

## Utilization Patterns of Maternal and Child Health (MCH) Care Services: A Cross-Sectional Study in Rawalpindi, Pakistan

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Maternal health; Child care; District Head Quarter; Antenatal Care

## 1. Abstract

**1.1. Background:** Despite the implementation of various maternal health programs and schemes at both regional and national levels in Pakistan, maternal mortalities and morbidity remain significantly high. This suggests that maternal health services are being underutilized.

**1.2. Aim:** This current study focuses on assessing the utilization patterns of maternal health services and the factors associated with their utilization in Rawalpindi, Pakistan.

**1.3. Methods:** The cross-sectional study was conducted over one year (2021-2022) among mothers aged 15 to 49 years in the field practice area of DHQ Rawalpindi. The minimum required sample size was determined as 645. Participants were selected using a simple random sampling technique from a randomized list of villages. Data was collected through home visits, utilizing a pre-tested, standardized questionnaire. In the analysis, the significance of associations between variables was established at  $P < 0.05$ .

**1.4. Results:** Among the 645 potential participants, 632 provided consent for inclusion in the study. Only 58.3% of participants received any Antenatal Care (ANC), and a mere 11.7% received full ANC services. More than half of the participants (52.7%) had experienced pregnancy-related complications. Variables such as younger age and limited decision-making capacity were significantly associated with the lack of full ANC services ( $P < 0.05$ ).

**1.5. Conclusion:** This study highlights that a woman's age, literacy status, parity, socioeconomic status, and occupation are

major determinants influencing the utilization of maternal health care services. These determinants should be taken into account when planning future interventions aimed at promoting attitudinal changes and, consequently, enhancing the utilization of maternal health care services.

## 2. Introduction

Maternal and child health (MCH) is a critical component of public health, reflecting the well-being and vitality of societies. Ensuring access to quality MCH care services is essential for reducing maternal and child mortality rates and promoting the overall health of populations [1]. However, despite substantial global efforts to improve MCH care, significant disparities in service utilization persist, particularly in low- and middle-income countries. Pakistan, a country with a high burden of maternal and child morbidity and mortality, is no exception to this challenge [2]. Rawalpindi, a populous city in Pakistan, serves as a microcosm of these broader challenges in MCH care utilization. Despite the presence of healthcare facilities and services, access to and utilization of MCH care remain unevenly distributed, leading to suboptimal health outcomes for women and children. Understanding the utilization patterns of MCH care services in Rawalpindi and identifying the factors that contribute to or impede their use are crucial steps towards addressing these disparities [3].

This cross-sectional study aims to delve into the utilization patterns of maternal and child health care services in Rawalpindi, Pakistan. By examining the socio-demographic characteristics of service users, exploring barriers to access, and assessing factors

that influence utilization, this study seeks to uncover a comprehensive picture of the MCH care landscape in the region [4, 5]. The insights gained from this research will not only contribute to academic knowledge but will also have significant implications for policy formulation and program implementation aimed at improving maternal and child health outcomes. The objectives of this study are threefold: first, to assess the current utilization rates of MCH care services among mothers and children in Rawalpindi; second, to identify the key factors that influence the utilization of these services, including socio-economic factors, cultural considerations, and geographic accessibility; and third, to provide evidence-based recommendations that can inform policies and interventions aimed at enhancing the utilization of MCH care services in Rawalpindi [6, 7].

By shedding light on the utilization patterns of MCH care services and unravelling the complex web of factors that impact their accessibility and use, this study aspires to contribute to the global discourse on improving maternal and child health [8-10]. Ultimately, the findings and insights generated could serve as a roadmap for stakeholders to formulate targeted strategies that bridge the gap between available MCH care services and their effective utilization, thereby fostering healthier futures for mothers and children in Rawalpindi, Pakistan, and beyond.

