Challenges of Avoiding Congenital Disorders: Experiences of Pregnant Women in Northeastern Thailand

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Abstract: Maternal knowledge and behaviors attempting to prevent or avoid congenital disorders have not reached optimal levels. This qualitative descriptive study describes the challenges of avoiding congenital disorders from the experiences of pregnant women in northeastern Thailand. Data were collected between November 2017 and August 2019 from 18 pregnant women through in-depth interviews and analyzed using thematic analysis.

Three themes reflecting challenges emerged. Firstly, 'traditional beliefs' were challenging regarding unclear and potential adverse outcomes. Secondly, the challenges of 'contemporary beliefs' included distinct views and inaccessible information, characterized as non-apprehension, non-comprehension, non-modernization, or non-precision to preventing congenital disorders. Finally, 'daily life activities,' in selectiveness in eating, attainment of mother-child healthiness, and harm avoidance were aimed at both congenital disorder prevention and fetal development promotion. Some significant challenging topics included: vulnerable periods; some taboos; nutrients for brain development; safety in food, working, and environment; concerns with dangers of physical activities, exercise, maternal stress, and medicines; and misperceived benefits of herbal drugs and fetal stimulation. Nursing and midwifery practice guidelines should integrate the concept of congenital disorders prevention into the promotion of fetal development using culturally-sensitive approaches. The found challenges should be overcome and further applied in refining the practice guidelines.

Keywords: Challenges, Congenital disorders, Pregnancy, Prevention, Qualitative research

Received 14 February 2023; Revised 5 June 2023; Accepted 7 July 2023

Introduction

Congenital disorders (CD) or congenital disabilities are structural or functional abnormalities occurring during pregnancy that are present at birth or later in life. These are a global burden, especially in low-and middle-income countries,[1] including Thailand. The most concerns are severe structural deformity at birth, mainly during the first trimester by exposure to

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DOI: 10.60099/prijnr.2023.261330

teratogens. Poor fetal development, especially in brain and intelligence, is a functional type that occurs by exposure to harmful substances throughout pregnancy. Thailand has encountered a hidden problem of a mild form of brain dysfunction, resulting in reduced intelligence, as seen from the national policies targeting preventing delayed child development starting from conception.[2]

Many external factors causing CD include malnutrition, infection, medications, illicit substances, and pollutants,[1] which are often manageable through pregnant women's behavior. However, there are reports of pregnant women in Thailand having low urinary iodine concentrations[3] and low intake of folate tablets.[4] In some studies, the scores of pregnant women's knowledge and practice on CD prevention[5] and food safety behavior[6] did not reach the optimal levels, and only 12.8% obtained food safety information.[5] There are also reports on exposure to methamphetamines,[7] organophosphates,[8] and secondhand smoke at home.[9] In the Thai context, some challenges to pregnant women's understanding and practice must hinder pregnant women's capability to prevent mild to severe forms of their unborn babies' abnormalities.

In this study, pregnant women who lived in Thailand's northeastern (NE) region were the target sample since the rate of age-appropriate development of early children was low at 51.9%, whereas the goal was 85%.[10] Compared with three other regions, the NE Thai region had the highest rates of age-inappropriate development of 3- to 4-year-old children, low birth weight, and very low to low income in households.[11] Also, many NE Thai people are likely to hold traditional and supernatural beliefs, which health providers may overlook. For example, in childbearing, there are several kinds of *Kalum* (คะลำ), the prohibition of eating or doing something, such as not eating vegetables with a strong odor or meat and not preparing essentials for a baby before birth.[12] A recent survey revealed that during pregnancy, abstaining from sexual intercourse and hard work and practicing according to Buddhist doctrines and rituals were the most common.[13] However, this study's findings are limited to local wisdom in the NE Thai context, excluding the challenges of pregnant women's behavior in safeguarding their unborn babies from abnormalities. In this current study, pregnant women were invited to share their experiences, and further interpret the challenges.

Study Aim

This study aimed to describe the challenges of avoiding congenital disorders from the experiences of pregnant women in northeastern Thailand.

Methods

Design: A descriptive qualitative design was chosen as it aims to understand the particular experiences of individuals.[14] This pragmatic approach involves familiarizing with everyday language usage and terms applicable to practitioners rather than abstract theories.[15,16] An authentic and deep understanding of individuals is based on their perceptions and everyday life experiences, which cannot be understood through quantified measuring but through interactions between individuals and researchers.[17] This report followed Consolidated criteria for reporting qualitative studies (COREQ): a 32-item checklist.

