International Journal of Public Health Asia Pacific
Open Access: e-Journal
ISSN: 2822-0587(Online)

Factors associated with maternal and child health services utilization among mothers of children under 5 years in Southern Shan State, Myanmar

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ABSTRACT

Background: Enhancing maternal and child health and reducing mortality rates are critical global concerns. In 2023, maternal mortality remained a significant global health issue, with over 700 deaths from preventable pregnancy-related causes affecting low- and lower-middle-income countries. Myanmar is facing obstacles in providing maternal and child health services.

Objectives: This study examined the prevalence and factors associated with maternal and child health (MCH) service utilization among mothers with children under five years of age in Southern Shan State, Myanmar.

Methods: A cross-sectional analytical study was conducted among mothers with children under five years of age, selected through multistage random sampling from four townships in Southern Shan State, Myanmar. Multiple logistic regression was applied. Factors with $p < 0.05$ were considered to have statistically significant association with the outcome.

Results: Among the 455 participants, the prevalence of MCH services utilization was 31.6% (95% Confidence Interval (CI): 27.52 – 36.07). Urban residents (AOR = 10.32, 95% CI = 5.65–18.83), mothers aged 26–30 years (AOR = 6.12, 95% CI = 3.11–12.04), and mothers aged over 31 years (AOR = 3.29, 95% CI = 1.58–6.87) showed higher utilization. Higher family income (AOR = 2.09, 95% CI = 1.03-4.22) and smaller family size (AOR = 4.26, 95% CI = 1.94–9.38) were also associated with greater use of services. Maternal and reproductive history factors linked to increased MCH service utilization included a history of abortion (AOR = 10.50, 95% CI = 4.04–27.30) and better maternal knowledge (AOR = 5.53, 95% CI = 2.37–12.86).

Conclusion: This study revealed approximately one-third of the mothers utilized MCH services. Factors associated with higher MCH services utilization included maternal health, access to healthcare, socioeconomic status, knowledge, and attitudes about MCH services.

Keywords: Antenatal care, Family planning, Maternal and child health service utilization, Postnatal care, Skilled birth attendant, Southern Shan State

1. Introduction

Maternal and Child Health (MCH) is a critical component of public health. Ensuring access to high-quality MCH care services is imperative for reducing maternal and child mortality rate [1]. Globally, the maternal mortality rate has decreased by 263 deaths per 100,000 live births, dropping from 460 in 1985 to 197 in 2023 [2]. Trends in maternal mortality indicate that improvement has slowed since 2016, about 260,000 women died in 2023 from pregnancy or childbirth complications, equivalent to one maternal death every two minutes [3]. The utilization of MCH service included recommended number of antenatal care visits [4], delivery of a child by the skilled birth attendant [5], and appropriate postnatal care services [6, 7].

Globally, many mothers fail to arrange for the utilization of MCH services, primarily in low- and middle-income countries [8]. Myanmar is a country that encounters obstacles in efficiently providing MCH services. The mortality rate in Myanmar was high in 2020, at 179 per 100000 births and was one of the highest in the ASEAN region [4]. Most maternal deaths in Myanmar occur during childbirth and can be prevented by improving MCH service accessibility [9].

Southern Shan State was ethnically diverse and mountainous, with areas affected by conflict facing challenges in accessing healthcare, particularly in rural regions, which hinders MCH services [10]. The low utilization of maternal and child health (MCH) services is influenced by both demand-side and supply-side factors [11]. The inadequate use of MCH services has resulted in a public health issue, necessitating efforts to address barriers to emphasize the difficulties faced [11]. However, no prior studies have explored the factors associated with MCH service utilization among mothers in Southern Shan State, and there is a huge gap in the research in terms of determining interventions and minimizing the challenges to increase MCH service utilization.

2. Methods

2.1 Study Area

The study took place in Southern Shan State, Myanmar, covering an area of 57,806 square kilometres and including 21 townships, but focused on four specific townships, Kunhing, Mawkmai, Mongnai, and Namsang, from April 2024 to February 2025.