### 3. Materials and Methods

#### 3.1. Study Area and Study Period

The present community-based observational study with a cross-sectional design was carried out at DHQ Hospital Rawalpindi, a field practice area under the aegis of Community Medicine for teaching, training and research activities for medical undergraduates. The ethical clearance was obtained from the Institutional Ethical Committee before the study commenced with reference letter DHQ/GW/2021/91 dated August 2021. This present cross-sectional study was done for one year between October 2021 and September 2022.

#### 3.2. Study Population and Sample Size

The study subjects were mothers (15-49 years) who delivered in the last year and stayed in the study area for twelve months or more. Mothers with a serious illness such as malaria (fever in the evening hours associated with chills), severe anemia (extreme paleness of either palm or tongue or lower inner side of eyelids), high-grade fever (temperature of 39.4°C or more), present history of urinary or vaginal discharge or burning micturition, and psychological distress) were excluded. Estimation for desired sample size ( $n = 516$ ) was based on the consideration that the proportion of women who received any ANC services in Rawalpindi was 70.8%, [11] by application of the formula for cross-sectional studies [ $n = (Z_{1-\alpha/2})^2 \times p(1-p)/d^2$ ]. In that formula,  $Z$  (1.96) is the standard normal variate for the level of significance for the two-sided test with “ $\alpha$ ” as the level of significance (0.05) at “ $p$ ” of 70.8% as prevalence, with “ $d$ ” as an absolute allowable error (4%) and “ $n$ ” reflects the

estimated sample size. In the study, an expected non-responsiveness from approximately 20% of participants was considered, so the final estimated sample size came out as 645 by applying the formula: final sample size = calculated sample size / (1 - non-response rate anticipated).

All 32 villages under DHQ Rawalpindi were enlisted. Of these 32 villages, 20 were selected by adopting a systematic random sampling procedure giving due representation to the study area. From each selected village, a list of mothers (15-49 years) who have a history of delivery (past one year) and were residing in that area for more than twelve months was prepared using sub-centre registers and approximately 32-33 mothers were included in the study by using simple random sampling technique from the prepared list. Thus, a sample of 645 mothers was selected for the study. The population of the adjacent village was appended if there was an unavailability of the required number of subjects in that village.

#### 3.3. Study Tool

A standard questionnaire was used in the study, which was pre-tested and pre-designed, which included demographic details, utilization pattern of maternal health care services and pregnancy-related complications. The questionnaire was first prepared in English. Then, it was translated into Urdu by an expert in that language keeping semantic equivalence. Again, two faculty members with total unawareness of the previous English version of the questionnaire were requested to translate the Hindi version into English to ensure the translation. The questionnaire's content for the collected 52 questions was put forward among a group of 10 faculty members for validity and to recognize the highest level of agreement among faculty members. The quantification of concord among faculty members for each question was done using Aiken's  $V$  value (cut off as more than 0.07), so, out of 52 questions, only 29 were included in the questionnaire. Every measure was taken to make the questions obvious per the study's objective. A pilot study was done randomly among twenty mothers, and it took an average of 20 minutes to complete the questionnaire. The questionnaire had 3 sections and consisted of a total of 29 items. Section one consisted of ten items and gathered information regarding participants' sociodemographic characteristics such as age, religion, literacy status, occupation, spouse literacy status, spouse occupation, age at marriage, parity, type of family, socioeconomic status and decision-making in household/family matters. The socioeconomic status was obtained using modified B.G. Prasad socioeconomic status classification (revised for 2015, CPI 2001 as the base). It is based on per capita monthly income, and based on it has five categories such as Class I (Rs. 5798 and above), Class II (2899-5797), Class III (1739-2898), Class IV (870-1738) and Class V (869 and below) [12]. There were seven items in the decision-making index (DMI) focusing on the mother's part in the decision of households and participation in society. The responses for each item of DMI were 0 (others), 1 (together by husband and wife)