Participants and Setting: Data were collected in Ubon Ratchathani province in northeastern Thailand. At the antenatal clinics of one tertiary and one community hospital, pregnant women who were 18 to 35 years old, had a gestational age of 20-32 weeks and had no medical or obstetric complication were approached by the primary investigator (PI) as the doctoral student and the researcher. After that, recruitment procedures were conducted following the protocol approved by the Research Ethics Committee. Purposive sampling techniques were employed to obtain diversity in socioeconomic status. They were excluded if they were unwilling to participate or could not give interviews. None of the potential participants refused

to participate. The point of data saturation, no new coming data, was reached after 18 participants were interviewed.

Ethical Considerations: The Research Ethics Committee of the Faculty of Nursing, Chiang Mai University, approved the study (FULL061/2017) as well as the hospitals involved. The PI asked pregnant women for their interest in the project and permission to review their health records. If they were eligible, the PI provided them with an information document about the research project, its risks and benefits, and their rights. Verbal explanations were also provided. They were requested to sign a written consent form if they volunteered to participate. No one withdrew from the study. Interview locations and schedules were arranged based on their safety, privacy, and convenience. All personal details were held confidential and respected.

Researchers as the Research Instrument: The PI lives and works in the study province as a midwife and a nursing teacher, and this work assists her in understanding the phenomenon of the study and the participants' culture. The research team acknowledged that our personal and professional backgrounds could not be excluded from the study. However, these were employed with caution. Additionally, in her doctoral study, the PI had experience collecting and analyzing qualitative data. In all processes of this study, the PI was supervised closely by an advisory committee. Based on the literature review, the interview guide of the study included broad issues such as: *"Please tell me what you do in your daily living to prevent your baby from having any anomalies?"* and *"What are your beliefs about the abnormalities of an unborn baby?"*

Data Collection: Data were collected between November 2017 and August 2019 using in-depth interviews, immediately followed by writing a reflective journal. Most of the interviews were conducted at the participants' homes in private and confidential places, for 2-3 sessions for 30-60 minutes each. The interviews started with broad issues about their daily living to avoid their baby from having any anomalies and their beliefs about the baby's abnormalities. Then probing techniques were used to gain depth and breadth of the interpretations and meaning of the participant's experiences. For example, *"What makes you believe that?" "What makes you do that?"* and *"What happened after you did that?"* The conversation was non-directive to allow the participants to tell their stories. Rapport was developed by having the participants choose the time and location for interviews, having informal conversations, and using attentive and non-judgmental listening techniques. The interviews were audio-recorded and transcribed verbatim.

Data Analysis: The analysis consisted of six steps.[18] The first was the PI familiarizing herself with data by reading the transcripts several times. The second was generating initial codes by splitting the data about the participants' beliefs and practices into distinct excerpts and labeling them with codes. The third was searching for themes by grouping various codes into potential subthemes and grouping subthemes into potential themes. The next was reviewing subthemes and themes, examining the relations of codes and the entire data set with the potential subthemes and themes. The fifth and last step was defining and naming subthemes and themes and writing the report.

Trustworthiness: As Lincoln and Guba determined, the researchers used the four conceptual elements to achieve the findings' trustworthiness.[19] Regarding credibility through a member-checking method, the obtained data were summarized, and the participants reviewed them. In peer debriefing, the advisory committees and experts validated all research processes and tentative findings. Auditing all research processes and documents also ensured dependability and confirmability. A reflective journal was immediately recorded after the interviews to reduce bias for the researcher to attain confirmability. Finally, a thick description of the findings was given to achieve transferability.

Findings

All 18 participants were Buddhists, with an age range of 20 to 34 years. Ten participants had finished vocational school or lower. Only one participant had a single marital status. Four participants were housewives; one worked as a farmer; three worked in healthcare settings; the remaining were self-employed or worked in the private sector. The family income of 15 participants was 10,000 baht per month or higher (1 US dollar = 33 baht). Fifteen participants lived in urbanized areas, and eight participants were in their first pregnancy. Their gestational age range was 20 to 32 weeks.

In trying to prevent their unborn babies from CD, the participants nurtured and safeguarded them through their daily life activities on food, attainment of mother-child healthiness, and harm avoidance. They had the capability to prevent CD to some extent, but some of them faced some challenges in each activity. Collectively across all participants, the common and significant challenges were extracted and reported. Their daily life activities were underpinned by their traditional beliefs and contemporary beliefs in relation to CD. Likewise, the challenges of the beliefs were found and presented. **Table 1** summarizes three themes, seven subthemes, and groups of codes for each subtheme, which emphasizes the challenges of the beliefs and the activities.

