

# Factors Associated with Post-Natal Care (PNC) Services Utilization among Adolescent Mothers in Rural Northern Malawi

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**Abstract** World Health Organization (WHO) statistics indicate that Sub-Saharan Africa accounts for the vast majority of global maternal deaths. Specifically, maternal deaths among adolescent mothers in rural settings contribute significantly to high maternal mortality. Among others, adolescent mothers' susceptibility to maternal deaths has been attributed to utilization of post-natal care (PNC) services. Using the Andersen Behavioral Model of Health Services Use, our study sought to examine factors associated with PNC utilization among adolescent mothers in a northern rural district of Malawi. A structured questionnaire was used to conduct interviews among adolescent mothers. A hierarchical logistic regression analysis was carried out using statistical package for social sciences (SPSS). Results show that need factors (severe abdominal pains, vaginal bleeding and obstetric complications) was the most significant factor associated with PNC utilization. Further, the study shows that predisposing factors such as age, educational level, marital status had considerable influence on PNC utilization. Lastly, enabling factors such as family income, adolescent mothers' occupation, distance to health facility positively influenced mothers' utilization of postnatal health care. The study recommends to health sector practitioners to use the need factors as the baseline in initiating postnatal health care policies and programs for adolescent mothers, while also paying attention to other factors such as predisposing and enabling because they all have the specific role they play in influencing adolescent mothers' behavior in accessing postnatal health care.

**Keywords:** *postnatal care utilization, adolescent mothers, maternal mortality, predisposing, enabling, need factors*

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## 1. Introduction and Background

Although considerable progress has been achieved at global level, maternal mortality remains a public health challenge that consistently confronts the world's marginalized and vulnerable groups in society. [1] Maternal mortality is more acute among marginalized women in society, and adolescent mothers in rural settings constitute the single most marginalized and vulnerable group that contributes to high maternal mortality. Adolescent mothers are girls who give birth between the age range of 11-19. It has been established that adolescent mothers are several times more likely to succumb to maternal deaths than older women due to their bodies' biological immaturity [2]. Apart from being physically disadvantaged, adolescent mothers are socially challenged as many are unable to finish their education, some raise their babies as single parents and have limited capacity for employment to sustain their livelihoods. [3] WHO statistics show a higher global disproportionate maternal

mortality ratio of 270/100,000 live births for adolescent mothers compared to 190/100,000 live births for women of 20-24 years. Among others, adolescent mothers' susceptibility to maternal deaths is caused by haemorrhage and Sepsis, all of which occur during the postnatal period. Most maternal post-natal deaths can be prevented if mothers receive timely and proper post-natal care (PNC) services. Empirical research evidence has proved that adequate utilization of PNC services can potentially reduce maternal deaths. For example, a study by [4] found that utilization of PNC within the first week by both skilled and unskilled health providers was responsible for the reduction of maternal deaths by significant proportions. Despite the seeming role played by postnatal care in reducing maternal deaths, the utilization of PNC services is generally minimal among mothers in low and middle-income countries, with only a third using them in 2017 [3]. This has led to suggestions that low PNC utilization aggravates and poses severe challenges towards efforts to reduce maternal deaths.

PNC is described as health care services given to mothers in the postnatal period. The postnatal period is

defined as a period beginning after child delivery and up to six (6) weeks. PNC is essential, as the period after delivery is high risk, which if neglected, can lead to loss of life for the mother and baby. Reports indicate that close to half of global maternal deaths occur in the postpartum period [3]. Thus, PNC services are considered important components of the essential obstetric continuum, which manage complications that may endanger the life of the mother and the baby. Thus reducing maternal deaths has become a global priority such that the WHO continuously advocates for the increased use of maternal health care services (including PNC) among young mothers as a strategic intervention to achieve Sustainable Development Goals (SDGs). SDG 3.1 aims to reduce maternal mortality to less than 70/100,000 live births by 2030. Under WHO guidelines, women are required to receive PNC service within 24 hours after giving birth, and make at least 3 PNC visits to health facilities. The timing for the visits is on day 3, between days 7-14 and six weeks after giving birth [5]. Among the services that women receive under PNC include screening and treatment of infections, haemorrhage, postnatal depression, folic and iron supplementation, counselling on nutrition and other possible threats to their lives. Additionally, mothers are assessed for blood pressure, heart rate, vaginal bleeding, uterine contraction, and temperature. Women are also continuously monitored for any possible threat to their healthy life. PNC services are given to both mothers with normal births, premature deliveries, stillbirths, and miscarriages.