and 2 (self). Depending upon the total DMI score, the mother's decision-making capacity was classified as low, moderate and high [13]. Division two comprised 17 items and aimed to gather the participant's utilization pattern for maternal health care services, including ANC registration, trimester for ANC registration, place of ANC registration, a place for seeking ANC-related services, number of self-ANC visits, number of ANC visits by health care workers, IFA tablets received, number of IFA tablets consumed, number of dose of TT vaccine received, place of delivery, delivery assisted by, any family planning method adopted, any PNC visit by self and any PNC visit by health care workers, any ANC and full ANC. Any ANC was defined as mothers who consumed 100 or more Iron Folic Acid (IFA) tablets, received three or more antenatal visits, or received one or more tetanus toxoid (TT) vaccines during pregnancy. The full ANC included mothers who had three or more ANC checkups, consumed 100 or more Iron Folic Acid (IFA) tablets, and received one or more TT vaccines during pregnancy.[14] Section three comprised two items and aimed to capture the pregnancy-related complications and seek treatment for such complications. The behaviour to seek treatment was captured only for the latest complications (either life or non-life-threatening, but the life-threatening event was only noted, even if the non-life-threatening event was the latest one) that occurred during recent pregnancy.

### 3.4. Data Collection

The principal investigator conducted house-to-house visits and contacted the mother. They were explained about the purpose of this study and were requested to participate. The study included subjects who provided written consent after understanding the study's objectives. The investigator administered the questionnaire to subjects by face-to-face interview technique. Also, the filled questionnaires were then checked for completeness. All possible attempts were made to keep the subjects' information anonymous and confidential. Being elective and not requisite were the properties for participating in the study. Data analysis Before analysis, the obtained subjects' responses were entered in an MS Excel spreadsheet, after which variables were coded accordingly, and any erratum, wherever found, was removed. International Business Machines Corporation (IBM) Statistical Package for the Social Sciences (SPSS) Statistics for Windows, Version 26.0 (IBM Corp. Armonk, New York, United States of America) was utilized

for carrying out the analysis of entered and cleaned data. Percentages (%) were used to represent the data of categorical variables. A chi-square test was applied (5% level of significance) to find out the strength of association ( $P < 0.05$ ) between the dependent variable (full ANC care) and independent variables (age, religion, literacy status, occupation, spouse literacy status, spouse occupation, age at marriage, parity, type of family, socioeconomic status and decision making in household/family matters).

### 3.5. Results and Interpretation

Out of 645 participants, 632 subjects were included in the study as they provided their informed written consent. More than two-fifths of mothers (44.8%) were 21 and 30 years old. Around two third of participants (61.2%) belonged to the Muslim religion. Among study participants, 60.4% were illiterate, and only 13.3% worked. About one-third of participants' spouses (35.6%) were illiterate, and two fifth (40.1%) of spouses were working. Not to surprise, nearly one-third of participants (38.3%) got married before attaining 18 years. More than two-fifths of participants (43.3%) had three or more children and 42.3% stayed in joint families. Only one-tenth of participants (13.4%) had a high decision-making capacity for family and social matters (Table 1).

The present study revealed that less than one-tenth of participants (7.0%) never visited or availed of ANC services. Among those who availed of ANC services, only half of the participants (58.3%) made their first ANC visit during 1st trimester; private health institution was the preferred place for ANC registration (53.6%) and seeking ANC care services (34.4%); only one-fourth of participants (28.1%) made three or more ANC visits; whereas nearly two-third of participants (59.4%) received at least one dose of TT vaccine. Among those who received IFA tablets, nearly one-third of participants (30.1%) did not consume them (Table 2 (i)). Table 2 (ii) showed that only 58.3% and 11.7% of participants made any ANC and full ANC services, respectively. Table 3, showed that more than half of the participants (52.7%) had suffered from pregnancy-related complications, and excessive fatigue and severe headache were the most common symptoms, and only 54.6% of participants sought treatment for such complications. The lower age group, lower literacy status, early age of marriage, lower socioeconomic status and low decision-making capacity of participants were significantly associated with not obtaining full ANC services ( $P < 0.05$ ).

