



## Association Between Pre-Intervention Knowledge of Postpartum Changes and Sociodemographic Characteristics of First-Time Mothers

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**Abstract:** Background: First-time mothers often face unique challenges due to limited prior experience, making knowledge of postpartum changes essential for effective adaptation. Sociodemographic factors such as age, education, occupation, and marital status may influence baseline knowledge and readiness to learn which can inform the design of effective health education interventions.

Objective: To determine the association between pre-intervention knowledge of postpartum changes and sociodemographic characteristics of first-time mothers.

Methods: A quasi-experimental study was conducted among 204 first-time mothers in Zaria Metropolis, Nigeria, assigned to study (n = 64) and control (n = 64) groups. Baseline knowledge of postpartum changes was assessed using a validated 10-item questionnaire. Sociodemographic characteristics including age, education, marital status, ethnicity, religion, and occupation were collected. Associations were analyzed using Chi-square tests, with significance set at  $p < 0.05$ .

Results: In the study group, no significant associations were observed between pre-intervention knowledge and any sociodemographic characteristics, including age ( $\chi^2 = 6.445$ ,  $p = 0.40$ ), education ( $\chi^2 = 3.307$ ,  $p = 0.347$ ), marital status ( $\chi^2 = 0.632$ ,  $p = 0.427$ ), ethnicity ( $p = 0.977$ ), religion ( $p = 0.594$ ), or occupation ( $p = 0.437$ ). Whereas, in the control group, age ( $\chi^2 = 9.820$ ,  $p = 0.007$ ) and education level ( $\chi^2 = 7.080$ ,  $p = 0.002$ ) were significantly associated with pre-intervention knowledge, with older mothers (25–29 years) and those with secondary or tertiary education demonstrating higher baseline knowledge. Other variables, including marital status, ethnicity, religion, and occupation, were not significantly related to knowledge.

Conclusion: Baseline knowledge of postpartum changes among first-time mothers is generally independent of most sociodemographic characteristics, except for age and educational level in the control group. These findings suggest that interventions aimed at improving maternal knowledge should focus on younger mothers and those with lower educational attainment while remaining accessible to all first-time mothers.

Recommendation: Maternal health education programs should be universally provided but tailored to address the needs of younger mothers and those with lower formal education to enhance postpartum knowledge and adaptation.

**Keywords:** Postpartum changes, first-time mothers, baseline knowledge, sociodemographic factors, Nigeria

## 1. Introduction

The period after childbirth represents a critical yet often overlooked phase in the continuum of maternal health care. Defined traditionally as the first 6 to 12 weeks following childbirth, this period is characterized by complex physical, psychological, and social transitions as women adjust to the demands of recovery and motherhood (Asadi, Noroozi & Alavi, 2021). During this time, first-time mothers in particular may experience a wide range of physiological changes, including fatigue, changes in sexual function, lactation challenges, and shifts in body image, alongside the emotional complexities of adapting to a new identity and role (Ngai, Zhu & Loke, 2019). While these transitions are universal, the degree to which first-time mothers understand and anticipate postpartum changes before delivery varies considerably, influenced in part by sociodemographic factors such as age, education, socioeconomic status, and access to health information (Sangdang et al., 2025).

A growing body of literature emphasize the importance of maternal knowledge during the postpartum period for improved health outcomes. Inadequate preparation has been linked to heightened stress, unmet learning needs, and poorer coping strategies among postpartum women (Howell, Mora, Chassin & Leventhal, 2013). A cross-sectional study examining unmet learning needs found that women of lower socioeconomic status were more likely to report gaps in essential postpartum knowledge, including infant care and self-care topics, four weeks after hospital discharge (Sword & Watt, 2005). These findings suggest that sociodemographic characteristics may shape expectations and preparedness for postpartum realities, subsequently affecting a woman's ability to navigate this period effectively.

Adams, Miller, Agbenyo, Ehla & Clinton (2023) found that postpartum care information for mothers often falls short, particularly regarding physical and mental postpartum health care for the mother,

suggesting gaps in prenatal preparation for postpartum changes. Physiologically, many women report significant alterations in sleep patterns, physical discomfort, and changes in sexual health that are often not anticipated adequately during prenatal education (Lewis et al., 2018). In a longitudinal cohort of first-time mothers, nearly half reported lack of interest in sexual activity and a high prevalence of vaginal dryness six months postpartum, highlighting the importance of anticipatory guidance on physical changes (O'Malley et al., 2018)). Psychosocially, first-time mothers may struggle with identity transitions, fluctuating emotions, and the need for social support, particularly when prior expectations are misaligned with lived experience (Feeley et al., 2020). These psychosocial stressors are compounded when women feel unprepared, potentially impacting mental well-being and the overall transition to motherhood (Leahy-Warren et al., 2012).

