Patterns and Associated Factors of Labour Pain Intensity During Childbirth and Immediately After Delivery among Postnatal Women in Obio/Akpor, Rivers State, Nigeria

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ABSTRACT

Background: Labour pain is the most intense acute pain experiences in obstetrics, profoundly influencing maternal satisfaction, psychological well-being, and postpartum recovery. In resource-limited environments with limited pharmacological options, pain intensity during and immediately after childbirth is associated with physiological factors, healthcare provider's practices, demographic profiles, and care delivery deficiencies. This study examined patterns of labour pain intensity, during postpartum, associated demographic and obstetric factors among postnatal women in primary healthcare centres in Obio/Akpor, Rivers State, Nigeria.

Methods: A cross-sectional descriptive survey was employed in the study. The study population comprised of postnatal women aged 15–49 years who had vaginal delivery within the three months prior to data collection. 393 participants were recruited from six selected centres through simple random sampling. Data collection involved a validated questionnaire, with test-retest reliability coefficient of 0.78, was used to assess sociodemographics, obstetrics, and verbal-rated pain intensity. Analysis was conducted using descriptive statistics, chi-square tests, and binary logistic regression, using SPSS version 27 ($p < 0.05$).

Results: Moderate-to-severe labour pain was reported by 72.1% of the total number of the participants, while 64.9% reported that they endured intense pain for 1–6 hours. In post-delivery, pain reduced notably, but

37.1% of the mothers experienced moderate-to-severe residuals. Chi-square tests showed significant links between labour pain intensity and age ($\chi^2 = 16.500$, $p = 0.036$), education ($\chi^2 = 15.867$, $p = 0.044$), parity ($\chi^2 = 31.330$, $p = 0.001$), labour onset ($\chi^2 = 32.454$, $p < 0.001$), and delivery type ($\chi^2 = 30.142$, $p < 0.001$). Logistic regression indicated that induced labour raised severe pain odds by 46% (AOR = 1.46, 95% CI [1.01, 2.09], $p = 0.042$).

Conclusion: labour pain imposes a substantial burden - intensified by interventions like induction, alongside primiparity, and low education. Recommendations include application of standardised pain protocols by providers, non-pharmacological supports, indication-restricted inductions, and education for at-risk groups to provide equitable and patient-centred care.

Keywords: Labour pain intensity, postpartum pain, induced labour, parity, primary healthcare, Nigeria

INTRODUCTION

Childbirth constitutes one of the most universal physiological events in women's reproductive lives, yet it is widely acknowledged as among the most intense acute pain experiences a woman can encounter. Recent demographic data estimate that approximately 132 million live births occurred globally in 2024. This scale

highlights the profound population-level exposure to labour-related pain and its immediate sequelae each year (United Nations, Department of Economic and Social Affairs, Population Division, 2024). In recent maternal health literature, labour pain intensity has evolved beyond a mere inevitable physiological process. It is now conceptualised as a multidimensional phenomenon influenced by the interplay of nociceptive mechanisms, psychological readiness, interpersonal support, cultural expectations, and the quality of intrapartum care (Whitburn et al., 2019). The World Health Organization framework for positive childbirth experiences explicitly integrates effective pain management within respectful, supportive, and responsive care, alongside clinical safety (World Health Organization, 2018).

Physiologically, labour pain emanates from complex, stage-specific nociceptive pathways. In early labour, pain is predominantly visceral, stemming from uterine contractions and cervical dilatation. As labour advances, somatic components emerge from vaginal distension, pelvic floor stretching, and perineal pressure (Gonzalez, et al et al., 2021., Chestnut et al., 2019; Labor & Maguire, 2008). While these mechanisms are universal, perceived intensity exhibits substantial inter-individual variation attributable to biological factors (such as parity, labour duration, and tissue elasticity) as well as psychological and contextual modulators, including fear, anxiety, previous birth experiences, cultural norms surrounding endurance, and perceived control (Whitburn et al., 2019). The burden of pain extends beyond delivery itself. A significant proportion of women experience notable acute pain in the immediate postpartum period, arising from uterine involution (afterpains), perineal trauma, episiotomy, operative vaginal delivery, or caesarean incisions. Such acute postpartum pain carries practical implications and may impede early ambulation, breastfeeding initiation, maternal rest, and mother–infant bonding, thereby prolonging the impact of intrapartum pain into the early postnatal phase (Declan & Hamilton, 2023).

