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Induced abortion among adolescent girls and young women: should geography matter in Ghana?

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Globally, there has been a slight reduction in abortion rates. However, abortion rates have increased in other major regions, including sub-Saharan Africa. Induced abortion rates vary by ecological zone and place of residence, and it is prevalent among women aged 15–24. This study examined the predictors of induced abortion in ecological zones by place of residence among adolescent girls and young women aged 15–24. The 2017 Ghana Maternal and Health Survey, which is a nationally representative household survey dataset, was used for this study. This analysis is restricted to 3194 Adolescent Girls and Young Women (AGYW) aged 15–24 years. A two-level multilevel binary logistic regression model was used to analyze the individual and contextual level characteristics associated with induced abortion. The results show that the prevalence rate of induced abortion among adolescent girls and young women is 26.0%. After adjusting for individual and community level factors, ecological zones and place of residence predicted induced abortion among AGYW. More importantly, the results demonstrate that AGYW residing in urban areas of the forest zones were statistically significant to report induced abortion compared to those in the rural areas. In conclusion, there is a strong association between place of residence, ecological zones and induced abortion in Ghana. Primarily, urban-dwelling women in the forest zone are more likely to report induced abortion. There is, therefore, a need to prioritize women residing in urban areas and the forest zone of Ghana. AGYW in these high-risk ecological zones should be reached with sufficient health education and sensitization about induced abortion. Given the protective factor of contraceptive use, it is recommended that the government and its health agencies strengthen campaigns to improve contraceptive use among AGYW across the country, particularly in the urban forest ecological zone.

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Introduction

Globally, there has been a slight reduction in abortion rates. Between 1990–1994 and 2015–2019, global abortion rates declined from 40 abortions per 1000 women aged 15–49 years to 39 abortions per 1000 women aged 15–49 years, respectively. However, abortion rates have increased in Oceania (51%), sub-Saharan Africa (24%), Central and South Asia (15%), and East and Southeast Asia (13%) regions (Bearak et al., 2020). Also, abortion rates declined in countries where abortion is broadly legal (−8%), while it increased in countries where abortion is restrictive (12%) (Bearak et al., 2020). In Ghana, abortion is relatively liberal and is permitted when there is incest, rape, or the life of the mother or unborn child is at risk (Sundaram et al., 2012) and can be conducted only by a registered medical practitioner at a government hospital, registered private hospital or a place approved by the Minister of Health (Finlay and Fox, 2013; Malhotra and Devi, 1979). According to the Ghana Maternal Health Survey, the proportion of women in Ghana aged 15–49 who have ever had an induced abortion increased from 14.5% in 2007 to 19.6% in 2017 (GSS et al., 2009, 2018).

Abortion is deemed induced if a pregnancy is terminated intentionally (Rigterink et al., 2023) or by artificial means (Atrash and Saftlas, 2000). Induced abortion can be safe or unsafe, depending on whether a qualified person performs it or is done in a standard environment (Atuhaire, 2019). Hence, induced abortion is unsafe if it is not performed by an unqualified person or done in a sub-standard environment or both. In contrast, induced abortion is safe when performed by a qualified person who adheres to WHO guidelines on performing abortions (Atuhaire, 2019).

Debates on induced abortion as a public health issue are shaped by two perspectives; pro-life and pro-choice proponents. Proponents of pro-life argue that the human embryo is an individual with a right to life. They express moral and political opposition to induced abortion and advocate for legal restrictions on abortions (Duduc and Coleman, 2007). On the other hand, proponents of pro-choice argue that the decision to terminate a pregnancy is the personal, reproductive and human right of the woman since it relates to her body, health and future (Schonhardt-Bailey, 2008), asserting that the embryo's rights should not supersede hers until viability (Hewson, 2001).