Maternal deaths in Sub-Saharan Africa accounts for the vast majority of global deaths. Two-thirds of the global maternal mortality occurred in the Sub-Saharan Africa region in 2017 [6]. Maternal mortality ratio in Malawi is estimated at 439/ 100,000 live births and adolescent mothers account for 29% of this figure [7]. The above statistics come against a background of uneven utilization of the continuum of essential obstetric care comprising of antenatal care (ANC), skilled birth attendance, and postnatal care (PNC) services. [7] reveals that only 33.5 % of mothers received PNC services compared to 93% who received antenatal care services. This entails that more women access ANC services but do not go back to the health facility for postpartum care. Past studies have suggested that a range of factors are responsible for the inadequate utilization of PNC services among women. While studies have explored utilization and coverage of maternal health care services, an extensive review of the literature shows that such studies have focused attention on ANC, skilled birth attendance, and all women of reproductive age in general [8,9,10]. To the best of our knowledge, less attention has been given to examining and understanding factors associated with the utilization of PNC services among adolescent mothers in rural settings in Malawi. Adolescent mothers in rural settings are among the most marginalized and their proportion to postpartum deaths is high in Malawi [7]. The lack of specific studies on the subject creates a research gap that has not yet been explored. It is against this background that our study sought to examine factors associated with PNC utilization among adolescent mothers in a rural northern district of Malawi. An exclusive study of this nature will provide information on appropriate context-specific interventions

that could be directed towards maximizing the utilization of PNC services.

## 2. Literature Review

Adolescent mothers have a greater risk of delivering premature and low-birth-weight babies because their bodies are biologically young to handle pregnancy. Post-natal care (PNC) services are integral to reducing maternal deaths, ensuring mother, and child survival. [5] WHO indicated that most perinatal deaths occur during the postpartum period. During this period, not only is the mother vulnerable to physical complications but also psychological disturbances which are aggravated by adverse social circumstances such as lack of understanding of their situation and lack of emotional support from their partner and family [11]. PNC services are a significant element of maternal healthcare which prevents mothers and newly born babies from maternal complications [11]. Among others, PNC services protect women from birth complications, discover post-birth risks, and help evaluate the development of the newborn baby [12]. Studies have shown that maternal deaths can be avoided if adequate utilization of PNC services is correctly adhered to. World Health Organization (WHO) recommendations on PNC stipulate that women must visit health facilities for PNC services for not less than three times after delivery. WHO designated these visits on day 3, between days 7-14 and six weeks after giving birth [5].

Various studies have investigated the utilization of maternal health care services in low and medium-income countries. Most of the studies have found that the utilization of ANC is higher while PNC remains low among women. For instance, a study by Mon et al [13] found that slightly less than 30% of women in Myanmar had utilized PNC services. Similarly, [14] found that only 5.8% of mothers had utilized PNC services in a Nigerian state. [10] carried out a study on health care utilization in a decentralized program to examine the use of maternal health care in Ethiopia and found out that, although there had been an increase in health care utilization in recent years, the majority of women did not make the WHO recommended ANC and PNC visits to health facilities. [15] stated in their study that, although the government had committed to deliver health facilities to ordinary people such as Essential Service Package (ESP), the utilization of maternal health care services was below acceptable standards in Bangladesh. However, the above studies differ spectacularly with those conducted in the West. An estimated 80-95% of women in the European Union (EU) region utilize health care services resulting in lower maternal deaths [16]. [17] reported that more than 90% of women meet the WHO recommended visits to the health facility to utilize maternal health care services in Sweden. The conclusion that can be deduced from the above contrasting utilization analysis is that the overall utilization of PNC is minimal in poor and medium-income countries.