Despite its clinical and psychosocial significance, access to effective pain management remains markedly inequitable across global health systems. In high-income countries, pharmacological options, particularly epidural analgesia, exhibit wide utilisation variability depending on institutional policies, provider preferences, and sociocultural factors (Declan & Hamilton, 2023). In low and middle-income settings, including many subSaharan African contexts, access to effective pharmacological relief remains severely constrained by systemic barriers such as medication and equipment shortages and absent protocols, compounded by normative attitudes that frame severe labour pain as an inevitable or even valorised aspect of childbirth (McCauley et al., 2018). These structural and attitudinal barriers suggest that reported pain intensity in such environments may be exacerbated not solely by physiological factors but also by deficiencies in the availability and organisation of effective pharmacological pain relief, as well as by limitations in provider training and supportive care practices.

Optimal coping during labour is facilitated when women experience psychological security, receive respectful and continuous interpersonal support, and are attended by skilled professionals who communicate effectively, respond promptly, and deliver appropriate pharmacological or non-pharmacological relief (Fumagalli et al., 2022; Bohren et al., 2017).

However, in many maternity settings, particularly in low-resource contexts, these enabling conditions are inconsistently realised. Studies from Nigeria and comparable environments have documented evidence of severe labour pain alongside limited, inconsistent, or absent obstetric analgesia provision and utilisation (Onasoga et al., 2022; Chigbu & Onyeka, 2011; Obuna & Umeora, 2014). This pattern suggests the presence of systemic gaps in pain assessment, provider preparedness, institutional responsiveness, and resource allocation. When health workers lack systematic training, standardised protocols, or adequate supplies to evaluate pain rigorously, communicate empathetically, and offer tailored interventions, women are often compelled to rely predominantly on personal endurance and informal strategies. Recent research reveals that women frequently employ prayer, stoicism, silence, or emotional withdrawal during labour, as part of management strategy (Esan et al., 2022; Aziato et al., 2017).

The outcome extends well beyond the intrapartum period. Severe or inadequately supported labour pain is linked to negative birth appraisals and contributes to elevated risks of postpartum mental health sequelae, including anxiety, depression, and post-traumatic stress symptoms (Amen et al., 2023; Dikmen-Yildiz et al., 2017). Persistent or unmanaged immediate postpartum pain can further undermine early recovery and shape long-term perceptions of maternity services. In a more recent study by Amen et al. (2023), in which the authors

reduced labour pain intensity to a single severe versus non-severe threshold using the Visual Analogue Scale, and they concentrated analytic attention on pain during labour, rather than providing a systematic, phase-specific quantification that separates childbirth pain from pain intensity in the immediate post-delivery period. In addition, although the study identified statistically significant associations with factors such as prelabour expectations, mode of delivery, labour augmentation, and pain relief modality, the design and modelling approach did not support strong causal inference, nor did it develop a comprehensive determinants framework capable of distinguishing background characteristics, intrapartum processes, and immediate post-delivery factors as analytically distinct drivers of intensity burden. Consequently, despite its contribution in establishing that severe labour pain was common in Rivers State, Amen et al. (2023) left unresolved the more granular empirical problem of quantifying labour pain intensity burden across childbirth and the immediate post-delivery phase, and of estimating independent predictors for each phase within resource-constrained local contexts.

This study therefore addresses a critical evidence gap: the limited understanding of the intensity of labour pain among postnatal women, its extension into the immediate postpartum period, and the demographic, obstetric, psychological, and care-related factors associated with heightened intensity. Without robust, context-specific data, maternity providers and health system planners will lack the foundational information required to anticipate pain-related needs, prioritise targeted supportive interventions, and strengthen woman-centred, respectful intrapartum and postpartum care. Consequently, there is a pressing need for context-specific evidence on the distribution and patterns of labour pain intensity (including immediate postpartum), its associations with demographic and obstetric factors, and predictive relationships with labour type, particularly in resource constrained settings where systemic barriers may exacerbate the burden. To achieve this, the following research questions guided the study.

Research Questions

1. What is the intensity of labour pain during childbirth and immediately after delivery among postnatal women in selected primary health care centres in Obio/Akpor, Rivers State?

2. What is the association between demographic characteristics and labour pain intensity among postnatal women in selected primary health care centres in Obio/Akpor, Rivers State?

3. What is the association between type of labour and pain intensity immediately after delivery among postnatal women in selected primary health care centres in Obio/Akpor, Rivers State?