These perspectives have influenced abortion legislation and its associated outcomes. While liberalization of abortion laws is associated with positive outcomes, criminalization of abortion laws is associated with negative outcomes (Ishola et al., 2021; De Londras et al., 2022). Ishola et al. (2021) suggest that relatively liberal legislation is associated with reductions in fertility and maternal mortality. Following the liberalization of the abortion law in Ghana, Finlay and Fox (2013) in their study using the Ghana Demographic and Health Survey (GDHS), reported lower odds of having a child. In Africa and Latin America, where abortion is illegal in most of those countries, the abortion rate is 29 per 1000 women of reproductive age and 32 per 1000 women, respectively. In contrast, in Western Europe, where abortion is allowed, there are 12 per 1000 women (Sedgh et al., 2012).

In sub-Saharan Africa (SSA) and Latin America and the Caribbean (LAC) countries with restrictive abortion laws, women's choice to terminate pregnancies reflects empowerment. Empowered women have the right to make choices, access opportunities and resources, and control their lives (Alsop and Heinsohn, 2005). Making independent healthcare decisions signifies empowered women exercising their reproductive rights (Castro Lopes et al., 2024).

Contrary to the views of pro-life proponents are international human rights perspectives. International human rights standards regarding abortion have progressed from abolishing punitive measures against women to broadening the criteria for lawful abortion and implementing procedural safeguards to ensure access (Erdman and Cook, 2020).

There is a favorable legal and policy environment regarding the provision of abortion services in Ghana. The Ghana Health Service Comprehensive Abortion Care Policy Standards and Protocols integrated into the national reproductive health policy allow healthcare professionals to provide both surgical and medication abortions (Ghana Health Service, 2021). Nevertheless, there is an unduly high criminal connotation of induced abortion in Ghana. This criminalization has not reduced the practice but rather promoted social stigma, shame, embarrassment and negative provider attitudes (Boah et al., 2019; Adjei et al., 2015; Hu et al., 2010; Aniteye and Mayhew, 2019; Payne et al., 2013). Morhe et al. (2020) recommend multilevel stakeholder engagement to decriminalize and consider abortion as an effective medicolegal intervention, thereby improving access to safe abortion in Ghana.

In the literature, geographic areas (geography) are measured as either region of residence, ecological zones (cluster of regions) or place of residence (rural/urban). Studies have established that geographic differences affect sexual and reproductive health services utilization (Baruwa et al., 2022; Lentiro et al., 2019; Tesema et al., 2020; Yao et al., 2012). For instance, Kumi-Kyereme's study (2021) among in-school young people with disabilities in Ghana found that young people in the coastal and forest zones are less likely to use sexual and reproductive health services than those in the Savannah zone. In South Africa, a study by Makola et al. (2019) found that adolescent girls and young women aged 15–24 residing in rural areas are more likely to use contraceptives than those in urban areas.

Our study hinges on the ecological theory, on the premise that individual behavior is shaped by the interaction of individual, community, and environmental factors (Cockrill et al., 2013). Instead of solely focusing on individual characteristics, the social–ecological framework explores how personal characteristics are shaped by broader factors such as legal and institutional policies and community norms, all interact to influence individual behavior. The social–ecological framework is relevant for examining induced abortion because the different levels of the social–ecological environment can affect the experience of induced abortion among AGYW. These factors (individual factors, community factors, and environment) form the three nested levels of the model. In this study, all three level factors are used to examine their effects on induced abortion among adolescents and young women.

Studies on induced abortion have identified individual (such as age, religion, educational level, marital status, and number of children, among others) and household (household income) level factors as predictors (Yeboah et al., 2024; Chae et al., 2017; Danso et al., 2022; Ranji, 2012; Sedgh et al., 2015). However, there are some limitations in studies on induced abortion. First, studies have found that induced abortion varies by ecological zone (Danso et al., 2022; Keogh et al., 2015; Polis et al., 2020) and by place of residence, with induced abortion more prevalent in urban areas than rural areas (Chae et al., 2017; Danso et al., 2022). However, studies on induced abortion have examined ecological zones and place of residence as independent variables predicting induced abortion. Second, studies on induced abortion have primarily focused on women in their reproductive ages (15–49 years) (Chae et al., 2017; Danso et al., 2022; Keogh et al., 2015; Boah et al., 2019). However, studies have reported that unsafe and induced abortions are prevalent among women aged 15–24, especially in sub-Saharan Africa (Chae et al., 2017; Shah and Åhman, 2012).