Crucially, pre-intervention knowledge about postpartum changes can influence maternal outcomes in the early postnatal period (Abdel-Samad et al., 2023). Knowledge has been shown to empower mothers to utilize positive coping strategies, adopt healthier behaviors, and seek necessary support services, thus facilitating adaptation (Fagan et al., 2024). A narrative review on factors affecting women's adjustment to postpartum changes indicated that awareness and preparedness can enhance self-efficacy and positive coping, while lack of information may hinder adjustment and widen disparities in postpartum experiences (Asadi et al., 2020). Despite this, many women still report unmet information needs regarding postpartum changes, particularly in contexts where prenatal education is limited or not tailored to diverse sociodemographic backgrounds (Carvalho et al., 2024).

Sociodemographic characteristics play a significant role in shaping maternal knowledge and experiences during the postpartum period, with variables such as age, education level, and family income

significantly influencing maternal health literacy and access to postpartum information (Gaspar-Damaso et al., 2023). Variables such as educational attainment, age, marital status, and socioeconomic position have been associated with differing levels of health literacy and access to postpartum education resources, affecting how women utilize maternal health services and information (Preston et al., 2025). In a study on oral health knowledge among early postpartum women, those who were younger and less educated were significantly more likely to have inadequate knowledge compared with older or more educated counterparts (PubMed, 36767256). Although this study focused narrowly on oral health, the underlying pattern suggests a broader trend where lower educational levels and socioeconomic disadvantage correspond with poorer postpartum knowledge.

First-time mothers especially those from vulnerable or resource-limited groups may lack adequate information about essential postpartum care practices, including self-care, infant feeding, and recognition of warning signs for complications (Brown et al., 2005). The unmet needs identified in postpartum follow-up studies emphasize that knowledge gaps are not random but systematically associated with socioeconomic and demographic contexts (Zakaria et al., 2023). Women of low socioeconomic status reported significantly more unmet learning topics than their higher-status peers, indicating that sociodemographic factors can intensify informational deficits and potentially affect postpartum outcomes (Brown et al., 2005). Despite the importance of education, gaps remain in understanding the relationship between baseline knowledge and sociodemographic characteristics among first-time mothers in Nigeria. It is important to identify whether certain sociodemographic groups require additional support.

## 2. Methods

### Study Design

A quasi-experimental design with study and control groups was used to evaluate the association between baseline knowledge and sociodemographic factors.

### Study Setting

The study was conducted in selected primary health care centers (PHCs) within Zaria Metropolis, Kaduna State, Nigeria. Zaria and Sabon Gari Local Government Areas (LGAs) were randomly selected.

### Participants

The study population consisted of first-time mothers within six weeks postpartum who had delivered a live infant via spontaneous vaginal birth and consented to participate. Mothers who experienced stillbirths, had obstetric complications, or declined to take part were excluded.

### Sample Size

A total of 128 participants were recruited, with equal allocation to study (n=64) and control (n=64) groups.

### Sampling Technique

A multistage sampling approach was used for participant selection. Two LGAs Zaria and Sabon Gari were purposively chosen. Four wards were then randomly selected by balloting: Samaru and Jushi (study group) and Tundun Wada and Babbandodo (control group). From these wards, four primary healthcare centers (PHCs) were randomly selected: PHC Tundun Wada, PHC Babbandodo, PHC Samaru, and PHC Jushi. Finally, participants were recruited from each PHC using systematic random sampling.

### Data Collection Instruments

Data were collected using two structured tools. First, a validated 10-item questionnaire with Yes/No responses was used to assess participants' knowledge of postpartum changes. Second, a sociodemographic questionnaire captured information on age, educational attainment, occupation, marital status, religion, and ethnicity. Together, these

instruments provided a comprehensive assessment of baseline knowledge and relevant participant characteristics.