4. What is the association between type of delivery and pain intensity immediately after delivery among postnatal women in selected primary health care centres in Obio/Akpor, Rivers State?

5. What is the predictive effect of type of labour-on-labour pain intensity among postnatal women in selected primary health care centres in Obio/Akpor, Rivers State?

METHODOLOGY

This study adopted a cross-sectional descriptive survey design to measure labour pain intensity and examine statistically testable associations between pain intensity and selected demographic and clinical characteristics among postnatal women at a defined point in time. Cross-sectional designs are well-suited for describing prevalence, patterns, and correlates in observational maternal health research, while enabling efficient data collection from a representative sample in resource-constrained settings (Yamane, 1973; Uakarn et al., 2021). This study was conducted in Obio/Akpor Local Government Area, Rivers State, Nigeria - a densely populated urban-periurban locality in the Niger Delta region characterized by socioeconomic significance due to oil and gas activities, rapid urbanization, and associated health infrastructure demands (Niger Delta Budget Monitoring Group, 2025; Okafor & Onwubiko, 2022). Data used in this study were collected from six purposively selected model primary healthcare centres that routinely provide antenatal, intrapartum, and postnatal services: Obio Cottage Hospital, Elelenwon Primary Health Care Centre, Rumuodomaya Primary Health Care Centre,

Rumuokwushi Primary Health Care Centre, Eliozu Primary Health Care Centre, and Rumuigbo Primary Health Care Centre (Rivers State Primary Health Information Management System, 2021). The target population comprised approximately 21,000 postnatal women of reproductive age (15-49 years) who had experienced spontaneous vaginal delivery within the last three months and received at least one labour pain management intervention in these facilities, with the estimate derived from projected births using local crude birth rate indicators and national demographic data (National Bureau of Statistics, 2023; World Bank, 2022). Inclusion criteria required delivery within the last three months, age 15–49 years, clinical stability at postnatal clinic attendance, ability to understand and communicate in English, and provision of informed consent. Exclusion criteria included severe complications necessitating emergency caesarean section, women who have severe preeclampsia, postpartum haemorrhage, or multiple gestation (twins or higher-order multiples). The sample size of 393 postnatal women was determined using the Taro Yamane formula for finite populations (n = N / [1 + N(e)²]), with N = 21,000 and a 5% margin of error at 95% confidence level, ensuring adequate representativeness for descriptive and inferential analyses (Yamane, 1973; Uakarn et al., 2021). Simple random sampling was employed via a balloting technique during postnatal clinic sessions to recruit eligible women, thereby minimizing selection bias and ensuring equal selection probability. Data were collected using a structured questionnaire with sections on socio-demographic and obstetric characteristics, and labour pain intensity indicators (using Likert-type and dichotomous formats). Face and content validity were established through expert review of the researchers and specialists to confirm item relevance, clarity, and alignment with study objectives, as recommended by Iyeuwa (2019). Reliability of the instrument was assessed via test-retest on a pilot group of 30 postnatal women, with a two-week interval, resulting in 0.78 reliability co-efficient. Data collection occurred over three months (January- March 2025) during clinic sessions. Trained research assistants approached eligible women during postnatal clinic sessions, clearly explained the study objectives in simple, accessible language, and provided opportunities for questions. Participation was entirely voluntary. Upon obtaining written informed consent, and thumb-printed consent for some participants, they were then given the questionnaire in a private, and comfortable setting to ensure confidentiality and minimize discomfort. Assistants remained available to provide clarification on any items if requested, while avoiding influence over responses. Completed questionnaires were immediately reviewed on-site for completeness, and some participants were encouraged to fill in any missing information to reduce data loss and enhance overall quality. SPSS version 27 was used to conduct data analysis using descriptive statistics (frequencies, percentages, means) to summarize demographic characteristics and pain patterns. The chi-square tests were used to examine associations between pain intensity and categorical variables, while binary logistic regression was used to assess the predictive effect of labour type on pain intensity at $p < 0.05$ significance level. Ethical approval was secured from Ethics Committee of University of Port Harcourt. Also, permissions for the study were obtained from Rivers State Ministry of Health. Participation in the study was entirely voluntary, and the participants were assured of confidentiality of their identities through anonymization in data handling, and security of data storage was also ensured.

