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Original Research Article

Association between socioeconomic factors, adverse childhood experiences, and intimate partner violence among infertile women in South Nigeria

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ABSTRACT

Background: Infertility is a global reproductive health issue with medical, psychological, and socio-economic consequences. In low- and middle-income countries, it is highly stigmatized, disproportionately affecting women. Socio-economic status, adverse childhood experiences, and intimate partner violence are emerging contributors to infertility and its psychosocial burden. This study examines the relationship between socio-economic factors, adverse childhood experiences, and intimate partner violence among infertile women in Nigeria, assessing prevalence and patterns of violence.
Methods: A cross-sectional study of 401 infertile women at the Rivers State University Teaching Hospital Port Harcourt, between November 2024 to February 2025 using structured questionnaires to collect data on socio-demographics, childhood adversity, and intimate partner violence. Multivariate analysis of variance and descriptive statistics were used for analysis.
Results: Intimate partner violence was highly prevalent, with emotional abuse (72.8%) and physical abuse (65.3%) most common. Socio-economic status did not significantly affect overall violence risk, but low-income women were more likely to experience physical abuse (p=0.001). Adverse childhood experiences were strongly linked to emotional (p=0.000) and physical abuse (p=0.000). The combined effect of socio-economic status and adverse childhood experiences significantly increased emotional abuse and harassment (p=0.023, p=0.002).
Conclusions: Infertile women in Nigeria experience a high burden of intimate partner violence, influenced by socio-economic disparities and childhood adversities. Addressing these factors through screening, trauma-informed care, and economic empowerment is essential for improving reproductive health outcomes.

Keywords: Infertility, Socio-economic status, Adverse childhood experiences, Intimate partner violence, Reproductive health, Nigeria

INTRODUCTION

Infertility is a significant public health issue affecting millions of couples worldwide, with enormous medical, psychological, social, and economic impact. It is a common gynaecological problem defined as the failure of a couple to achieve clinical pregnancy after 12 months or more of adequate unprotected sexual exposure.[1,2] Infertility is not a disease, but it can affect all aspects of an individual's life. Infertility is a psychological crisis that is stressful for both partners. The treatment process is economically expensive and involves complex procedures.

Infertility is not merely a biomedical concern but a complex condition influenced by a myriad of social determinants. Among these determinants, socioeconomic factors, adverse childhood experiences (ACEs), and intimate partner violence (IPV) have gained increasing attention for their role.

The estimate of couples affected globally by infertility is 60-80 million.[3,4] In sub-Saharan Africa, including Nigeria, infertility rates are among the highest in the world, with estimates between 5% and 23%.[5] Despite the biological causes of infertility, growing evidence suggests that socioeconomic disparities, adverse childhood experiences, and exposure to intimate partner violence significantly contribute to the burden of infertility.

Socioeconomic factors such as income level, education, and employment status affect access to fertility treatments, healthcare services, and overall reproductive well-being. The limited access to fertility care in Nigeria further compounds these challenges.[6]

Adverse childhood experiences, such as neglect, abuse, household dysfunction, and exposure to violence, can have long-term consequences on reproductive health. It causes chronic stress, altering hormonal balances, and leading to risky health behaviours. Globally, ACEs affect 1 in 3 children, with higher rates in communities experiencing poverty, instability, and conflict.[7] In Nigeria, the prevalence of ACEs is difficult to ascertain due to underreporting, but available data suggest that a substantial proportion of women have experienced at least one form of childhood adversity.

The link between intimate partner violence and infertility is complex, as IPV is associated with reproductive coercion, sexually transmitted infections, and stress-related anovulation, all of which can lead to infertility. In developed countries, voluntary child-free status is an acceptable lifestyle. Hence, women experience infertility as a secret stigma, but in developing countries, it is difficult to conceal due to societal expectations.[8] Both male and female factors can be contributory, but in LMICs, it is mostly seen as the woman's problem; hence, she takes the brunt and consequences, including IPV.[9,10] It can take different forms: physical, verbal, emotional, economic, and sexual.