Factors affecting health care utilization have been discussed and analyzed from different perspectives and based on varying objectives. Some scholars have categorized factors associated with the utilization of

maternal health care along the Andersen conceptual framework: predisposing, enabling, and need factors. Research has shown a strong correlation between predisposing factors such as age, education, marital status, gender to health care utilization. [18] found that marital status is statistically associated with the utilization of maternal healthcare services among women in Jimma zone, Ethiopia. According to their findings, marital status affected health-seeking behavior because married people tend to get help from their spouses. This study is consistent with another study carried out by [19] which revealed that apart from marital status, women with older age accounted significantly to the utilization rate of PNC services in Uganda. Religion as another example of a predisposing factor can either facilitate or discourage women's use of PNC services. Studies carried out in majority Muslim communities indicate that women are less likely to seek maternal health care. Studies by [20] in Bangladesh and [21] in Ghana found that most Muslim women sought permission from their husbands before seeking maternal care service. Another study by [22] which used Peruvian Demographic and Health Survey data indicated that mother's education affected the use of antenatal and delivery assistance. [23] found that education was the most important variable influencing the use of maternal health care services. Similar to other studies [24,25,26] have found that better-educated women are aware of health problems and more likely to use maternal health care services.

Enabling factors are associated with the utilization of PNC services among women. Distance to the health facility, place of residence and income have all contributed to both utilization and underutilization of PNC. Women who travel for long hours to a health facility are more concerned about the distance they travel and thus affect their use of PNC services. In a study in Bangladesh, [20] found that geographical distance is one of the most important determinants of health care service utilization in rural areas. [18] indicated that the place of delivery was one of the strongest predictors of postnatal care service utilization. Mothers who had given birth to their latest child at a health facility were more likely to seek PNC services when compared with those mothers who gave birth to their latest child at home. This finding was consistent with [27] which indicated that giving birth at health institution has a significant association with postnatal care service utilization. According to this study, women who give births at health facilities have a chance of being exposed to health education programs such as PNC services during their stay in health facilities. This exposure increases their healthcare-seeking behavior. Similarly, income contributes to the utilization of health care services. The majority of residents in rural areas are neither on health insurance nor do they have enough money and must pay for health expenditure, which leads to economic problems. Therefore, such vulnerable people with low income will experience financial hardship in seeking and utilizing health care services. Studies by [28], [29] found that the income disposition of families was a key variable in the contrasting utilization rate of PNC services among women in Kenya. Mothers in urban areas, particularly those from the middle or wealthy background were found more likely to utilize PNC services.

Need factors such as the severity of illness are also linked with the utilization of health care services. Studies conducted by [10], [30] indicated that the level of illness of a mothers were positively associated with health care utilization. Patients with chronic illness are more likely to use health care services. This is a clear indication that chronic diseases can play a role in increasing health care service utilization. More so, [13] indicated in their study that women who delivered through cesarean section were about five (5) times more likely to utilize PNC compared with women who had a vaginal delivery, this finding corroborates another finding in rural Tanzania [32]. Mothers are left with no option than seek care in a health facility because of the state of their health after delivery. Additionally, family members and close friends tend to offer support to mothers with birth complications thereby encouraging them to utilize PNC services compared with women who had no immediate birth complications. This is consistent with research findings by [33].

### 3. Methodology

#### 3.1. Research Setup

This community cross-sectional study was conducted among adolescent mothers in Mabalabo, a rural area located in the northern district of Mzimba, Malawi. Mabalabo has a population of 198,276 and remains among the most impoverished areas where both maternal and child mortality rates remain high. The study was carried at Emfeni, Luwerezhi, and Unyolo health facilities, all of which render comprehensive maternal health care services including post-natal health care services. The three health facilities were selected because they have the largest rural catchment population and had the lowest PNC utilization rate in Mzimba district [7]. Official registry records sourced from the health facilities had a combined total of 11,422 deliveries from 2018 to 2020, of which 40% were from adolescent mothers. Adolescent mothers who had given birth in the last two years preceding the study were selected for the study, partly to avert the likelihood of recall bias.

#### 3.2. Research Design and Sampling Procedure

A society-based, cross-sectional design was employed in this research to determine the representative samples from the health facilities. The researchers engaged both purposive and two-stage cluster sampling technique in choosing respondents among Emfeni, Luwerezhi, and Unyolo health care facilities respectively. Cluster sampling technique permitted the researchers to categorize respondents with homogeneity into different clusters and random sampling was used to select adolescent mothers until the sample size was achieved at a particular health care facility. A letter was written to the administrators explaining the purpose of the research (Informed consent form). A meeting was then arranged for the researchers to engage the administrators and other staff deemed necessary for this particular research to explain the purpose and to seek their request to participate in the study.

