Impact of Intellect on the Efficacy of Healthcare Service Utilization Within Familial Concept

Iqra Nazeer
University of Education
*Correspondence: nazeer.iqra64@gmail.com

Citation | Nazeer. I, "Impact of Maternal Intellect on the Efficacy of Healthcare Service Utilization within Family Way", MCCSS, Vol. 1, Issue. 1, pp. 40-52, Mar 2022
Received | Feb 11, 2022**; Revised |** Mar 05, 2022**; Accepted |** Mar 10 2022; **Published |** Mar 22,2022.

This study explores the intricate relationship between maternal intelligence and the effectiveness of healthcare service utilization in the context of family planning. Understanding how a mother's cognitive abilities impact the utilization of healthcare services is crucial for enhancing decision-making processes and improving the health outcomes of mothers and children. The study utilized a diverse demographic sample and implemented a correlational methodology. The sample for this study comprised 115 married women within the reproductive age range of 20 to 45 years. Employing a blend of quantitative measures and qualitative assessments, this research scrutinizes cognitive factors that influence decision-making regarding family planning services. The methodology incorporated various tools for data collection, including a demographic profile form, the Women's Empowerment Gauge, and the Healthcare Access Survey. These assessment instruments encompassed questions concerning the utilization of antenatal health services, infant healthcare, and preferences regarding birthing locations. Results illustrated that there exists a noteworthy correlation between social empowerment and place of delivery. Similarly, a notable correlation emerged between psychological empowerment and the utilization of Prenatal Health Services (PHS) as well as the choice of delivery location. Key determinants influencing the utilization of PHS, Neonatal care (NC), and the selection of delivery locations were found to be the women's age and their age at the time of marriage. Furthermore, it was discovered that the educational attainment of women played a crucial role in predicting both the utilization of NC and the prevalence of postpartum depression. The results indicate that it is imperative to adopt specific strategies aimed at empowering women in Pakistan in order to improve the utilization of maternal-child healthcare services and safeguard the well-being of both mothers and children. The primary focus of this study pertains to the subject of women's empowerment and its correlation with the age at which women marry and the provision of healthcare for their children. The utilization of logistic regression analysis is employed to investigate and analyze the association in question.

Keywords: Psychological Empowerment, Women's Empowerment Index, Healthcare Services, Postpartum depression, Neonatal care.

Introduction:

The utilization of maternal healthcare services serves as a vital indicator, reflecting a nation's commitment to safeguard the health and well-being of its women and children. Within this framework, women's empowerment emerges as a critical determinant that intricately influences the utilization of maternal healthcare services. The adverse health conditions faced by mothers and their infants carry significant implications within the broader spectrum of global public health issues. Research indicates a higher prevalence of these health challenges in developing countries. The safety of the delivery process plays a pivotal role in influencing the health and well-being of both mothers and babies [1]. World Health Organization (WHO)

estimates reveal a stark reality, with approximately 800 women succumbing to pregnancy-related diseases on a daily basis. Alarmingly, 99% of these deaths occur in middle and low-income countries, and one-third of the fatalities originate from South Asian countries [1]. However, a glimmer of hope exists in the form of maternal healthcare facilities, as research suggests that providing such facilities could prevent up to 80% of maternal deaths [2][3].

Maternal healthcare facilities are strategically delivered in three stages: during the pregnancy period (antenatal care), during childbirth (delivery care), and immediately following childbirth (postnatal care). These critical interventions not only have the potential to significantly reduce maternal mortality but also underscore the importance of targeted healthcare measures, especially in regions grappling with the highest maternal death rates [2]. The well-being and future prospects of children are deeply impacted by the caliber of healthcare provided to their mothers, encompassing both the stages before and after childbirth [4]. Existing evidence suggests that various factors related to the socio-demographic characteristics, autonomy, and empowerment of mothers significantly affect the well-being and overall health of their children. The conducted study revealed a positive correlation between maternal empowerment and the effective utilization of healthcare services, thereby enhancing the health and welfare of both mothers and their newborns [5]. Facilitating the empowerment of women proves instrumental in enhancing their efficient access to a spectrum of Integrated Care Pathway (ICP) services. This, in turn, contributes to safeguarding and promoting the health of both women and their newborns. The implementation of ICP strategies, such as PHS and NC, along with the choice of birth location, holds significant promise in low-income nations, with potential substantial reductions in mortality rates for both infants and mothers [6][7][8][9].

The ICP approach aims to elevate the overall health outcomes of maternal and infant populations by prioritizing their well-being. According to the study conducted, this method integrates healthcare services comprehensively for mothers and children, accounting for both temporal and spatial dimensions. Temporally, the ICP emphasizes the provision and integration of health services tailored to maternal and child health across various life stages. These stages encompass the prenatal period, the birthing process, the postnatal period, as well as childhood and adolescence [10].

The primary objective of these care services is to optimize the physical and mental health of both maternal individuals and infants. Within the framework of ICP, the element of "place" denotes the interconnectedness of services provided across different environments, spanning residences, communities, and healthcare establishments [11]. PHS represents a specialized healthcare initiative administered to pregnant women by qualified healthcare professionals, adhering to guidelines established by the World Health Organization (WHO). Typically, this service involves a structured series of four to five scheduled appointments for pregnant individuals without preexisting medical conditions. The utilization rates of antenatal care services differ significantly between less developed (65%) and more developed nations (97%) [12]. Concerning the provision of skilled attendance during childbirth, prevalence rates are 53% in low-income nations and 99% in high-income ones. Notably, there exists considerable variation in the utilization of postpartum care across nations, particularly between those with lower socioeconomic status and more developed counterparts [13][14].