2.2 Study Design

A cross-sectional analytical study described the prevalence and associated factors includ-

ing socioeconomic, demographic, and maternal factors, access to care, knowledge, and attitude toward MCH service utilization among mothers of children under five years of age in Southern Shan State, Myanmar.

2.3 Sample Size and Sampling

The sample size of 455 respondents was determined based on data from a prior study conducted in Central Myanmar [12]. The sample size estimation employed the formula for logistic regression outlined in [13]. Nine wards and 17 village tracts from four townships were selected using a multistage random sampling method, and the necessary samples were chosen through simple and systematic random sampling.

2.4 Data Collection

Data were gathered through face-to-face interviews using a Shan version of structured questionnaires consisting of eight parts: demographic and socioeconomic characteristics, partner and psychosocial factors, maternal information and pregnancy history, mother's ANC, delivery and PNC history, mother's family planning services utilization, access to health, and mother's knowledge and attitude toward MCH. Questionnaires were developed in English, translated into Burmese and Shan, and designed to respect participants' norms. Questionnaire content validity was established through an assessment by three experts and was revised as required. A pilot test with a sample of 30 mothers was conducted to evaluate question comprehension and accuracy. Feedback from this pilot test guided necessary adjustments, and reliability was measured using Cronbach's alpha coefficient resulted 0.76 for knowledge and 0.81 for attitude questions. The outcome variable, MCH service utilization, was computed using four variables, that is, four or more ANC visits, institutional delivery with SBA during the delivery of children (i.e., doctor, medic, midwife), and PNC during the postpartum period (within 42 days of childbirth) family planning received after postpartum were considered as utilized MCH services "Yes". Otherwise, if any of the women failed to meet any one of the mentioned four criteria, they were considered not utilize the MCH service "No".

2.5 Data Analysis

Data were recorded in Excel, imported into Stata version 18.0 (College Station, Texas 77845 USA), and checked before the analysis. Baseline characteristics were described as frequencies, percentages, means, standard

deviations (SD), medians, and ranges. Bivariate and multivariable analyses examined factors associated with MCH service utilization among mothers of children under five years old in Southern Shan State, Myanmar. Simple logistic regression was used to calculate the crude odds ratio (COR), 95% Confidence Interval (CI), and P-value for each variable. Variables with a P-value less than 0.25 were selected for initial multivariable logistic regression. Multicollinearity was assessed using a Variance Inflation Factor (VIF) (VIF =1.46). The final model was refined using backward elimination to obtain the best fit. Significant factors associated with MCH service utilization were reported using adjusted odds ratios (AOR), 95% confidence intervals (CI), and a P-value threshold of 0.05.

3. Results

3.1 Baseline characteristics of the participants

A total of 455 respondent was recruited through multistage random sampling from nine wards and 17 village tracts from four townships across three districts in Southern Shan State, Myanmar. Most participants 69.7% were from rural areas, while 30.3% were from urban areas. The age distribution of the respondents indicated that the predominant group comprised mothers in the middle-reproductive age range of 25–34 years, constituting 53.6% of the sample. The mean age of the respondents was 28.53 years (± 5.7) years, with a median age of 28 (range: 18-40). Regarding ethnicity, 64.6% were Shan, Pa-O 10.8% and Burmese 9%. The respondents were Buddhist 80.7%, Christian 15.1%, and Hinduist and Islamic 4.1%. Most participants were married 91.4%. The sample was dominated by key social determinants such as low education, low income, and male-headed households. About 90% of respondents had secondary-level education or lower, with 34% completing only primary school. Farming was the primary occupation, accounting for 69.2% of respondents. Approximately 49.6% of families had a monthly income of less than 60 USD, and in 90.6% of households, the husband was the household head. These factors provide important context for interpreting patterns of MCH service utilization. Of the families, 31.2% experienced inadequacy and debt, while 30.3% had adequate money but could not save. A total of 76.7% had one child under five years old. Regarding husbands' education, 28.7% had no formal education but were literate, while 27% had primary school education. In terms of oc-