IPV is any behaviour in an intimate relationship that results in physical, sexual, and psychological harm.[11-13] Aggressive behavior may be the consequence of difficulty dealing with the situation, leading males to transfer their anger onto women; thus, infertility itself may be a trigger for IPV. IPV against women has been recognized as one of the most serious social problems in most cultures and societies in recent years.[14]

Women across all socioeconomic and educational classes can be affected. The 60th World Health Assembly in 2014 made a resolution to address violence against women. IPV is seen as a violation of the constitutional rights of women.[15,16] In most cases, the perpetrator is the husband, but women may suffer abuse from the husband's family, including her in-laws. IPV compromises women's health, diminishes self-esteem, and limits interpersonal freedom, leading to avoidance of healthcare services and chronic depression, disability, or even death.[17,18] WHO estimates that 27% of ever-married/partnered women experience physical or sexual violence or both at least once in their lifetime.[19]

Compared to the general population, infertile women might have a higher risk of IPV.[20,21] Both infertility and IPV can individually contribute to anxiety, depression, and low self-esteem when experienced together, they may create a more challenging emotional environment that affects the mental and overall health of the woman. The additional burden of IPV may negatively impact infertility through hormonal changes and psychological factors.[21,22]

Unfortunately, for fear, shame, and stigma, IPV is often kept secret. Healthcare providers should be sensitive to signs of IPV when managing infertility patients, seeking out leading information to determine the likelihood of exposure to violence in any form, and where possible, providing tailored interventions that will be effective in the specific cultural context.[23] Women facing infertility often experience social stigma, marital instability, and psychological distress.

While most research has focused on the biomedical causes of infertility, there is limited understanding of the role of social determinants such as adverse childhood experiences, intimate partner violence, and socioeconomic status in shaping infertility outcomes among women.

Given the high burden of these factors in Nigeria, where gender-based violence, poverty, and childhood adversities are prevalent, there is an urgent need to investigate how these experiences intersect to influence infertility. Though research on these associations in the Nigerian context remains scarce, there is a critical gap in knowledge that hinders the development of targeted interventions and policies to address the needs of infertile women.

Socioeconomic factors and infertility

Numerous studies have established a strong link between socioeconomic status (SES) and infertility. Research in Nigeria has shown that low-income women face significant barriers to accessing fertility treatments due to financial constraints and inadequate healthcare infrastructure.[25]

Chiware et al, reported that 65% of infertile women from low-income households could not afford assisted reproductive technologies (ART), compared to only 25% from higher-income groups.[26] This finding aligns with broader African studies, where lower SES is associated with poor nutrition, exposure to environmental toxins, and

higher rates of untreated infections, all contributing to infertility.[27]

While these studies highlight the financial burden of infertility, they do not sufficiently address the association between socioeconomic factors and IPV among infertile women, a key research objective. Davies et al. link socioeconomic disadvantages to increased IPV vulnerability, but their study does not specifically focus on infertile women.[28]

Similarly, Stubbs and Szoeke emphasize the role of IPV in adverse reproductive outcomes, including STIs and psychological distress, but they do not explore how economic instability may exacerbate these risks for infertile women.[29] This gap suggests the need for targeted research addressing the intersection of SES, IPV, and infertility.

Adverse childhood experiences (ACEs) and infertility

ACEs, including childhood abuse, neglect, and household dysfunction, have been identified as significant risk factors for infertility. In Nigeria, Jacobs et al. after conducting a cross-sectional study found that women with three or more ACEs were twice as likely to report infertility compared to those with no ACEs.[30]

The research does not comprehensively address how ACEs contribute to IPV among infertile women. This omission is crucial because Zamir et al. demonstrate that women with a history of childhood trauma are more likely to experience abusive relationships.[31] Yet, the mediating role of infertility remains unexplored.

