The Perceptions of Parents in Northern Thailand Regarding Prenatal Development

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Abstract: Parents are the primary actors in promoting their unborn baby's development, however, their worldviews on prenatal development are not clearly known. This qualitative descriptive research using semi-structured interviews to describe prenatal development from the perceptions of parents in northern Thailand. Data were collected between October 2015 and July 2016 from 31 mothers and 23 fathers living in Chiang Mai, and analysed using content analysis.

Based on the parents' perceptions, two categories emerged. Firstly, *Beyond physical growth* indicated that prenatal development was not limited to physical changes but included six subcategories: *Growth, forming and functioning of organs; Meaningful fetal movement; Performing daily activities; Displaying feelings; Sensing and responding;* and *Learning and memorizing.* The second category was *Essential issues,* consisting of four subcategories: *No deformities, strong and healthy, or normal; Risks exist from conception to birth; Primarily moral and happy, and secondly intelligent;* and a *Link of development and deformity.* The first three subcategories indicated parents' perceptions about optimal prenatal development, a vulnerable period, and their expectations of a grown-up child. The last implied that development was not isolated from deformity; and that in promoting prenatal development, preventing fetal deformity was also performed simultaneously. Parents' perceptions differed from healthcare providers' worldviews to some extent. To strengthen person-centered care, nurses and midwives should consider parents' perceptions of prenatal development in their dealings and education activities and care with them. Attempts to prevent birth defects should also be integrated into the topic of prenatal development promotion.

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Introduction

Early life events have a critical impact on human development, affecting physical, cognitive, social, and emotional aspects over the entire life-course.[1] Physical and psychological intrauterine stress have been found to influence the development of children's personalities.[2] Further, children's cognitive functions may be shaped by prenatal maternal infection and malnutrition.[3] In particular, severe nutritional deprivation during pregnancy has impacts on brain development[4] and intellectual functioning,[5] resulting in poor motor, cognitive, and socioemotional development.[6] Thus, certain prenatal

events may acutely affect development and have lasting effects on later life.[7] In addition, fetal undernutrition may predispose a child to certain adult chronic diseases.[8] Growth and development are continuous processes from conception to death, and proceed in an orderly sequence;[9] however, the above literature demonstrates that development may be hindered substantially if prenatal development is inadequate.

Optimal promotion of prenatal development is crucial in Thailand where poor child development remains a national health problem,[10] especially in the north of Thailand as seen in the 2016 Annual Report of the Health Region 1 (HR 1), covering 10 northern provinces.[11] That is, the national rate of 0-5 years old children with appropriate development was 47.84% but the HR 1 rate was only 45.13%. The incidence of low birth weight was 8.78% whereas the overall incidence was 8.54%. Taking iodine supplements during pregnancy only occurred in 55.54% of women and consuming iodized salt was 85.55%. In response to poor prenatal and child development, the 2nd National Reproductive Health Development Policy and Strategy (2017-2026) on Quality Birth and Growth has been established.[12] Further, 'The Miracle of the First 1,000 Days of Life' has been set as a national policy to improve children's brain development, focusing on the period from conception to two years of age.[13]

Parents are the primary actors regarding the promotion of their baby's health, with their influence beginning while the baby is still inside the womb. A previous study conducted in Thailand indicated that parents often prioritized their unborn baby's well-being over their own.[14] In particular, mothers commonly exhibited intensive devotion and care for their baby.[15] Meanwhile, fathers showed their concern for the safety of their unborn babies and protecting them through confirming and accepting the baby as a human being, and ensuring the health of the mother and baby.[16] However, there is no current empirical evidence particularly on the development of the unborn baby from the parents' perceptions. During childhood, promotion of child development should encompass physical, cognitive, psycho-emotional, and social aspects.[17] It is not clearly known if parents view the aspects of their unborn baby's development similar to those of child development.

Parents can appropriately promote their unborn baby's development when they have proper perceptions regarding the development and the potentials of their unborn baby, and have appropriate developmental expectations. In antenatal clinics, the significance of the critical period of prenatal development is conveyed and parents are encouraged to seriously avoid harmful substances and conditions during this period. Optimal development of the baby at birth is mostly attempted at ensuring an appropriate birth weight and being healthy, with no congenital anomalies. The Thai national campaign of 'being intelligent, moral, and happy' children from the period of being in utero has been launched. However, these issues are not well explored from parents' points of view. Little is known about parents' perceptions on their concerns and their expectations about their unborn baby. Additionally, existing frameworks for enhancing parents' behavior in promoting prenatal development might not be suited to person-centered care.