RESULTS

Demographic Characteristics of Participants

Table 1 shows that the 393 participants were predominantly women of prime reproductive age, with 89.1% aged 25–49 years. This distribution corresponds closely to national fertility patterns, where childbearing is concentrated in the 20–39 age range. The sample therefore provides a representative profile of actively reproductive women. Marital status was overwhelmingly married (94.9%), reflecting the sociocultural norm that positions marriage as the primary context for reproduction in Nigeria. This high marital prevalence suggests a cohort embedded in established familial support networks. Ethnic composition exhibited notable diversity, with 45.8% identifying with minority groups beyond Hausa, Yoruba, and Igbo. Such representation broadens the sociocultural scope of the findings.

Table 1: Demographic Characteristics of participants (n= 393)

| Variable	Sub-Variable	Frequency (n)	Percentage (%)
Age Group	15–24	43	10.9

M±SD age = 33.91 ± 7.76	25–34	177	45.0
	35–49	173	44.1
Marital Status	Single	12	3.1
	Married	373	94.9
	Divorced	8	2.0
Religion	Christian	228	58.0
	Muslim	63	16.0
	Others (Traditional Religion, No religion)	102	26.0
Ethnicity	Yoruba	28	7.1
	Ibo	122	31.0
	Hausa	63	16.0
	Others (**Efik, Ijaw, Ibibio**)	180	45.8
Education	Primary	39	9.9
	Secondary	118	30.0
	Tertiary	236	60.1
Employment	Housewife	31	7.9
	Civil Servant	31	7.9
	Business	149	37.9
	Trader	59	15.0
	Farmer	12	3.1
	Others	111	28.2
Parity	Primigravida	204	51.9
	Multigravida	189	48.1
Type of Delivery	Vaginal Delivery	377	95.9
	Assisted Vaginal Delivery	16	4.1
Type of Labour	Spontaneous	310	78.9
	Induced with Oxytocin	59	15.0
	Induced with Misoprostol	24	6.1

Table 1 further revealed that educational attainment was markedly high, with 60.1% holding tertiary qualifications, far exceeding national averages. This indicates a bias towards urban, facility-attending populations with greater healthcare access. Occupational patterns revealed a majority engaged in business, trading, or informal sectors (52.9%), consistent with prevalent female employment structures. Parity was evenly distributed (51.9% primigravida, 48.1% multigravida), while deliveries were predominantly physiological (95.9% normal vaginal, 4.1% assisted). Overall, the profile depicts a married, ethnically diverse, highly educated, informally employed cohort of reproductive-age women who experienced largely unassisted vaginal deliveries.

Levels of Labour Pain Intensity

Figure 1 is a bar chart showing the distribution of labour pain intensity across three indicators among the 393 respondents: overall pain during labour, duration of intense pain, and pain intensity immediately after delivery. The result revealed that the overall pain during labour was predominantly moderate to severe. Only 1.0% of the women reported no pain, while 23.9% experienced mild pain. The largest proportion (46.1%) described the pain as moderate, followed by 26.0% who reported severe pain, while 3.1% of the women classified their pain level as unbearable. This distribution indicates that the majority of the women encountered substantial pain, with moderate and severe levels together accounting for over 72% of responses.