Members who were willing, mentally sound and literate were included in the data collating processes from August to October, 2020.

### 3.3. Data collection technique

A structured questionnaire was used to conduct interviews as a data collection tool. A total number of 200 questionnaires were randomly distributed to respondents selected from the three (3) health care facilities, summing up to 600 questionnaires. Three midwife nurses from each health care facility and three research assistants were engaged in collating the research data. A day training was organized for the research assistants and nurses involved in the collating of the data. Adolescent mothers who delivered and accessed postnatal health care two years prior to the research period and lived in the study area were all included in this research. From a total number of 600 questionnaires that were administered, after data cleansing, 577 were considered valid for analysis, indicating a response rate of 96.1%.

### 3.4. Measurement

#### 3.4.1. Independent Variable

The framework used for this study is the Andersen Behavioral Model of Health Services Use [34]. The model analyzes the use of health care services from a socio-demographic angle and hypothesizes that a person's decision to seek health care service is a multifaceted human behavior phenomenon influenced by factors that have been grouped as predisposing, enabling, and need factors.

Predisposing factors are social and cultural demographic characteristics that influence a need for health care service. Demographic characteristics such as age, sex, marital status, and social structures like cultural beliefs, ethnicity, religion, education, occupation are examples of predisposing factors. For this current study, the predisposing factors adopted are adolescent mother's age which is in three categories (13-15, 16-17, 18-19), mother and father educational level (no education, primary and secondary), marital status (married and single), mother's religion

(Christian, Muslim and others) and mother's parity (0,1 and 2).

Enabling factors are variables or means which allow an individual to seek health care. They contextualize an individual's capability to use health care services. Variables such as income, health insurance, and distance to the health facility have been adopted for this study. Mother's and father's occupation (not employed, formally employed, farming and business), family income (<\$25, \$26-50, \$51-\$100, and >\$101), and distance to health facility (0-5km, 6-10km, 11km & above) were used to define enabling factors.

Need factors have been defined as perceived and evaluated needs. [35] Perceived needs represent self-assessment of the severity of a health problem that necessitates seeking health care. How a person view and experience their general health and self-perception of the disease has an undeviating effect on their decision to seek health care. On the other hand, evaluated needs are medical needs based on professional and objective assessments of patients' health status [36]. A person is compelled to seek medical care when they are examined and given recommendations by medical practitioners. Need factors for this research are severe abdominal pains, vaginal bleeding and obstetric complications, each identified as a binary variable (yes or no).

#### 3.4.2. Dependent Variable

The outcome variable was PNC utilization by adolescent mothers. The WHO guidelines recommend PNC uptake within 24 hours of delivery, on day 3 after delivery, and between day 7-14 after delivery. In total, WHO recommends that mothers should undertake 3 PNC visits. Mothers who undertook all the 3 are considered to have complete PNC utilization and considered as meeting the required postnatal visit. In addition, adolescent mothers who could not access the recommended PNC utilization were also considered as not meeting the required number of visit. From the perspective of this research, PNC utilization was categorized into two that is (mothers who met the recommended number of visit and those who did not meet the recommended visit). The various categorization of Anderson's health utilization model concerning this current study is depicted in Figure 1.