Since parents' cultural beliefs and perception shape the ways they nurture their unborn baby, their worldview should be incorporated into existing treatment and care frameworks. Hence, it is worthwhile to explore parents' perceptions on the development of their unborn baby. Nurses, midwives and other health professionals could use the gained knowledge to refine their clinical practice and further reduce the problems of poor prenatal and child development in the north of Thailand. A qualitative approach was employed to obtain understanding of parents' explanations from their own experience since this approach is sensitive to the social context and enables an in-depth understanding of cultural beliefs and perceptions.

Research question and objectives

The research question was *What is prenatal development as believed and understood by parents in the northern Thai context?* Specifically, their points of view in relation to various issues employed in clinical practice were explored, including aspects of development, optimal development at birth, a vulnerable period of prenatal development, as well as expectations for the grown-up child and how to achieve these issues during pregnancy.

Methods

Design: A qualitative descriptive study was used. The goal of qualitative description is a comprehensive summarization, in everyday terms, of specific events experienced by individuals or groups of individuals.[18] This design is less interpretive but more naturalistic because it does not require the generation of highly abstract concepts.[19] Therefore, the gained knowledge is likely understandable and practicable among practitioners.

Research setting: This study was conducted in Chiang Mai province in northern Thailand. Among 25 districts of Chiang Mai City, one university hospital in Muang district or the urban area was selected. Four community hospitals in four districts, San Pa Tong, Doi Tao, Mae Chaem, and Fang, which are 30, 125, 150, and 154 kilometers from the city, were also the settings to recruit parents in sub-urban and rural areas. The land of these four selected districts are mostly agricultural fields. Two districts are close to an industrial complex located in a nearby province. Three districts are located in the highlands in which hill tribe people live.

Participants: A purposive sampling technique and a referring technique were employed to recruit the participants based on the following criteria: 18 years old or older, mother or father having at least one baby younger than one year, or having no baby but the pregnancy was in the prenatal period, being born and living their life in northern Thailand, and being able to communicate in the Thai language.

Data collection: Data were collected between October 2015 and July 2016 in in-depth interviews until analysis revealed that saturation of data was achieved. Semi-structured interviews can capture the concerns and perceptions of groups and the order of interviewed issues and questions can be modified allowing the flexibility to probe for details.[20] In this study, the participants were invited to undertake 1-2 interviews but all of them preferred only one session, ranging from 20-70 minutes. If the interviews are the sole source of information, many interviews should be conducted.[20] Therefore, a large number of participants with different backgrounds were recruited until findings were complete through data saturation. These data collection procedures ensured the richness and thickness of data.

Each interview was audio-recorded, without note-taking but field notes were written immediately after each interview. Interviews were transcribed verbatim. The interview started with a broad request: *Please tell me the development or changes of your baby from early pregnancy to the present time* (or up to birth, for the participants who were not in the prenatal period). Additionally, specific questions were asked to explore their perceptions on aspects of prenatal development, optimal development at birth, expectations of the grown-up child and how to reach their expectations during pregnancy, and a vulnerable period of prenatal development. Examples of questions asked are: *How many aspects of development are there?; What do you wish for your baby at birth?*; and *During which periods of pregnancy is your baby most at risk?* Probing techniques were also employed to obtain deep and authentic understanding, as well as rich and thick data. A demographic data sheet was employed to describe the parents' background.

Data analysis: Data collection and analysis were conducted simultaneously. The data were analysed

using a content-analysis approach.[21] We began by identifying a unit of analysis, which was interview text regarding the parents' perceptions on prenatal development. The interview text was sorted into two main content areas: prenatal development and its aspects, and issues related to optimal development, a vulnerable period, and expectations of a grown-up child. Each interview transcript was reviewed several times to obtain a comprehensive understanding of each participant's situations and experiences. The meaning units were identified by considering their applicability to the two content areas. The meaning units were condensed into forms that closely resembled the original text, and were then further condensed to highlight the underlying meaning by the researchers. Codes were assigned then to these condensed meaning units. The various codes were then compared, and their similarities and differences were identified. The codes were sorted into subcategories and categories.

Trustworthiness: To achieve credibility of findings, the tentative categories and subcategories were reviewed by five participants, a process known as member-checking technique.[22] Additionally, three discussions were held among the team and one expert (peer-debriefing technique). An audit trail to achieve confirmability was also performed in the discussion by reviewing all documents recorded throughout the research process.[22]

Ethical considerations

This research project was approved by the Research Ethics Committee of the Faculty of Nursing, Chiang Mai University (REC approval number: No.381/58COA-NUR123/58). Informed written consent was obtained from all participants. The right to withdraw from the study at anytime was explained, but no one wanted to. All participants wanted only one interview session, which some of them agreed to extend the interview to 70 minutes. No one appeared to develop stressful feelings during or following the interviews. Each participant was awarded 150 Baht (4-5 US dollars) in return for their time. Anonymity and confidentiality was maintained throughout the study.