Figure 1: Bar chart showing the Distribution of Pain Intensity During Labour
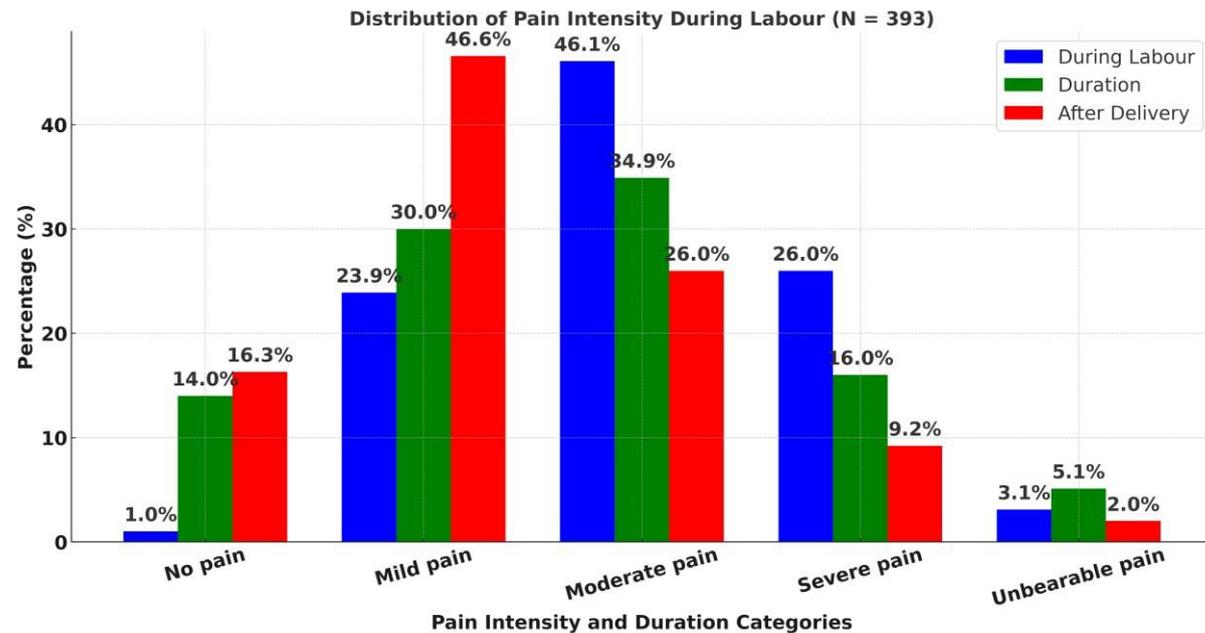
The duration of intense pain showed a skewed pattern towards moderate to prolonged exposure. While 14.0% of women experienced intense pain for less than one hour, the most frequent durations were 1-3 hours (30.0%) and 3-6 hours (34.9%). In addition, 16.0% of the participants endured intense pain for 6-12 hours, while 5.1% reported durations of pain exceeding 12 hours. This pattern implies that a considerable proportion faced extended periods of intense pain. In contrast, pain intensity immediately after delivery was markedly lower. No pain was reported by 16.3% of the respondents, and mild pain was the most common response (46.6%). Moderate pain persisted among 26.0% of the women, while severe (9.2%) and unbearable (2.0%) pain were infrequent according to our findings. This substantial reduction in reported pain intensity in post-delivery highlights a rapid decline in discomfort following birth.

Association between Demographic Variables and Labour Pain Intensity

Table 2 presents the results of chi-square tests examining the association between selected demographic variables and labour pain intensity, dichotomised as mild–moderate versus severe–unbearable pain (n = 393). Significant associations were observed for age group ($\chi^2(8) = 16.500$, p = 0.036), educational attainment ($\chi^2(8) = 15.867$, p = 0.044), and parity ($\chi^2(4) = 31.330$, p = 0.001). No significant associations emerged for marital status ($\chi^2(8) = 7.284$, p = 0.506), religion ($\chi^2(8) = 12.781$, p = 0.120), ethnicity ($\chi^2(12) = 13.325$, p = 0.346), or employment status ($\chi^2(20) = 21.298$, p = 0.380).

Table 2: Chi-square test of association between demographic variables and labour pain intensity

Demographic Variable	Category	Mild–Moderate Pain n (%)	Severe–Unbearable Pain n (%)	Total	χ^2 (df)	p-value
Age Group	15–24	22 (51.2)	21 (48.8)	43	16.500 (8)	0.036*

	25–34	97 (54.8)	80 (45.2)	177		
	35–49	99 (57.2)	74 (42.8)	173		
Marital Status	Single	6 (50.0)	6 (50.0)	12	7.284 (8)	0.506
	Married	205 (55.0)	168 (45.0)	373		
	Divorced	4 (50.0)	4 (50.0)	8		
Religion	Christian	128 (56.1)	100 (43.9)	228	12.781 (8)	0.120
	Muslim	33 (52.4)	30 (47.6)	63		
	Others	54 (52.9)	48 (47.1)	102		
Ethnicity	Yoruba	14 (50.0)	14 (50.0)	28	13.325 (12)	0.346
	Ibo	66 (54.1)	56 (45.9)	122		
	Hausa	33 (52.4)	30 (47.6)	63		
	Others	104 (57.8)	76 (42.2)	180		
Education	Primary	18 (46.2)	21 (53.8)	39	15.867 (8)	0.044*
	Secondary	64 (54.2)	54 (45.8)	118		
	Tertiary	139 (58.9)	97 (41.1)	236		
Employment	Housewife	15 (48.4)	16 (51.6)	31	21.298 (20)	0.380
	Civil Servant	16 (51.6)	15 (48.4)	31		
	Business	82 (55.0)	67 (45.0)	149		
	Trader	31 (52.5)	28 (47.5)	59		
	Farmer	6 (50.0)	6 (50.0)	12		
	Others	58 (52.3)	53 (47.7)	111		
Parity	Primigravida	116 (56.9)	88 (43.1)	204	31.330 (4)	0.001*
	Multigravida	98 (51.9)	91 (48.1)	189		