cupation, the highest proportion 69.2% of fathers were farming. For MCH service costs, and 39.6% reported costs below 60 USD, and 32.5% reported over 100 USD. The mean cost was 93.28 USD, ranging 0-800 USD. Regarding accessibility, 43.5% found facility hours convenient, and 72.1% reported no security risks. For maternal and child health knowledge, 48.6% had low scores, 39.6% had moderate scores, and 11.9% had high scores. Regarding attitude, 43.9% had poor scores, 38.0% had moderate scores, and 18.0% had good scores (Table 1).

Table 1: Baseline characteristics of the participants (n=455).

Characteristic	Number (n)	Percentage (%)
Socioeconomic and demographic characteristics of mothers		
Living areas of participants		
Urban	138	30.3
Rural	317	69.7
Township		
Kunhing	98	21.5
Mawkmai	88	19.4
Mongnai	71	15.6
Namsang	198	43.5
Age (years)		
≤ 24	122	26.8
25-34	244	53.6
≥ 35	89	19.6
Mean (±SD)	28.5 (± 5.7)	
Median (Min: Max)	28 (18:40)	
Ethnicity		
Shan	294	64.6
Burmese	41	9.0
Pa-O	49	10.8
Ta'ang	31	6.8
Other	40	8.8
Religion		
Buddhist	367	80.6
Christian	69	15.2
Others (Hinduism and Islam)	19	4.2
Marital status		
Married	416	91.4
Divorced	13	2.9
Widowed	16	3.5
Separated	10	2.2
Education level of participant		
Illiterate	48	10.5
No formal education but literate	86	18.8
Primary school	155	34.1
Secondary school	119	26.2
Higher secondary school	28	6.2
Bachelor's degree and above	19	4.2
Occupation of participant		
Farmer	274	60.2
Livestock	30	6.6

Characteristic	Number (n)	Percentage (%)
Vendor	55	12.1
Government staff	19	4.2
Own business	28	6.2
Private employee	17	3.7
Manual labour	10	2.2
Dependent	22	4.8
Monthly family income in USD		
< 60 USD	226	49.7
60 – 100 USD	133	29.2
Income > 100 USD	96	21.1
Mean (±SD)	80.4 (±52.8)	
Median (Min: Max)	80 (16:300)	
Monthly family expense in USD		
< 60 USD	187	41.1
60 – 100 USD	202	44.4
> 100 USD	66	14.5
Mean (±SD)	75.4 (±35.8)	
Median (Min: Max)	80 (14:200)	
Head of the household		
Wife	43	9.5
Husband	412	90.5
Household economic factors of mothers		
Financial condition		
Inadequate	131	28.8
Inadequate and in debt	142	31.2
Adequate but unable to save	138	30.3
Adequate but able to save	44	9.7
Types of family		
Nuclear family	275	60.4
Extended family	108	23.7
Joint family	58	12.8
Single-parent family	14	3.1
Total number of family member		
3 - 4	161	35.4
5 - 6	194	42.6
≥ 7	100	21.0
Mean (±SD)	5.3 (±1.8)	
Median (Min: Max)	5 (3:10)	
Total number of under five children		
1 Child	349	76.7
2 Children	89	19.6
3 Children	17	3.7
Mean (±SD)	1.2 (±0.52)	
Median (Min: Max)	1 (1:3)	
Partner and psychological factors of mothers		
Education level of husband/child's father		
Illiterate	51	11.2
No formal education but literate	130	28.6
Primary school	123	27.4
Secondary school	100	21.5
Higher secondary school	43	9.5
Bachelor's degree and above	8	1.8
Occupation of husband/child's father		
Farmer	315	69.2