Table 1. Summary of challenges in trying to prevent congenital disorders

Themes	Subthemes	Groups of codes
1: Traditional beliefs	1.1 Unclearness	Unclear messages about traditional beliefs
		Unobtainability of professional explanation
		Uneasiness in belief-adopting
		Incompatibility with parents
	1.2 Potential adverse outcomes	Non-recognition of potential adverse outcomes
		Unavailable evidence and professional explanation
2. Contemporary beliefs	2.1 Distinct views	Non-recognition of mild forms of functional CD, such as reduced intelligence
		A bad omen of using the term 'deformity'
		Non-separation of the practice for CD prevention from that for fetal development promotion, integrating into daily life activities
		An unborn baby as far beyond a physical creature, consisting of mental and spiritual aspects, mutually connecting with those of the mother
		Reliance on non-professional sources of information about CD-preventing practice
	2.2 Inaccessible information	Non-apprehension, non-comprehensiveness, non- modernization, and non-precision of information about CD preventing practice
3. Daily life activities	3.1 Selectiveness in eating	Nutritious food
		Prohibited/injurious foods
	3.2 Attainment of mother-child healthiness	Physical activities
		Vitamins/minerals supplement
		Mental well-being
		Mother-child interactions
	3.3 Harm avoidance	Vulnerable period
		Work safety
		Environmental safety
		Dealing with illness/medicines

Theme 1: Traditional beliefs

The traditional beliefs were transmitted from the participants' parents and ancestors, wishing to protect the unborn baby and the mother or to give birth easily, mainly by *Kalum* (คะลำ, P12) or taboos, disallowing the women to eat or to do something (**Table 2**). The participants faced some troubles due to the unclearness of traditional beliefs and potential negative outcomes.

Table 2. Some traditional beliefs held by pregnant women

Prohibition or Suggestion	Results
Do not eat too much oily food.	A fat baby, difficulty in childbirth
Do not eat hot and spicy food.	A bald baby
Do not eat seasoning powder.	A bald baby
Do not eat fish.	A deformed baby
Do not eat from the pot.	A deformed baby
Do not talk about, watch, or laugh at deformed people. [Prefer the term of *Krob* 32].	A deformed baby
Do not eat from the pot.	A deformed baby
Do not eat black food.	A baby's black skin
Drink coconut water.	A baby's nice skin
Do not eat periwinkles or vegetables having tendrils such as ivy gourd.	A baby is structured inside the womb
Do not take modern medicines. [Take herbal drugs.]	Harm a baby
Do not take a bath at night.	Harm a baby
Do not wash the dishes.	Harm a baby
Do not do sewing, embroidery, or needlework.	Have a baby with a cleft lip
Do not attend funeral ceremonies.	Bring bad things to a baby, or lose a baby, probably by ghosts
Do not do bad deeds.	Bad things happen to a baby
Do not prepare the essentials for a baby.	Lose a baby
Put on a clasp or a safety pin.	Do not lose a baby

Subtheme 1.1: Unclearness

Many traditional beliefs did not clearly explain the reasons to do or not to do something. For example, for the belief, 'Do not eat from a pot,' one participant (P13) said, *"My parents said that my child might be deformed without supporting reason."* Despite lacking a clear explanation, no one asked for clarification from providers regarding various beliefs. Some participants adhered to the beliefs because they trusted in the rich experiences of their parents, as one (P6) said, *"I believe because they have had a hot shower before [they have lots of experience]. They have many children."* Beliefs in supernatural powers, such as ghosts, would take away the baby if mothers attended funeral ceremonies (P13), and religious beliefs, such as putting on a Buddha image instead of a safety pin (P6), led these participants to adhere to traditional beliefs. 'Taking a statement with a grain of salt' (ฟังหูไว้หู), meaning no shutting down and listening led one participant (P7) to adopt beliefs as a precaution in case of the known being unclear: *"It's nothing, but one day we don't know if it happens or not."*

It was challenging for some participants to adopt traditional beliefs because they needed logical explanations. As one (P7) stated, *"I try to add science to why those ancestors believed that way [Do not attend funeral ceremonies]. Search! [on Internet]."* She stated that a taboo was an ancestors' trick, and there were

some scientific reasons behind the taboo. 'Do not attend funeral ceremonies' could be rationalized regarding maternal stress affecting the baby (P5). However, some beliefs failed to be explained logically, such as eating black food resulted in a baby's black skin (P6). Another challenge was when the participants did not adopt their parents' beliefs. For example, one participant sometimes did not wear a safety pin when her parents were absent (P13). She disbelieved it, but she conformed to pay respect and avoid disputes with her parents.