Findings

Forty-eight participants were recruited from the antenatal clinics of five hospitals. Six additional participants with infants were referred by former participants. In total, 54 parents served as participants, 28 mothers (M), 20 fathers (F), and 3 couples (MF or FM). The average age was 29.9 years. All participants were married, most were Thais and Buddhists, and lived in suburban or urban areas. The participants who graduated at 10-12 grades, senior vocational school or higher accounted for 64.8%. Approximately 59% of participants considered they had adequate income. The participants' occupations varied. Overall, the recruited parents were predominantly Thais who were not in a low socioeconomic status and could access healthcare services. Only a small number of participants from ethnic groups were recruited due to language barriers. Among 48 participants in prenatal period, the majority of unborn babies were of 28-41 weeks gestational age. Twenty-two reported experiencing at least one pregnancy complication. A half had no other living child (see **Table 1**).

Based on the participants' responses, their perceptions on prenatal development were determined in two categories: *Beyond physical growth* and *Essential issues*. Excerpts from the interviews are presented in italics, '---' indicates a pause or stutter, while '...' indicates the exclusion of an unrelated statement; meanwhile, the interviewer's statements are enclosed in '[ ].' The participants are distinguished using codes; a code of M^1 indicates the mother from couple number one whose husband did not participate in the study. A code of FM^9 indicates the father from couple number nine and his wife also participated in the study. The terms baby or the unborn baby is used to indicate a fetus.

Table 1. Participants' background (n=54)

Participants' Background	Mothers (M=32, 59.3%)	Fathers (F=22, 40.7%)	Total (54, 100%)
Age			
18-30	17 (53.1)	10 (45.5)	27 (50.0)
31-42	15 (46.9)	12 (54.5)	27 (50.0)
Race			
Thai	22 (68.8)	21 (95.5)	43 (79.6)
Karen, Hmong, or Tai-yai	10 (31.3)	1 (4.5)	11 (20.4)
Religion			
Buddhism	27 (84.4)	19 (86.4)	46 (85.2)
Christian	5 (15.6)	3 (13.6)	8 (14.8)
Home towns			
Chiang Mai City	23 (71.9)	11 (50.0)	34 (63.0)
Other parts of northern Thailand	9 (28.1)	11 (50.0)	20 (37.0)
Residence			
Urban	8 (25.0)	7 (31.8)	15 (27.8)
Semi-urban	15 (46.9)	10 (45.5)	25 (46.3)
Rural	9 (28.1)	5 (22.7)	14 (25.9)
Education			
Grade 6 or lower	4 (12.5)	1 (4.5)	5 (9.3)
Grade 7-9 or junior vocational school	7 (21.9)	7 (31.8)	14 (25.9)
Grade 10-12 or senior vocational school	12 (37.5)	8 (36.4)	20 (37.0)
Bachelor degree or above	9 (28.1)	6 (27.3)	15 (27.8)
Incomes			
Inadequate-just adequate	13 (40.6)	9 (40.9)	22 (40.7)
Adequate and residual	19 (59.4)	13 (59.1)	32 (59.3
Occupation			
Unemployed or housework	9 (28.1)	2 (9.1)	11 (20.4)
Farmers or labourers	10 (31.3)	9 (40.9)	19 (35.2)
Clerks, officers, or merchants	13 (40.6)	11 (50.0)	24 (44.4)
Gestational age (weeks) (n=48)			
8-14	2 (7.4)	1 (4.8)	3 (5.6)
15-27	4 (14.8)	4 (19.0)	8 (16.7)
28-41	21 (77.8)	16 (76.2)	37 (77.1)
Pregnancy complications			
No	21 (65.6)	11 (50.0)	32 (59.3)
Yes*	11 (34.4)	11 (50.0)	22 (40.7)
Number of live children			
0	16 (50.0)	11 (50.0)	27 (50.0)
1	11 (34.4)	6 (27.3)	17 (31.5)
2	5 (15.6)	5 (27.3)	10 (18.5)

*DM=9; elderly=8; twins=3; obesity=2; others=15

Category 1: *Beyond physical growth*

Prenatal development was believed to be growth and chronologically progressive changes of an unborn baby as evidenced by these statements:

> *Getting bigger ... is similar to development, which means gradually growing* (F^{35}),

and

> *First, the cells separate and expand to form hands and legs. The heart then begins beating. Then, the eyes and other body parts develop* (FM^{9}).