Characteristic	Number (n)	Percentage (%)
Vendor	54	11.9
Government staff	7	1.5
Own business	50	10.1
Private employee	12	2.6
Manual labour	17	3.7
MCH services cost		
< 60 USD	180	39.6
60 to 100 USD	127	27.7
> 100 USD	148	32.7
Mean (±SD)	93.3 (±78.7)	
Median (Min: Max)	70 (0:800)	
Opening hour of health facility		
Yes	198	43.5
No	257	56.5
Security risk (during moment for seeking MCH services)		
Yes	86	18.9
No	328	72.1
Don't know	41	9.0
Level of acceptability to the MCH services utilization		
Poorly acceptable (<60%)	62	13.6
Moderately acceptable (60% - 79%)	306	67.3
Highly acceptable (≥80%)	87	19.1
Mean (±SD)	68.9 (±9.90)	
Median (Min: Max)	72 (36:96)	
Level of Quality to the MCH services		
Poorly quality (<60%)	100	21.0
Moderately quality (60% - 79%)	239	52.5
Highly quality (≥80%)	116	25.5
Mean (±SD)	69.4 (±12.52)	
Median (Min: Max)	(36:100)	
Level of knowledge on the MCH		
Low knowledge (<60%)	221	48.6
Moderate knowledge (60% -79%)	180	39.5
High knowledge (≥80%)	54	11.9
Mean (±SD)	53.1 (±20.11)	
Median (Min: Max)	62.5 (12.5:93.8)	
Level of positive attitude towards the MCH services		
Poor attitude (<60%)	200	43.1
Moderate attitude (60% -79%)	173	38.0
Good attitude (≥80%)	82	18.9
Mean (±SD)	62.3 (±17.29)	
Median (Min: Max)	63.8 (36.3:87.5)	

3.2 Prevalence of MCH Services utilization services among mothers of children under 5 years in Southern Shan State, Myanmar

In our study, the overall prevalence of MCH service utilization, defined as receiving all four key services (at least four ANC visits, institutional delivery with a skilled birth attendant such as a doctor, medic, or midwife, postnatal care within 42 days of childbirth, and family planning services after the postpartum period), among mothers of children under five years of age in Southern Shan

State, Myanmar, was 31.7% (95% CI: 27.52–36.07). A total of 35.4% (95% CI: 31.11-39.90) of respondents received antenatal care at least four times, institutional delivery service with SBA had the highest utilization rate at 41.9% (95% CI: 37.51-46.58), while 41.0% (95% CI: 36.65-45.69) of respondents received postnatal care within two days of delivery. Additionally, 34.5% (95% CI: 30.26-39.00) of respondents accessed family planning services during the postpartum period, as presented in (Table 2).

Table 2: Prevalence of MCH services utilization among mothers of children under 5 years in Southern Shan State, Myanmar (n=455).

MCH service utilization	Number (n)	Percentage (%)	95% CI
Yes	144	31.7	27.52 – 36.07
No	311	68.3	63.92 – 72.47

3.3 Factors associated with MCH services utilization among mothers of children under 5 years in Southern Shan State, Myanmar

The location of residence was significantly associated with maternal and child health (MCH) service utilization after adjusting for covariates. Urban residents were ten times more likely to utilize MCH services than rural residents (AOR:10.32, 95% CI: 5.65-18.83). Mothers aged 26-30 years were six times more likely to use MCH services than those aged 18-25 years (AOR: 6.12, 95% CI: 3.11-12.04). Mothers aged 31 years and older were three times more likely to utilize MCH services compared to mothers aged 18-25 years (AOR: 3.29, 95% CI: 1.58-6.87). Families earning 40 USD or more monthly were twice as likely to use MCH services compared to those earning less (AOR: 2.09, 95% CI: 1.03-4.22). Families with 3-4 members were four times more likely to utilize MCH services than those with seven or more members (AOR: 4.26, 95% CI: 1.94 - 9.38). Families with 5-6 members were three times more likely to use MCH services than larger families (AOR: 3.05, 95% CI: 1.46 - 6.38). Women with one abortion history were ten times more likely to utilize MCH services than those without (AOR: 10.50, 95% CI: 4.04 - 27.30). Maternal knowledge level significantly affected MCH service utilization. Those with moderate knowledge were three times more likely to use MCH services than those with low knowledge (AOR: 3.51, 95% CI: 1.98-6.22). Respondents with high knowledge were five times more likely to utilize MCH services than those with low knowledge (AOR: 5.53, 95% CI: 2.37-12.86) (Table 3).