Subtheme 1.2: Potential adverse outcomes

One participant (P13) turned to believe in 'Do not prepare the essentials for a baby' for her third pregnancy because she used to disbelieve, and her second baby had a fatal congenital heart disease. She also believed in a holy place and ghosts inside her workplace as she related to her colleagues' loss of a child. Her traditional beliefs and practices were helpful for her mental strength as she said, *"So, I pray with holy things to have a strong baby. At least, it helps mental support, and* [I] *have no stress."* Some other beliefs provided health-related benefits, such as 'Do not eat too much oily food' (P12). Severe harmful beliefs were not found.

Some beliefs could not be determined precisely whether they brought beneficial, neutral, or adverse outcomes. It depended on how the beliefs were carried out. Sixteen of 18 participants believed in and drank coconut water for their baby to have nice skin. No one mentioned the negative consequence of the over-intake of sugar from overdrinking it. This disadvantage might not happen if drinking was limited and the participants had no obesity. The consequences of several food taboos, such as 'Do not eat fish,' were also hard to determine. It was challenging that some potential harms may not be recognized because there was inadequate evidence and explanation about the outcomes. They used their own judgment, which could be limited. For example, one participant (P9) who believed in 'Do not laugh at deformed people' made her conclusion from observing her neighbor, *"The woman who lives in the near house told that while she was pregnant, she laughed at him [a deformed man], said something to him, and her baby is deformed."*

Theme 2: Contemporary beliefs

Contemporary beliefs developed from the internalization of current information, which could be accessed from professional and non-professional sources. Maternal views on CD and the information on practices to avoid this could be challenging when they were incongruent with practitioners' points of view and standards.

Subtheme 2.1: Distinct views

The participants' views on CD, in general, were somewhat found to be distinct from professional views. Abnormality of an unborn baby at birth was mostly recognized regarding organ abnormalities, such as a cleft lip and Down's syndrome. Only a few participants mentioned an unborn baby's poor development, especially in brain and intelligence, caused by external factors such as harmful substances (P7). The challenge was overlooking mild forms of functional CD.

The participants preferred the term '*Krob 32*' or being complete, implying no abnormality or deformity instead of deformity to avoid bad omens. In addition to *Krob 32*, almost all participants wished for their baby to be healthy and strong; as one (P12) said, *"I want my baby Krob 32, to have no brain anomaly, and be strong. That's all."* Therefore, in their daily activities, they safeguarded their baby from abnormality and nurtured them to grow healthy and strong simultaneously rather than practicing both in isolation. This finding was interpreted from their replies as nurturing the baby with food when asked how to avoid their baby being abnormal; for example, P12 said, *"Eat supplementary food to be healthy and then a baby's born without abnormalities."* Additionally, their preventing and promoting practices were integrated into their daily activities.

Another challenge was that the participants viewed their baby as being far beyond a physical creature. The baby was also comprised of mental and spiritual aspects, leading them to safeguard their baby

mentally and spiritually. In addition, all these aspects were believed to be interrelated, as well as connected with and mutually influenced by their mother, as shown in the following statements:

> *If I'm strong, my baby will be strong because the baby is being with me.* (P4)

> *If a mother's stressed, a baby inside her womb will feel sad.* (P12)

> *Bad things happen to us. It'll happen to a baby in the same way.* (P6)

> *While walking, my baby knows and walks too. When doing anything, it seems they both do.* (P4)

Subtheme 2.2: Inaccessible information

A significant challenge was that no participants received formal health education about congenital disabilities. They were informed briefly about some harmful things. They had some difficulty accessing the information on CD-preventing practices. Mostly, they counted on non-professional sources through Internet searches and acquiesced suggestions, likely obtaining inadequate or even inaccurate information. For example, from an Internet advertisement, one participant (P7) took DHA tablets, and another who was overweight (P6) often ate durian to obtain folic acid without being informed about the high carbohydrate content.

