Journal of
Health Science and Alternative Medicine

Original Article Open Access

Maternal and Child Health Service for the Hill Tribe and Stateless Populations in Northern Thailand: Outcomes and Barriers

Phornthip Ruangrit[1], Napaporn Jantakat[2,*], Kaset Chimplee[3], Komkham Pattanaporn[4], Chompunut Sopajaree[5], Tawatchai Apidechkul[6]

[1]*Mae Suai District Hospital, Chiang Rai, Thailand, 57180,*

[2]*Mae Fah Luang District Public Health Office, Chiang Rai, Thailand, 57240*

[3]*School of Medicine, Mae Fah Luang University, Thailand, 57100*

[4]*School of Dentistry, Mae Fah Luang University, Thailand, 57100*

[5]*School of Nursing, Mae Fah Luang University, Thailand, 57100*

[6]*School of Health Science, Mae Fah Luang University, Thailand, 57100*

Received August 13, 2021

Accepted September 8, 2021

Published September 8, 2021

*__Corresponding author__:
Napaporn Wongpin, Mae Fah Luang District Public Health Office, Mae Fah Luang, Chiang Rai, Thailand, 57240

E-mail: ann_icez@hotmail.com

ABSTRACT

Background: Maternal and child healthcare (MCH) services are a very significant health service for the safety of women and children during pregnancy, which is a standard and basic service for all people including the hill tribe and stateless populations lived in Thailand. This study aimed to investigate the health performance, health outcomes, and barriers to accessing MCH clinics from two district hospitals accessible to the hill tribe and stateless population in Chiang Rai, Thailand. **Methods:** Retrospective data collection and group discussions were performed to extract information to understand the situation and barriers to accessing MCH clinics among the hill tribe and stateless populations living in Mae Suai and Mae Fah Luang districts, Chiang Rai, Thailand. Data were collected from July to August 2021. **Results:** A number of child deliveries were performed by the Mae Suai district hospital every year; a high proportion with preterm delivery and low birth weight, less than 50.0% of pregnant women had early and complete access to antenatal clinics (ANC); more than 15.0% of pregnant hill tribe women were pregnant before age of 20 years. Only a few children were on the right developmental track, according to the standard development assessment tools. Several poor outcomes were detected among pregnant women and child births in Mae Fah Laung District; a low number of pregnant women visited the antenatal clinic and postpartum clinic, a large proportion had a high risk for pregnancy, 17.9% of children aged 6-12 months of age were diagnosed with anemia, 31.2% experienced asphyxia problems during delivery, and poor development among children had asphyxia and birth weight less than 2,500 g. Several challenges and barriers were detected in healthcare providers, such as poor attendance rate of early ANC due to their belief, poor personal hygiene related to postpartum care, substance use among pregnant women, and multiple pregnancies from poor rate family planning. In the clients' aspects, distance, lack of family and community support, and financial problems were major barriers. **Conclusion:** There is an urgent need to strengthen the current MCH system to improve the health and safety of the hill tribe and stateless populations by focusing on linking health information among institutes, improving professional skills to health care providers, and engaging community members in the system, including improvement of individual socioeconomic characteristics.

Keywords: *Maternal and child health, Health system, Hill tribe, Barriers, Health Outcomes*

Introduction

Maternal and child healthcare (MCH) is one of the main health concerns globally. It is an indicator of having a standard health system in a country, especially in terms of accessibility to the system [1]. The World Health Organization (WHO) reported that approximately 810 women die from preventable causes related to pregnancy and childbirth every day, and 94.0% of all maternal deaths occur in low- and lower middle-income countries [2]. The major direct causes of death in pregnant women are antenatal hemorrhage, infection, high blood pressure, unsafe abortion, and obstructed labor. In contrast, the indirect causes are anemia, malaria, and heart disease [3]. Access to healthcare services is the principle of saving pregnant women's lives because the prevention of maternal mortality can be handled by a high skill of health professional in timely management. However, a number of pregnant women do not have access to healthcare, particularly those who are a minority in a country with specific sociodemographic characteristics facing several barriers in accessing the system which reflects inequalities in access to quality health services and highlights the gap between rich and poor [4, 5].