Some participants thought of the emotion, feelings, minds, cleverness or IQ of their baby. One mother (M^{37}) had a belief that the mind of her unborn baby existed before conception. Notably, the participants did not limit prenatal development to the growth of the babies' bodies. That is, prenatal development was a period of progressive changes which went *Beyond physical growth.* Aside from physical growth, the participants believed their unborn babies had meaningful movements, engaged in daily activities, had feelings, were able to sense and respond, and had the ability to learn and memorize. All these kinds of changes were grouped into 6 subcategories.

1. Growth, forming and functioning of organs

In addition to physical growth and organ formation, progressive changes in the baby's body included organ functioning. Heart and lung functions were interpreted from the parents' experience that their unborn baby's heartbeats were felt by touch (F^{13}) or pressing their ear (F^{27}) to the mothers' abdomens, and that the baby practiced breathing (M^{44}). There was a variation on the perceived periods of organ formation, such as the third to fourth (F^{45}), the third to sixth (M^{42}), and the fourth to seventh (M^{44}) months of gestational age; and on the most important baby's organs, such as all organs, heart, brain, eyes, lungs, as well as hands and arms. The importance of the fetal brain was mostly related to intelligence and physical control, but not considered related to moral and psychosocial control.

2. Meaningful fetal movement

Fetal movement was mentioned by many participants as a prominent change regarding their unborn baby's development. One mother (M^{21}) described various kinds of movements: simple movement, moving like waves or flowing, hiccupping, jerking, and elbowing. In addition, parents described the movements as moving the entire body, moving around, rotating, slightly moving the body, wiggling, kicking, knocking, knocking and nibbling, nibbling, back-blending, and changing positions. Movements of certain body parts could be seen during ultrasound exams, such as sucking fingers (M^{4}, FM^{9}), opening eyes and mouth (M^{10}, F^{19}), smiling (FM^{9}), and raising hands and legs (M^{10}). Interestingly, M^{10} said her baby tried to grasp her hands while she was playing with and touching her baby on her abdomen. Fetal movement was also considered to indicate many meaningful things other than body movement, including the baby's well-being and being alive ($M^{15,20}$), waking up (M^{4}), being strong and healthy ($M^{4,42}$), good brain growth (M^{7}, F^{2}), expression of feelings (M^{30}) and needs, such as hunger (M^{4}), communication with their father (M^{30}), and responses to certain stimuli (M^{4}). Other parents felt that fetal movement was sometimes caused by the baby feeling muscle tiredness ($M^{10,14}$, F^{35}). Although the participants may have different perceptions about the fetal movement, they shared similar views about the meaningfulness of their baby's movement.

3. Performing daily activities

Many participants explained about their unborn babies' activities, including sleeping, waking-up, taking a rest, eating (F^{45}), and elimination activities. One said:

> *The kid eats and then stools, but passing urine? Probably not, I'm not sure* (F^{25}).

One mother said her baby probably swam and floated inside her womb, because she often swam and

walked in the swimming pool (M^{37}); she felt that her baby needed exercise. Both mother and baby were believed to have a connection through activities since while the mother was doing something, her baby was also performing the same action, such as eating (M^{38}, F^{45}), swimming (M^{37}), and having fun while going out (MF^{34}). Some participants believed that their baby could communicate with the mother and/or the father ($M^{7,37,45}$, F^{12}), talking with themselves (M^{37}), playing with their parents, mostly in regard to cases when the parents talked to the baby or touched the mother's belly (e.g. $M^{5,10}$, F^{6}), or when they shone a flashlight on the mother's belly (MF^{34}), and played with themselves by sucking fingers (M^{4}). In summary, from the participants' understanding, a baby has many similar daily activities to those of an infant, including sleeping, resting, waking, doing exercise, eating, defecating, socializing, playing, and communicating.

4. Displaying feelings

Although many participants were ambivalent regarding whether their baby underwent emotional development, they described their unborn babies' changes using various terms relating to emotions or feelings. These included being in a good mood and feeling cheerful ($M^{3,47}$, $F^{1,13}$), smiling ($F^{2,9}$), having fun (M^{4}, $F^{1,2,35}$), feeling fresh (M^{26}), as well as some stressful feelings, such as being moody (M^{26}), upset (M^{37}), angry (F^{45}), stressful (M^{10}), or sad (M^{40}). Other expressed feelings were: hungry (e.g. $M^{10,44}$, F^{45}), stomach pains ($M^{10,42}$), dislike or like ($F^{12,13}$), uncomfortable as a result of uterine contraction (M^{44}) or the small space available in the womb (M^{8}), or startled following a motorcycle accident (M^{10}). However, not all participants had similar beliefs about their baby's emotional expression, for example, some thought that their baby did not experience 'like' or 'dislike' (M^{16}, F^{25}).