To the best of our knowledge, after an extensive literature search, there is currently no study in Ghana that has examined the nuances pertaining to induced abortion in ecological zones by place of residence. Therefore, this study examined the predictors of induced abortion in ecological zones by place of residence among women aged 15–24. The study sample was restricted to only women who had ever been pregnant, as they were the ones likely to have experienced either a live birth, miscarriage or induced abortion. Understanding the predictors of induced abortion within each ecological zone can facilitate the development of targeted interventions and policies that address the specific needs and challenges faced by young women in different regions. This study had two hypotheses: (a) AGYW in the Savannah zone are less likely to have an induced abortion than those in the forest zone, and (b) AGYW residing in urban areas are more likely to have an induced abortion than those in the rural areas.

Methods

Data source and design. The 2017 GMHS is a nationally representative cross-sectional survey that collected information from 25,062 women. The data collected was implemented by the Ghana Health Service (GHS) and Ghana Statistical Service (GSS) and received technical support from the ICF through the Demographic and Health Survey (DHS). Ethical clearance for the survey was provided by the ICF Macro Institutional Review Board and the Ethics Committee of Ghana Health Service. This study was a secondary analysis of the 2017 GMHS, and therefore, no ethical approval was needed. However, the authors sought permission from ICF to use the data and the permission was granted. In total, this analysis is restricted to 3194 (weighted) women aged 15–24 years who had ever been pregnant. Such women were considered as they were the ones likely to have experienced either a live birth, miscarriage or induced abortion. The detailed sampling procedure, sample size, and findings are available in the national report (GSS et al., 2018).

Measurement of variables

Outcome variable. Induced abortion was the outcome variable in this study. It was captured as a binary variable where those who had induced abortion in the five years preceding the survey were coded as '1' and otherwise were coded as '0'.

Independent variables. Individual- and contextual-level characteristics were examined in our study based on theoretical and practical significance as well as the availability of variables in the dataset. These variables were grouped into individual and contextual level factors.

Individual-level factors: The individual-level factors were age (15–19, 20–24), educational attainment (no education, primary, middle/Jhs, secondary/higher), marital status (currently married, cohabiting, not in a union), current contraceptive use (yes, no), age at first sex (<18 years; 18 years above), parity (no birth, 1, 2+).

Contextual level factors: The contextual level factors were ecological zones (savannah, coastal, forest) and place of residence (rural, urban). The classification of the ten administrative regions into ecological zones was based on the geographical and socioeconomic characteristics associated with each zone. The regions that constitute the savannah zone are the Northern Region, Upper West and Upper East Regions. The coastal zone comprises Western, Central, Volta and Greater Accra Regions. Finally, the forest zone consists of Brong Ahafo, Ashanti and Eastern Regions. The fixed spatial variables such as place of residence (urban/rural) and ecological zone (savannah, forest and coastal) were the key explanatory variables of interest.