**Table 1:** Distribution of socio-demographic characteristics of study participants (N=632)

Study variable	Number (%)
Age (in years)	
<21 years	117 (18.5)
21-30 years	283 (44.8)
31-40 years	154 (24.4)
>40 years	78 (12.3)
Religion	
Muslim	387 (61.2)
Hindu	245 (38.8)
Literacy status	
Illiterate	382 (60.4)
Primary	109 (17.3)
Middle	93 (14.7)
Higher or above	48 (7.6)
Occupation	
Working	84 (13.3)
Housewife	548 (86.7)
Spouse literacy status	
Illiterate	225 (35.6)
Primary	173 (27.4)
Middle	139 (21.9)
Higher or above	95 (15.1)
Spouse occupation	
Working	253 (40.1)
Non-working	379 (59.9)
Age at marriage	
<18 years	242 (38.3)
18 years or more	390 (61.7)
Parity	
1	187 (29.5)
2	171 (27.1)
3 or more	274 (43.4)
Type of family	
Nuclear	365 (57.7)
Joint/Extended	267 (42.3)
Socioeconomic status	
Class I	63 (10.0)
Class II	77 (12.2)
Class III	253 (40.0)
Class IV	129 (20.4)
Class V	110 (17.4)
Decision-making capacity	
High	85 (13.4)
Moderate	117 (18.6)
Low	430 (68.0)

**Table 2(i):** Distribution of utilization pattern of maternal health care (MCH) services among the study participants (N=632)

Variables	Number (%)
Availed ANC services	
Yes	588 (93.0)
No	44 (7.0)
If ANC services availed	N=588 Number (%)
ANC registration done in which trimester (First ANC check-up)	
1 <sup>st</sup> trimester	343 (58.3)
2 <sup>nd</sup> trimester	125 (21.3)
3 <sup>rd</sup> trimester	120 (20.4)
Place of ANC registration	
Private	315 (53.6)
Public	273 (46.4)
Place of seeking ANC care services	
Only private institutions	202 (34.4)
Only public institutions	124 (21.1)
Both (private and public)	262 (44.5)
Number of ANC visits	
1	96 (16.3)
2	327 (55.6)
3 or more	165 (28.1)
ANC visits by healthcare workers	
Yes	265 (45.1)
No	323 (54.9)
IFA tablets received	
Yes	508 (86.4)
No	80 (13.6)
If received, the number of IFA tablets consumed (n=508)	
Not consumed	153 (30.1)
Jan-99	261 (51.4)
100 or more	94 (18.5)
Received at least one dose of the TT vaccine	
Yes	349 (59.4)
No	239 (40.6)
Yes	349 (59.4)

**Table 2 (ii):** Distribution of utilization pattern of maternal health care (MCH) services among the study participants (N=632)

Variables	Number (%)
Place of delivery	
Public Institution (Medical college/GH/CHC/PHC/SC)	225 (35.6)
Private Institutions (Hospitals/Nursing homes)	97 (15.3)
Home	310 (49.1)
Delivery assisted by	
Doctor	123 (19.4)
Nurse/LHV/ANM/TBA	173 (27.4)
Untrained birth attendant	336 (53.2)
Any family planning method adopted	
Yes	98 (15.5)
No/Lactational amenorrhea	534 (84.5)
Any Post-natal care (PNC) visits herself	
Yes	287 (45.4)
No	345 (54.6)
Any Post-natal care (PNC) visits by healthcare workers	
Yes	166 (26.3)
No	466 (73.7)
Any ANC	369 (58.3)
Full ANC	74 (11.7)

**Table 3:** Distribution of pregnancy-related complications among study participants (N=632)

Variables	Number (%)
Pregnancy-related complications	
Yes	333 (52.7)
No	299 (47.3)
If yes specify symptoms*	
Edema	141 (22.3)
High-grade fever	109 (17.2)
Convulsion	44 (6.9)
Severe headache	157 (24.8)
Lower abdomen pain	131 (20.7)
Foul-smelling excessive blood	28 (4.4)
Excessive fatigue	248 (39.2)
Sought treatment for the symptoms (n=333)	
Yes	182 (54.6)
No	151 (45.4)

