in Table 1.

Part 1 of Table 1 is a summary of the demographic characteristics of mothers. Forty-one mothers (42% of total participants) indicated that they never received prenatal education and 18 mothers (19%) were not sure whether they received prenatal education. This could be interpreted as the mother's ignorance of prenatal education and/or her non-involvement in such. Forty-one mothers attended only one to three antenatal care clinic sessions – clearly inadequate as the schedule for return antenatal visits in low risk women should be at least be seven in total (DOH, 2002:26). Only 39% of mothers attended prenatal education classes which may have exposed them to some information on foetal movement monitoring. Lundgren and Dahlberg (2002:158) pointed out that it is important for midwives to collaborate by inviting the mothers to participate in and be responsible for their own care during childbirth. According to the 'Pregnant Patients' Rights' by Ladewig, London and Olds (1998:795), the patient has the right to be informed by the midwife about the available childbirth education classes, which could help to prepare the mother physically and emotionally to cope with the stress and experience of childbirth and to participate actively during childbirth.

However, in a study on women's perceptions of informed choices in maternity care, O'Cathain, Thomas, Walters, Nicholl and Kirkham (2002:143) asserted that women who were multiparous and of lower educational status preferred not to participate in decision-making with midwives. The authors further indicated the importance for midwives to at least know how women in their care preferred to be involved in decision-making as an aim to be sensitive and flexible in meeting their needs. According to Halliday and Horgarth-Scott (2000:52), childbirth is a natural process and mothers should be at the center of decisions about their care. However, Pelkonen, Perala and Vehvilainen-Julknnen (1998:22) pointed out

Table 1: Foetal movement monitoring in relation to perinatal outcome

Part 1: Biographical characteristics		**N = 97**	
1.	Age in years	Frequency	Percentage
	14-19	24	25%
	20-29	41	42%
	30+	32	33%
2.	Parity		
	0-2	64	66%
	3-5	28	29%
	6+	5	5%
3.	Number of ANC visits		
	1-3	41	42%
	4-6	38	39%
	7+	18	19%
4.	Prenatal education received		
	Yes	38	39%
	No	41	42%
	Don t know	18	19%
Part 2: Perceptions of foetal movements		**N = 97**	
1.	Perceptions of foetal movements for the first time	Frequency	Percentage
	0-3 Months	21	22%
	4-6 Months	69	71%
	7-9 Months	7	7%
2.	Is it important to perceive/feel foetal movements during pregnancy?		
	Yes	88	91%
	No	6	6%
	Don t know	3	3%
3.	Why is it important?		
	Baby growing well	20	21%
	Baby alive	75	77%
	Don t know	2	2%
Part 3: Knowledge of foetal movement monitoring in relation to perinatal outcome		**N = 97**	
1.	The foetal movement experienced	Frequency	Percentage
	Kicking and rolling	52	54%
	Kicking only	36	37%
	Rolling only	5	5%
	Don t know	4	4%
2.	Number of foetal movements per hour		
	0-4	35	36%
	5-12	43	44%
	Don t know	19	20%
3.	Is it normal to experience at least four movements per hour?		
	Yes	35	36%
	No	43	44%
	Don t know	19	20%
4.	Is it normal to experience more than 12 movements per hour?		
	Yes	56	58%
	No	14	14%
	Don t know	27	28%

5.	Do foetal movements increase during the first trimester?		
	Yes	75	77%
	No	11	11%
	Don t know	11	12%
6.	Do foetal movements increase during the last trimester?		
	Yes	18	19%
	No	65	67%
	Don t Know	14	14%
7.	The cause of poor/decreased foetal movement is?		
	The baby is asleep	50	52%
	The baby is dead	17	18%
	Don t know	30	14%
8.	The cause of absence of foetal movement for more than 24 hours is?		
	The baby is asleep	47	48%
	The baby is dead	33	34%
	Don t know	17	18%
Part 4: Home coping skills during monitoring of foetal well-being		**N =97**	
1.	When foetal movements are 0-3 per hour, do you?	Frequency	Percentage
	Drink glucose water	20	21%
	Recount the movements	33	34%
	Don t know what to do	44	45%
2.	When foetal movements are more than 12 per hour, do you?		
	Drink glucose water	5	5%
	Recount the movements	36	37%
	Don t know what to do	56	58%
3.	If you don t experience foetal movements for more than 12 hours, do you?		
	Report to Dr/clinic	67	69%
	Report to your mother/significant others	25	26%
	Don t do anything	5	5%
4.	If the baby is not moving for 24 hours, do you?		
	Report to your mother/significant others	26	27%
	Report to the health professional	56	58%
	Don t do anything	15	15%
5.	If the baby is not moving for than two days, do you?		
	Wait for the next appointment date	39	40%
	Report to the clinic	52	54%
	Don t do anything	6	6%
Part 5: Informational support		**N = 97**	
1.	Where did you receive information on foetal movements during pregnancy?	Frequency	Percentage
	At the clinic	39	40%
	From my mother/significant others	52	54%
	Never received information	6	6%
2.	Can you formally monitor foetal movements during pregnancy?		
	Yes	10	10%
	No	52	54%
	Not sure	35	36%