Table 3: Bivariate and Multivariable analysis of factors associated with MCH services utilization among mothers of children under five years in Southern Shan State, Myanmar (n=455).

Factors	No of Sample	MCH service utilization		COR	95% CI	AOR	95% CI	P-value
		No.	%					
Living areas								< 0.001**
Rural	317	55	17.4	1		1		
Urban	138	89	64.5	8.65	5.49 – 13.62	10.32	5.65 – 18.83	
Ethnicity								
Shan	294	83	28.2	1		-		<0.001*
Burmese	41	24	58.5	3.58	1.83 – 7.02	-		
Pa-O, Ta'ang and Others	120	37	30.8	1.13	0.71 – 1.80	-		
Religion								<0.001*
Buddhist	367	92	25.1	1		-		
Christian	69	39	56.5	3.88	2.28 – 6.61	-		
Others	19	13	68.4	6.47	2.39 – 17.52	-		
Income								0.030**
Income < 40 USD	143	17	11.9	1		1		
Income 40 – 100 USD	216	71	32.9	3.62	2.03 – 6.48	2.09	1.03 – 4.22	
Income > 100 USD	96	56	58.3	10.37	5.42 – 19.85			
Total number of family members								0.001**
(≥ 7 members)	100	19	19.0	1		1		
5 – 6 members	194	65	33.5	2.14	1.20 – 3.84	3.05	1.46 – 6.38	
3 – 4 members	161	60	37.3	2.53	1.39 – 4.58	4.26	1.94 – 9.38	
Education level of husband								<0.001*
Illiterate and no formal education but literate	181	32	17.7	1		-		
Primary and secondary school	223	86	38.6	2.92	1.83 – 4.66	-		
Higher secondary school and Bachelor's degree and above	51	26	51.0	4.84	2.48 – 9.45	-		
Age of mother								< 0.001**
18- 25	142	28	19.7	1		1		
26-30	165	74	44.9	3.31	1.97 – 5.54	6.12	3.11 – 12.04	
≥ 31	148	42	28.4	1.61	0.93 – 2.78	3.29	1.58 – 6.87	
Age at first pregnant								<0.001*
16 - 19	156	23	14.7	1		-		
20 - 23	173	54	31.2	2.62	1.51 – 4.53	-		
≥ 24	126	67	53.2	6.56	3.73 – 11.54	-		
Education level of mother								<0.001*
Illiterate and no formal education but literate	134	16	12.0	1		-		