Statistical analyses. Percentages and frequencies were used to explore the individual and contextual characteristics of respondents. Second, a bar chart was used to show the distribution of induced abortion across ecological zones and places of residence using the chi-square test. Multilevel analyses were employed in this current study. A two-level logistic regression model was used to model the likelihood of induced abortion against the explanatory variables. A two-level multilevel binary logistic regression model was used to analyze the individual and contextual level characteristics associated with induced abortion. In the modeling, women were nested inside households, and households were nested within clusters. To account for the unexplained variability at the community level, clusters were treated as random effects. Four different models were fitted. An empty model, model 0, was first fitted with no predictors (random intercept). Following that, model I contained only individual-level variables, model II contained only contextual-level variables and model III featured both individual- and contextual-level variables. The results for models I–III are presented as adjusted ORs (aORs) and their corresponding 95% CIs. This signified the level of precision. The Stata command 'melogit' was used to fit these models. The log-likelihood ratio (LLR) and Akaike information criteria (AIC) were utilized for model comparison. The best-fit model has the lowest AIC and the highest log-likelihood. All analyses were weighted to account for over- and under-sampling, and the 'svy' command was used to account for the survey's complex character, which also helps with generalizability. All statistical analysis was performed using Stata version 16.0 (Stata Corporation, College Station, TX, USA). In a separate analysis, the data was partitioned into three different ecological zones, controlled for individual-level factors and predicted for place of residence on induced abortion using a multilevel logistic regression.

Results

According to Table 1, the prevalence of induced abortion among adolescents and young women aged 15–24 was 26.0%. More than three-fourths (77.9%) of the respondents were aged 20–24 years. A little over half (54.1%) of the respondents reside in rural areas. About 54.6% reside in savannah zones, 31.4% reside in the coastal zone, and 14.0% reside in forest zones. Almost half (49.2%) of the respondents have attained middle/JHS education, one-fifth (21.2%) have secondary/higher education, while 1 in 10 women had no education. While 1 in 5 women were currently married, 4 in 10 women were cohabiting. Two-thirds of the respondents were currently not using modern contraceptives. Seven (7) in 10 women had a sexual debut when <18 years. More than half of the adolescents and young women 15–24 years have a child. A little over one-fourth of the respondents had two or more children. Figure 1 indicates that a higher proportion of the respondents with induced abortion reside in urban areas across all the ecological zones. More than one-third (38.0%) of respondents who had induced abortion reside in the urban areas of the forest zones.

From Fig. 1, induced abortion in rural areas was highest (23.1%) in the forest zone, followed by the coastal zone (21.9%) and the least proportion in the savannah zone (7.0%). For the urban areas, induced abortion was highest in the forest zone (38.0%), and the lowest proportion (12.0%) was in the Savannah zone.

Multilevel fixed effects (measures of associations). With the individual level, the odds of induced abortion were higher among those aged 20–24 years (aOR:2.14; 95%CI: 1.57–2.92), those with

Table 1 Background characteristics of women 15–24 years old, Ghana, 2017.

Characteristics	Frequency	Percentage
Age		
15–19	706	22.1
20–24	2488	77.9
Place of residence		
Rural	1729	54.1
Urban	1465	45.9
Ecological zones		
Savannah	1743	54.6
Coastal	1002	31.4
Forest	448	14.0
Educational attainment		
No education	366	11.4
Primary education	583	18.2
Middle/JHS	1569	49.2
Secondary/Higher	676	21.2
Marital status		
Currently married	695	21.8
Cohabiting	1269	39.7
Not in union	1229	38.5
Current contraceptive use		
Yes	1080	33.8
No	2114	66.2
Age at first Sex		
<18 years	2348	73.5
18 years above	846	26.5
Parity		
No birth	521	16.3
1	1753	54.9
2+	919	28.8
Induced abortion		
No	2362	74.0
Yes	831	26.0

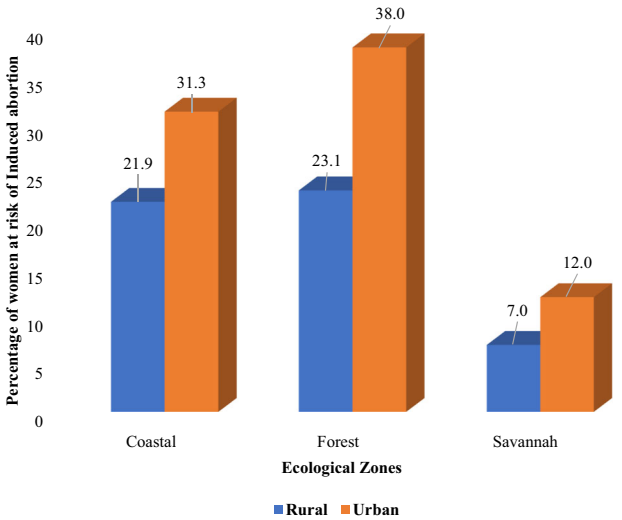

Fig. 1 A bar graph of the percentage of adolescent girls and young women at risk of induced abortion in Ghana. The blue bar indicates rural areas and the orange bar indicates urban areas.