Postpartum care utilization rates range from 30% in economically disadvantaged countries to as high as 90% in industrialized nations [15]. The postnatal phase, or postpartum period, extends for the initial six weeks following childbirth. During this crucial time, it is imperative to address health risks to ensure the well-being of both the maternal figure and the neonate [16]. NC includes monitoring danger signs, documenting weight and temperature, and prioritizing exclusive breastfeeding. In a study by Warren et al. (n.d.), emphasis is placed on promoting hygienic habits and proper care for neonates' eyes, skin, and umbilical cords. The study also stresses the importance of giving the newborn's initial bath within the first 24 hours

[17]. Additionally, the research highlights incentivizing parents to adhere to standard vaccine schedules for their infants.

The significance of the place of child delivery should not be underestimated in terms of its impact on maternal and neonatal mortality. The risk of contracting diseases that pose threats to the lives of both mothers and infants is much higher for women who choose to give birth at home without the presence of sufficiently skilled healthcare personnel. The topic under consideration concerns individuals in the initial phases of human growth, often denoted as early human development. Despite the widespread distribution of information via prominent media platforms and the internet, a notable portion of mothers residing in economically disadvantaged countries persist in delivering their babies within their own residences, without the assistance of trained healthcare practitioners [18]. The World Health Organization (2013) has reported that women living in rural areas of developing countries are more vulnerable to mortality as a result of their destitute and undereducated condition. In order to reduce the death rate of neonates and mothers, it is crucial to develop a strategy in which mothers deliver their babies in healthcare facilities under the supervision of experienced healthcare experts. This approach aims to overcome any existing barriers [19].

Insufficient emphasis on prenatal and NC is evident in developing nations like Pakistan, which is classified among countries with high maternal and newborn mortality rates. The perinatal period, encompassing the moment of birth and the immediate postnatal phase, is associated with a significant number of fatalities, with insufficient NC being a primary contributing factor. The global annual infant mortality rate has notably decreased, dropping from 65 deaths per 1000 live births (8.8 million deaths) to 29 deaths per 1000 live births (4.1 million deaths) during the 1990s. In the same period, Pakistan witnessed a decline in its infant mortality rate, decreasing from 90 deaths per 1000 live births to 65 deaths per 1000 live births [20]. Pakistan ranks third worldwide in the prevalence of fetal, child, and maternal mortality. According to the World Health Organization (2017), Pakistan has a significantly high infant mortality rate, with 330,479 infants not surviving beyond their first year of life. The mortality rate in this context is calculated at 64 deaths per 1000 live births, over eight times higher than the corresponding rate in the European Region, standing at 8 fatalities per 1000 live births. The urgent concern regarding elevated rates of infant mortality necessitates the collaborative involvement of governmental entities, non-governmental groups, society at large, and researchers to thoroughly examine factors that can effectively mitigate this upward trend in newborn fatalities [21].

Previous Researches have demonstrated that when married women faced restricted autonomy and empowerment during their adolescent years, there was a 1.5-fold increase in the probability of mortality among their offspring, as compared to children born to moms who were older. The notion of women's empowerment involves various elements, such as economic, familial, social, and psychological components [22].

There is a significant body of research that substantiates the proposition that women have a pivotal role in facilitating the utilization of maternal healthcare services. The lack of clear and specific metrics that assess women's autonomy poses a challenge in establishing connections between women's empowerment and health outcomes. The subsequent aspect to contemplate is the current section offers a thorough examination of the extant scholarly works related to the topic under discussion [23].

As per researcher [24] performed a survey to evaluate the influence of multiple factors, including women's empowerment, education, health awareness, labor market engagement, and media exposure, on child health. The research centered on a sample of 1000 families located in two provinces of Pakistan, specifically Punjab and KPK [25]. The results of the study revealed that the level of empowerment and knowledge possessed by moms exerted a substantial impact on the well-being of their offspring. identified a significant association between the

empowerment of women and the holistic welfare of children in India and Nigeria, as revealed in their research. Research has indicated that the decision-making abilities of women have a positive impact on the overall rates of immunization and the prevalence of stunting among children. conducted a study that aimed to evaluate multiple variables related to women's [26].

The current study examined the link between empowerment, the well-being of mothers and children, and maternal health-seeking practice. According to the study's findings, women' empowerment has a significant and positive impact on the health outcomes of mothers as well as infant. The researchers conducted a study in India's Kalale area and established a link between women becoming empowered and the well-being of their kids results. [27]. The establishment of this association was facilitated by the examination and interpretation of secondary data. Based on the research conducted by it was discovered that there exists a positive association between women's autonomy and their utilization of maternal health care services for their offspring. conducted a study that employed data from the DNHS of India, Nepal, and Bangladesh. The aim of the study was to investigate the impact of women's decision-making capabilities and their attitudes towards domestic violence on different measures of child health, such as antenatal care visits, NC visits, institutional delivery, immunization, and modern family planning. The study's results indicated a statistically significant correlation between the degree of empowerment among mothers and their utilization of reproductive child health care in the nations under investigation [24].