Thailand has a great healthcare system with a universal coverage scheme that aims to provide standard care and cover all medical fees of the citizens [6]. Health institutes under the Ministry of Health provide service to all basic clinics, including maternal and child healthcare from the national to village levels [7]. However, some marginalized populations living at the border areas of Thailand and Myanmar, such as hill tribe and stateless populations, are facing several barriers to healthcare access. This includes access to maternal and child healthcare clinics, which is the basic principle to all people [8].

There were more than 3.5-4.5 million hill tribe people who had been granted Thai citizenship and did not in 2020 [9,10].These populations had their own culture, languages, and lifestyles, which were totally different from Thai local population [8, 11, 12]. Despite the availability of healthcare services to the Thai people, including the hill tribe and stateless populations, there was no guarantee that all these people could have equal access to these services. Several barriers to healthcare access had been identified, such as language [8], the distance of their habitats to the health institutes [8], financial problems [13], stigma [14], etc. Moreover, hill tribe women might be felt shame or perceived low self-esteem when they should come to health care service.

Among seventeen districts, Mae Suai and Mae Fah Luang districts, Chiang Rai Province are the favorite areas of the hill tribe and many hill tribe people lived these areas [8, 10]. Therefore, this study aimed to investigate the health caregiver performance, health outcomes, and barriers to accessing MCH clinics in two district hospitals serving the hill tribe and stateless populations lived in Mae Suai and Mae Fah Luang districts in Chiang Rai, Thailand and to provide as a basis information about conditions and barriers on access to health care service during pregnancy and postpartum period. Health performance was assessed by the number and ratio of work and health professionals and also the work outcomes in each year.

Methods

Study design and study population

A descriptive design was used based on the combination of a retrospective data collection approach and focus group discussion. A retrospective data collection approach was used to extract the secondary sources of data on MCH outcomes of patients from Mae Suai and Mae Fah Luang district hospitals. In addition, a group discussion was conducted to gather the group's perspective among the hill tribe pregnant women and health care providers on the barriers and challenges in accessing MCH clinics located in hill tribe villages.

Sources of data and research instruments development

Secondary sources from two MCH clinics between 2017-2021 were selected and extracted after obtaining approval from the chief of clinics. All health performances and health outcomes existed in two hospitals between 2017-2021 were collected and analyzed. Several health outcome indicators were set before evaluating the sources of data, such as the number of pregnant women, number of pregnant women aged below 15 years, number of postpartum hemorrhages, number of childbirths with APGAR score ≤ 7, number of childbirths with low birth weight, etc.

Two group discussions were conducted in each district: one among health care providers and another among hill tribe and stateless pregnant women. Six main question guides were developed and used in the group discussion among healthcare providers:

1) What are the major challenges in workflow in your MCH clinic?
2) How did you improve these challenges?
3) What are the critical points of care and management for hill tribe and stateless pregnant women?
4) Do you get involvement from the community to improve MCH and management? How?
5) What are the keys to success in working in the MCH clinics, particularly in caring and managing for the hill tribe and stateless population pregnant women?
6) What are the challenges of working among health institute networks in the district? How would you make it better?

Another five-question guide was used to gather information in the discussion among the hill tribe and stateless pregnant women:

1) Did you have any bad experiences while attending an MCH clinic?
2) What factors influence you to not visit the MCH clinic during your current or previous pregnancy?
3) What are the points of MCH clinics that should be improved? Why?
4) How was your husband or your family members involved in your care during pregnancy? Should it be improved?
5) Do you think the stigma impacts the hill tribe people who access MCH clinics?

The validity and reliability of the questionnaires were assessed by experts using the item-objective congruence (IOC) method. Three experts (medical anthropologists, MCH nurses, and public health professionals working in the MCH clinic) were invited to assess the questions related to the content and context of the study.

Data gathering procedures

The health professionals working at the MCH clinic in Mae Suai district (one district hospital and 12 health-promoting hospitals) and Mae Fah Luang district (one district hospital and 13 health-promoting hospitals) were invited to give their ideas according to the question guides.Two group discussions among the MCH clinic providers were held (eight people in a group discussion at Mae Suai district, and eight people in a group discussion at Mae Fah Luang district). Another two group discussions were conducted among pregnant women or those who recently experienced pregnancy and living in Mae Suai and Mae Fah Luang (11 pregnant women in Mae Suai district, and 7 pregnant women in Mae Fah Luang district). Group discussions were conducted between July and August 2021.