Similarly, Ruiz-Fuentes and Coloma argue that ACEs contribute to low self-esteem and maladaptive coping strategies, increasing IPV vulnerability.[32] Nevertheless, existing studies do not directly examine whether infertile women with ACE histories face heightened IPV risks compared to their fertile counterparts. Addressing this gap is essential to fully evaluating the relationship between ACEs, IPV, and infertility.

Intimate partner violence (IPV) and infertility

IPV is a significant issue in Nigeria, where infertile women face heightened risks of abuse due to cultural norms that place the burden of childbearing on women.[33] Eka et al, found that 40% of infertile women in northern Nigeria reported IPV, compared to 20% of fertile women.34 The study suggests that IPV may contribute to infertility through physical trauma, exposure to STIs, and chronic stress. However, the cross-sectional design limits the ability to establish causality.

From a methodological standpoint, these studies successfully establish a link between infertility and IPV but do not explore IPV as a determinant of infertility, as outlined in the research objectives. For instance, MacQuarrie and Mallick report that infertile women in Kenya were 1.5 times more likely to experience IPV.[35] Yet, they do not analyse whether IPV precedes infertility or arises as a consequence.

Similarly, Mudin and Mohamed highlight the psychological impact of IPV after a qualitative study of females who have experienced both IPV and childhood abuse, but their study does not account for pre-existing reproductive health conditions, which could confound their findings.36 Future research should focus on longitudinal designs to establish whether IPV contributes to infertility rather than simply coexisting with it.

Interconnections between socioeconomic factors, ACEs, and IPV

The interplay between socioeconomic factors, ACEs, and IPV is critical to understanding infertility in women. Sekoni et al, conducted a community-based cross-sectional household survey and found that low SES is a predictor of both ACEs and IPV in Nigeria, with women from disadvantaged backgrounds facing higher risks of childhood trauma and abusive relationships.[37]

Chiang et al, further support this connection, demonstrating that childhood exposure to violence increases the likelihood of experiencing IPV in adulthood.[38]

While these studies highlight important associations, they do not effectively explore the combined effect of SES and ACEs on IPV risk among infertile women, which is a key research objective. Furthermore, Giovanelli et al, emphasize the long-term consequences of ACEs but do not consider how infertility interacts with these variables to influence IPV risk.[39]

METHODS

Study design

This study employs a cross-sectional research design to analyze the association between socioeconomic factors, adverse childhood experiences (ACE), and intimate partner violence (IPV) among infertile women attending Rivers State University Teaching Hospital Port Harcourt between November, 2024 to February, 2025.

Study population

The study population consists of infertile women attending the gynaecology in RSUTH. These women were selected based on their infertility status and willingness to participate in the research. The target population includes women who have experienced primary or secondary infertility and sought medical consultation at the facility. The choice of this population is grounded in evidence suggesting that infertility can be a major stressor,

influencing relationship dynamics and potentially increasing the risk of IPV.

Sampling technique and sample size

The final sample size included 401 respondents. Stratification was conducted based on key socio-demographic characteristics such as age, marital status, and educational background to enhance the diversity and inclusivity of the sample. This sampling technique minimizes bias and ensures that the results are generalizable to a broader population of infertile women facing similar challenges.

Data collection

Data were collected using structured questionnaires that included socio-demographic information, IPV experiences, and adverse childhood experiences. The questionnaire was designed to capture both qualitative and quantitative aspects of IPV, socioeconomic status, and childhood experiences.

Ethical approval and informed consent were obtained before data collection, ensuring compliance with research ethics. Trained data collectors administered the survey to minimize reporting bias and improve data accuracy.

Data analysis techniques

Data were analyzed using descriptive statistics and multivariate analysis of variance (MANOVA) to determine the influence of socioeconomic factors and ACE on IPV. The analysis involved descriptive statistics such as mean, standard deviation, and frequency distribution to summarize the data. MANOVA was employed to examine the combined effects of socioeconomic factors and ACE on various IPV patterns, allowing for a deeper understanding of their interrelationships.