The information held by the participants could be addressed in four challenges. Firstly, misapprehension was due to misinterpretation or inaccessibility to accurate information. For example, during the first trimester, the baby had a greater immunity against chemicals than in other periods and needed lots of protein (P5, health personnel). Secondly, non-comprehensive and brief messages were disseminated repeatedly and interpreted by participants mentioning various types of prenatal prohibition. However, they could neither explain nor apply these messages to their activities in detail. For example, avoiding medications was misperceived as avoiding some safe drugs, such as paracetamol (P6). Thirdly, non-modernization was the holding onto outdated information due to inaccessibility to new messages; for example, fetal stimulation was the best way to enhance an unborn baby's intelligence development (P4, P5, P7). Finally, there were imprecise messages about CD regarding applying general information. 'Take lots of rest' is commonly said and practiced when weak or sick. This practice was adopted by many participants, further leading to the unlikelihood of exercise. The challenges of beliefs also brought out the challenges in their daily lives.

Theme 3: Daily life activities

The participants' avoiding and promoting practices for CD prevention and an unborn baby's development could be conceptualized as three types of daily life activities. The challenges of each type were presented.

Subtheme 3.1: Selectiveness in eating

The participants selected nutritious food and avoided unsafe food as one (P15) said, *"Eating, be careful! Eat only good food. For injurious food, don't eat."* Most knew the importance of protein, iron, and calcium, but some mentioned food in general. Certain nutrients essential for brain development, such as DHA and iodine, were unlikely to be cited. One participant (P3) knew about the necessity of protein but expressed, *"I can't eat meat. It doesn't smell good. I think my baby dislikes meat."* Participants not only substituted food and how to handle non-favorite food, but knowing if they obtained sufficient daily food requirements (P7) was also challenging.

Considering unsafe food, the challenge was the misperception of harm mentioned in tabooed food, such as black food (**Table 2**), seasoning powder (P10), and cow milk (P5, P7, P13). The prohibited food was mainly mentioned as non-hygienic, raw/uncooked, hot and spicy, salty, and fermented, but they could not explain the details of food safety handling. Worms (P12) and germs (P2, P3, P7) in contaminated and uncooked food were cited, but no one knew about Listeriosis and Toxoplasmosis. All of them knew pesticides, but lead, mercury, and arsenic were unlikely recognized as one (P2) said, *"I don't know how lead residues in food will affect my baby."* Another participant (P5) who used low-quality pots for cooking did not know about lead exposure from these pots. The food challenges are summarized in **Table 3**, and some findings mentioned in subthemes 2.2 are included.

Table 3. Challenges of selectiveness in eating

Selectiveness in eating	**1. Nutritious food**
	Eat in general (all five principal groups of food), eat lots of vegetables
	Misunderstanding of the need for high protein diets during the 1st trimester
	Over-intake coconut water, durian, liver
	Take DHA supplement tablets
	Unrecognize DHA, iodine, and food-enhancing brain development
	Difficult to handle non-favorite food
	Hard to know whether obtain an adequate amount of food requirement
	2. Prohibited or injurious food
	Incongruence between traditional food and health-related reasons
	Non-comprehension on prohibited food: caffeine, raw/uncooked food
	Unrecognition of listeriosis, toxoplasmosis, lead, mercury, and arsenic
	Misperception of harms: cow milk causing a baby's allergy, seasoning power
	Inadequacy of food safety handling, particularly for pregnant women

Subtheme 3.2: Attainment of mother-child healthiness

Since a mother and her unborn child were believed to be connected in all aspects and mutually affected to attain a non-deformed, healthy, and strong baby, the participants attempted to promote their babies' and their own health. Mother-child healthiness could be attained through physical activities, vitamins and mineral supplement tablets, mental well-being, and mother-child interactions; these challenges are summarized in **Table 4.** Firstly, among various physical activities, adequate rest and sleep were highlighted (P10, P14, P15). Some activities, such as traveling, long-time standing, and so on, especially vigorous activities such as hard work and lifting heavy objects, were perceived to cause miscarriage and premature delivery. The women avoided various activities as much as possible because they did not know the permitted limit to perform them. Exercise was not their priority. Working, doing house chores, walking, and swinging arms and legs were mentioned as their exercise (P3, P4, P11), but no one mentioned yoga or pelvic muscle exercise for childbirth.