Factors	No of Sample	MCH service utilization		COR	95% CI	AOR	95% CI	P-value
		No.	%					
Primary and secondary school	274	102	37.2	4.37	2.45 – 7.78	-		
Higher secondary school and Bachelor's degree and above	47	26	55.3	9.13	4.19 – 19.85	-		
Head of household								<0.013*
Husband	412	123	29.9	1		-		
Wife	43	21	48.9	2.24		-		
Occupation of mother								<0.001*
Farmer, livestock and Vendor	359	86	24.0	1		-		
Manual labour and dependent	32	18	56.3	4.08	1.94 – 8.54	-		
Government staff, own business and private employee	64	40	62.5	5.29	3.01 – 9.27	-		
Abortion history								< 0.001**
No abortion	425	124	29.2	1		1		
One time	30	20	66.8	4.85	2.20 – 10.66	10.50	4.04 – 27.30	
Opening hour of MCH facility								0.029*
Yes	198	52	26.3	1		-		
To some extent and No	257	92	35.8	1.56	1.04 – 2.35	-		
Acceptability of MCH services								0.016*
Poor	62	26	42.0	2.76	1.34 – 5.70	-		
Moderate	306	100	32.7	1.86	1.05 – 3.29	-		
High	87	18	20.7	1		-		
Quality of services								
Poor	100	42	42.0	1.98	1.12 – 3.51	-		0.039*
Moderate	239	71	29.7	1.15	0.70 – 1.90	-		
High	116	31	26.7	1		-		
MCH services cost								<.0.001*
< 60 USD	180	25	14.0	1				
60 to 100 USD	127	34	26.8	2.26	1.27 – 4.03			
> 100 USD	148	85	57.4	8.36	4.90 – 14.26			
Knowledge								< 0.001**
Poor knowledge	221	42	19.0	1		1		
Moderate knowledge	180	74	41.1	2.97	1.90 – 4.65	3.51	1.98 – 6.22	
Good knowledge	54	28	51.9	4.58	2.44 – 8.62	5.53	2.37 – 12.86	
Attitude								
Poor attitude	200	39	19.5	1		-		
Moderate attitude	173	70	40.5	2.80	1.76 – 4.45			
Good attitude	82	35	42.7	3.07	1.75– 5.38			

Note: * COR P-value, ** AOR P-value

4. Discussion

The findings revealed a pattern of low utilization of maternal and child health services. Only 31.7% (95% CI: 27.52–36.07) of the respondents reported utilizing MCH services in Southern Shan State, Myanmar. These prevalence findings were aligned with the broader challenges in MCH service utilization observed in other low-income and middle-income countries [14]. Factors such as geographical, socioeconomic, cultural, and quality-of-care issues likely contribute to suboptimal utilization rates according to the findings of a pooled study of 37 low- and middle-income countries [15]. This showed that mothers in Southern Shan State faced challenges in using MCH services. Another study in the Philippines found that 43.4% of mothers had an institutional delivery with a skilled birth attendant (SBA) for their last childbirth [16]. The lower utilization rate in Southern Shan State compared to the Philippines and other settings may be explained by differences in inclusion criteria, definitions of MCH services, and the specific challenges faced in low-income country contexts. These disparities likely reflect variations in healthcare infrastructure, service accessibility, socioeconomic conditions, and public health policies between Myanmar and the Philippines.

Urban residence emerged as a strong association, being ten times more likely to use MCH services than their rural counterparts (AOR: 10.32, 95% CI: 5.65-18.83). For instance, the findings are also aligned with the former survey in Tanzania and India also revealed a considerably wide rural-urban disparity in the utilization of MCH services [17, 18]. This finding is in line with many other previous studies conducted in India observed that urban women were more likely to use maternal health care services [19]. They attributed these disparities to better healthcare infrastructure, higher female education and autonomy, greater mass media exposure, and wealth in urban areas. This finding difference could be attributed to urban-rural disparities in healthcare access and utilization due to better infrastructure, greater availability of facilities, and increased awareness in urban areas. Additionally, rural areas of our study area, especially mountainous regions, face barriers, including limited healthcare providers and MCH facilities, transportation challenges, and restricted access due to conflicts and geographic isolation.

Maternal age also played a crucial role, with mothers aged 26-30 years (AOR: 6.12, 95%