RESULTS

Socio-demographic analysis

The study examined 401 women with infertility, revealing key demographic insights. The majority (32.9%) were aged 40-49 years, highlighting infertility concerns in later reproductive years.

Most respondents (68.8%) were married, aligning with cultural expectations for seeking medical help, while 16.5% were single, suggesting a growing trend of unmarried women seeking infertility care. Additionally, 9.2% were separated, 3.5% cohabiting, and 2.0% divorced, indicating potential links between infertility and marital instability.

Educational backgrounds varied, with 32.4% having tertiary education, 32.2% primary education, 25.7% secondary education, and 9.7% no formal education. This diversity suggests infertility affects women across all education levels, potentially influencing access to treatment.

Employment data showed that 53.6% worked in government jobs, 42.8% in private employment, and only 2.7% were unemployed. The high employment rate, especially in government jobs, implies financial stability may impact access to infertility healthcare.

Table 1: Socio-demographic analysis of the respondents.

Variables	Sub-variables	Frequency (%)
Age of the respondent (in years)	Less than 20	19 (4.7)
	20-29	97 (24.2)
	30-39	127 (31.7)
	40-40	132 (32.9)
	More than 50	26 (6.5)
Marital status	Single	66 (16.5)
	Separated	37 (9.2)
	Married	276 (68.8)
	Divorced	8 (2.0)
	Cohabiting	14 (3.5)
	Widowed	0 (0)
Educational level	None at all	39 (9.7)
	Primary	129 (32.2)
	Secondary	103 (25.7)
	Tertiary	130 (32.4)
Employment status	Unemployed	9 (2.7)
	Employed with private	168 (42.8)
	Employed with government	215 (53.6)
	Self-employed	0 (0)

Table 2: Number count and percentage of prevalence and patterns of intimate partner violence among infertile women attending a Nigerian healthcare facility.

Pattern of IPV	Frequency of occurrence of IPV	Prevalence of IPV
Severe combined abuse	Never	0 (0)
	Once	230 (57.4)
	Several times	170 (42.4)
	Once monthly/weekly (Frequently)	1 (.2)
	Daily	0 (0)
Physical abuse	Never	4 (1.0)
	Once	263 (65.3)
	Several times	134 (33.4)
	Once monthly/weekly (frequently)	0 (0)
	Daily	0 (0)
Emotional abuse	Never	0 (0)
	Once	292 (72.8)
	Several times	108 (26.9)
	Once monthly/weekly (frequently)	1 (0.2)
	Daily	0 (0)
Harassment	Never	27 (6.7)
	Once	221 (55.1)
	Several times	131 (32.7)
	Once monthly/weekly (frequently)	17 (4.2)
	Daily	5 (1.2)
Overall abuse/Violence	Never	0 (0)
	Once	327 (81.5)
	Several times	73 (18.2)
	Once monthly/weekly (frequently)	1 (0.2)
	Daily	0 (0)

Table 3: One-way MANOVA analysis of the influence of socioeconomic status (SES) factors on intimate partner violence in infertile women.

IPV pattern	SES level	Mean	Std. Dev	N	Uni test (F)	Sig	Multi test (f)	Sig
Severe combine	High SES	14.3939	2.87162	33				
	Low SES	15.0462	2.15617	368	2.609	0.107		
	Total	14.9925	2.22653	401				
Emotional	High SES	17.1818	4.53772	33				
	Low SES	17.3043	3.81090	368	0.030	0.862		
	Total	17.2943	3.86952	401				
Physical	High SES	10.1212	3.16976	33				
	Low SES	12.1848	3.28544	368	12.014	0.001	4.258	0.002
	Total	12.0150	3.32111	401				
Harassment	High SES	7.5758	2.37211	33				
	Low SES	7.8125	2.82653	368	0.218	0.641		
	Total	7.7930	2.79008	401				

Table 4: Two-way MANOVA analysis of the influence of SES factors and ACE on intimate partner violence in infertile women.