that it was obvious that not all clients were willing to participate.

Part 2 of Table 1 shows that a high percentage (71%) of mothers perceived foetal movements at 4-6 months whereas seven (7%) perceived foetal movements only at 7-9 months gestation. This confirms that mothers have limited knowledge on the normal physiologic changes of pregnancy. Cronjé and Grobler (2003: 52) indicated that the primigravidae feel foetal movements at 18-20 weeks while multigravidae feel it at 16-18 weeks. Eighty-eight mothers (91%) expressed that it is important to feel the foetal movements, but only 75 (77%) reasoned that this is an indication that the baby is alive. Twenty mothers (21%) stated the significance of foetal movements as a sign that the baby is growing well which is not the accurate reason for perceiving foetal movement. Two mothers (2%) did not know the importance of foetal movements, further pointing to the lack of information on this gestational signal. To correct this deficiency in knowledge Gibbins and Thomson (2001:302) suggested that appropriate information be given during pregnancy to enable the mother to take decisions and to empower her to make informed choices. This suggestion was supported by Nolan (1997:1201) who affirmed that women need to be given information and opportunity to discuss how information relates to their particular circumstances in building confidence and self-esteem to enable them to take control over childbirth, ask questions, make informed choices and communicate more effectively with midwives.

Part 3 of Table 1 summarises the mothers' knowledge of foetal movement monitoring. Fifty-two mothers (54%) have experienced both rolling and kicking movements whereas 36 (37%) experienced only the kicking movements. Five mothers (5%) experienced the rolling movements only and four mothers (4%) did not know which movements to monitor during pregnancy. Thus, accurate information should be given to mothers on which foetal movements to monitor. Limited knowledge was displayed on the total number of movements to be experienced per hour in that 43 mothers (44%) indicated that it was normal to experience 4-12 movements per hour whereas 75 mothers (77%) pointed out that the foetal movements increased during the last trimester of pregnancy. The causes of poor/decreased foetal movements were cited by mothers as follows: baby is asleep (52%) and did not know (30%). Of great concern was the observation that 47 mothers (48%) stated the absence of foetal movements for 24 hours as that of the baby being asleep whereas 17 mothers (18%) were not sure what caused the absence of foetal movements. The above responses from mothers confirm a knowledge deficit on foetal movements. Cessation of foetal movement precedes intrauterine death by at least 12 hours (Cronjé & Grobler, 2003:596). According to Levy (1999:110), pregnant mothers require accurate information during pregnancy and delivery to guide their actions and to raise their awareness of issues to be considered.

Part 4 of Table 1 shows the mothers' coping skills when monitoring foetal movements at home. A high percentage of mothers, 45% and 58% respectively, did not know what to do when foetal movements were 0-3 or more than 12 per hour. However, 67 mothers (69%) mentioned that when the baby was not moving for more than 12 hours, they reported to the health professionals or the nearest clinic. By contrast, 39 mothers (40%) pointed out that they waited for the next appointment and six (6%) did not know what to do when the baby was not moving for more than 24 hours. The response of waiting for the next appointment date poses a great challenge to midwives because this may not only be a sign of a mother's ignorance, but may well point to a severe lack of information. Cronjé and Grobler (2003:596) noted a 35% reported incidence of decreased foetal movements which, with accurate surveillance, only presented 3% - hence emphasising the need for improved antenatal education.

Part 5 of Table 1 summarises information on support given to mothers on foetal movement monitoring. Even though fifty-two mothers (54%) received information on foetal monitoring from their mothers/significant others, this may still be regarded as a knowledge gap because it was not clear whether the information received was accurate. Regarding the formal monitoring of foetal movements, only 10 mothers (10%) indicated that they were able to formally monitor foetal movements. A significant number of mothers (54%) had no clear understanding of how to monitor foetal movements and 35 (36%) were absolutely lacking knowledge of this clinical manoeuvre.