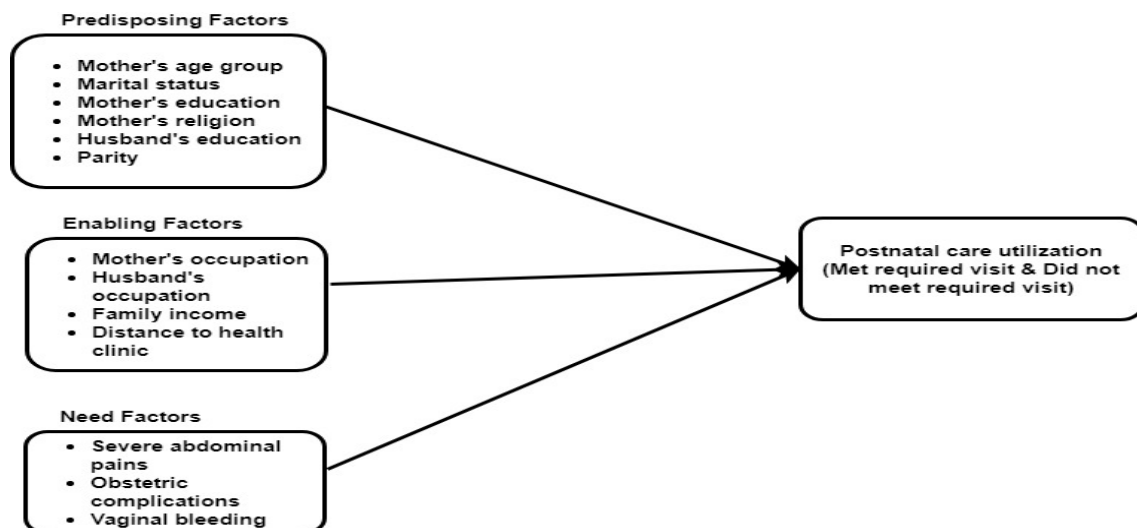


Figure 1. Conceptual framework of Andersen's model on health-service utilization

### 3.5. Data Processing

Descriptive statistics were employed to estimate the frequency distribution and the proportions for variables categorization. [31] argued that the variance inflation factor (VIF) greater than 10 shows redundancy among the variables. Therefore, our variables met this criterion with VIF less than 3.0. More so, to examine the direct effects of predisposing, enabling and need factors on postnatal health care utilization grounded on Anderson's model, a hierarchical logistic regression analysis was carried out using statistical package for social sciences (SPSS).

### 3.6. Method of Analysis

Since the dependent variable, recommended number of visit is a binary variable with 1 being met the recommended visit and 0 being did not meet the recommended visit, the dependent variable can be represented in binary form as:

$$Y = \begin{cases} 1, & \text{Met recommended visit} \\ 0, & \text{Did not meet recommended visit} \end{cases}$$

Where Y is the recommended number of visit. In order to appropriately estimate the results, the general binary logistic regression model is represented in the form:

$$P(Y = 1 / x_1, \dots, x_k) = \frac{\exp(a_0 + \beta_1 x_1 + \dots + \beta_n x_n)}{1 + \exp(a_0 + \beta_1 x_1 + \dots + \beta_n x_n)}$$

$$p = \frac{1}{1 + e^{-z}}$$

Where p represents the probability of meeting the recommended visit, x is the explanatory variables (predisposing, enabling and need factors), a and b are the parameters to be estimated. Z captures all unobservable continuous numbers. Logit (x), can be rewritten as:

$$\text{Logit}(x) = \log\left(\frac{x}{1-x}\right)$$

$$P(Y = 1 / x_1, \dots, x_k) = a_0 + \beta_1 x_1 + \dots + \beta_n x_n$$

The specific binary logistic model implemented in this study is written as:

$$PV = a_0 + \beta_1 P + \beta_2 E + \beta_3 N + \varepsilon$$

Where PV represents postnatal visit, P represents predisposing factors, E represents enabling factors and N represents need factors.  $a_0$  is the constant term,  $\beta_1$ - $\beta_3$  are parameters to be estimated while  $\varepsilon$  is the error term.

## 4. Results

### 4.1. Socio-demographic Characteristics of Respondents

From Table 1, the total number of 577 adolescent mothers constituted our sample size. These mothers had given birth two years earlier before this study was conducted. Eighteen and 1.2 are the mean and SD years of

respondents. A total of 369 (64%) of adolescent mothers were between the ages of 18-19 years. With respect to the marital status of the respondents, 526 adolescent mothers were married indicating ninety-one percent of the respondents had a husband.

Three hundred and three (53%) of the adolescent mothers had no formal education, 261 (45%) had attained primary education and 13 (3%) had secondary education. Pertaining to their husband's level of education, 286 (50%) had no formal education, 250 (43%) had primary education, 41 (7%) had attained a secondary level of education and 294 (51%) were either farmers or engaged in business activity. Two hundred and ninety-five (51%) of the respondents earn an average monthly income of less than \$25 and 278 (48%) make 11 kilometers and above distance to access postnatal health care in the clinics.