### Method Data Collection Procedure

Data collection was conducted over a twelve-week period. During the baseline phase, first-time mothers within two weeks postpartum completed a structured questionnaire assessing their knowledge of postpartum changes. Four trained research assistants facilitated data collection. Literate participants completed the questionnaire independently, while illiterate participants were interviewed face-to-face, with questions explained to ensure accurate responses. Sociodemographic information, including age, education, marital status, occupation, religion, and ethnicity, was collected concurrently. This approach allowed for the assessment of pre-intervention knowledge and its association with sociodemographic characteristics. All completed questionnaires were reviewed for completeness, coded, and prepared for statistical analysis. Chi-square tests were later used to examine the relationship between baseline knowledge and

each sociodemographic variable, with significance set at  $p < 0.05$  of data collection

### Ethical Considerations

Ethical approval for the study was obtained from the Ahmadu Bello University Teaching Hospital Health Research Ethics Committee (Approval number: ABUTHZ/HREC/W32/2021). Permission to conduct the study was also obtained from the relevant Local Government Authorities, community leaders in the selected LGAs, and the heads of the primary healthcare centers (PHCs) involved in the study. Written informed consent was obtained from all participants prior to data collection, ensuring that they understood the purpose, procedures, and voluntary nature of participation.

### Data Analysis

Data were analyzed using SPSS version 25. Frequencies, percentages, means, and standard deviations summarized data. Chi-square tests assessed associations between baseline knowledge and sociodemographic characteristics. Significance was set at  $p < 0.05$ .

## 3. Results

Variable	Category	Study (% F)	Control (% F)	$\chi^2$	p-value
<b>Age (years)</b>	15–19	16 (25.0)	32 (50.0)	11.418	0.003
	20–24	45 (70.3)	26 (40.6)		
	25–29	3 (4.7)	6 (9.4)		
	30+	0 (0)	0 (0)		
<b>Religion</b>	Islam	55 (85.9)	62 (96.9)	0.062	0.804
	Christianity	9 (14.1)	2 (3.1)		
<b>Level of Education</b>	Informal	21 (32.8)	20 (31.3)	17.533	<b>0.001</b>
	Primary	12 (18.8)	32 (50.0)		
	Secondary	24 (37.5)	9 (14.1)		

Variable	Category	Study (% , F)	Control (% , F)	$\chi^2$	p-value
<b>Occupation</b>	Tertiary	7 (10.9)	3 (4.7)	3.053	0.384
	Housewife	34 (53.1)	31 (48.4)		
	Petty trader	15 (23.4)	20 (31.3)		
	Civil servant	6 (9.4)	2 (3.1)		
	Student	9 (14.1)	11 (17.2)		
<b>Marital Status</b>	Single	5 (7.8)	2 (3.1)	1.360	0.244
	Married	59 (92.2)	62 (96.9)		
<b>Ethnic Group</b>	Hausa/Fulani	47 (73.4)	50 (78.1)	3.243	0.356
	Yoruba	9 (14.1)	8 (12.5)		
	Igbo	3 (4.7)	0 (0.0)		
	Others	5 (7.8)	6 (9.4)		

Analysis of participants' sociodemographic characteristics in table 1 above revealed significant differences in age and educational level between the study and control groups. In terms of age, the majority of mothers in the study group were 20–24 years (70.3%), while the control group had the highest proportion in the 15–19 years category (50.0%) ( $\chi^2 = 11.418$ ,  $p = 0.003$ ). Regarding education, most participants in the study group had secondary education (37.5%), whereas the control group had a higher proportion with primary education (50.0%) ( $\chi^2 = 17.533$ ,  $p = 0.001$ ). These findings suggest that the study group was generally older and more educated compared to the control group.

No significant differences were observed between the groups for other sociodemographic variables. Most participants in both groups were Muslim (study: 85.9%, control: 96.9%;  $\chi^2 = 0.062$ ,  $p = 0.804$ ), married (study: 92.2%, control: 96.9%;  $\chi^2 = 1.360$ ,  $p = 0.244$ ), and predominantly Hausa/Fulani (study: 73.4%, control: 78.1%;  $\chi^2 = 3.243$ ,  $p = 0.356$ ). Occupational distribution was also comparable, with housewives forming the largest category in both groups (study: 53.1%, control: 48.4%;  $\chi^2 = 3.053$ ,  $p = 0.384$ ). These results indicate that, aside from age and education, the two groups were similar in their sociodemographic composition.