Index: * = Significant association

The proportion of women that reported mild–moderate pain increased with advancement in age: 51.2% of the women were among those aged 15–24 years, 54.8% were aged 25–34 years, and 57.2% were aged 35–49 years. This pattern in Table 2 indicates that older age is associated with lower reported pain intensity. Similarly, higher educational attainment corresponded to a greater likelihood of mild–moderate pain, with 58.9% of tertiary educated women in this category compared with 46.2% of those with only primary education. Parity exhibited the strongest association, given that primigravida women were more likely to report severe–unbearable pain (43.1%) than multigravida women (48.1% mild-moderate).

Association between Labour Pain Intensity Immediately After Delivery and Clinical Obstetric Factors

Table 3 presents the results of chi-square tests examining the association between labour pain intensity immediately after delivery and two clinical variables: type of labour onset (spontaneous versus induced) and type of delivery (vaginal versus assisted vaginal), among the 393 respondents. Both associations were statistically significant: type of labour onset, $\chi^2(8) = 32.454$, $p < 0.001$; type of delivery, $\chi^2(4) = 30.142$, $p < 0.001$.

Table 3: Chi-square Test of Labour Pain Intensity Immediately After Delivery by Type of Labour and type of Delivery (N = 393)

Pain Intensity	Spontaneous Labour [n = 310 (%)]	Induced Labour [n = 83 (%)]	Total [n = 393 %)]	χ² (df)	p-value
No Pain	51 (16.5)	9 (10.8)	60 (15.3)	32.454 (8)	.001*
Mild Pain	147 (47.4)	30 (36.1)	177 (45.0)		
Moderate Pain	82 (26.5)	19 (22.9)	101 (25.7)		
Severe Pain	26 (8.4)	17 (20.5)	43 (10.9)		
Unbearable Pain	4 (1.3)	8 (9.6)	12 (3.1)		
Pain Intensity	Vaginal Delivery [n = 364 (%)]	Assisted Vaginal Delivery [n = 29 (5)]	Total [n = 393 %)]		
No Pain	58 (15.9)	2 (6.9)	60 (15.3)	30.142 (4)	.001*
Mild Pain	170 (46.7)	7 (24.1)	177 (45.0)		
Moderate Pain	93 (25.5)	8 (27.6)	101 (25.7)		
Severe Pain	36 (9.9)	7 (24.1)	43 (10.9)		
Unbearable Pain	7 (1.9)	5 (17.2)	12 (3.1)		

For type of labour onset in the Table 3, women with spontaneous labour exhibited a markedly more favourable pain profile immediately post-delivery. The proportion reporting no pain was higher (16.5%) and severe or unbearable pain substantially lower (9.7%) compared with induced labour, where severe or unbearable pain reached 30.1% and no pain was reported by only 10.8% of the participants. This distribution indicates that induced labour is associated with greater residual pain intensity in the immediate postpartum period. A similar pattern emerged for type of delivery. Unassisted vaginal deliveries were characterised by higher rates of no pain (15.9%) and lower rates of severe or unbearable pain (11.8%), whereas assisted vaginal deliveries showed markedly elevated severe or unbearable pain (41.3%) and reduced absence of pain (6.9%). Moderate pain levels remained relatively comparable across delivery types. These results collectively demonstrate that deviations from physiological labour processes, specifically induction of labour and the use of assisted vaginal delivery - are strongly associated with increased intensity of pain immediately following childbirth.

Binary Logistic Regression Analysis of Labour Pain Intensity by Type of Labour Onset

Table 4 presents the results of binary logistic regression examining the association between type of labour onset and labour pain intensity (dichotomised as mild–moderate versus severe–unbearable), adjusted for potential confounders.

Table 4: Binary Logistic Regression Analysis of Labour Pain Intensity and the Type of Labour (N = 393)

Variable	AOR (Exp(B))	95% CI	p-value
Type of Labour (Spontaneous)	1.00		
Type of Labour (Induced)	1.46	[1.01 – 2.09]	.042*

*Significant at p < .05

Using spontaneous labour as the reference category, induced labour emerged as a significant independent predictor of higher pain intensity (AOR = 1.46, 95% CI [1.01, 2.09], p = 0.042). The adjusted odds ratio indicates that women whose labour was induced were 46% more likely to experience severe or unbearable pain compared with those whose labour commenced spontaneously. This relationship remained statistically

significant after accounting for relevant covariates, thereby strengthening the inference of a direct association between induction and elevated subjective pain severity. The finding is consistent with established physiological mechanisms whereby induction of labour, typically through exogenous oxytocin or prostaglandin administration, frequently produces more intense and frequent uterine contractions than those occurring in spontaneous labour.