**Table 1. Sociodemographic characteristics of the study participants of adolescent mother in Mabulabo, Malawi**

Variables	Frequency (%)
Age of the mother at an interval (Mean, SD: 18 ±1.2)	
13-15	12 (2%)
16-17	196 (34%)
18-19	369 (64%)
Marital status of adolescent mothers	
Single	51 (9%)
Married	526 (91%)
Educational level of adolescent mothers	
No education	303 (53%)
Primary level	261 (45%)
Secondary Level	13 (2%)
Religion of adolescent mothers	
Christian	556 (96%)
Muslim	6 (1%)
Others	15 (3%)
Occupation of Adolescent mothers	
Formally Employed	48 (8%)
Not employed	490 (85%)
Farming/Business	39 (7%)
Husband's educational level	
No education	286 (50%)
Primary level	250 (43%)
Secondary level	41 (7%)
Husband's occupation	
Formally employed	79 (14%)
Not employed	204 (35%)
Farming/Business	294 (51%)
Family income	
<\$25	295 (51%)
\$26-\$50	165 (29%)
\$51-\$100	88 (15%)
>\$101	19 (5%)
Distance to a health clinic	
0-5km	175 (30%)
6-10km	126 (22%)
11km & above	278 (48%)

### 4.2. Obstetric Characteristics of Respondents

In Table 2, 512 (89%) of respondents had at least a baby, and 388 (67%) had a normal birth delivery before this research was conducted. Three hundred and thirty (57%) gave birth to a girl child and 348 (60%) which is

more than half of the respondents did not access antenatal care services during their last pregnancy.

**Table 2. Obstetric characteristics and postnatal health care utilization of adolescent mothers in Mabalabo, Malawi**

Variables	Frequency (%)
Postnatal visit	
Did not meet recommended visit	344 (60%)
Met recommended visit	233 (40%)
Parity	
0	6 (1%)
1	512 (89%)
2	56 (10%)
Gender of child	
Boy	247 (43%)
Girl	330 (57%)
Mode of delivery	
Caesarean section	189 (33%)
Normal birth	388 (67%)
Antenatal visit during last pregnancy	
Yes	189 (40%)
No	348 (60%)
Reasons for adolescent mothers not accessing postnatal care	
Insufficient income	244 (42%)
Distance to a health facility	149 (26%)
Unscheduled for a postnatal visit	114 (20%)
Did not feel sick	70 (12%)
Severe abdominal pains	
Yes	189 (33%)
No	388 (67%)
Vaginal bleeding	
Yes	211 (37%)
No	366 (63%)
Obstetric complication	
Yes	168 (29%)
No	409 (71%)

Among all the adolescent mothers interviewed for this study, 388 (67%), 366 (63%) and 409 (71%) had complication-free in areas such as severe abdominal pains, vaginal bleeding and obstetric issues respectively after birth. This shows that majority of the adolescent mothers had safe and complication-free delivery. The results also depicted that 388 (67%) had a normal delivery, and 189

(33%) of adolescent mothers had caesarean section during birth.

Lastly, adolescent mothers who could not access postnatal care services, 244 (42%), 149 (26%), 114 (20%), 70 (12%), mentioned insufficient income, distance to the health facility, unscheduled for a postnatal visit and did not feel sick, respectively, were reasons for not making a postnatal visit.

Utilization of postnatal care services among adolescent mothers.

From Table 2, a total number of 344 (60%) of respondents did not meet the recommended postnatal visit, and 233 (40%) met the required number of postnatal visit, showing that less than half of the respondents could not access postnatal care services three times or more.

### 4.3. Logistic-regression Analysis

The outcome of the hierarchical logistic-regression analysis on adolescent mothers' utilization of postnatal health care services is presented in Table 3.

In model 1, 2, and 3 that is for predisposing factors presented significant results for adolescent mother's age, educational level of fathers and adolescent mothers but showed insignificant results for religion and marital status. Even though religion gave insignificant results, Muslims accessed postnatal health care three times more in model 3. Others that includes people who are neither Muslims nor Christians accessed postnatal health care services five times more in model 3. In the case of parity, results indicated that adolescent mothers with one parity results were significant and could access postnatal health care two times more in all the three models. Adolescent mothers with two parity results were insignificant.