Mostly, the baby was believed to express their feelings similar to and simultaneously with their mother because they were considered to be mentally connected (M^{1}, F^{52}), bonded (M^{1}), related (M^{3} F^{2}), a single person (F^{51}), or physically connected, such as maternal carrying of the baby (F^{2}), as well as sharing the same heart (M^{30}) or blood (M^{37}). Moreover, one mother believed that her emotions influenced her unborn baby's emotions after her baby was born, as she said that if she was regularly angry during pregnancy, her baby would be aggressive or depressed after the baby was born (M^{10}). Whilst the connection between mother and her baby were explained, one father (F^{13}) felt that his baby's mind was connected to his own mind; another father (F^{12}) said that his baby could sense his moods. In conclusion, parents believed there were positive and negative feelings displayed by the baby, the connection of the mother's and the baby's feelings, the influences of maternal feelings on the baby's emotions inside and probably outside the womb, as well as the possibility to have connections between the father's and the baby's mood.

5. Sensing and responding

Mostly, the participants felt that their baby could hear their voice (such as their speech and singing), or songs and music, and could feel when their parents touched their mother's belly, as shown through the following statements:

> *At first, when dad touched* (the mother's belly), *the baby did nothing; seemingly, the baby was afraid of him. However, after a while, the baby began responding when dad talked to* (M^{4}).

One mother described in terms of playing in response to a flashlight stimulus (MF^{34}). However, some participants did not know if their baby could see ($M^{26,41}$), while some felt that their baby could not see (M^{39}, F^{25}). Some mothers mentioned about their baby's reactions to the sweet taste (MF^{9}) or spicy food ($M^{14,23}$, F^{17}). Aside from concrete sensation to stimuli and interaction, many participants felt that

their babies could sense their parents' love. Interestingly, one mother (M^{30}) thought her baby had an extraordinary sense, as she said:

> *When dad comes back home, it seems that the kid realises that dad is home. The kid stops moving in order to behave for dad.*

In conclusion, the unborn baby could sense or feel and then respond or react towards that sensory stimulation, interaction, and parents' love, but their abilities might be perceived in different ways among the parents.

6. Learning and memorizing

Two participants stated:

> *The kid learns ... I said to the kid 'move,' and shortly afterwards the kid moved. Then, I asked to move once more. It seemed that the kid thought for a while and then moved a little* (M^{1}),

> *The kid may possibly recognise some things, such as parents' voices, but the kid's thoughts are not similar to a newborn's* (F^{2}).

Some participants believed that their unborn baby had the ability to learn, to think, and to remember. One father (F^{2}) read stories to his baby because he believed that it would make them remember their dad's voice, and would encourage them to think and follow the stories. A few mothers believed that if their baby listened to English stories or songs, they would be good at the English language. However, some participants believed their baby did not have thoughts (M^{44}), did not have memories (F^{27}), or had neither ($F^{17,19}$).

Category 2: *Essential issues*

Parents performed their behaviors to promote their baby's development based on their perceptions about various aspects of prenatal development. In addition, there were other kinds of their understanding surrounding prenatal development, categorized as *essential issues*, and consisting of 4 subcategories.

1. No deformity (Krob 32 ครบ 32), strong and healthy, or 'normal

In terms of optimal development of the baby at birth, most parents wished the best for their unborn baby, but that they did not expect their baby to return such a sentiment. Their wishes included '*Krob 32* (ครบ 32),' 'strong and healthy,' or 'normal' (like other babies), or of common criteria/standards. '*Krob 32*,' in Thai means a baby has all organs complete without deformity. This is preferred rather than using the negative word *Phikan* (พิการ means deformity or congenital anomaly). This implies cultural beliefs among Thais about bad omens. That is, bad things might happen to their baby if one saw or mentioned some bad things. In addition to no health problems of their unborn babies, some mothers wished their child would be easy-going or obedient, not naughty or bad-tempered.

2. A link of development and deformity

The participants believed that deformity and development were linked and that promoting the development of their babies and preventing deformity had to be performed simultaneously. *'Krob 32'* and *'strong and healthy'* were sometimes used interchangeably when describing the optimal development of the baby at birth, as one father (F^{19}) said:

> *I wish for only one thing, Krob 32.* [What do you mean?] *Strong and healthy.*

The ways they prevented deformity were similar to those of promoting development for example:

> *By being with the kid, playing music, and talking with the kid* (FM^{15}),

and

> *By the mother drinking milk and eating vegetables* (F^{22}).

3. Primarily moral and happy, and secondly intelligent

The participants were asked whether they would most prefer their baby to become intelligent,

moral, or happy, when they became adults; and how to achieve this during pregnancy. Some participants wished all three traits because they felt that all three were related. Nevertheless, most of them desired their unborn babies to be moral or happy; and intelligence was considered a less-important, but nonetheless welcome trait, as one father said:

> *To be happy. I don't care whether my kid will be clever or not* (F^{13}).