Statistics and ethical consideration

The descriptive data obtained retrospectively were presented as number and percentages. Moreover, the data obtained from the group discussions were analyzed in a thematic form. Study approval was obtained by the Chiang Rai Provincial Public Health Office Human Research Ethics Committee No. CRPPHO 69/2564, approved on 30 July 2021. Ethical considerations included the nature and processes of the study and protection of confidentiality.

Results

General information

A total of 133,846 hill tribes and stateless people lived in Mae Suai and Mae Fah Luang districts; 56,544 people lived in Mae Suai district, and 77,302 people live in Mae Fah Luang district.

Process of antenatal care

Pregnant women were advised by village health volunteers to visit a doctor at a district hospital or healthcare practitioners (a nurse or public health professional with antenatal care training) working at a health-promoting hospital near their village. During the first antenatal care (ANC), maternal health and fetal development were examined, including testing for HIV/AIDS, STDs, and other genetic-related diseases, as well as counseling, if necessary. Five consecutive appointments were scheduled before the labor. Pregnant women had to go through several procedures during the visits to ensure that mother and child were healthy. According to the standard ANC, a pregnant woman was required to meet a medical doctor three times: 1) to confirm gestational age, 2) scan to check for normal pregnancy, and 3) to double-check signs of abnormality before delivery. The healthcare procedures were performed according to the standards of ANC by the medical staff.

During labor, pregnant women were transferred to the labor and delivery room and cared for by a nurse. As many pregnant women in labor were admitted at a district hospital, the staff had hectic schedules. Postpartum care was handled by staff from the Department of Community Medicine and Epidemiology. In this stage, all postpartum women were checked for general health and training including breastfeeding and immunization for the child. Family planning was also an important activity to support postpartum women. Only one subdistrict was managed by the Department of Community Medicine and Epidemiology of a district hospital to provide services related to ANC, postpartum and childcare, and immunization. The remaining pregnant women were cared for by health practitioners working at 12 health-promoting hospitals. When a doctor was required for a check-up or delivery, pregnant women were referred to a district hospital. Due to its location, transportation to the hospital was not convenient, especially during the rainy season. The farthest hill tribe village is 1.30 hours away (on a motorcycle) from the hospital. The work related to the ANC process, labor, and postpartum care, including the EPI program, was performed manually by the health workers at a district hospital and health-promoting hospitals. All information on the services was written in documents and numbered. Any required data or information was requested manually. There was no specific link of data between a district hospital and the other health-promoting hospitals. Only a logbook was available for officially transferring messages between hospitals.

A. Mae Suai district

In 2020, there were 27,488 households in 126 villages with a total population of 84,378 people (67.0% of the hill tribe) in this area (seven subdistricts); with 42,485 men and 41,893 women.

Approximately 56,544 persons (27,141 men and 29,403 women) belonged to the hill tribe and stateless population. Seven tribes lived in this area: Akha, Lahu, Karn, Lisu, Yao, Chinese-Yunnan, and Hmong.

Health facility (as of 26 July 2021)

There is a 60-bedded district hospital with nine medical doctors, six pharmacists, seven dentists, and 73 nurses as well as 12 health-promoting hospitals with 88 public health professionals. The distance between Mae Suai Hospital and Chiang Rai Prachanukroh Hospital (tertiary hospital), located in the Muang Chiang Rai district, is 60 km.

Departments related to MCH at Mae Suai district hospital

Three departments are involved in the MCH services: the Department of Community Medicine and Epidemiology, Department of Dentistry, and Department of Labor. The first (three nurses and three public health professionals), provides all antenatal services, including laboratory tests, assessment of pregnancy risk, counseling, child development, and expanded immunization program (EPI). The second (seven dentists and seven nurse-aids) provides oral health examination, oral healthcare and health promotion for pregnant women. The third department (11 nurses and nurse-aids) handles the delivery procedures and MCH.

Key outcomes of MCH services from Mae Suai district hospital between 2017 and 2021

A large number of child deliveries were performed by the Mae Suai district hospital every year. Healthcare workers had been overworking for many years. Among the hill tribe and stateless populations, a large proportion of pregnant women had preterm delivery and low birth weight. A stateless population referred to those people who lived in Thailand but were not granted a Thai identification card (ID). Moreover, less than 50.0% of pregnant women had early and complete access to ANC and more than 15.0% of pregnant hill tribe women had been pregnant before 20 years. Postpartum hemorrhage was an important issue among the hill tribe women. Only a few children were on the right developmental track according to standard development assessment tools (Table 1).