IPV pattern	SES level	ACES level	Mean	Std. dev	N	Uni test (f)	Sig	Multi test (f)	Sig
Severe combine	High SES	High ACE	14.7500	3.54965	16				
		Low ACE	14.0588	2.10566	17				
		Total	14.3939	2.87162	33				

Continued.

IPV pattern	SES level	ACES level	Mean	Std. dev	N	Uni test (f)	Sig	Multi test (f)	Sig
	Low SES	High ACE	15.1288	2.27750	163				
		Low ACE	14.9805	2.05789	205	0.450	0.503		
		Total	15.0462	2.15617	368				
	Total	High ACE	15.0950	2.40714	179				
		Low ACE	14.9099	2.07135	222				
		Total	14.9925	2.22653	401				
Emotional	High SES	High ACE	18.0000	5.12510	16				
		Low ACE	16.4118	3.90607	17				
		Total	17.1818	4.53772	33				
	Low SES	High ACE	18.6380	3.58808	163				
		Low ACE	16.2439	3.65404	205	0.358	0.550	2.866	0.023
		Total	17.3043	3.81090	368				
	Total	High ACE	18.5810	3.73683	179				
		Low ACE	16.2568	3.66490	222				
		Total	17.2943	3.86952	401				
Physical	High SES	High ACE	10.6250	4.03113	16				
		Low ACE	9.6471	2.08989	17				
		Total	10.1212	3.16976	33				
	Low SES	High ACE	13.0245	3.27533	163				
		Low ACE	11.5171	3.14455	205	0.207	0.650		
		Total	12.1848	3.28544	368				
	Total	High ACE	12.8101	3.40649	179				
		Low ACE	11.3739	3.11322	222				
		Total	12.0150	3.32111	401				
Harassment	High SES	High ACE	9.3125	1.77834	16				
		Low ACE	5.9412	1.56007	17				
		Total	7.5758	2.37211	33				
	Low SES	High ACE	7.9877	2.81966	163				
		Low ACE	7.6732	2.83111	205	9.314	0.002		
		Total	7.8125	2.82653	368				
	Total	High ACE	8.1061	2.76514	179				
		Low ACE	7.5405	2.79069	222				
		Total	7.7930	2.79008	401				

Prevalence and patterns of IPV

The analysis of intimate partner violence (IPV) among infertile women in a Nigerian healthcare facility highlights a high prevalence of abuse. IPV was categorized into severe combined abuse, physical abuse, emotional abuse, and harassment, with frequency levels ranging from never to daily.

Severe combined abuse was reported by 57.4% of respondents at least once, with 42.4% experiencing it multiple times, though frequent or daily occurrences were rare. Physical abuse was also common, with 65.3% experiencing it once and 33.4% several times. Emotional abuse was the most prevalent, affecting 72.8% at least once and 26.9% multiple times. Harassment was reported by 55.1% at least once, with 1.2% experiencing it daily. Overall, 81.5% of respondents experienced some form of IPV, though frequent cases were less common. The findings suggest infertility may be a significant risk factor for IPV, particularly emotional abuse and harassment.

Influence of socioeconomic factors on IPV

The analysis in Table 3 examines the influence of socioeconomic status (SES) on intimate partner violence (IPV) among infertile women using a one-way MANOVA. It assesses four IPV patterns-severe combined abuse, physical abuse, emotional abuse, and harassment-by comparing mean scores between high and low SES groups.