One reason for this was the feeling that intelligence would be a source of pressure for their child (M^{21}). For a child to be 'intelligent', the participants thought it was necessary to promote brain development through enriched food and talking with the baby. In order to have a happy child, one father (FM^{9}) felt that if a baby was happy while being inside the womb, such as by the mother eating good food and taking adequate rest, they would develop an open mind, further affecting development and intelligence. Other methods practiced included maintaining a good mood (M^{21}), talking to the baby (M^{10}), and travelling to places the baby would like (F^{12}). Moral development was considered to be better promoted during childhood than during the prenatal period, through teaching or cherishing the child. However, some participants suggested talking to their unborn babies (F^{6}), avoiding fighting between parents (F^{22}), and continually telling the unborn baby to be a good child (M^{10}).

4. Risks exist from conception to birth

Theoretically, a fetus is most vulnerable to birth defects during the first trimester since it is the period of organ formation. However, the participants perceived that their baby was at risk throughout the pregnancy and many believed that early pregnancy was the stage during which miscarriage was most likely. Abnormalities or deformities during early pregnancy were also mentioned by some participants as the stage of organs formation ($M^{10,21,29}$, FM^{15}), rapid fetal development (F^{27}), or low immunity of an unborn baby (F^{22}). Inadequate nourishment at this stage was believed to negatively impact further development, such as an inability to form arms and legs (MF^{9}), and morning sickness could cause food deprivation. Regarding late pregnancy, the main risks mentioned were premature delivery, leakage of amniotic fluid, and lack of physical development as a result of inadequate food and fast growth. Decreased fetal movement and tangling of the umbilical cord around the unborn baby's neck was also considered to occur during the near-term period because there was a lack of space inside the womb (M^{44}).

Discussion

Growth represents an increase in size, whereas development represents an increase in function.[9] In regard to fetal development, these two terms are commonly used interchangeably.[23] Parents tend to use 'growth' more often, as its meaning is quite clear and the fetal development in this regard is observable by the enlargement of the mother's belly. Parents can also access information regarding fetal growth from midwives and other healthcare providers, through ultrasound examinations, and various websites. On the contrary, some organ functions were not adequately explained to them as indicated by some misunderstanding about the baby's breathing, for gas exchange, stool elimination, and no urination. Further, description about macronutrient deprivation during the first trimester was exaggerated to interfere with organ formation.

According to the parents interviewed in this study, development involved various progressive changes, but this was too abstract form them to explain explicitly. Similar to healthcare providers, most of them did not refer to the aspects of child development. Instead, parents' understanding of prenatal development was 'beyond physical growth,' and concerned with believing that unborn babies are people with daily activities, feelings, senses, and responses, and the abilities to learn and memorize. Theoretically, however,

fetal neurobehavioral function implies fetal development, consisting of the heart rate, motor activity, behavioral state, and interaction with the environment.[23] Some, but not all, parents considered brain development to represent one part of prenatal development. Further, they viewed fetal heart beats as indicative of their baby being alive and well, whereas healthcare providers use fetal heart-rate patterns as indicators of the condition of the autonomic nervous system and for performing more intensive assessments of well-being.

From an academic point of view, researchers have attempted to determine fetal behavioral states by considering patterns of three parameters: heart rates, motor activities, and eye movements, similar to the means of measuring the sleep-wake states of newborns;[23] meanwhile, the parents in this study mentioned that their unborn babies had clear sleep and awake states. Moreover, similar to healthcare providers, the parents described various types of physical activities; but they could not observe progress from uncoordinated movements to more integrated, narrow, behavioural patterns, which can be observed by physicians through ultrasound exams. The parents tended to view fetal activities, especially fetal movements, as more cognitive-, psycho-emotional-, social-, and behavioral-oriented, as well as more meaningful and more similar to normal human actions, than do healthcare providers.

Although there are no direct neural connections between the mother and the fetus,[23] the parents believed that a psychological bond existed, and that a fetus depended heavily on their mother in this regard, and somewhat on the father. This belief led them to interact with their unborn babies as if they were persons, performing protective and productive behaviours, and they were also careful to adopt healthy behaviours. In addition, they felt that the father contributes to the optimal development of an unborn baby.[1] Interestingly, physical activities of a mother and her baby were believed to connect and occur with synchronicity.