B. Mae Fah Luang district

In 2020, there were 21,616 households in 77 villages comprising 77,302 people (100.0% are hill tribe); with 39,117 men and 38,185 women. Seven tribes live in this area (four subdistricts): Akha, Lahu, Lisu, Hmong, Lua, Chines-Yunnan, and Thai-Yai.

Health facility (as of 26 July 2021)

A district hospital with a 30-bedded capacity and 13 health-promoting hospitals were available in Mae Fah Luang district. At the district hospital, seven medical doctors, three pharmacists, one dentist, and 40 nurses provided all medical services, including MCH care. There were 61 health professionals working at 13 health-promoting hospitals. There is a 60 km distance between the district hospital and Chiang Rai Prachanukroh Hospital (Tertiary Hospital), which is located in the Muang Chiang Rai district, Chiang Rai province.

Key outcomes of MCH services at the Mae Fah Luang district hospital between 2018 and 2021

Several key MCH clinic performances at the Mae Fah Luang District were found, including a low number of visiting MCH clinics, a high rate of high-risk pregnant women, high proportion of postpartum hemorrhage (17.0%), anemic children aged 6-12 months (17.9%), asphyxia (31.2%), and poor development among children who had asphyxia and low birth weight (Table 2).

Key findings from group discussions

Four group discussions were conducted between July and August 2021 in the Mae Suai and Mae Fah Luang districts. Eight health practitioners working at the Mae Suai district participated in the first group discussion, and another eight health practitioners from the Mae Fah Luang district participated in the second group discussion. Several challenges to healthcare providers were identified:

1) There was no link in the information system between health institutes at the district level;
2) Poor knowledge, attitude, and perception of the hill tribe women and their partners on accessing MCH care during pregnancy;
3) Language barriers between clients and healthcare workers;
4) Illiteracy and inability to understand messages from healthcare providers;
5) Only a passive service available,
6) Poor access to reproductive control clinics; and
7) Malnutrition among pregnant women.

Additionally, major barriers and challenges to pregnant women were identified, such as

1) Lack of support at the family and village levels;
2) Financial problems;
3) Difficulty in transportation of pregnant women to access MCH;
4) Difficulty in visiting a doctor;
5) Fear of communication with health officers or unfriendly healthcare providers; and
6) Specific beliefs and practices during pregnancy and post-delivery impact on mother and child health.

Table 1 Work performances of antenatal care and delivery services at Mae Suai District Hospital, 2017-2021

Item	2017	2018	2019	2020	2021 (6 months)
Total delivery	**574**	**566**	**511**	**458**	**210**
- Hill tribe	479(83.5)	469(82.8)	395(77.3)	351(76.6)	162(77.1)
- Stateless population	30(5.2)	37(8.5)	95(18.6)	140(30.6)	49(23.3)
LBW	40	35	28	30	5
Preterm with LBW	16	11	9	22	4
Mother HCT<33%	11	10	8	17	6
Postpartum hemorrhage	24(4.3)	16 (2.8)	13(2.5)	13(2.8)	3(1.43)
Birth asphyxia (BA)	15	11	8	9	0
No ANC	6	7	6	9	7
Complete ANC	234(40.7)	282(49.8)	254(49.7)	266(58.1)	128(61.0)
Early ANC	270(47.0)	303(53.5)	266(52.0)	272(59.4)	128(60.9)
TT	548(95.4)	552(97.5)	487(95.3)	266(95.6)	196(93.3)
Episiotomy	465(81.0)	474(83.8)	409(80.0)	400(87.3)	117(84.3)
Disrupted episiotomy	21(4.6)	72(15.2)	63(12.3)	31(7.8)	2(1.1)
HIV +	4(0.7)	2(0.4)	2(0.4)	3(0.7)	1(0.5)
Mother aged less than 15 years	3(0.5)	7(1.3)	3(0.6)	4(0.9)	3(1.43)
Pregnant before aged 20 years	132 (23.0)	111(19.6)	99(19.4)	83(18.1)	38(18.1)
Pregnant aged after 35 years	N/A	N/A	123(14.7)	121(14.9)	16(4.3)
Multiple pregnant before aged 20 years	N/A	N/A	32(3.8)	35(4.3)	16(4.3)
• Children aged less than 6 months were fed breast milk only	N/A	N/A	N/A	N/A	595/646 (91.9)
• Children aged 6-12 months were detected as anemia	N/A	N/A	N/A	N/A	76/221 (34.4)
• Children with birth asphyxia during delivery and had APGAR score less than 7, have been detected the development by DSPM, and % of abnormal	N/A	N/A	N/A	N/A	403/(68/241) (28.2)
• Children with birthweight less than 2,500 grams at delivery, were detected the development by DSPM, % of abnormal	N/A	N/A	N/A	N/A	61/(21/37) (56.7)
• Lived birth from mother aged less than 20, and were detected the development by DSPM and % of abnormal	N/A	N/A	N/A	N/A	275/(57/163) (34.9)