CI: 3.11-12.04) showing the highest likelihood of utilizing MCH services, followed by those aged ≥ 31 years (AOR: 3.29, 95% CI: 1.58-6.87). These findings aligns with those of a study conducted on how young mothers in 32 middle-income countries use maternal health services and found that teenage mothers often do not have enough access to prenatal care and skilled assistance during childbirth compared to older women [20], from similar background further synthesized evidence across low- and middle-income countries, identifying biological and social disadvantages of adolescent mothers such as higher risks of postpartum complications and economic vulnerability that limit their use of maternal services [21] after adjusting for background factors like education, parity, and residence and matched the findings of the survey from Indonesia, and that having a skilled birth attendant was linked to the mother's age in a positively associated with skilled birth attendant use, indicating age-related disparities even in contexts with national health initiatives [22]. In our study, teenage mothers similar to those described in sub-Saharan Africa and Indonesia likely experience constrained access to prenatal and skilled delivery care due to lower health literacy, reduced autonomy in decision-making, financial constraints, and limited empowerment. These age-related inequalities mirror the multifactorial barriers highlighted in the literature and underscore the need for targeted interventions to improve maternal service utilization among adolescent mothers. Furthermore, ongoing ethnic conflicts and political instability in Shan State can disrupt health service delivery and discourage mothers from seeking institutional care.

Income level demonstrated a strong positive association with MCH service utilization, with higher-income groups being significantly more likely to use these services. Families earning more than 40 USD less (AOR: 2.09, 95% CI: 1.03-4.22) per month were more likely to utilize MCH services. These findings are aligned with the former study in south eastern Nigeria and Chad, which reported that increasing monthly income was associated with MCH service utilization (OR: 1.32) also highlighted that higher income not only increased the likelihood of accessing MCH services but also reflected broader socioeconomic advantages such as improved transportation options, ability to afford out-of-pocket costs, and greater autonomy in healthcare decisions. [6, 23]. Similarly, the finding also found in Myanmar that mothers

from the most abundant wealth status are significantly more likely to receive MCH services compared to women in the poorest wealth quintile [24] . This disparity reflects not only greater financial resources but also increased access to information, health facilities, and empowerment to make healthcare decisions among wealthier women in suburban Mandalay. This finding could be low-income families face greater financial burdens and multiple barriers such as affordability, transportation, and limited social support that restrict their access to healthcare and highlight systemic inequities in service utilization.

Family size was inversely related to MCH service utilization, with smaller families being more likely to use these services than larger ones (AOR: 4.26, 95% CI: 1.94 - 9.38) but it is different a previous study in southeastern Nigeria and study among developing countries revealed that families with more children were more likely to use MCH services. (OR: 1.20, 95%CI: 1.56–7.00) [6, 25]. One possible explanation for this difference is that in Southern Shan State, families with fewer children may have greater financial flexibility and resources to seek formal health services. Larger families may face greater challenges in accessing healthcare due to economic constraints and time limitations, reducing their ability to utilize MCH services. Another reason could be differences in health policy implementation and outreach strategies. In some countries, including Nigeria, MCH programs may specifically target larger families or multiparous mothers by offering incentives or tailored interventions that encourage service utilization. In contrast, in Myanmar, particularly in Shan State, MCH outreach and health promotion activities may not differentiate by family size, meaning smaller families who are more proactive or better informed are more likely to access services on their own.

A history of abortion, with women who had experienced one abortion being ten times more likely to use these services (AOR: 10.50, 95% CI: 4.04 - 27.30). These findings are relevant to the previous study in Southern Ethiopia found that women who have had abortions are more likely use MCH services compared to those who have carried pregnancies to term [26]. This findings was also aligned with the another study in Central Myanmar observed that mothers with a history of abortions were 14.3 times (OR = 14.3; 95% CI 1.63-125) more likely to use the MCH services utilization [12]. This finding