secondary/higher education (aOR:2.38; 95%CI:1.51–3.74) and those cohabiting (aOR:2.32; 95%CI:1.63–3.29) compared with those aged 15–19 years, those with no education and those currently married respectively. On the other hand, those not using contraceptive (aOR: 0.54; 95%CI: 0.43–0.67), those whose first sex was at 18 years and above (aOR:0.28;95%CI: 0.21–0.38), and those with a child (aOR:0.06;95%CI:0.04–0.08) or 2 and above (aOR:0.04; 95%CI:0.03–0.06) were less likely to have induced abortion. Regarding the contextual level factors, those residing in urban areas (aOR: 1.83; 95%CI: 1.47–2.28), those residing in the coastal zone (aOR:2.60;95%CI:1.89–3.62) or forest zone (aOR:2.74; 95%CI: 2.74–3.91) were more likely to have induced abortion compared to residing in rural areas and the savannah zone, respectively.

Random effects (measures of variations) results. As shown in Table 2, the empty model (Model 0) depicted that 15% of the variation in induced abortion among AGYW in Ghana was attributed to the variation between cluster characteristics, i.e., (ICC = 0.15). The variation between-cluster decreased to 12% in Model I, representing only the individual level model (Model I). In the community level-only model (Model II), the ICC was further reduced to 11% from the individual ICC of 12%. The complete model (Model III) comprising both the individual and household/community models had ICC declined to 7%. This explains that the variations in the likelihood of induced abortion among AGYW are attributed to the clustering differences. The AIC and BIC values showed a successive reduction, which means a substantial improvement in each of the models over the previous model and also affirmed the goodness of Model III developed in the analysis. Therefore, the complete model (Model III) with both the selected individual and community factors was chosen to predict AGYW-induced abortion's eventuality or occurrence.

Community-level estimates associated with the likelihood of AGYW-induced abortion. As shown in Table 3, there was a statistically significant association between residing in urban areas in the forest zone and induced abortion. That is, among AGYW residing in the forest zone, those living in the urban areas were more likely to have induced abortion compared with those living in the rural areas.

Discussion

Previous studies on induced abortion in Ghana have examined ecological zones (Danso et al., 2022; Keogh et al., 2015; Polis et al., 2020) and places of residence (Chae et al., 2017; Danso et al., 2022) as independent variables predicting induced abortion and mainly focused on women in their reproductive ages (Chae et al., 2017; Danso et al., 2022; Keogh et al., 2015; Boah et al., 2019). To our knowledge, this study is the first in Ghana to examine the predictors of induced abortion in ecological zones by place of residence among women aged 15–24. An analysis of the factors that influence induced abortion in each ecological zone and place of residence can aid in the design of context-specific interventions and policies to address the needs and barriers to induced abortion among AGYW. The study hypothesized that (a) AGYW in the Savannah zone are less likely to have an induced abortion than those in the forest zone, and (b) AGYW residing in urban areas are more likely to have an induced abortion than those in the rural areas. This study was guided by the ecological theory since it highlights the influence of individual, community, and environmental factors on human behavior, including induced abortion experience.