Table 2 Work performances of antenatal care and delivery services at Mae Fah Luang District Hospital, 2018-2021

Item	2018	2019	2020	2021 (6 months)
Total ANC	**348**	**239**	**273**	**178**
Having 1st ANC within 12 weeks of gestational age	N/A	N/A	N/A	162/178(91.1)
Completely 5-time ANC before delivery	N/A	N/A	N/A	147/176 (83.5)
Received three times post-delivery care	N/A	N/A	N/A	114/195(58.5)
Having a risk for pregnancy as the MOPH indicators	N/A	40	48	76
Delivery at the hospital	N/A	415	260	257
Death (child)	N/A	1	0	0
Referred to Chiang Rai Prachanukroh (Tertiary hospital)	N/A	N/A	N/A	44
Postpartum hemorrhage	N/A	23.0%	25.0%	17.0%
LBW	24/608 (3.9%)	35/620 (5.6%)	34/650 (5.2%)	13/361 (3.5%)
• Children aged less than 6 months were fed breast milk only	N/A	N/A	N/A	567/659 (86.0%)
• Children aged 6-12 months were detected as anemia	N/A	N/A	N/A	38/212 (17.9%)
• Children with birth asphyxia during delivery and had APGAR score less than 7, have been detected the development by DSPM, and % of abnormal	N/A	N/A	N/A	221/ (25/80) (31.2%)
• Children with birth weight less than 2,500 grams at delivery, were detected the development by DSPM, % of abnormal	N/A	N/A	N/A	50/ (10/23) (43.4%)
• Lived birth from mother aged less than 20, and were detected the development by DSPM and % of abnormal	N/A	N/A	N/A	174/(21/63) (33.3)

Discussion

The hill tribe and stateless pregnant women faced several challenges in accessing MCH clinics, and the outcomes did not reach some of the Ministry of Public Health Key Performance Indexes (KPIs). Several health problems were identified among them, such as postpartum hemorrhage, poor rate of early antenatal care, poor rate of complete ANC, high of birth before admitted rate, high rate of disrupted episiotomy, high rate of pregnancy before 20 years of age, and multiple pregnancies. Both system and individual challenges were detected in MCH clinics, such as lack of a single platform of information linkage system among hospitals, availability of only passive clinics, poor access to reproductive clinics, and malnutrition. Additionally, language, distance, family finance, and unhealthy mother and child, which were related to the tribe's belief and practice were detected.

The hill tribe and stateless pregnant women received MCH under the national standard of MCH indicators, despite the current MCH care service (passive method) and its system, and their socioeconomic backgrounds. Many unreached indicators were caused by the current existing ANC system, while the others were caused by a non-active approach in reaching the target populations. The local MCH staff preferred to have an active MCH clinic to improve the maternal and child health among the hill tribe and stateless populations. Jongh et al. [15] reported that the perspectives of service users and providers, social and political factors, and health system characteristics were related to health outcomes in MCH clinics in low- and middle-income countries. Furthermore, community-based dialog study reported that limited health service promotion and poor accessibility to health facilities were detected as major barriers to health service utilization [16]. Several studies [17, 18] reported that unfriendly maternal health service providers were an important factor in reducing the rate of MCH clinic utilization among pregnant women.

Moreover, the language, beliefs, knowledge, and attitudes of the hill tribe and stateless pregnant women were also considered as barriers to accessing MCH clinics. A meta-analysis reported that language was a key barrier for MCH clinics globally [19]. Moreover, a systematic review reported that negative attitudes and behaviors of pregnant women undermined health care seeking and affected mother and child well-being [20]. Pahwa et al. [21] reported that the individuals' attitudes impacted the MCH clinic utilization among Indian pregnant women. A study in Nigeria clearly demonstrated that the knowledge and attitude toward access to MCH were significant factors in clinic utilization [22].