Findings show that SES does not significantly impact severe combined abuse (high SES: 14.39, low SES: 15.05, p=0.107) or emotional abuse (high SES: 17.18, low SES: 17.30, p=0.862), indicating that these forms of abuse affect infertile women regardless of financial status. Harassment also showed no significant difference between SES groups (p=0.641). However, physical abuse was significantly higher among low SES women (mean: 12.18) compared to high SES women (mean: 10.12, p =0.001), suggesting that financial instability may increase vulnerability to physical violence. Overall, while SES does not strongly influence emotional abuse, harassment, or severe combined abuse, it

significantly impacts physical abuse. The multivariate analysis confirms that SES plays a statistically significant role in IPV experiences (p=0.002), indicating that economic factors contribute to variations in IPV patterns.

DISCUSSION

The results indicate a high prevalence of IPV among infertile women, with emotional abuse being the most reported form. Socioeconomic factors influence physical IPV, while ACEs significantly impact both emotional and physical IPV. The interaction between SES and ACEs also contributes to IPV risk. These findings underscore the complexity of IPV experiences among infertile women, necessitating multifaceted intervention strategies.

These findings align with previous studies that highlight infertility as a risk factor for IPV. Eka et al, similarly reported that infertile women in northern Nigeria experienced IPV at significantly higher rates than their fertile counterparts.[34] Their findings support the conclusion that cultural and societal expectations around fertility play a significant role in IPV risk. Additionally, MacQuarrie and Mallick et al, found that infertile women in Kenya were 1.5 times more likely to experience IPV, reinforcing the association between reproductive challenges and IPV vulnerability.[35]

The strong correlation between ACEs and IPV is consistent with global research on childhood trauma and victimization in adulthood. Zamir et al, demonstrated that women with a history of childhood trauma are significantly more likely to enter and remain in abusive relationships.[31] Ruiz-Fuentes et al and Coloma et al, also support this conclusion, noting that ACE exposure increases susceptibility to IPV through maladaptive coping mechanisms and psychological distress.[32] These studies affirm the need for early intervention strategies targeting individuals with ACE histories to mitigate future IPV risks.

However, some studies present divergent findings. While the current study finds a strong link between SES and physical IPV, Stubbs and Szoeke et al, found that SES had a weaker correlation with IPV severity when controlling for other variables such as partner alcohol use and psychological distress. This discrepancy may arise due to differences in sample populations and socioeconomic contexts.[29] Additionally, Chiang et al, argue that the syndemic of low SES, ACEs, and IPV does not always directly translate to infertility risk, suggesting that other mediating factors, such as access to mental health services, may influence outcomes. These variations highlight the need for further research to better delineate these relationships.[38]

Implications for policy and practice

Healthcare interventions should integrate IPV screening into infertility treatments, while psychosocial support programs should address ACE among women at risk. Additionally, economic empowerment programs may help reduce IPV among low-SES women, and awareness campaigns should be launched to educate women on IPV and available support services. The findings also suggest that medical practitioners should be trained to recognize IPV indicators in infertile women and refer them to appropriate support services.

This study benefits from a large sample size, which enhances the reliability and generalizability of the findings. Additionally, the use of robust statistical analysis methods, including MANOVA, allows for a comprehensive examination of the relationships between multiple variables, ensuring that the results are both statistically sound and meaningful.

However, this study relies on self-reported data, which may introduce bias due to recall issues or social desirability effects. Additionally, the cross-sectional design limits the ability to infer causality between IPV, socioeconomic factors, and adverse childhood experiences. Another limitation is the lack of qualitative insights into IPV experiences, which could provide a deeper understanding of the lived realities of the participants. Future research should incorporate longitudinal designs and qualitative methods to provide a more comprehensive understanding of these complex interactions.

CONCLUSION

The study's findings contribute to the growing body of literature linking infertility, IPV, ACEs, and SES. The consistency of findings with previous studies reinforces the validity of these relationships, while divergent results suggest the need for further contextual analysis. Addressing IPV among infertile women requires an integrated approach that considers socioeconomic and psychological factors. Future research should expand on these findings by incorporating longitudinal and qualitative methodologies to deepen our understanding of the underlying mechanisms at play.

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