The current body of literature addressing the connection between demographic factors and maternal healthcare utilization is notably limited. Empirical findings confirm the substantial influence of age and age at marriage on women's engagement with healthcare services, among other contributing factors. Notably, an affirmative correlation emerges between advanced maternal age and heightened attention to personal health, leading to a greater likelihood of utilizing healthcare facilities for their offspring. Conversely, younger and adolescent mothers exhibit lower levels of concern for their personal well-being and that of their children [28].

The issue of early marriage holds particular significance, particularly in countries such as Pakistan and India. A study analyzing data from the National Family Health Survey (NFHS) in India from 2005 to 2006 aimed to explore the impact of early marriages on mothers' utilization of child healthcare services and the overall well-being of their children. The results derived from the logistic regression model underscore that early marriage adversely affects both women's reproductive health and their utilization of child healthcare services. In contrast, another study indicated that the health outcomes of offspring born to adolescent mothers were comparable to those born to mothers of old age [29]. Maternal education stands out as a crucial demographic variable influencing women's engagement with healthcare services for their children. In a study conducted by [30], the impact of maternal education on children's health outcomes was thoroughly examined. The findings highlighted a substantial correlation between mothers' educational attainment and various indicators of child welfare, including mortality rates, disease incidence, and measurements of height-for-age and weight-for-age. Notably, the study unveiled a statistically significant link between maternal literacy and the prevalence of malnutrition, particularly stunting, among the observed children.

Furthermore, a researcher [19] conducted a study shedding light on the positive association between women's empowerment, maternal education, and the socio-economic status of women with their utilization of healthcare services for their children [30]. This research underscores the interconnected influence of educational attainment, empowerment, and socio-economic factors on maternal decisions regarding healthcare utilization for their offspring.

Pakistan is identified as one of the countries facing significant challenges related to infant well-being and the prevalence of elevated infant mortality rates. However, there is a notable dearth of scholarly literature addressing the determinants of infant health in Pakistan, particularly concerning the impact of women's empowerment on children's health outcomes. Existing

research endeavors are scarce, with a predominant focus on countries such as India, Bangladesh, and Nepal, and a reliance on secondary data sources rather than primary data. It is essential to highlight that none of the current empirical studies have taken a comprehensive approach to ICP services or explored the cumulative impact of all facets of women's empowerment [31].

Previous scholarly inquiries have extensively explored various dimensions of women's empowerment, including economic, familial, socio-cultural, and psychological aspects, in the context of reproductive and child healthcare service utilization. However, a significant gap in the literature exists due to the prevalent reliance on secondary data in many of these studies. To address this gap, the current study aims to investigate the respective impacts of all dimensions of women's empowerment on the utilization of ICP services by mothers, utilizing primary data. The paper presents two hypotheses:

Hypothesis 1 suggests that women's empowerment across economic, familial, socio-cultural, and psychological domains significantly influences their usage of child healthcare services, encompassing PHS, NC, and the choice of the place of delivery.

Hypothesis 2 posits that variables such as women's age, age at marriage, education, and employment status have a significant impact on their utilization of healthcare services for their children.

Materials and Method:

Sample:

The study involved a sample of 115 married women within the reproductive age ranging from20 to 45 years, from diverse socio-economic backgrounds and educational levels. The sample also included women who chose not to remarry in cases of widowhood or divorce. A representative sample engaged in both professional and domestic roles was selected from various cities within the Gujranwala division using an appropriate sampling technique.

Data Collection:

Demographic information was collected using a comprehensive socio-economic data sheet. The Women's Empowerment Index (WEI), consisting of 25 items in Urdu, was employed to evaluate economic, familial, socio-cultural, and psychological empowerment. Economic empowerment was assessed using five metrics, familial empowerment with eight questions, socio-cultural empowerment with five questions, and psychological empowerment with a battery of fifteen measures. The reliability analysis indicated Cronbach's alpha values of 0.65 for the four components of women's empowerment. Furthermore, the Healthcare Services Utilization Questionnaire in Urdu, comprising three items, was designed to assess PHS, NC, and preferences regarding the place of delivery. The assessment of antenatal care was categorized as 'Yes=1' if women had a minimum of four PHS visits and 'No=0' if this criterion was not met. Optimal timing and frequency of NC visits were considered within a range of three to four, following WHO guidelines.

Data Analysis:

The collected data revealed essential insights into healthcare utilization patterns among women in the postpartum phase. Post-delivery checkups, particularly within the first 48 hours, emerged as a pivotal aspect of NC. Regarding the place of delivery, the data highlighted choices between home and institutional deliveries, shaping healthcare service preferences among participants. The data collection process employed a tailored approach, respecting participants' preferences by engaging them at their homes or workplaces. The flexibility in sampling facilitated a more comprehensive understanding of healthcare utilization behaviors in diverse settings. The questionnaires, thoughtfully formulated in Urdu, ensured accessibility and ease for the participants, fostering their willingness to contribute to the study. Despite an initial engagement of 200 women, the final dataset for analysis encompassed 115 respondents due to questionnaire incompleteness. Participants dedicated an average of 10 to 15 minutes to complete the surveys, showcasing their commitment to sharing valuable insights into their healthcare experiences.

Ethical considerations remained paramount throughout the study, with researchers securing informed consent from participants and ensuring the utmost confidentiality of all shared information. This commitment to ethical practice underlined the integrity and trustworthiness of the data collected.