Evidence from our analyses indicates that the AGYW residing in urban areas in the forest zone reported the highest proportion of induced abortion. This result is further corroborated by our findings that urban-dwelling AGYW in the forest zone were 1.91 times more likely to report induced abortions compared to their counterparts in the coastal or savannah ecological zones. These findings support our hypotheses that (a) AGYW in the Savannah zone are less likely to have an induced abortion than those in the forest zone, and

Table 2 Estimated odds ratios and their 95% Confidence Intervals for risk of induced abortion by individual and community characteristics of adolescent girls and young women.

Variables	Model 0	Model I aOR (95%CI)	Model II aOR (95%CI)	Model III aOR (95%CI)
Fixed effects				
Individual level variables				
Age				
15–19 (ref.)				
20–24		2.35 (1.72–3.21)***		2.14 (1.57–2.92)***
Education				
No education (ref.)				
Primary		1.66 (1.05–2.61)*		1.34 (0.85–2.12)
Middle/JHS		2.06 (1.37–3.11)**		1.50 (0.99–2.28)
Secondary/Higher		3.42 (2.19–5.36)***		2.38 (1.51–3.74)***
Marital status				
Currently married (ref.)				
Cohabiting		3.62 (2.60–5.05)***		2.32 (1.63–3.29)***
No, not in union		3.23 (2.30–4.54)***		2.04 (1.43–2.92)***
Contraceptive Use				
Yes (ref.)				
No		0.54 (0.43–0.68)***		0.54 (0.43–0.67)***
Age at first sex				
Below 18 years (ref.)				
18 years above		0.27 (0.20–0.37)***		0.28 (0.21–0.38)***
Parity				
No child (ref.)				
1		0.05 (0.04–0.07)***		0.06 (0.04–0.08)***
2+		0.04 (0.03–0.07)***		0.04 (0.03–0.06)***
Community level characteristics				
Ecological zones				
Savannah (ref.)				
Coastal			3.70 (2.80–4.88)***	2.60 (1.89–3.62)***
Forest			4.76 (3.51–6.45)***	2.74 (1.92–3.91)***
Residence				
Rural (ref.)				
Urban			1.83 (1.47–2.28)***	1.48 (1.16–1.88)**
Random effects results				
Cluster variance (95%CI)	0.15 (0.13–0.17)	0.43 (0.21–0.89)	0.41 (0.23–0.75)	0.26 (0.09–0.73)
ICC	0.15	0.12	0.11	0.07
LR Test	100.32***	11.77***	19.81***	5.00*
Wald chi-Square	Reference	491.63***	169.12***	499.05***
Model fitness				
Log-likelihood	−1572.3709	−1149.9257	−1474.9852	−1121.7596
AIC	3150.742	2323.851	2959.97	2273.519
BIC	3168	2396.68	2990.316	2364.555
Number of clusters	839	839	839	839

*$p < 1$, **$p < 0.05$, and ***$p < 0.001$.

Table 3 Community-level variable estimates associated with the risk of AGYW-induced abortion after partitioning by the three ecological zones of Ghana.

Variables	Coastal zone	Forest zone	Savannah
Individual level variables controls	√	√	√
Community level characteristics			
Residence			
Rural (ref)			
Urban	1.41 (0.97–2.02)	1.91 (1.23–2.94)**	0.90 (0.49–1.68)

*$p < 1$, **$p < 0.05$, and ***$p < 0.001$.

(b) AGYW residing in urban areas are more likely to have an induced abortion than those in the rural areas.

Similar findings have been reported in previous studies that have found the likelihood of induced abortions to be significantly higher in the forest zone as compared to those in the coastal and savannah ecological zones (Polis et al., 2020; Keogh et al., 2020). The associative effect between the ecological zone and the likelihood of induced abortion could be explained by the dynamics of migration and its concomitant outcomes (Klu et al., 2020). The Savannah ecological zone is primarily characterized by agriculture; therefore, when the season is over, AGYW relocates to the forest zone (middle zone) to engage in mining operations and head porter business (popularly known as kayayei) (Baada et al., 2019). AGYWs who relocate to the forest zones are frequently exploited and raped, resulting in pregnancy (Achana and Tanle, 2020). This situation compels many AGYW to seek induced abortion services.