**Table 2: Association of pretest level of knowledge and sociodemographic characteristics of primiparous mothers in the study group**

S/N	Variables	Good	Poor	Chi square	P value	Df
<b>1</b>	Age			6.445	0.40	2
	15-19	10	6			
	20-24	38	7			
	25-29	1	2			
	30 and above					

2	Marital status		2	0	0.632	0.427	1
	Single	47					
3	Level of education		16	4	3.307	0.347	3
	Informal	25					
	Primary	7					
	Secondary	1					
4	Ethnicity		36	11	0.204	0.977	3
	Hausa/Fulani	7					
	Yoruba	2					
	Igbo	4					
5	Religion		7	3	0.284	0.594	1
	Christianity	42					
6	Occupation		22	9	2.721	0.437	3
	Housewife	16					
	Petty trader	1					
	Civil servant student	10					

The association between pre-intervention knowledge of postpartum changes and sociodemographic characteristics of first-time mothers in the study group is presented in Table 2 above. The results show that the majority of mothers with good knowledge were aged 20–24 years (38 participants), while smaller numbers were observed in other age categories. However, statistical analysis revealed no significant association between age and pretest knowledge ( $\chi^2 = 6.445$ ,  $p = 0.40$ ). Marital status did not show a significant relationship with knowledge scores, with 47 married participants demonstrating good knowledge compared to 15 with poor knowledge ( $\chi^2 = 0.632$ ,  $p = 0.427$ ).

The level of education, ethnicity, religion, and occupation were also examined for potential associations with baseline knowledge. Although mothers with higher levels of education appeared to have slightly better knowledge, the differences were not statistically significant ( $\chi^2 = 3.307$ ,  $p = 0.347$ ). Also, ethnicity, religion, and occupation did not show significant associations with pre-intervention knowledge, with p-values of 0.977, 0.594, and 0.437 respectively. These findings indicate that, in the study group, pre-intervention knowledge of postpartum changes was not significantly influenced by any of the measured sociodemographic factors, suggesting a relatively homogeneous baseline knowledge distribution among first-time mothers prior to the educational intervention.

**Table 3: Association of pretest level of knowledge and sociodemographic characteristics of primiparous mothers in the control group**

S/N	Variables	Good	Poor	Chi square	P value	Df
1	<b>Age</b>					
	15-19	0	26	9.820	0.007	2
	20-24	5	1			
	25-29	32	0			
30 and above						
2	<b>Marital status</b>			0.086	0.769	1
	Single	0	5			
	Married	1	58			
3	<b>Level of education</b>			7.080	0.002	3
	Informal	1	19			
	Primary	3	7			
	Secondary	24	3			
	Tertiary	7	0			
4	<b>Ethnicity</b>			0.284	0.867	2
	Hausa/Fulani	1	49			
	Yoruba	0	8			
	Others	0	6			
5	<b>Religion</b>			0.166	0.597	1
	Christianity	0	9			
	Islam	1	54			
6	<b>Occupation</b>			0.896	0.826	3
	Housewife	1	33			
	Petty trader	0	15			
	Civil servant	0	6			
	student	0	9			

Result from the table above revealed the association between pre-intervention knowledge of postpartum changes and sociodemographic characteristics of first-time mothers in the control group is presented. Analysis of age revealed a significant association with knowledge scores ( $\chi^2 = 9.820$ ,  $p = 0.007$ ). Specifically, mothers aged 25–29 years had the highest proportion of good knowledge (32 participants), while none of the youngest mothers (15–19 years) demonstrated good knowledge. This indicates that age is an important factor influencing baseline knowledge in this group, with older mothers tending to have better understanding of postpartum changes. Level of education also showed a statistically significant association with pre-intervention knowledge

( $\chi^2 = 7.080$ ,  $p = 0.002$ ). Mothers with secondary education had the largest number of participants with good knowledge (24), followed by those with tertiary education (7). In contrast, mothers with informal or primary education had substantially lower numbers with good knowledge. This finding showed the role of formal education in enhancing mothers' understanding of postpartum changes.

Other sociodemographic variables, including marital status, ethnicity, religion, and occupation, did not demonstrate significant associations with pretest knowledge ( $p > 0.05$ ). The majority of mothers in both knowledge categories were married, Hausa/Fulani, Muslim, and housewives, reflecting the demographic composition of the

population, but these characteristics did not significantly influence baseline knowledge. The results indicate that in the control group, age and educational level were key determinants of pre-intervention knowledge of postpartum changes, whereas other sociodemographic factors were not significantly related. These findings suggest that interventions aimed at improving knowledge in this population should consider targeting younger mothers and those with lower educational attainment to maximize effectiveness.