Results and Discussion:

In the subsequent analysis, Logistic Regression conducted through R statistical software examined the relationships between demographic factors, maternal empowerment, and the utilization of maternal-child healthcare services. This analysis revealed significant associations and interdependencies among the variables under study. The coefficient for age at marriage showed a positive value of +0.13210, indicating a positive correlation between women's age at marriage and the utilization of PHS for their children. The odds ratio for age was 1.1389, suggesting that an increase in women's age at marriage is associated with a 1.1389-fold increase in the likelihood of having PHS for their child. Economic and psychological empowerment were found to have statistically significant associations with PHS ($p<0.05$), whereas socio-cultural and family empowerment did not exhibit significant influence ($p>0.05$). Age at childbirth and age at marriage were observed to have a substantial impact on the utilization of antenatal care services ($p<0.05$), but paid employment and schooling did not significantly impact PHS. The positive coefficient for economic empowerment (+0.2293) indicated a direct relationship between women's economic empowerment and PHS for their children. The odds ratio for economic empowerment was 1.2599, suggesting that an increase in women's economic empowerment is associated with a 1.2631 times higher likelihood of having higher PHS for their child.

The affirmative coefficient pertaining to psychological empowerment (+0.05862) signifies a direct correlation between heightened levels of women's psychological empowerment and the augmented utilization of PHS for their offspring. As women's psychological empowerment experiences an ascent, there is a concomitant elevation in the frequency of PHS sought for their children. The computed odds ratio for psychological empowerment, denoted as 1.060743, implies that an escalation in psychological empowerment among women corresponds to a 1.060347-fold heightened probability of securing an increased number of antenatal care visits for their offspring. Conversely, the ascertained coefficient for age manifests a negative value (-0.12838), indicative of an inverse relationship between women's age and the frequency of PHS availed for their children. The odds ratio for age is 0.882162, suggesting that with an increase in women's age, there is a corresponding 0.882162-fold reduction in the probability of accessing an elevated number of PHS for their children. This implies a potential proclivity among younger women to seek PHS for their offspring compared to their older counterparts.

In synthesis, the positive coefficients associated with economic and psychological empowerment underscore their affirmative associations with PHS utilization. This implies that as women's economic and psychological empowerment intensifies, there is a simultaneous augmentation in the utilization of PHS for their children. Conversely, the negative coefficient associated with age intimates a diminishing likelihood of increased PHS for children as women's age progresses. These findings underscore the intricate interplay of demographic factors and women's empowerment in shaping patterns of maternal-child healthcare utilization, offering nuanced perspectives for both policy formulation and prospective research endeavors.

The coefficient of -0.8835 implies that as women age and transition from young adulthood to middle adulthood, there is a reduction in their likelihood of securing PHS for their child by a factor of 0.8835. In the realm of maternal and child health, abbreviations such as PHS, NC, point of delivery, and age are commonly employed. The variables under consideration in this study encompass Age at marriage, Education, Personal job, Personal income, Economic empowerment, Familial empowerment, social empowerment, and psychological empowerment. The model's goodness of fit for PHS involves 10 groups in total. The Hosmer-Leme show chi-

square statistic, computed with 8 degrees of freedom, stands at 13.99. The associated p-value for this statistic is 0.0679. The presence of positive or negative signs (±) on coefficients serves as a robust indicator of the direction of change in the dependent variable concerning the independent variable.

Table 1: The coefficients and odds ratios for the variables considered in the logistic regression analysis.

Variable	Coefficient	Odds Ratio	p-value	Interpretation
Age at Marriage	+0.13210	1.1389	<0.05	Positive correlation with PHS utilization for children
Economic Empowerment	+0.2293	1.2599	<0.05	Positive correlation with increased PHS utilization for children
Psychological Empowerment	+0.05862	1.0607	<0.05	Positive correlation with increased PHS utilization for children
Age	-0.12838	0.8822	<0.05	Inverse correlation with PHS utilization for children

Table 1 demonstrates a statistically significant relationship between economic and familial empowerment and the variable of interest, PNC, at a significance level of $p < 0.05$. It shows the model's goodness of fit was assessed using the Hosmer-Leme show chi-square statistic, which resulted in a p-value of 0.0679. While the p-value is slightly above the conventional significance level of 0.05, it suggests a reasonably good fit for the model.

This table provides a comprehensive overview of the logistic regression results, offering insights into the direction and strength of the relationships between the examined variables and the utilization of maternal-child healthcare services.

Socio-cultural and psychological empowerment were found to lack a significant influence on PNC, evident from p-values exceeding 0.05. Conversely, demographic factors such as age, age at marriage, and education significantly impacted NC. Notably, paid employment did not exert a significant influence on PNC, as indicated by a p-value surpassing 0.05. The coefficient associated with economic empowerment was positive at 0.2682, indicating a positive correlation between women's economic empowerment and the likelihood of children participating in the labor force.

The calculated odds ratio for economic empowerment stood at 1.3102, suggesting that when women experience economic empowerment, they are 1.3102 times more likely to exhibit a higher level of NC for their children, while accounting for other relevant factors. In contrast, familial empowerment exhibited a negative coefficient of -0.1432, implying that as women gain strength within their families, there is a corresponding decrease in child mortality prevalence. The odds ratio for familial empowerment was 1.85432, indicating that when women experience empowerment within the familial context, they are 0.85432 times more likely to possess a higher level of prenatal and child control, after accounting for other variables.

Age had a significant and negative impact on positive parenting behavior for children, with a coefficient of -0.1399. This suggests that as women age, the likelihood of seeking neonatal care from a skilled healthcare professional decrease. The odds ratio for the variable "age" was 0.8701, indicating a 0.8701-fold decrease in the likelihood of having neonatal care for their child as women transition from young adulthood to older adulthood, while controlling for other covariates.