Parents and researchers have some similar points of view regarding fetal interaction with the surrounding environment, that is, an unborn baby can sense and respond to stimuli.[1] The parents mostly focused on external stimuli, especially their voices; however, researchers have found that a fetus can respond to stimuli both inside and outside the uterus. Fetal sensory systems develop in an analogous order: cutaneous, vestibular, auditory, and visual.[23] In addition to nutrition and stress regulation, appropriate light and sound stimulation may yield improved fetal neurodevelopment and reduced newborn sleep disturbance.[24] After the formation of functional sensory and motor systems, the fetus can learn and respond to non-complex external stimuli.[25] The early phases of learning begin after mirror neurons stimulate the fetus to become aware of the environment, and memory functionality develops through auditory cues and frequencies.[24] Further, the fetus has the ability to learn from linguistic experience; a recent study has suggested that the earliest prenatal experience of speech may play a more important role in language development than previously believed.[26] However, some parents had a particular belief that the experience of their unborn baby in English language could lead their baby have English language development.

Regarding optimal outcomes at birth, the parents wished their unborn babies to be either *'Krob 32'*, 'strong and healthy,' or 'normal.' Good brain development or intelligence was also mentioned by some parents. In 1990, according to the goal of safe motherhood recommended by the WHO,[27] the Thai national goal became that 'the baby is born alive and that the mother is safe'. Since 2010 the goal has expanded to *'Krob 32 Samong dee'*, meaning no deformities and good brain development,[28] which is somewhat congruent with the parents' wishes. Deformity in a body part concerns a deviation from its normal shape or size, resulting in disfigurement.[29] In addition to structural abnormalities such as cleft

palate or lip, there can also be abnormalities in function, such as poor intelligence. Birth defects, structural anomalies or physical deformities are highly concerning for parents. As some Thai people hold traditional beliefs regarding omens, they use the term *'Krob 32'* to refer to a lack of deformities, congenital anomalies, and birth defects; this Thai term comes from the *Sutta Pitaka*, volume 17, of the *Tipitaka*, volume 25.[30] Despite this use of *'Krob 32'*, many healthcare providers prefer the terms 'deformity', 'congenital anomaly', or 'birth defect' when communicating with parents. Another issue is the link of deformity and development; with one end of this link being deformity and the other being optimal development. Thus, when discussing optimal development, a lack of deformities is implied. Similarly, in promoting fetal health, a significant practice is preventing fetal exposure to teratogens, which are factors that can adversely affect a fertilised ovum, embryo, or fetus.[9]

The most critical period of fetal growth is the embryonic or organogenesis period,[31] during which it is very important for women to avoid teratogens. However, many parents viewed their unborn baby as vulnerable throughout pregnancy, not limiting their concern to teratogen exposure; for instance, some were concerned that morning sickness could result in their unborn baby experiencing malnourishment leading to organ malformation. The parents were unlikely to mention folate insufficiency. Such individuals require accurate information regarding micronutrient requirements during the first trimester. Additionally, some parents mistakenly believed that undernutrition of a fetus would have no impact on later life and that any malnutrition could be improved after birth.

Most parents hoped that their babies would grow to be 'moral' and 'happy' adults; with some parents also desiring 'intelligence'. This finding supports that of a survey conducted in Bangkok, which found that 99% of 407 parents agreed that a child should develop good health, emotions, and morality, with just 49–52% wanting their child to be intelligent.[32] The national goal of intelligent, moral, and happy children is slightly different from parents' expectations which emphasizes intelligence less. Although some different perceptions of the parents were found in this study, influences related to the different backgrounds of the parents could not be determined.

Conclusion and recommendations

To strengthen person-centerd care, nurses and midwives should ascertain and incorporate parents' perceptions into their clinical practice. A common understanding among parents' regarding prenatal development is that it is 'beyond physical growth', and that it involves various progressive changes towards becoming a human being. This partly contrasts with the view of most scholars, who feel that prenatal development is much more physical aspects oriented. There are some different points of view in this regard, but these do not necessarily contradict. Information provided to parents regarding prenatal development must be accurate and scientifically support. However, their own beliefs should also be acknowledged. Their misunderstandings about lung, kidney, and bowel functions, as well as macronutrient and micronutrient requirements of the fetus needs more clarification and health education. When interacting with an unborn baby, healthcare providers should respect the unborn baby as a person who has daily activities, feelings, a mind, thoughts, and capabilities. Optimal prenatal development should be pursued, focussing on preventing deformities as well as promoting an unborn baby to be strong and healthy, and normal. When discussing promotion of prenatal development with parents, the goal of their baby growing up to be a good and happy person can be employed as motivation. Fostering an intelligent person can also be used as motivation, but this needs some modification based on parents' attitudes, using other more positive and less expectant

terms, such as 'brain development.' Brain functions on moral and psychosocial control should also be elaborated. In promoting prenatal development, prevention of birth defects should be integrated, since these topics are related and they reflect parents' desires. More importantly, individual parents' perceptions need to be assessed and an individual approach needs to be employed. This study has provided some rich and interesting knowledge useful to clinical practice; however, it is limited to the northern Thai context. Exploration on perceptions of parents in other parts of Thailand is also recommended to achieve accumulative knowledge.