Table 4. Challenges of attainment of mother-child healthiness and harm avoidance

Attainment of mother-child healthiness	**1. Physical activities**
	Unknown limit of some physical activities
	Inadequate exercise; Working and doing house chores is perceived to be exercise
	Inadequacy of exercise preparation for childbirth
	2. Vitamins/minerals supplement
	Unrecognition of folate and iodine supplement tablets
	3. Mental well-being
	High concerns with harms of maternal stress on the baby
	4. Mother-child interactions
	Uncertainty on benefits of fetal stimulation for fetal development
Harm avoidance	**1. Vulnerable period**
	Misunderstanding of high immunity against chemicals during the first trimester
	2. Work safety
	Inaccessible information on the effects of workplace hazards on CD and measures for exposure prevention
	3. Environmental safety
	Inaccessible information on passive smoking and various pollutants
	4. Dealing with illness/medicines
	Be concerned with harm from medicines
	Refuse to use safe medicines
	Abuse of disapproved herbal drugs

Secondly, vitamins and mineral supplement tablets containing iron, iodine, and folic acid were taken regularly (P8), but no one mentioned iodine. Only two participants (P5, P7) mentioned folic acid. Thirdly, having mental well-being was highly attempted because mental stress was a concern to affect the unborn baby in terms of bad tempers (P15), sadness (P12), and low intelligence (P4).

Finally, mother-child interactions were believed in building closeness and bonding (P10), but some participants believed in the effects of promoting a baby's development, such as intelligence, memory, and hearing by listening to light music (P5); language learning, even a foreign language; and being a good person by reading aloud from some selected stories (P7). One participant encouraged her baby to exercise and play inside the womb (P4) because the fetus was believed to be like a baby already born. Although the outcomes of the stimulation and interaction were unclear, they thought of the benefits for the mother as harmless and worth trying as one (P5) said, *"Partly, it seems like a belief, trying isn't a loss. Right? Turning on music doesn't do anything to bother* [you] *like blood puncture."*

Subtheme 3.3: Harm avoidance

Table 4 summarizes the challenges of harm avoidance. Almost all participants stated that their baby was vulnerable throughout their pregnancy, and the most vulnerable period was the first trimester. However, misunderstandings occurred:

> *I'm not sure, seemly the first 1-3 months. It's OK. It's the period a baby has his/her own immunity. Although chemical substances or other things, the baby obtains so little.* (P5, a healthcare provider)

Another challenge was work safety, as seen by the participant who worked as a farmer (P1) and did not realize the harm of weedkillers for the baby. Additionally, regarding environmental safety, all participants recognized the harm of smoking, but some did not know about passive smoking. Other pollutants, such as lead and mercury from industrial wastes, were unlikely to be recognized. Considering illness and medicines use, they thought of effects on the baby in causing severely abnormal growth of the brain, arms, and legs (P2) and cognitive disability (P12). Therefore, refusing some safe medicines (such as paracetamol for headaches, P6), and switching to natural methods, occasionally abusing non-approved herbal drugs for treating fever, such as green chiretta (P12), were found to be the challenges.

Discussion

The challenges found in this study support that there were barriers to practices to avoid CD among pregnant women in NE Thailand. The most important was inaccessibility to information regarding measures to prevent external factors of CD. Health education focusing on strategies to avoid CD and related information is unavailable on professional websites in Thailand. On the contrary, various overseas organizations have disseminated information on CD prevention,[20] food safety,[21] and occupational safety[22] through websites. Food safety during pregnancy is also recommended to be incorporated into nutritional care and education in healthcare settings.[23]

Similar to a previous study,[24] pregnant women in our study prioritized food selection and restriction advice more than any other lifestyle topics. Information on prohibited food items was provided in antenatal clinics, excluding some essential topics, such as food contaminated with lead, mercury, arsenic, and pesticides, and food safety handling. One study in Slovenia revealed that a small proportion of pregnant women and the postpartum group received food safety information in parenting classes from health professionals. In contrast, the media was the primary source of food safety information.[25] Pregnant women need to have their awareness raised on food safety.[26] However, a study revealed that pregnant women had suboptimal food safety awareness.[27]

Regarding work safety, there are at least 17 items of substances (e.g., anesthetic gases, epoxies/resins, formaldehyde, lead, and other metals, solvents, pesticides) and conditions (e.g., heat, shift work) that can be workplace hazards for pregnant women.[28] Practically, in Thailand, reproductive health safety from occupational hazards is well-regulated only in large workplaces and companies, whereas there is no safety measure in small factories or self-employed work situations. In addition, antenatal clinics do not emphasize this matter. Additionally, passive smoking at home is more prevalent in pregnant women than non-pregnant women,[29] which jeopardizes their fetus,[30] but comprehensive intervention is not available at antenatal clinics.