In model 2 and 3, thus for enabling factors, depicted significant results in family income and adolescent mothers' occupation but presented insignificant results with distance to a health facility. However, with the husband's occupation, husbands that either were farmers or engaged in business activity results were significant in both model 2 and 3 but showed insignificant results with unemployed husbands in both models.

Lastly, in model 3 specifically for need factors, results indicated significant results for all factors that are, severe abdominal pains, vaginal bleeding and obstetric complications.

**Table 3. Factors influencing postnatal health care utilization of adolescent mothers: Logistic regression.**

Variables	Model 1			Model 2			Model 3		
	$\beta$	SE	OR	$\beta$	SE	OR	$\beta$	SE	OR
Predisposing factors									
Mother's age group									
13-15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
16-17	0.322***	0.063	0.693	0.301***	0.075	0.652	0.296***	0.087	0.655
18-19	0.266***	0.083	1.001	0.211**	0.086	1.011	0.201**	0.088	1.031
Marital status									
Married	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Single	0.298	0.280	0.742	0.239	0.310	0.787	0.212	0.320	0.774
Mother's education									
No education	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Primary	0.330***	0.093	0.958	0.280***	0.098	0.958	0.260***	0.095	0.954
Secondary	0.390***	0.095	0.975	0.310***	0.098	0.968	0.280***	0.093	0.956

Variables	Model 1			Model 2			Model 3		
	$\beta$	SE	OR	$\beta$	SE	OR	$\beta$	SE	OR
Religion									
Christian	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Muslim	0.440	1.680	3.281	0.360	1.810	3.473	0.330	1.610	3.648
Others	0.310	0.550	4.362	0.650	0.780	5.207	0.610	0.810	5.672
Parity									
O	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1.000	0.990**	0.380	2.629	1.028**	0.430	2.796	1.340***	0.460	2.961
2.000	0.325	0.790	0.723	0.375	0.860	0.688	0.408	0.880	0.665
Husband's education									
No education	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Primary	0.289***	0.081	1.802	0.251***	0.074	1.729	0.230***	0.075	1.738
Secondary	0.301***	0.072	1.710	0.299***	0.077	1.676	0.271***	0.078	1.699
Enabling factors									
Mother's occupation									
Formally employed				1.000	1.000	1.000	1.000	1.000	1.000
Not employed				0.289***	0.069	0.615	0.255***	0.071	0.628
Farming/Business				0.198***	0.053	0.820	0.172***	0.055	0.816
Husband's occupation									
Formally employed				1.000	1.000	1.000	1.000	1.000	1.000
Not employed				0.147	0.120	0.864	0.134	0.710	0.855
Farming/Business				0.167*	0.090	0.932	0.161*	0.092	0.929
Family Income									
<\$25				1	1	1	1	1	1
\$26-\$50				0.298**	0.120	1.347	0.271***	0.150	1.393
\$51-\$100				0.219***	0.057	1.245	0.222***	0.039	1.249
>\$101				0.183***	0.043	1.201	0.202***	0.063	1.224
Distance to health facility									
0-5km				1.000	1.000	1.000	1.000	1.000	1.000
6-10km				0.094	0.063	1.099	0.104	0.075	1.110
11km & above				0.084	0.079	0.797	0.073	0.087	0.794
Need factors									
Severe abdominal pains									
No							1.000	1.000	1.000
Yes							0.256***	0.069	0.774
Vaginal bleeding									
No							1.000	1.000	1.000
Yes							0.087**	0.043	1.090
Obstetric complication									
No							1	1	1
Yes							0.151***	0.051	1.163

## 5. Discussion

The research examined factors that influence postnatal health care utilization among adolescent mothers. Using the Andersen's model on health-service utilization, researchers analyzed the direct effect of predisposing, enabling and need factors on postnatal health care utilization using logistic-regression analysis.

First, need factors were more significant with postnatal health care utilization than predisposing and enabling factors. All the three aspects of the need factors namely: severe abdominal pains, vaginal bleeding and obstetric complications showed strong significance for PNC

utilization. This outcome indicates that need factors had the greatest influence on postnatal health care utilization. This finding is consistent with studies carried out by [37].