Limitation

Different perceptions of parents with different gender, personal and ethnic backgrounds could not be determined in this study. The results could not be applicable to the particular groups of parents. Parents with pregnancy complications in the present study were limited to those with mild forms of complications. This might lead to be unable to grasp different perceptions of this group from those without complications. Additionally the perceptions of the hill tribe parents might not have been homogenous with the native Thai parents.

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การรับรู้ของบิดามารดาในภาคเหนือของไทยเกี่ยวกับพัฒนาการของทารกในระยะตั้งครรภ์

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บทคัดย่อ: บิดามารดามีบทบาทสำคัญในการส่งเสริมพัฒนาการของทารกตั้งแต่อยู่ในครรภ์ แต่ยังไม่ทราบแน่ชัดว่าบิดามารดามีโลกทัศน์เกี่ยวกับพัฒนาการของทารกในครรภ์เป็นอย่างไร การวิจัยคุณภาพเชิงพรรณนาโดยการสัมภาษณ์แบบกึ่งมีโครงสร้างนี้มีวัตถุประสงค์เพื่ออธิบายพัฒนาการของทารกในระยะตั้งครรภ์ตามการรับรู้ของบิดามารดาไทยในภาคเหนือ เก็บข้อมูลในช่วงตุลาคม 2559 ถึง กรกฎาคม 2560 จากมารดา 31 รายและบิดา 23 รายซึ่งอยู่ในจังหวัดเชียงใหม่และวิเคราะห์ข้อมูลด้วยวิธีวิเคราะห์เชิงเนื้อหา จากการรับรู้ของบิดามารดาพบว่าประกอบด้วย 2 หมวดใหญ่ ประการแรกคือ 'เหนือเกินกว่าการเจริญโตด้านร่างกาย' กล่าวคือพัฒนาการของทารกในระยะตั้งครรภ์ไม่ได้จำกัดอยู่เพียงการเปลี่ยนแปลงทางร่างกายเท่านั้นแต่รวมถึง 6 หมวดย่อยดังต่อไปนี้ 'การเติบโตและการสร้าง/ทำหน้าที่ของอวัยวะ' 'การดิ้นของทารกในครรภ์อย่างมีความหมาย' 'การทำกิจวัตรประจำวัน' 'การแสดงความรู้สึก' 'การรับความรู้สึกและการตอบสนอง' และ 'การเรียนรู้และการจดจำ' ประการที่ 2 คือ 'สาระสำคัญ' ซึ่งประกอบด้วย 4 หมวดย่อยคือ 'ปราศจากความพิการ สมบูรณ์แข็งแรง หรือปกติ' 'ความเสี่ยงมีตั้งแต่ปฏิสนธิจนกระทั่งคลอด' 'เบื้องต้นคือเป็นคนดีและมีความสุข ตามมาด้วยมีความเฉลียวฉลาด' และ'ความเกี่ยวเนื่องของพัฒนาการและความผิดปกติ' สามหมวดย่อยแรกเป็นการรับรู้เกี่ยวกับพัฒนาการอย่างเหมาะสมเมื่อแรกเกิด ระยะเปราะบาง และ ความคาดหวังเมื่อบุตรเติบโตขึ้น ส่วนหมวดย่อยสุดท้ายแสดงว่าพัฒนาการไม่ได้แยกจากความผิดปกติ การส่งเสริมพัฒนาการของทารกในครรภ์ต้องมีการป้องกันความผิดปกติไปพร้อม ๆ กันด้วย จะเห็นได้ว่าบิดามารดามีการรับรู้แตกต่างไปจากโลกทัศน์ของบุคลากรทางสุขภาพอยู่ในระดับหนึ่ง เพื่อส่งเสริมการดูแลโดยยึดบุคคลเป็นศูนย์กลาง พยาบาลและผดุงครรภ์ควรส่งเสริมพัฒนาการของทารกในครรภ์ในทุกมิติโดยปรับให้เหมาะสมกับความเชื่อและความเข้าใจของบิดามารดา การป้องกันความผิดปกติแต่กำเนิดควรบูรณาการไปพร้อมกันกับหัวข้อการส่งเสริมพัฒนาการของทารกในครรภ์

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คำสำคัญ: บิดามารดา การรับรู้ พัฒนาการของทารกในระยะตั้งครรภ์ ภาคเหนือของประเทศไทยและ การวิจัยเชิงคุณภาพ

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