DISCUSSION OF FINDINGS

The demographic profile of the 393 participants of this study reveals a cohort that is made of women who are predominantly in their prime of reproductive years, as 90% of them were aged 25–49 years – a rate that is an alignment with national fertility patterns where childbearing peaks in the 20–39 age range (National Population Commission [Nigeria] & ICF, 2024). Evidence from this study shows a high marital rate (94.9%), reflecting sociocultural norms prioritising marriage as a prerequisite for reproduction – a consistent finding that suggests that non-marital childbearing in Nigeria is unpopular (Adeyemi et al., 2024). Ethnic diversity findings showed that 45.8% of the women were from minority groups, and this mirrors national estimates of 40% minority representation (Central Intelligence Agency, 2026), implying a broader sociocultural influence on obstetric experiences than in studies focused on dominant ethnicities (Amen et al., 2023). High tertiary education (60.1%) exceeds national averages of 14% (National Population Commission [Nigeria] & ICF, 2024), suggesting the presence of recruitment bias towards urban, facility-based populations, as corroborated by Adegboye et al. (2020) on socioeconomic disparities in healthcare access. Informal employment dominance (e.g., business/trading at 52.9%) echoes female labour trends (National Bureau of Statistics, 2023), potentially intersecting with resource constraints affecting pain management (Aziato et al., 2017). Balanced parity (51.9% primigravida) enables parity-based comparisons, while physiological deliveries (95.9% vaginal) and spontaneous labour (78.9%) indicate low-intervention contexts, which are typical in Nigerian and other regions with low-resourced facilities (Sapira-Ordu et al., 2025). These characteristics imply enhanced external validity for educated, urban cohorts but caution against generalisation to rural, less-educated groups, thus warranting stratified analyses in future research to address equity in maternal care.

Levels of Labour Pain Intensity

Participants reported predominantly moderate-to-severe overall labour pain (72.1%), with only 1.0% experiencing none, emphasizing labour pain's ubiquity and intensity in this study. This aligns with prior Nigerian studies where 70–85% rated pain as severe (Amen et al., 2023; Sapira-Ordu et al., 2025), associating to limited analgesia access (Aduloju, 2013). Duration patterns revealed that 64.9% of the mothers endured intense pain for 1–6 hours, indicate the fact that intense pain was prolonged for a substantial number of the participants – a report that is consistent with Aziato et al. (2017) on Ghanaian women's moderate-to-severe ratings and variable durations. In post-delivery, pain decreased rapidly, with 62.9% of the participants reporting none/mild, which suggest physiological resolution post-birth, as evidenced by Whitburn et al. (2019) on pain trajectories. When these findings are viewed with biopsychosocial lens (Bolton, 2023), it is implicitly evident that pain perception integrates physiological (e.g., contractions) and contextual factors (e.g., support), with implications for tailored interventions, particularly non-pharmacological methods, which more than 50% preferred in related samples (Ogboli-Nwasor et al., 2011), which could mitigate duration burdens, by enhancing coping while reducing postpartum distress (Akpor et al., 2023; Anozie et al., 2018).

Association between Demographic Variables and Labour Pain Intensity

Findings showed that Age, education, and parity were significantly associated with pain intensity ($p < 0.05$), with older, highly educated, and multiparous women reporting milder pain, thus supporting claims that experiential and cognitive factors moderate perception. Evidence also shows that mild–moderate pain rises with age (51.2% in 15–24 vs. 57.2% in 35–49), paralleling Akadri et al. (2018), who reported that reduced severity in older Nigerian parturients, possibly due to enhanced tolerance (Smith et al., 2022). Tertiary education was linked to milder pain (58.9% vs. 46.2% primary), implying that knowledge fosters coping, as highlighted in Akinyemi et al. (2018), where education was correlated with better outcomes. Parity's strongest association with labour pain intensity (primigravida 43.1% severe vs. multigravida 48.1% mild–moderate) reflects that inexperience amplifies pain – a finding that is largely consistent with Onasoga et al. (2022), who observed that primiparous experienced severe pains. Non-significant sociocultural variables (e.g., religion,

ethnicity) contrast with Fernández-Carrasco et al. (2022) on religious influences, and mya suggest that clinical factors predominate in this urban sample (Awotunde et al., 2023). By implications, targeted antenatal education for younger, less-educated primigravida are imperatives to building strong resilience, and in integrating biopsychosocial models (Verywell Mind, 2023) for equitable pain management.