The findings from our study affirm the tenet of ecological theory that states that an individual is influenced by different levels of factors (Cockrill et al., 2013). While there is evidence from elsewhere (Huneeus et al., 2020) indicating no significant association between place of residence and induced abortions, our study revealed that AGYW residing in urban areas were more likely to experience an induced abortion. The result is analogous to evidence from studies conducted in Ethiopia (Binayew et al., 2022) and Kenya (Kabiru et al., 2016) that have found the likelihood of having an induced abortion to be significantly high among AGYW residing in urban areas compared to those in rural residences. First, this observation could be due to the high exposure of urban-dwelling AGYW to risky sexual behaviors that tend to exacerbate their risk of unintended pregnancies and the decision to have an induced abortion to protect their image (Binayew et al., 2022). Another perspective to this could be the possible easy access to abortion services in health facilities in urban areas as compared to rural areas. Moreover, AGYW in urban areas may be more assertive and not laid back by traditional beliefs that tend to frown on induced abortions. Hence, they are empowered to make autonomous decisions to have an induced abortion.

Beyond the primary aim of examining the predictors of induced abortion in ecological zones by place of residence, the study revealed some covariates, including age, marital status, education, contraceptive use, age at first sex and parity, were significantly associated with induced abortions. Regarding age, young women were two times more likely to report an induced abortion than adolescent girls. Perhaps, these differences could be attributed to the knowledge level of young women about induced abortion, the legalities, and safety issues; these factors may influence their decision to have an induced abortion (Obiyan et al., 2023). However, adolescents may be less likely to have an induced abortion because they lack sufficient and accurate knowledge about abortion, and may be shy to visit the healthcare facility for the procedure (Coast and Murray, 2016). In addition, the fear involved in abortion, such as mortality and morbidity as perceived by the adolescents, may deter them from inducing a pregnancy.

AGYW who were not in union and those cohabiting were more likely to have an induced abortion than those who were married. A related study from Ghana (Lentiro et al., 2019) has also reported similar associations between marital status and induced abortions. This is not surprising because, within the cultural context of Ghana, pregnancy out of wedlock is regarded as a taboo and deviation from the moral and cultural values of the society (Klutsey and Ankomah, 2014). Since cohabiting is technically not marriage, any pregnancy that comes from such a union is likely to be meted with disdain from society, thereby causing shame and discomfort to the AGYW. Therefore, to avoid this shame and societal castigation, the individual may decide to abort the pregnancy. Relatedly, higher educational attainment was associated with higher odds of induced abortion; an observation that contradicts a related study conducted in Ghana (Klutsey and Ankomah, 2014) that found no significant association between education and induced abortion. This finding is equally inconsistent with studies from Ethiopia (Alemayehu et al., 2019) and Kenya (Kabiru et al., 2016). However, it is postulated that perhaps the observed direction of the association between education and induced abortion could be explained from the point that AGYW with higher educational attainment may have aspirations to delay childbearing due to their career. Therefore, should contraceptives fail them, or should they have an unintended pregnancy, then their knowledge of induced abortion would influence them to have the procedure. In addition, women with higher education have higher opportunities, increased access to financial resources and autonomous decision-making over their life issues, including their reproductive health issues.

Contraceptive use was associated with a lower likelihood of having an induced abortion. Possibly, those who used contraceptives were using it consistently and correctly. Hence, it was effective at preventing unintended pregnancy, which is a primary precursor for an induced abortion. The study also revealed that AGYW who had their first sexual intercourse after age 18 were less likely to have an induced abortion. Similar findings have been reported in a study by Binayew et al. (2022) that shows that those who have their sexual debut before age 18 tend to be four times more likely to have an induced abortion. It is possible that AGYW who have an early sexual debut would also engage in other risky sexual behaviors, including having multiple sexual partners, which might elevate their risk of unintended pregnancies that will result in induced abortions.