The positive coefficient for age at marriage (+0.1472) implies that as the age at marriage increases, there is a higher likelihood that a woman may opt for professional assistance from a trained healthcare provider for neonatal care of her child. The calculated odds ratio for age at marriage was 1.1583, indicating that an increase in women's age at marriage, particularly when married at a relatively older age, results in a 1.1583-fold increase in the likelihood of experiencing

neonatal care for their child, while controlling for other variables. Additionally, the positive coefficient for education (0.2693) suggests a direct relationship between higher levels of education among women and the occurrence of neonatal care for their children. The odds ratio of 1.3201 indicates that as women's education levels increase, they become 1.3201 times more likely to have neonatal care for their children, while controlling for other variables.

Table 2: Logistic Regression Results for the Aspect of Positive Parental Nurturance and Care (PNC)

Variable	Coefficient	Odds Ratio	p-value	Interpretation
Socio-Cultural Empowerment	Not Significant	--	>0.05	No significant influence on PNC
Psychological Empowerment	Not Significant	--	>0.05	No significant influence on PNC
Age	-0.1399	0.8701	<0.05	Inverse correlation with likelihood of neonatal care
Age at Marriage	+0.1472	1.1583	<0.05	Positive correlation with likelihood of neonatal care
Education	+0.2693	1.3201	<0.05	Positive correlation with likelihood of neonatal care

The presented findings highlight a significant association between women's economic, socio-cultural, and psychological empowerment and the Power of Decision-making. However, familial empowerment does not exhibit a statistically significant impact on the overall development of fetus or baby. Moreover, demographic factors, including age, age at marriage, and education, exert a considerable influence on the likelihood of divorce. Remunerated employment does not seem to significantly affect the development and delivery of fetus. The positive coefficient of economic empowerment (0.1899) indicates a positive relationship between women's economic empowerment and the likelihood of improved child well-being. The calculated odds ratio for economic empowerment is 1.2119, suggesting a 1.2119-fold higher likelihood of improved outcomes in child well-being when women experience economic empowerment, while considering other influential factors.

Table 3: Logistic Regression Results for the Aspect of Power of Decision-making

Variable	Coefficient	Odds Ratio	p-value	Interpretation
Economic Empowerment	+0.2682	1.3102	<0.05	Positive correlation with decision-making
Familial Empowerment	-0.1432	0.8543	<0.05	Inverse correlation with decision-making
Socio-Cultural Empowerment	Not Significant	--	>0.05	No significant influence on decision-making
Psychological Empowerment	+0.1190	1.1292	<0.05	Positive correlation with decision-making

In contrast, the coefficient for socio-cultural empowerment is negative (-0.3010), implying that an increase in socio-cultural empowerment does not lead to an improvement in the perceived overall development of their children. The odds ratio for socio-cultural empowerment is 0.6402, indicating that for every unit increase in socio-cultural empowerment, the likelihood of having a positive development for a child in a hospital decreases by a factor of 0.6402, after accounting for other relevant variables. On the psychological front, the positive coefficient of psychological empowerment (+0.1190) suggests that higher levels of psychological empowerment in respondents correlate with an improvement in the psychological well-being of their children. The calculated odds ratio for psychological empowerment is 1.1292, indicating

that women with high levels of psychological empowerment are approximately 1.1292 times more likely to have a positive impact on delivery of child in hospital compared to those with lower levels, considering other variables.

The age coefficient is negative (-0.3602), suggesting that as women progress from young adulthood to middle adulthood, their concern regarding the congenial place of delivery decreases. The calculated odds ratio for age is 0.7008, indicating a 0.7008-fold decrease in the likelihood of a successful delivery of a child as women age. Conversely, the positive coefficient for age at marriage (+0.3374) suggests that women marrying at a later stage in life are more likely to experience positive outcomes in terms of their psychological well-being. The calculated odds ratio for age at marriage is 1.3943, indicating a 1.3943-fold increase in the likelihood of improved child outcomes when women marry at a more mature age. Additionally, the positive coefficient for education (+0.2602) indicates that an increase in the number of years of education is associated with a higher level of understanding among mothers regarding the probability of death of their child in a hospital, as evidenced by the odds ratio of 1.3002. The findings of this study suggest that women with higher levels of education are 1.3002 times more likely to experience a positive outcome during childbirth, while accounting for the influence of other relevant factors. Tables 2, 3 and 4 provide a clearer breakdown of the logistic regression results for each aspect of maternal and child health, facilitating easier interpretation and understanding of the findings.

Table 4: Logistic Regression Results for the Aspect of Child Well Being

Variable	Coefficient	Odds Ratio	p-value	Interpretation
Economic Empowerment	+0.1899	1.2119	<0.05	Positive correlation with child well-being
Socio-Cultural Empowerment	-0.3010	0.6402	<0.05	Inverse correlation with perceived overall development
Psychological Empowerment	+0.1190	1.1292	<0.05	Positive correlation with psychological well-being
Age	-0.3602	0.7008	<0.05	Inverse correlation with likelihood of successful delivery
Age at Marriage	+0.3374	1.3943	<0.05	Positive correlation with likelihood of improved outcomes
Education	+0.2602	1.3002	<0.05	Positive correlation with likelihood of positive outcome

Discussion:

This study sought to explore the impact of four facets of women's empowerment and their socio-demographic characteristics on healthcare service utilization, specifically focusing on PHS, NC, and point of delivery. A binary regression model was employed for data analysis, revealing substantial associations between economic and psychological empowerment and PHS utilization. Specifically, women with higher levels of empowerment in these domains demonstrated greater utilization of PHS compared to those with lower empowerment levels. Similarly, women with greater empowerment in economic and familial aspects were more likely to avail themselves of prenatal and neonatal care services. Conversely, women with higher empowerment in economic, socio-cultural, and psychological aspects were more likely to opt for institutional delivery.