#### 4. Discussion

This study examined the association between pre-intervention knowledge of postpartum changes and sociodemographic characteristics among first-time mothers in Zaria Metropolis, Nigeria. The findings revealed that the study and control groups were largely comparable in socio-demographic characteristics, with the exception of age and educational level. Importantly, pre-intervention knowledge in the study group was not significantly associated with any measured sociodemographic variables, whereas in the control group, both age and level of education were significant determinants of baseline knowledge.

The significant association between age and pre-intervention knowledge in the control group indicates that older first-time mothers (25–29 years) had a higher level of understanding of postpartum changes compared to younger mothers (15–19 years). This is consistent with previous studies suggesting that maternal age is positively correlated with knowledge of maternal health practices, potentially due to greater exposure to health information, previous interactions with healthcare providers, or increased maturity and cognitive capacity to process health-related information (Ooni et al., 2025). Younger mothers may have less prior exposure to health education and may require more targeted interventions to improve their understanding of postpartum changes.

The association between educational level and baseline knowledge in the control group highlights the critical role of formal education in maternal health literacy. Mothers with secondary or tertiary education demonstrated significantly higher knowledge compared to those with informal or primary education. This aligns with findings from similar studies in Nigeria and other low- and middle-income countries, which report that higher educational attainment enhances the ability to comprehend health information, apply health recommendations, and engage with healthcare services effectively. Their studies revealed that mothers with higher educational attainment demonstrated significantly higher knowledge of postpartum care compared to those with lower education levels, highlighting the critical role of formal education in maternal health literacy (Phommachanh et al., 2021). Higher educational levels are associated with better maternal health literacy, greater engagement with healthcare information, and improved utilisation of maternal healthcare services (Bello et al., 2022). The lack of a significant association between education and knowledge in the study group may be explained by the relative homogeneity of the study population, the influence of community-level health education, or sample size limitations within higher education categories.

Other sociodemographic variables, including marital status, ethnicity, religion, and occupation, were not significantly associated with pre-intervention knowledge in either group. This suggests that in this population, baseline understanding of postpartum changes may be influenced more by individual-level factors such as age and education rather than social or cultural characteristics. These findings are consistent with previous research indicating that, while sociodemographic factors may shape access to resources, they do not always predict health knowledge when basic maternal health information is widely disseminated through community health services (Bello et al., 2022). Phommachanh et

al., (2021) found in a community survey of maternal health literacy that education (and not other sociodemographic variables such as marital status, ethnicity, or occupation) was the primary factor associated with the ability to understand maternal health information, while the other variables did not show strong significant relationships with maternal health literacy outcomes. This revealed that formal education and literacy matter more than those social/cultural variables in explaining differences in maternal health understanding.

The study findings have important implications for maternal health interventions. Educational programs aimed at improving knowledge of postpartum changes should prioritize younger mothers and those with lower educational attainment, as these groups are more likely to have limited understanding. Health education interventions delivered through immunization or postnatal clinics can be particularly effective in reaching these populations.

Despite these insights, certain limitations should be acknowledged. The study was conducted in selected Primary health care centers within Zaria Metropolis, which may limit the generalizability of the findings to other regions with different sociodemographic profiles. Nonetheless, the study provides valuable evidence on the influence of age and education on maternal knowledge of postpartum changes in a Nigerian setting.

## 5. Conclusion

The study demonstrates that pre-intervention knowledge of postpartum changes among first-time mothers is significantly influenced by age and educational attainment, particularly in the control group. Other sociodemographic factors, such as marital status, ethnicity, religion, and occupation, were not significant determinants. These findings suggest the importance of targeted educational interventions for younger and less educated first-time mothers to enhance maternal knowledge and potentially improve postpartum health outcomes. Structured

educational interventions are recommended to enhance postpartum knowledge universally.

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## Conflict of Interest

The authors declare no conflict of interest.

## Authors' Contributions

Shatu Ishaku: Conceptualized and led the study, drafted manuscript

Oluwatoyin A. Ogunyewo: Conceptualization, supervision

Ramatu Balarabe: Supervised methodology and revised manuscript

Ishaku Hassan: Critical review of manuscript

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