Compared to nulliparous women, those with one or more births were less likely to have an induced abortion. This is inconsistent with Klutsey and Ankomah's study (2014), which found an inverse association between parity and induced abortion in Ghana. The study is, however, in agreement with Ahinkorah et al.'s study (2021), which revealed that those with one or more parity were less likely to have an induced abortion. One explanation for this could be that nulliparous AGYW may have terminated their previous pregnancies, resulting in their zero parity (Alemayehu et al., 2019). Another possible justification could be that, unlike AGYW with one or more parties, nulliparous women may think themselves unprepared to give birth and, as a result, may choose an induced abortion to appropriately prepare themselves before giving birth.

Strengths and limitations

This study has some strengths. First, it used nationally representative data that relied on sound sampling procedures. Second, it focused on AGYW aged 15–24 who are most at risk of unsafe and induced abortions. However, the study presents limitations to consider. The cross-sectional design of the study makes it challenging to reach causal inferences between the place of residence and the likelihood of induced abortions. Given that the data was self-reported, there is a likelihood of social desirability and recall biases. Also, the study was delimited to only variables available in the dataset. Hence, important variables such as cultural values and norms, as well as some health variables like gestational hypertension could not be factored in the analysis as potential confounders.

Conclusion and recommendation

In conclusion, there is a strong association between place of residence, ecological zones and the probability of induced abortion in Ghana. Primarily, urban-dwelling women in the forest zone are more likely to report induced abortion. There is, therefore, a need to prioritize women residing in urban areas in the forest zone of Ghana. AGYW in these high-risk ecological zones should be reached with sufficient health education and sensitization about induced abortion. Given the protective factor of contraceptive use, it is recommended that the government and its health agencies strengthen campaigns to improve contraceptive use among AGYW across the country, particularly in the urban forest ecological zone.

Future studies should use longitudinal data to examine the predictors of induced abortion in ecological zones by place of residence among women aged 15–24. In addition, data on confounding factors that can influence the experience of induced abortion, such as cultural values and norms, and gestational hypertension, should be captured during data collection so they

can be analyzed as predictors of induced abortion. This will help reduce bias and enhance the validity of the study. The ecological theory assumes that human behavior is influenced by individual, community, and environmental factors. This study demonstrated that individual (e.g., age, marital status, education, age at first sex, and parity) and community (e.g., place of residence and ecological zones) factors predict induced abortion among AGYW. Policymakers should target these factors to accelerate Ghana's attainment of Sustainable Development Goals Targets 3.7 and 5.6, which aim to ensure universal access to sexual and reproductive healthcare services and rights.

Data availability

The datasets analyzed during the current study are available in the figshare repository: https://doi.org/10.6084/m9.figshare.25860475.v1.

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Author contributions

Joshua Okyere: Conceptualization, data curation, supervision, writing-original draft, writing-review, and editing. Frank Kyei-Arthur: Conceptualization, data curation, supervision, writing-original draft, writing-review, and editing. Martin Wiredu Agyekum: Conceptualization, data curation, supervision, writing-original draft, writing-review and editing. Pascal Agbadi: Conceptualization, data curation, supervision, writing-original draft, writing-review, and editing. Isaac Yeboah: Conceptualization, data curation, formal analysis, supervision, writing-original draft, writing-review and editing.

Competing interests

The authors declare no competing interests.

Ethical approval

This study was a secondary analysis of the 2017 GMHS, and therefore, there was no need for ethical approval. However, the authors sought permission from ICF to use the data and the permission was granted. However, ethical approval for the 2017 GMHS was provided by the ICF Institutional Review Board. Evidence of the ICF Institutional Review Board's approval of the 2017 GMHS is available at https://doi.org/10.6084/m9.figshare.25864273.v1 All the survey procedures were performed in accordance with all the principles of the Helsinki Declaration.

Informed consent

Written informed consent was obtained from all respondents before they participated in the survey.

Additional information

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