These results align with the multifaceted effects observed in prior research on women's empowerment, emphasizing its multidimensional nature. The findings also underscore that progress in one dimension of women's empowerment does not necessarily correlate with advancement in all dimensions. The study's outcomes are in harmony with existing research linking maternal empowerment and knowledge to child health and healthcare. Economic

empowerment emerged as a crucial factor, positively influencing all three dimensions of healthcare services. Women with agency over economic resources exhibited more effective management of childbirth-related affairs compared to those dependent on external financial support.

Furthermore, the study findings align with existing literature suggesting that women's socioeconomic status plays a pivotal role in antenatal care utilization. The results also echo prior research linking women's decision-making capacity within the home to positive outcomes in child immunization and stunting. The demonstrated adverse effect of socio-cultural empowerment on professional obstetric delivery services may be attributed to factors such as adherence to family traditions and a potential reluctance to seek hospital-based delivery, even with increased empowerment. These results are consistent with previous research indicating that women may prefer home births due to past negative experiences with healthcare systems.

This scrutiny provides valuable insights into the complex interplay of women's empowerment dimensions and socio-demographic factors in shaping maternal and child healthcare utilization patterns. The multifaceted effects observed underscore the need for comprehensive and context-specific interventions to enhance women's empowerment and improve maternal and child health outcomes.

Age emerges as a noteworthy demographic factor with a discernible impact on PHS, NC, and the place of delivery). The data indicates that as women age, their accumulated experience in childbirth and heightened knowledge of pregnancy-related concerns lead to a heightened sense of ease. Consequently, with advancing age, there is a decreased preference for hospital deliveries and a reduced frequency of visits to healthcare facilities for both PHS and NC. These findings align with the belief that the likelihood of birth-related complications is higher for first-time deliveries, and this perception may carry over to subsequent births. It also aligns with the notion that as mothers age, their decision-making authority tends to strengthen.

The age at which individuals enter into marriage emerges as a factor with a favorable influence on PHS, NC, and pregnancy outcomes. The data suggests that women who marry at a later age are less inclined to opt for home delivery, instead preferring to seek medical care through regular visits to the hospital for PHS and NC. As individuals age, gynecological concerns tend to become more intricate and complex in nature.

Education is identified as a positive influence on both Parental Nurturance and Care (PNC) and the Psychological Well-being of Offspring. The findings of this study align with research conducted by [31], suggesting that women with higher education are more likely to schedule a minimum of four PHS appointments with qualified healthcare providers. Additionally, existing research indicates a beneficial association between a mother's level of education and the weight and height of her offspring. The literature also supports the idea that the educational attainment of both parents significantly shapes the choice of childbirth location for their children.

The presented points of this study collectively lead to the logical deduction that Based on the findings, it can be inferred that economic, familial, socio-cultural, and psychological empowerment, along with education, exert a substantial and favorable influence on women's utilization of PHS, NC, and the choice of the place of delivery. To enhance infant well-being and alleviate mortality rates, it is imperative to formulate policies that prioritize increased investment in girls' education and the empowerment of women across various domains. This strategic approach aims to equip women with the necessary knowledge and resources to effectively care for both anticipated and newborn children, ensuring safe deliveries through access to adequately equipped healthcare facilities.

The findings indicate that, alongside women's socio-demographic circumstances, the extent of women's empowerment across several domains significantly influences their utilization of healthcare services for the purpose of ensuring safe delivery and the well-being of newborns.

In general, it is imperative for both public and private sector groups to undertake concrete measures, particularly in relation to women's issues. This study focuses on a specific organization that aims to empower women in order to enhance their access to PHS, NC, and child healthcare services. The organization's primary objective is to raise awareness among women, with the ultimate goal of improving newborn health outcomes and reducing death rates in Pakistan. Government policies should prioritize the creation of a conducive environment for women, thereby enabling them to access equitable and respectable opportunities within society. The primary emphasis of public health policy should be directed at expanding access to obstetric care, particularly among socioeconomically disadvantaged populations in both urban and rural settings. Healthcare professionals should employ specific approaches in parental and couples therapy sessions to enhance the capacity of moms to access and utilize reproductive healthcare services. The findings indicate that policymakers should prioritize the promotion of women's empowerment as a viable approach to addressing the existing gap in order to enhance the health outcomes of both mothers and children. The positive association between age at marriage and consumption of child healthcare services implies that early weddings in Pakistan serve as a contributing element to the utilization of such services. Consequently, discouraging early marriages becomes imperative in order to effectively address and control the child death rate.

Conclusion:

The study highlighted the importance of educational attainment in predicting both neonatal care utilization and the prevalence of postpartum depression. These outcomes emphasize the need for targeted strategies aimed at empowering women in Pakistan to enhance the utilization of maternal-child healthcare services and ensure the well-being of both mothers and children. The majority of women who took part in the study were from metropolitan regions. Therefore, it is recommended that future researches should also involve women from rural areas in order to have a more comprehensive understanding of the subject matter. The findings underscore the critical role of women's empowerment and demographic factors, including age at marriage and educational attainment, in predicting the utilization of healthcare services for mothers and children.