Maternal stress was perceived to cause an unborn baby's severe abnormalities. Only high levels of stress that continue for a long time may cause high blood pressure and heart disease, which can increase the chances of preterm delivery or low-birth weight.[31] Herbal drugs were preferred greater than modern medicines due to inadequate information on dangers and safety, whereas in some countries,[32] herbal drugs were more commonly used due to availability and accessibility.

Previously in Thailand, vigorous physical activities had been believed to be beneficial for giving birth, similar to the findings of one study.[32] On the contrary, messages about the dangers of physical activities and exercise are disseminated, discouraging some pregnant women from exercising. Pregnant women without complications are recommended to have at least 150 minutes weekly of moderate-impact aerobic exercises, such as fast walking, which does not increase the risks of miscarriage, premature delivery, or low-birth weight.[30] Physical activity can improve mood, control weight, and promote fetal growth.[30] Pelvic muscle exercise is beneficial for childbirth, which is one unlikely to attain from working.

One study in northern Thailand[33] confirms our study's finding that pregnant women have a holistic view of fetal development promotion and avoiding CD. In fetal development, some participants could not access information on diet during pregnancy, especially for promoting brain development, and there was a misunderstanding about the high protein requirement during the first trimester. Protein is highly needed during the second and third trimesters.[34] The abstinence from drinking cow milk to prevent a baby's allergy found in our study indicates that they still held outdated information. Rather, there is a recommendation for pregnant women to drink milk, including cow milk, avoiding non-pasteurized or non-sterilized milk.[35] However, unpasteurized milk may be dangerous if it is infected.

The outcomes of fetal stimulation on fetal brain development are inconclusive. For example, one study reported that 'Fetal response to sound and light: possible fetal education?' and maternal voice could not improve fetal education.[36] However, from the systematic review, music and speech can form stimulus-specific memory traces, but further studies that follow safety recommendations are needed.[37] Nutrients, especially folic acid, iodine, iron, vitamin D, choline, and DHA,[38] are approved to be essential for fetal brain development, but this information is less informed than fetal simulation.

Like other cultures,[32,39] this study shows that our participants from Thailand adhered to traditional beliefs regardless of their backgrounds. Some beliefs are still applicable and known as local wisdom.[12,13] However, in other studies,[32,39] some traditional beliefs may bring potential harm. For example, similar to fruit juice, coconut water is low in protein, iron, and calcium, and there is no scientific proof of causing an unborn baby's nice skin.[40] However, this potentially harmful practice is highly adopted, implying inadequate intervention in traditional beliefs. Health education to demystify food taboos using scientific information and promoting dietary diversification is recommended in Asian countries.[41]

Some traditional beliefs are still adhered to, and although there is no logical explanation, some pregnant women search for supporting explanations

for their beliefs. One study found that traditional beliefs could be modified through advice from health professionals.[32] Unfortunately, some pregnant women have difficulty making choices and hesitate to ask their providers. It implies the discrepancy between women's and providers' cultures. As recommended by international organizations, culturally appropriate approaches for caring for pregnant women are crucial.[42,43] The care is person-centered, considering the person's preferences and the unique experience from a cultural perspective.[44] This approach is appropriate not only to the issue of traditional beliefs but also to contemporary beliefs incongruent with healthcare providers' beliefs. This study also indicates the need for an integrated approach to CD prevention and fetal development promotion.

Limitations

Congenital disorders are often related to occupational hazards, especially in agriculture and industry. However, in this study, only one participant worked as a farmer. No one worked in factories or with handicrafts using fabric dyes. Therefore, the findings related to the challenges of work safety in these three occupations were limited. For example, it was unclearly known whether participants accessed self-protection equipment. Additionally, most of the participants lived in urban areas. These findings might not be transferred to pregnant women in far remote areas, which likely have limited resources.

Conclusion and Recommendation

Various challenges concerning traditional maternal beliefs, contemporary beliefs, and daily life activities for avoiding CD indicate the need to include the issue of CD in clinical practice and health education. The integration of trying to avoid CD into existing health promotion and education during pregnancy is practical for pregnant women as this is a crucial time for them to learn and adopt better practices through the teaching by nurses and midwives. Culturally appropriate approaches are recommended, involving different values and beliefs between pregnant women and providers. Pregnant women should be treated with cultural respect and care. Traditional beliefs and practices should be mandated to be assessed and clarified for pregnant women's decision-making. Beliefs with positive outcomes are encouraged. Traditional harmful practices need intervention without threatening their dignity. Conflict resolution is assisted when pregnant women's beliefs and practices contradict those of their parents.