In conclusion, the findings of this study directly call for

appropriate intervention of making information on foetal movements monitoring available to all mothers before and during pregnancy. Monitoring of foetal movements is perceived as a valuable indicator of foetal well-being and is an inexpensive and simple tool which can be implemented to save babies' lives. It is envisaged that when mothers receive accurate, simple and relevant information on foetal movement monitoring they would be empowered and this will strengthen their partnership or relationship with health professionals.

LIMITATIONS OF THE STUDY

The research was only conducted at three clinics in Polokwane Municipality, and the results may thus not necessarily be generalisable to other municipalities within the Limpopo Province.

PROPOSED HEALTH EDUCATION CONTENT ON FOETAL MOVEMENTS MONITORING TO BE GIVEN TO MOTHERS

What to teach mothers on foetal movement monitoring

The content is to be presented in the language that the mother understands well (for example, in this study, Northern Sotho). Details should include the following:

- Basic information on foetal movements
  - Foetal movements are felt from the 14th week of pregnancy.
  - Foetal movements are felt by primigravida from the 18th week and by multipara from the 16th week of pregnancy.
  - By the 28th week of gestation the foetal kicks become stronger and more regular.
- Foetal movements are important because they indicate that the foetus is alive and healthy.
- During the last trimester of pregnancy the foetal movements may appear to be reduced due to the enlarging foetus and decreased amniotic fluid.
- Count all foetal movements, for example, kicking and rolling, everyday.
- Although each mother and foetus are different and each foetus has its own pattern of activity and development, the average normal movements to feel is 4 - 6 per hour or 10 - 12 per two hour. However, in a cross-over trial comparing maternal acceptance of two foetal movement charts, Christensen, and Rayburn (1999:609); Christensen, Olson and Rayburn (2003: 1056) observed that mothers preferred the count to ten (10) foetal movement chart since it promotes a higher level of adherence.
- A change in a normal pattern or number of foetal movements may indicate that the foetus is under stress.
  - A reduced rate or absence of foetal movements for more than 24 hours after 22 weeks of gestation should be reported to the health professional immediately.
  - Excessive movements should also be noted as this may point to foetal compromise. An increase of more than 50% of the normal daily rate is considered significant for mothers to seek medical assistance.
- If the foetus is not moving by lunch time or any day after ingestion of glucose, report to the health professional.
- Avoid the taking of drugs (for example, sedatives) as this temporarily inhibits foetal movements.
- Alcohol and smoking suppress the foetal central nervous system which subsequently decreases the foetal movements.
- The foetus sleeps for more than 90% of the day, and the periods gradually increases as pregnancy increases (Nolte, 1998:100).

Perceived inactivity requires assessment of any underlying antepartum complication and a more precise evaluation by Foetal Heart Rate (FHR) testing or real time ultrasonography before delivery is considered. Nolte (1998:100) pointed out that foetal movements are a significant indication of a well-functioning foeto-placental unit.

How to monitor foetal movements

- The mother is to set aside the same time each day to do the counting. A good time is usually after a main meal (breakfast, lunch or dinner). The mother is to fit the counting period into her

Table 2: Chart on How to Monitor Foetal Movements

Date	Time When Counting Started	Time When Counting Finished	Frequency (Number) of Movements	Total Number Per Hour
11.03.2005	13h00	14h00	✓✓✓✓✓	5
12.03.2005	13h00	14h00	✓✓✓✓✓✓	6

daily schedule at the most convenient time.

- Have the kick count chart and a pen ready. The kick count chart should have the information as shown in Table 2.
- Lie down preferably on your side or sit upright quietly.
- Put your hand on the abdomen and focus only on foetal movements (kicking and rolling), that is those that are definitely felt.
- Record all the movements on the chart with a tick (✓) when experiencing movement (Table 2) then at the end of an hour to reach the total.
- Have a glucose drink (juice) if less than four counts are experienced in an hour, then recount again for the next hour.
- Call the doctor or visit to the nearest clinic if you still do not feel at least four movements at the end of the second hour.

CONCLUSION

The findings of the study pointed out that there is a need for involving mothers in the care of their unborn foetuses through information sharing. It is envisaged that when mothers become involved they will participate in foetal well-being monitoring and this will save the lives of their babies, enhance foetal-maternal attachment and further empower them to be partners with health professionals.

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