Secondly, enabling factors such as family income and adolescent mothers' occupation positively influence mothers' utilization of postnatal health care. This could be as a result that adolescent mothers who are employed or engaged in farming or business activity could have resources to enable them access health needs. In addition, the findings illustrate an indication that families with high average income are able to access postnatal health care services because they have the economic power to pay for their hospital expenses and associated cost [38] and this

finding is in association with [39]. Furthermore, results indicated that the various classification of family income whether low or high had a significant impact on postnatal health care utilization. This could be that both low and high-income families consider their health needs very important. With regards to husbands' occupation, men that are engaged in business activity or farming, significantly influenced adolescent mothers' ability to seek postnatal health care services but husbands who are not employed showed insignificant results. This result may perhaps be because men who are gainfully employed are likely to receive income and thereby increasing the average income of the family and vice versa. More so, distance to health facility had significant influence on adolescent mothers' utilization of postnatal health care services. [20] argued that geographical distance to health facility is one of the most important determinants of health care utilization in rural areas. This might be due to the fact that, in most rural areas, access to means of transport is limited, thereby affecting their willingness to utilize postnatal health care services.

Lastly, an explanatory variable that is predisposing factors such as adolescent mothers' age, educational level of husbands and adolescent mothers had a significant influence on postnatal health care utilization. These results show that adolescent mothers' age and their educational level play a significant role in their ability to access postnatal health care. The analysis reveal that older adolescent mothers use PNC less than younger adolescent mothers. This result is in agreement with studies carried out by [8]. Adolescent mothers with one parity showed significant influence on postnatal health care utilization, for instance, there was high utilization rate for PNC among adolescent mothers with one parity and this is in conformity with studies done by [40]. Furthermore, adolescent mothers with two parities could not significantly influence postnatal health care utilization and this could be because multiparous mothers assume the position that there is less risk associated with current delivery due to their previous birth experience [31]. This finding is in line with studies such as [31,41]. Religion that is Christians, Muslims and others, could not significantly influence adolescent mothers' utilization of postnatal health care. This could be that, religious bodies in these research areas give minimal or no education on postnatal health care utilization to their members. These findings are quite different from studies by [37] which showed that religion was a significant contributor to PNC services.

## 6. Conclusion

The study reveals that need factors were the most significant factor affecting PNC utilization. The study identified need factors as relatively important for adolescent mothers seeking postnatal health care services in rural Malawi. Enabling factors also showed considerable significance, they being more significance than predisposing factors. The findings reinforce the need to acknowledge and pay attention to how the need factors are translated on the health fields. Therefore, it is

imperative on the side of health sector practitioners to use the need factors as the baseline in initiating postnatal health care policies and programs for adolescent mothers specifically in rural areas. In addition, it is essential to consider other factors such as predisposing and enabling because they all have the specific role they play in influencing adolescent mothers' behavior in accessing postnatal health care. Particularly, the study recommends interventions on programs to educate adolescent mothers about importance of PNC, encourage utilization of PNC among mothers with higher parities, financially empower adolescent mothers and establish more health facilities.

## 7. Limitations

Although the research adds to scholarly academic research and practical contribution, it has some limitations, which creates an opportunity for further studies. First, data for this study was collated from one out of the nine districts of north of Malawi, which in broader sense limit its generalization. This research could be carried out in other districts of the country to come up with different findings to determine the true reflection of Anderson's model on postnatal health utilization among adolescent mothers in Malawi.

Second, with the classification of postnatal health care utilization visit made by adolescent mothers' to the health facility, further studies could consider categorizing it into three dimensions that is (those who met the recommended visit, those who made few visits and those who made no visit). By categorizing postnatal health care visit into three, this could bring out interesting findings which could be helpful for policy direction in the area of health.

Notwithstanding the limitations, the research has significance in that it empirically examined Anderson's model on adolescent mothers' utilization of postnatal health care in rural Malawi. [11,41] have analyzed women utilization of postnatal health care in general. Therefore, by focusing on adolescent mothers, the current study will help ascertain salient factors of Anderson's model that influence the utilization of postnatal health care. This in effect, will guide in policy formulation that involves adolescent mothers.

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## Conflict of Interest

There is no conflict of interest among the authors.



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