Association between Labour Pain Intensity Immediately After Delivery and Clinical Obstetric Factors

This study also showed that induced labour and assisted delivery significantly heightened post-delivery pain among the participants ($p < 0.001$), with induced cases showing 30.1% severe/unbearable vs. 9.7% spontaneous, thus substantiating procedural intensification of residual discomfort. This pattern, in which spontaneous labour yielded higher no-pain rates (16.5%), aligns with physiological mechanisms in induced labour (e.g., augmented contractions), and can elevate nociception (Bonapace et al., 2018). Assisted deliveries' 41.3% severe/unbearable vs. 11.8% unassisted corroborates the results of Bassey et al. (2015), which showed presence of intervention linked pain in Nigerian settings. These associations indicate that medically intensified labour processes, such as induction, can be linked with greater pain-management needs and may extend the pain burden into the immediate postpartum period, as indicated by Ashagrie et al. (2020), who reported increased epidural analgesia utilisation following labour induction. The implications of these findings are relevant to policy, on the need to minimize non-essential inductions (15–21.1%), which could help to reduce pain, thereby enhancing maternal satisfaction (Pietrzak et al., 2022), while training on supportive care could help to mitigate procedural impacts (Bohren et al., 2017).

Furthermore, our findings showed that induced labour independently predicted 46% higher odds of severe pain (AOR=1.46, p=0.042), thus reinforcing causation after confounder adjustment. This evidences oxytocic intensification (Reynolds et al., 2021), and align with Sapira-Ordu et al. (2025) on heightened perception postinduction, which is also consistent with Adepoju (2013), who reported that primigravida vulnerability compounds induction risks. By implications, Anozie et al. (2018) advocated for selective induction protocols and analgesia integration, and the promotion of informed consent to optimise experiences as suggested by World Health Organization [WHO] (2016).

CONCLUSION

The study establishes that labour pain constitutes a pervasive and predominantly severe experience among postnatal women attending primary healthcare facilities in Obio/Akpor. More than 72% of participants reported moderate-to-severe pain throughout labour, with over half enduring intense pain for between one and six hours, reflecting the near-absence of effective pharmacological analgesia in this setting. Although pain intensity decreased substantially immediately following delivery, clinically significant residual pain persisted in approximately one-third of women. Both induced labour and assisted vaginal delivery were strongly associated with heightened immediate postpartum pain, with binary logistic regression confirming that induced labour independently predicted a 46% increase in the odds of severe or unbearable pain. Younger age, lower educational attainment, and primiparity emerged as consistent demographic risk factors for greater perceived pain intensity. These results highlight the urgent need for woman-centred care, evidence-informed enhancements in intrapartum pain management, selective use of obstetric interventions, and targeted support for vulnerable subgroups within resource-constrained Nigerian maternity services.

RECOMMENDATIONS

Based on the findings, the following recommendations were suggested.

1. The Rivers State Primary Health Care Management Board should develop and implement standardised labour pain assessment protocols using validated tools (e.g., Verbal Rating Scale) across all primary healthcare facilities in Obio/Akpor.

2. The Rivers State Ministry of Health, in collaboration with midwifery training institutions, should integrate mandatory modules on labour pain physiology, biopsychosocial modulation, and respectful care into preservice and in-service curricula for midwives and doctors.

3. Facility Medical Officers and Labour Ward Heads should ensure the routine provision of continuous labour support and non-pharmacological pain relief strategies (e.g., positioning, breathing techniques) as first-line interventions, pending pharmacological scale-up.

4. The Rivers State Ministry of Health should issue clinical guidelines restricting labour induction to strict obstetric indications, mandating documented informed consent that explicitly addresses elevated pain risk.

5. Antenatal Clinic Coordinators in selected primary healthcare centres should design and deliver targeted education sessions for primigravida, younger (15–24 years), and lower-educated women focusing on realistic pain expectations and coping strategies.

6. The Federal Ministry of Health, through the National Primary Health Care Development Agency, should prioritise resource allocation for scalable, low-cost pain management interventions in low-resource maternity settings nationwide.

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