Family and community support were also key factors in increasing the access to MCH clinics. This was supported by a study in Myanmar, which reported that geographical setting, household income, and access to transportation were associated with accessing MCH clinics among pregnant women [23]. Dahab et al. [24] also reported that family economic status was one of the key barriers to accessing MCH clinics among pregnant women living in low-income countries.

Geographical barriers such as distance and transportation were also identified as another key factor in reducing the access to MCH clinics among the hill tribe and stateless pregnant women. Dahab et al. [24] reported that the most important barrier to maternal health is the transportation to health facilities. A study in Uganda reported that distance and transportation costs were key factors in accessing MCH clinics among pregnant women in Uganda [17], while another study in Nigeria reported that geographic difficulty and distance were major barriers to access to MCH among pregnant women [25].

Our study had some limitations. First, based on a retrospective data collection process, the completeness of data and the information system used in the two MCH clinics were different; therefore, it was very difficult to analyze the comparison between the two clinics. Second, many work-performance indicators were collected on based on paper, which was a barrier to the completion of data for the analysis. Finally, the difference in the hill tribes living in the two areas might impact the outcomes of MCH clinics, which were not completely compared between the two clinics.

Conclusion

The hill tribe and stateless women should have access to the MCH clinics during their pregnancy to receive standard care and services. The information linkage system among health institutes in a district is a key factor in improving the quality of the service. Furthermore, it is necessary to get the involvement of family members and the community to improve MCH outcomes for the hill tribe and stateless pregnant women, including having translators to help in reducing the misunderstanding between the patients and healthcare providers. Many factors act as significant barriers to the access to MCH, such as language, knowledge and attitude, belief, and distance and transportation. Implementation research by collaborating with all stakeholders should be considered to improve the quality of MCH clinics for these populations.

Acknowledgments

We would like to thank the director of Mae Suai Hospital and Mae Fah Luang hospital for accessing data. We thank all participants for providing information during the group discussion.

References

[1] World Health Organization (WHO). Quality, equity, dignity: a network for improving quality of care for maternal, newborn and child health. Available from: https://www.who.int/maternal_child_adolescent/topics/quality-of-care/quality-of-care-brief-standards.pdf

[2] World Health Organization (WHO). Maternal mortality. Available from: https://www.who.int/news-room/fact-sheets/detail/maternal-mortality

[3] World Health Organization (WHO). Maternal health. Available from: https://www.who.int/health-topics/maternal-health#tab=tab_1

[4] Dahab R, Sakellariou D. Barriers to Accessing Maternal Care in Low Income Countries in Africa: A Systematic Review. IJERPH 2020;17:4292. https://doi.org/10.3390/ijerph17124292.

[5] Franchi JV de O, Pelloso SM, Ferrari RAP, Cardelli AAM. Access to care during labor and delivery and safety to maternal health. Rev Latino-Am Enfermagem 2020;28. https://doi.org/10.1590/1518-8345.3470.3292.

[6] Tangcharoensathien V, Witthayapipopsakul W, Panichkriangkrai W, Patcharanarumol W, Mills A. Health systems development in Thailand: a solid platform for successful implementation of universal health coverage. The Lancet 2018;391:1205–23. https://doi.org/10.1016/s0140-6736(18)30198-3.

[7] Tejativaddhana, P, Briggs, D, Singhadej, O and Hinoguin, R. Developing primary health care in Thailand: Innovation in the use of socio-economic determinants, Sustainable Development Goals and the district health strategy. Public Administration and Policy: An Asia-Pacific Journal. 2018; 21(1): 36-49. https://doi.org/10.1108/PAP-06-2018-005

[8] Apidechkul, T, Laingoen, O, & Suwannaporn, S. Inequity in Accessing Health Care Service in Thailand in 2015: A Case Study of the Hill Tribe People in Mae Fah Luang District, Chiang Rai, Thailand. Journal of Health Research. 2016; 30(1): 67-71.

[9] Princess Maha Chakri Siridhorn Anthropology Center. Hill tribe. 2020. http://www.sac.or.th/main/index.php.

[10] Apidechkul T. A 20-year retrospective cohort study of TB infection among the Hill-tribe HIV/AIDS populations, Thailand. BMC Infect Dis 2015;16. https://doi.org/10.1186/s12879-016-1407-4.