#### 4. Discussion

This study focused on the extent of maternal healthcare services utilization. Here we made a bridge between several maternal healthcare facilities available from the various health sectors to understand the impact of individual healthcare facilities on the utilization of healthcare services. Further, it helps to find the association between mothers' utilization patterns of MCH services and sociodemographic economic variables. The findings suggest that the level of utilization of full antenatal care (11.7%) is quite low compared to any ANC (58.3%), which is supported by a study done by Ray et al. [11] where it was have shown that full ANC and any ANC services utilization by study subjects were 14.9 and 70.8% respectively. In the present study, ANC utilization was significantly rising with the increase in the age of participants (5.1% among participants with the age of females being homemakers reflects their financial dependency, so males being decision-makers complemented with higher literacy and economic status easily affect and support the behaviour of females to utilize the MCH services.[19,20] In the present study, it was observed that the usage of antenatal services was higher with the enhancement in the literacy status of mothers and the highest ANC usage was found among mothers with literacy status as higher school or above and the lowest among illiterate mothers. This pattern is similar to the findings of Singh et al. [21], Kaur et al. [22] and Barman et al. [23], which can be factually described that with the enhancement in the educational level, mothers are more aware of ongoing health-related schemes and programs which in turn improves their MCH care services usage. So, there is a dire need for females from childhood to be provided with basic education to improve the usage of ANC services. It was found in the present study that with the increase in the number of children, there is an increase in ANC services utilization. This could be because the mothers gained and became more confident towards ANC services and institutions after every successful parturition. It shall be considered a welcoming step as increased parity is associated with an increased chance of morbidities and mortalities among mothers, including children. But this finding was incoherent with the studies done by Kaur et al.,[22] and Gupta et al.,[24], where a decreasing trend was observed in the utilization of MCH services among mothers with higher parity. In the present study, a significant association was observed between mothers' usage of MCH services and socioeconomic status based on per capita monthly income. The studies by Gupta et al. [25], Sahni et al [26], and Sangwan et al [27]. have also shown the contrast in the usage pattern of ANC services among mothers from distinct socioeconomic statuses, where mothers from lower socio-economic groups were lagging in utilizing ANC services when compared to the mothers from middle or higher socioeconomic group. The present study has revealed a significant difference in the utilization of maternal health services among participants of different religions. Few default standards or laws of a religion set for women can bring defeatist attitudes and behaviour for using

ANC services. In a country like Pakistan with wide cultural and religious variations, the approach which merges the religious representatives and health care representatives has an important role in changing society's attitudes and perceptions towards seeking health services. As discussed, religion has some or more influencing impact, so including and involving the religious members or organizations in the MCH care services scheme or program can benefit their utilization pattern [28, 30]. The observations of the present study are the analysis of data collection from primary sources, i.e., mothers, which constitute the study's major strength. Since the study is quantitative and cross-sectional, it derives only association, not a causal relationship between various characteristics of maternal health services utilization, which can be considered a limitation of the study. The future studies shall also cover qualitative aspects such as quality analysis of the service being provided, mothers' feedback to measure the level of satisfaction for services being availed, the role of health professionals and their perspective about MCH care services.

## 5. Conclusion

In the present study, major determinants of women influencing utilization of maternal health care service include their age, literacy status, parity, socioeconomic status and occupation. The lower utilization of ANC among women under 21 raises a serious concern. Such determinants shall be considered for upcoming interventions aiming to bring attitudinal changes and concurrently lead to improved and enhanced usage of maternal health care services. Males being decision-makers and their participation in health care delivery can easily affect and support the behaviour of females to utilize the MCH services. Additionally, regular training of health staff and an established institution with most of the required facilities complemented with proper implementation of in-hand resources can bring down the mother and child deaths. Declaration of patient consent The authors certify that they have obtained all appropriate patient consent forms. In the record, the patient(s) has/ have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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