could be because past pregnancy complications influence future health-seeking behaviours, possibly due to increased risk awareness, closer monitoring by healthcare providers, and greater recognition of danger signs, prompting mothers to seek MCH care services. Mothers with moderate (AOR: 3.51, 95%CI: 1.98-6.22) and high knowledge (AOR: 5.53, 95% CI: 2.37-12.86) levels were significantly more likely to use these services than those with poor knowledge. This finding was consistent with a previous study conducted in Myanmar [27] and another study regarding implications of MCH service utilization in developing countries [28] found that women who had a moderate to good level of knowledge utilized SBA 2.7 times more than those who had a poor level of knowledge (OR: 2.705, 95% CI: 1.31-5.57). The findings were relevant to the study in Benue State, Nigeria and another mix method systematic review MCH service update in low and middle income countries [29] observed the importance of health education programs that consider cultural values and beliefs to promote MCH services utilization [30]. This finding could be because mothers who received health education about MCH were more aware of these services' importance, sought safe delivery, and could recognize danger signs during pregnancy. Health education programs can play a key role in promoting MCH service utilization.These findings highlighted the complex interplay of sociodemographic, economic, and personal factors that influence MCH service utilization. The findings highlighted the need for targeted public health interventions to reduce disparities in MCH service utilization, particularly among rural communities, low-income families, larger households, and younger mothers. Barriers related to access, cost, and cultural factors should be addressed through comprehensive, community centred approaches. Improving the training and capacity of healthcare workers in underserved areas can enhance both the availability and quality of MCH services. Expanding outreach programs, such as mobile clinics and community health worker initiatives, can help overcome geographic and infrastructure barriers. Strengthening collaboration between government health systems and ethnic health organizations is vital to ensuring inclusive and equitable service delivery in Southern Shan State. Health education efforts should focus on improving maternal knowledge and awareness, especially among younger mothers, to increase the use of antenatal care, skilled birth attendance, postnatal

care, and postpartum family planning. Additionally, strategies that improve the convenience and perceived quality of services, such as flexible facility hours and respectful care, are essential for boosting service uptake. Finally, promoting equitable access to MCH services, including the availability of subsidized services for low-income families, is crucial for improving maternal and child health outcomes and reducing the substantial challenges identified in this study.

This study employed simple and multiple logistic regression to examine the factors influencing MCH service utilization. By analysing sociodemographic, service-related, and maternal knowledge and attitude factors, this study provides a holistic perspective and practical implications for policymaking. The study's locally relevant insights for Southern Shan State, Myanmar, enhance its potential impact on improving maternal and child health outcomes. However, the findings may not be generalizable to other regions or the entire population of Myanmar. The cross-sectional design of this study captures only a single point in time regarding MCH service utilization, thereby restricting the ability to establish causal relationships between variables. Ethnic and cultural diversity, along with geographic variations within the region, may introduce language barriers and cultural nuances that affect data interpretation and limit the generalizability of the findings. Additionally, the study is subject to potential recall bias in participants' memories, possible interviewer influence on responses, language barriers arising from ethnic diversity, and limited applicability of the findings across Myanmar.

5. Conclusion

In Southern Shan State, only about one-third of mothers with children under five years old accessed MCH services, which is relatively low. Factors that were linked to higher MCH service usage included living in urban areas, older maternal age, higher family income, having a smaller family, a history of abortion, and possessing moderate to high levels of knowledge. Interventions were aimed at improving knowledge and awareness of the benefits of MCH services, encouraging mothers to seek these services more frequently, and supporting better healthcare infrastructure and more accessible facilities in rural areas. Future studies might investigate specific knowledge and attitude elements influencing MCH service usage, and community-based initiatives promoting these services could impact utilization rates.

Acknowledgement

I am grateful to the Shan State Development Foundation (SSDF), health post staff, village administrators, community leaders, and healthcare personnel at the Health Post of Southern Shan State, Myanmar, for their assistance during data collection.

Author contributions

SMSA and TP contributed to the study conception and design, data collection, data analysis, and manuscript drafting. Both authors critically revised the manuscript and approved the final version for publication.

Declaration

Ethics approval and consent to participate

This study was approved by the Centre for Ethics in Human Research, Khon Kaen University, Thailand, with reference number HE 672210, and the approval date was December 3, 2024.

Competing interests

The authors declare that they have no competing interests.

Funding

Not applicable.

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Received 19/04/2025
Received in revised form 20/06/2025
Accepted 23/06/2025