[11] Chomchoei, C., Yeemard, F., Tamornpark, R., & Upala, P. Burden and Factors Associated with Hypertension Among the Adult Population of the Lisu Hill Tribe, Northern Thailand. Journal of Health Science and Alternative Medicine 2021;3:9–15. https://doi.org/10.14456/JHSAM.2021.3.

[12] Chomchoei C., Apidechkul T, Khunthason S, Kullawong N, Keawdounglek V, Tamornpark R, et al. Prevalence and factors associated with type-2 diabetes mellitus among middle-aged and elderly Lisu hill tribe people, northern Thailand: a cross-sectional study. Journal of Health Science and Alternative Medicine. 2019; 1(3): 17-23.

[13] Apidechkul T. Prevalence and factors associated with type 2 diabetes mellitus and hypertension among the hill tribe elderly populations in northern Thailand. BMC Public Health 2018;18. https://doi.org/10.1186/s12889-018-5607-2.

[14] Thutsanti P, Apidechkul T, Inta C, Upala P, Tamornpark R. Adaptation to Thai citizenship: a case study of Thai-Chinese Yunnan, Mae Fah Luang District, Chiang Rai, Thailand. Journal of Health Science and Alternative Medicine. 2019; 1(1): 8-13.

[15] Jongh T, Gurol‐Urganci I, Allen E, Jiayue Zhu N, Atun R. Barriers and enablers to integrating maternal and child health services to antenatal care in low and middle income countries. BJOG: Int J Obstet Gy 2016;123:549‐57. https://doi.org/10.1111/1471-0528.13898.

[16] Kusena P. Understanding barriers to utilization of maternal and childhood services through community dialogue in the context of result based financing. Texila International Journal of Public Health. 2017; 5(4): 1-8.

[17] Tumuhimbise W, Atukunda E, Ayebaza S, Katusiime J, Mugyenyi G, Pinkwart N, et al. Maternal health-related barriers and the potentials of mobile health technologies: Qualitative findings from a pilot randomized controlled trial in rural Southwestern Uganda. J Family Med Prim Care 2020;9:3657. https://doi.org/10.4103/jfmpc.jfmpc_281_20.

[18] Ochieng CA, Odhiambo AS. Barriers to formal health care seeking during pregnancy, childbirth and postnatal period: a qualitative study in Siaya County in rural Kenya. BMC Pregnancy Childbirth 2019;19. https://doi.org/10.1186/s12884-019-2485-2.

[19] Nair M, Yoshida S, Lambrechts T, Boschi-Pinto C, Bose K, Mason EM, et al. Facilitators and barriers to quality of care in maternal, newborn and child health: a global situational analysis through metareview. BMJ Open 2014;4:e004749. https://doi.org/10.1136/bmjopen-2013-004749.

[20] Mannava P, Durrant K, Fisher J, Chersich M, Luchters S. Attitudes and behaviours of maternal health care providers in interactions with clients: a systematic review. Global Health 2015;11. https://doi.org/10.1186/s12992-015-0117-9.

[21] Pahwa P, Sood A. Existing practices and barriers to access of MCH services - a case study of residential urban slums of district Mohali, Punjab, India. Global Journal of Medicine and Public Health. 2013; 2(4):1-8.
[22] Onasoga AO, Osaji TA, Alade OA, Egbuniwe MC. Awareness and barriers to utilization of maternal health care services among reproductive women in Amassoma community, Bayelsa State. Int J Nurs Midwifery 2014;6:10–5. https://doi.org/10.5897/ijnm2013.0108.
[23] Milkowska-Shibata MA, Aye TT, Yi SM, Oo KT, Khaing K, Than M, et al. Understanding Barriers and Facilitators of Maternal Health Care Utilization in Central Myanmar. IJERPH 2020;17:1464. https://doi.org/10.3390/ijerph17051464.
[24] Dahab R, Sakellariou D. Barriers to Accessing Maternal Care in Low Income Countries in Africa: A Systematic Review. IJERPH 2020;17:4292. https://doi.org/10.3390/ijerph17124292.
[25] Fagbamigbe AF, Idemudia ES. Barriers to antenatal care use in Nigeria: evidences from non-users and implications for maternal health programming. BMC Pregnancy Childbirth 2015;15. https://doi.org/10.1186/s12884-015-0527-y.