Abbreviations:

Integrated Care Pathway (ICP)
Prenatal Health Service (PHS)
World Health Organization (WHO)
National Family Health Survey (NFHS)
Women's Empowerment Index (WEI)
Familial empowerment (FE)
Social empowerment (SOC)
Psychological empowerment (PSY)
Neonatal Care (NC)
Parental Nurturance and Care (PNC)

References:

[1] M. P. Fallah *et al.*, "Pregnancy outcomes in Liberian women who conceived after recovery from Ebola virus disease," *Lancet Glob. Heal.*, vol. 4, no. 10, pp. e678–e679, Oct. 2016, doi: 10.1016/S2214-109X(16)30147-4.

[2] R. J. McCurdy, K. H. Kjerulff, and Z. Junjia, "Prenatal care associated with reduction of neonatal mortality in Sub-Saharan Africa: Evidence from demographic and health surveys," *Acta Obstet. Gynecol. Scand.*, vol. 90, no. 7, pp. 779–790, Jul. 2011, doi: 10.1111/J.1600-0412.2011.01133.X.

[3] M. Yaseen and M. Naveed, "Variability of Geomorphological Characteristics and the Altered Hydrological Regime of the Upper Indus Basin, Pakistan," *Int. J. Innov. Sci. Technol.*, vol. 5, no. 4, pp. 402–423, Oct. 2023, doi: 10.33411/IJIST/548.

[4] M. Do and D. Hotchkiss, "Relationships between antenatal and postnatal care and post-partum modern contraceptive use: Evidence from population surveys in Kenya and Zambia," *BMC Health Serv. Res.*, vol. 13, no. 1, 2013, doi: 10.1186/1472-6963-13-6.

[5] N. S. Mugo, M. J. Dibley, and K. E. Agho, "Prevalence and risk factors for non-use of antenatal care visits: Analysis of the 2010 South Sudan household survey," *BMC Pregnancy Childbirth*, vol. 15, no. 1, Mar. 2015, doi: 10.1186/S12884-015-0491-6.

[6] C. O. F. Zamawe, M. Banda, and A. N. Dube, "The impact of a community driven mass media campaign on the utilisation of maternal health care services in rural Malawi," *BMC Pregnancy Childbirth*, vol. 16, no. 1, Jan. 2016, doi: 10.1186/S12884-016-0816-0.

[7] A. K. Bakhsh and H. Qureshi, "Hybrid LLM–Genetic Programming for Adaptive Behavior Tree Evolution in Autonomous Robots," *Front. Comput. Spat. Intell.*, vol. 4, no. 3, pp. 168–190, Jul. 2026, Accessed: Oct. 12, 2026. [Online]. Available: https://journal.xdgen.com/index.php/FCSI/article/view/563

[8] M. Irfan *et al.*, "Genetic Analysis of Quantitative Traits in Elite Bitter Gourd (Momordica charantia L.) Hybrids Using a Top-Cross Mating Design," *Int. J. Agric. Sustain. Dev.*, vol. 8, no. 1, pp. 237–249, Feb. 2026, Accessed: Oct. 15, 2026. [Online]. Available: https://journal.xdgen.com/index.php/ijasd/article/view/480

[9] H. Zafar, S. Ahsan, and S. Ahmed, "Impact of Empty Nest Syndrome on Parental Mental Health: Moderating Role of Coping Styles," *Int. J. Innov. Sci. Technol.*, vol. 7, no. 4, pp. 2440–2450, Oct. 2025, doi: 10.33411/IJIST/1599.

[10] M. N. Onah and S. Horton, "Male-female differences in households' resource allocation and decision to seek healthcare in south-eastern Nigeria: Results from a mixed methods study," *Soc. Sci. Med.*, vol. 204, pp. 84–91, May 2018, doi: 10.1016/J.SOCSCIMED.2018.03.033.

[11] A. A. Aliyu and T. Dahiru, "Predictors of delayed Antenatal Care (ANC) visits in Nigeria: secondary analysis of 2013 Nigeria Demographic and Health Survey (NDHS)," *Pan Afr. Med. J.*, vol. 26, p. 124, 2017, doi: 10.11604/PAMJ.2017.26.124.9861.

[12] S. E. Haque, M. Rahman, M. G. Mostofa, and M. S. Zahan, "Reproductive Health Care Utilization among Young Mothers in Bangladesh: Does Autonomy Matter?," *Women's Heal. Issues*, vol. 22, no. 2, Mar. 2012, doi: 10.1016/J.WHI.2011.08.004.

[13] R. Shaheen and Z. Khan, "Predicting Rice Yield Using Multi-Temporal Vegetation Indices and Machine Learning: A Comparative Study of Random Forest and Support Vector Regression Models," *Front. Comput. Spat. Intell.*, vol. 2, no. 4, pp. 158–167, Oct. 2024, Accessed: Oct. 02, 2026. [Online]. Available: https://journal.xdgen.com/index.php/FCSI/article/view/324

[14] U. Farhan *et al.*, "Screening of Cotton (G. hirsutum L.) for Cotton Leaf Curl Virus (CLCuV) Through Pathological, Morphological and Fiber Quality Parameters," *Int. J. Agric. Sustain. Dev.*, vol. 7, no. 4, pp. 595–607, Nov. 2025, Accessed: Oct. 15, 2026. [Online]. Available: https://journal.xdgen.com/index.php/ijasd/article/view/426

[15] N. N. Asundep *et al.*, "Determinants of access to antenatal care and birth outcomes in Kumasi, Ghana," *J. Epidemiol. Glob. Health*, vol. 3, no. 4, pp. 279–288, 2013, doi: 10.1016/J.JEGH.2013.09.004.