The challenging topics and contents should be overcome and further applied in refining the existing guidelines. These challenging topics, which might bring potential harm, include the vulnerable fetal period; overdrinking coconut water; as well as hazards of contaminated food, working, herbal drugs, heavy metals, arsenic, and passive smoking. Cultural health education for pregnant women should be developed to redefine their beliefs and practices characterized as non-apprehension, non-comprehension, non-modernization, and non-precision to CD. Health education should be specific to CD regarding causes, effects on an unborn baby, and prevention. The content should be adequate and detailed to better understand and apply in daily activities. Nursing protocols and existing outdated and inaccurate messages should be revised and notified. Pregnant women need direction about accessing accurate Internet and social media information.

Acknowledgments

The authors are grateful to the experts' formation of suggestions regarding tentative findings and all participants for sharing their information.

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สิ่งท้าทายในการหลีกเลี่ยงความผิดปกติแต่กำเนิด: ประสบการณ์ของสตรีตั้งครรภ์ในภาคตะวันออกเฉียงเหนือของประเทศไทย

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บทคัดย่อ: ความรู้และพฤติกรรมของมารดาที่พยายามป้องกันหรือหลีกเลี่ยงความผิดปกติแต่กำเนิดยังไม่ถึงระดับเหมาะสมเท่าที่ควรจะเป็น การวิจัยพรรณนาเชิงคุณภาพนี้มีวัตถุประสงค์เพื่ออธิบายสิ่งท้าทายในการหลีกเลี่ยงความผิดปกติแต่กำเนิดจากประสบการณ์ของสตรีตั้งครรภ์ในภาคตะวันออกเฉียงเหนือของประเทศไทย เก็บข้อมูลระหว่างพฤศจิกายน 2560 และ สิงหาคม 2562 จากสตรีตั้งครรภ์จำนวน 18 ราย ด้วยการสัมภาษณ์เชิงลึกและวิเคราะห์ด้วยการจัดหมวดหมู่ ผลวิจัยพบว่ามี 3 ประเด็นที่สะท้อนถึงสิ่งท้าทาย ประเด็นแรก 'ความเชื่อดั้งเดิม' มีความท้าทายที่ไม่กระจ่างชัดและผลลัพธ์ที่อาจจะเป็นข้อเสีย ประเด็นที่สองคือ ความท้าทายของ 'ความเชื่อร่วมสมัย' ที่พบว่ามีมุมมองแตกต่างและข้อมูลที่ไม่สามารถเข้าถึงได้ซึ่งมีลักษณะไม่เข้าใจ ไม่ลึกซึ้ง ไม่ทันสมัย หรือไม่เฉพาะเจาะจงกับความผิดปกติแต่กำเนิด ประเด็นสุดท้าย 'กิจวัตรในชีวิตประจำวัน' ในการเลือกกิน การมีสุขภาพดีของมารดา-ทารก และการหลีกเลี่ยงสิ่งอันตราย เพื่อป้องกันความผิดปกติแต่กำเนิดและส่งเสริมพัฒนาการของทารกในครรภ์ หัวข้อสำคัญที่น่าท้าทายคือ ระยะเปราะบาง ข้อห้ามที่เป็นความเชื่อดั้งเดิม อาหารบำรุงสมอง ความปลอดภัยในอาหาร การทำงาน และสิ่งแวดล้อม ความเป็นห่วงเรื่องอันตรายของกิจกรรมทางกาย การออกกำลังกาย ความเครียดของมารดา และยา ตลอดจนการรับรู้คลาดเคลื่อนเรื่องประโยชย์ของยาสมุนไพรและการกระตุ้นทารกในครรภ์

ในแนวปฏิบัติของผดุงครรภ์ ควรนำเรื่องการป้องกันความผิดปกติแต่กำเนิดเข้าไปรวมไว้ในการส่งเสริมสุขภาพของสตรีตั้งครรภ์โดยการคำนึงถึงความไวทางวัฒนธรรม ควรจัดการกับสิ่งท้าทายที่พบแล้วนำไปประยุกต์ในการปรับปรุงแนวปฏิบัติ

Pacific Rim Int J Nurs Res 2023; 27(4) 640-653

คำสำคัญ: สิ่งท้าทาย ความผิดปกติแต่กำเนิด การตั้งครรภ์ การป้องกัน การวิจัยเชิงคุณภาพ

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