[16] P. Pratley, "Associations between quantitative measures of women's empowerment and access to care and health status for mothers and their children: A systematic review of evidence from the developing world," *Soc. Sci. Med.*, vol. 169, pp. 119–131, Nov. 2016, doi: 10.1016/J.SOCSCIMED.2016.08.001.

[17] L. Carvajal-Aguirre, A. Amouzou, V. Mehra, M. Ziqi, N. Zaka, and H. Newby, "Gap between contact and content in maternal and newborn care: An analysis of data from 20 countries in sub-Saharan Africa," *J. Glob. Health*, vol. 7, no. 2, Dec. 2017, doi: 10.7189/JOGH.07.020501.

[18] K. Fatema and J. T. Lariscy, "Mass media exposure and maternal healthcare utilization in South Asia," *SSM - Popul. Heal.*, vol. 11, Aug. 2020, doi: 10.1016/J.SSMPH.2020.100614.

[19] I. N. Okedo-Alex, I. C. Akamike, O. B. Ezeanosike, and C. J. Uneke, "Determinants of antenatal care utilisation in sub-Saharan Africa: A systematic review," *BMJ Open*, vol. 9, no. 10, Oct. 2019, doi: 10.1136/BMJOPEN-2019-031890.

[20] L. K. Merrell and S. R. Blackstone, "Women's Empowerment as a Mitigating Factor for Improved Antenatal Care Quality despite Impact of 2014 Ebola Outbreak in Guinea," *Int. J. Environ. Res. Public Heal. 2020, Vol. 17, Page 8172*, vol. 17, no. 21, p. 8172, Nov. 2020, doi: 10.3390/IJERPH17218172.

[21] A. F. Fagbamigbe and E. S. Idemudia, "Assessment of quality of antenatal care services in Nigeria: Evidence from a population-based survey," *Reprod. Health*, vol. 12, no. 1, Sep. 2015, doi: 10.1186/S12978-015-0081-0.

[22] R. K. Rai, P. K. Singh, and L. Singh, "Utilization of Maternal Health Care Services among Married Adolescent Women: Insights from the Nigeria Demographic and Health Survey, 2008," *Women's Heal. Issues*, vol. 22, no. 4, Jul. 2012, doi: 10.1016/J.WHI.2012.05.001.

[23] P. A. Afulani, "Rural/urban and socioeconomic differentials in quality of antenatal care in Ghana," *PLoS One*, vol. 10, no. 2, Feb. 2015, doi: 10.1371/JOURNAL.PONE.0117996.

[24] R. Atinga, A. Baku, and P. Adongo, "Drivers of prenatal care quality and uptake of supervised delivery services in Ghana," *Ann. Med. Health Sci. Res.*, vol. 4, no. 9, p. 264, 2014, doi: 10.4103/2141-9248.141970.

[25] J. P. Souza *et al.*, "Moving beyond essential interventions for reduction of maternal mortality (the WHO Multicountry Survey on Maternal and Newborn Health): A cross-sectional study," *Lancet*, vol. 381, no. 9879, pp. 1747–1755, May 2013, doi: 10.1016/S0140-6736(13)60686-8.

[26] M. M. Islam and M. S. Masud, "Determinants of frequency and contents of antenatal care visits in Bangladesh: Assessing the extent of compliance with the WHO recommendations," *PLoS One*, vol. 13, no. 9, Sep. 2018, doi: 10.1371/JOURNAL.PONE.0204752.

[27] R. M. Mickey and S. Greenland, "The impact of confounder selection criteria on effect estimation," *Am. J. Epidemiol.*, vol. 129, no. 1, pp. 125–137, 1989, doi: 10.1093/OXFORDJOURNALS.AJE.A115101.

[28] A. Delamou *et al.*, "Effect of Ebola virus disease on maternal and child health services in Guinea: a retrospective observational cohort study," *Lancet Glob. Heal.*, vol. 5, no. 4, pp. e448–e457, Apr. 2017, doi: 10.1016/S2214-109X(17)30078-5.

[29] A. F. Fagbamigbe and E. S. Idemudia, "Barriers to antenatal care use in Nigeria: Evidences from non-users and implications for maternal health programming," *BMC Pregnancy Childbirth*, vol. 15, no. 1, Apr. 2015, doi: 10.1186/S12884-015-0527-Y.

[30] C. L. Patil *et al.*, "Randomized controlled pilot of a group antenatal care model and the sociodemographic factors associated with pregnancy-related empowerment in sub-Saharan Africa," *BMC Pregnancy Childbirth*, vol. 17, Nov. 2017, doi: 10.1186/S12884-017-1493-3.

[31] H. Satti *et al.*, "Comprehensive approach to improving maternal health and achieving MDG 5: Report from the mountains of Lesotho," *PLoS One*, vol. 7, no. 8, Aug. 2012, doi: 10.1371/JOURNAL.PONE.0042700.



Copyright © by authors and 50Sea. This work is licensed under Creative Commons Attribution 4.0 International License.