Research Article

Open Access

Influences of Smoking and Contraception on Women's Ability to become Pregnant in Ghana: Evidence from 2022 Demographic and Health Survey

Anthony Edward Boakye[1]*and Rita Tekpertey[2]

[1]Department of Health, Physical Education and Recreation, University of Cape Coast, Cape Coast, Ghana

[2]Department of Biostatistics and Epidemiology, University of Health and Allied Sciences, Ho, Ghana

ABSTRACT

Background: Women currently using hormonal contraceptive are more likely to smoke. It appeared the link between smoking and the lungs is well-known, but the link between smoking, contraception and women's ability to become pregnant is less.

Objective: The study aimed at investigating the influences of smoking and contraception on women's ability to become pregnant in Ghana.

Methods: Data were extracted from the 2022 DHS. Frequency distribution and binary logistic regression were used to analyse the data. The sample was 34663. The ethical clearance to conduct the 2022GDHS was taken from both Ghana Health Service Ethical Review Committee and ICF Institutional Review Board. The frequency distribution was used to summarise socio-demographic characteristics of the participants. The Pearson's chi-squared test of independence was used to test the hypotheses postulated in the study to either confirm or reject the null hypothesis. The binary logistic regression was used to identify from the various explanatory variables thus, smoking and contraception those that are related to women's ability to become pregnant.

Results: The study revealed that more than ninety-nine per cent (99.2%) of the participants do not smoke cigarettes. It was revealed that more than sixty per cent (66.2%) of the participants were currently not using any contraceptive method. Frequently smoking cigarettes every day was statistically significant related to women's ability to become pregnant at p<0.001, (OR=5.176, 95%CI ([2.744-9.764]). Frequently uses other type of tobacco every day as statistically significant at P=0.006, (OR=0.057, 95%CI [0.007-0.445]).

Conclusions: The study recommends that laws and policies should be enacted to support and ensure comprehensive contraceptive information and services dissemination to all segments of the population especially disadvantaged and marginalised populations in their access to these services.

*** Corresponding author**
Anthony Edward Boakye, Department of Health, Physical Education and Recreation, University of Cape Coast, Cape Coast, Ghana.

Introduction

Smoking can cause fertility problems [1]. Therefore, women who smoke have more trouble becoming pregnant than women who do not smoke. It has been established that exposure to cigarette smoke can make it harder to get pregnant compared to people who are not exposed to cigarette smoke. Women who smoke more than 10 cigarettes a day might have a problem of becoming pregnant. Even low-level smoking can make pregnancy more difficult and dangerous. Smoking fewer cigarettes does not lower the risk of preterm birth or low birth weight. Cigarette smoke can also increase the chance of an ectopic pregnancy [when a fertilized egg grows outside of the uterus]. Studies have shown that women who smoke are at an increased risk for a delay in conception. Women who smoke do not conceive as efficiently as nonsmokers. Infertility rates in female smokers are about twice the rate of infertility found in nonsmokers [2-10]. The risk for fertility problems increases with the number of cigarettes smoked daily. Smoking may make it more difficult to conceive, as it can negatively affect the female reproductive system, including egg numbers and quality and the menstrual cycle. Smoking during pregnancy can also cause maternal and foetal health problems and increase the risk of pregnancy complications. Smoking can reduce fertility in females and negatively affect hormone production, which may make it more difficult to become pregnant [11]. The number of cigarettes a woman smokes per day may also contribute to the length of time to conceive, with more cigarettes smoked correlating with increased delays to conception. Female smokers may have a 54% higher rate of delayed conception over 12 months compared with nonsmokers. Smoking can also negatively affect In Vitro Fertilisation [IVF]. Research suggests that smokers may require almost twice as many cycles of IVF as nonsmokers to conceive. Additionally, smokers retrieve fewer eggs per IVF cycle and have lower fertilization rates. Smoking can lower female fertility and interfere with hormone production, making it more difficult to conceive. Smoking may have a harmful impact on female reproductive health and fertility [12-16].

Infertility occurs when a couple cannot conceive after having frequent, unprotected intercourse for a year or more. Women and mothers who smoke are twice as likely to be infertile as nonsmokers. This is true whether you are attempting to conceive for the first time or have previously been pregnant. Smoking can also reduce the success rate of fertility treatments like IVF [In vitro fertilization]. Even modest amounts of cigarettes (between 5 and 9 cigarettes per day) and passive smoking can make it harder to achieve pregnancy. And it is not just your chance of getting pregnant that can be affected if you smoke. If you do become pregnant, you have a higher risk of ectopic pregnancy – up to three times higher than non-smokers, which is a considerable difference. Ectopic pregnancy is where the fertilised egg becomes implanted outside of the womb – usually (but not always) in the fallopian tubes [17-21]. This coupled with contraception has decreased fertility in Ghana.

For instance, the fertility in Ghana has declined from 6.4 children per woman in 1988 to 3.9 children per woman in 2022. Rural women have more children than urban women (4.8 children versus 3.2 children). By region, fertility ranges from 2.9 children per woman in Greater Accra to 6.6 children per woman in the North East Region. Family planning allows people to attain their desired number of children, if any, and to determine the spacing of their pregnancies [22]. Only one contraceptive method, condoms, can prevent both a pregnancy and the transmission of sexually transmitted infections, including HIV. Use of contraception advances the human right of people to determine the number and spacing of their children. In 2022, global contraceptive prevalence of any method was estimated at 65% and of modern methods at 58.7% for married or in a union woman [23,24].

Contraception, or birth control, helps prevent pregnancies and plan the number and spacing of children. There are many options to choose from to prevent pregnancy. Some methods are more effective than others, and no one product is best for everyone. Contraceptive information and services are fundamental to the health and human rights of all individuals. The prevention of unintended pregnancies helps to lower maternal ill-health and the number of pregnancy-related deaths. Delaying pregnancies in young girls who are at increased risk of health problems from early childbearing, and preventing pregnancies among older women who also face increased risks, are important health benefits of family planning. By reducing rates of unintended pregnancies, contraception also reduces the need for unsafe abortion and reduces HIV transmissions from mothers to newborns. This can also benefit the education of girls and create opportunities for women to participate more fully in society, including paid employment [25-27].

There are many different types of contraception, but not all types are appropriate for all situations. The most appropriate method of birth control depends on an individual's overall health, age, frequency of sexual activity, number of sexual partners, desire to have children in the future, and family history of certain diseases. Ensuring access for all people to their preferred contraceptive methods advances several human rights including the right to life and liberty, freedom of opinion, expression and choice and the right to work and education, as well as bringing significant health and other benefits [28].

Use of contraception prevents pregnancy-related health risks for women, especially for adolescent girls, and when expressed in terms of interbirth intervals, children born within 2 years of an elder sibling have a 60% increased risk of infant death, and those born within 2–3 years a 10% increased risk, compared with those born after an interval of 3 years or longer. It offers a range of potential non-health benefits that encompass expanded education opportunities and empowerment for women, and sustainable population growth and economic development for. The number of women desiring to use family planning has increased markedly over the past two decades, from 900 million in 2000 to nearly 1.1 billion in 2021 [29-31].

Between 2000 and 2020, the number of women using a modern contraceptive method increased from 663 million to 851 million. An additional 70 million women are projected to be added by 2030. Between 2000 and 2020, the contraceptive prevalence rate [percentage of women aged 15–49 who use any contraceptive method] increased from 47.7 to 49.0%. The proportion of women of reproductive age [aged 15–49 years] who have their need for family planning satisfied with modern methods [SDG indicator 3.7.1] is 77.5% globally in 2022, a 10% increase since 1990 [67%]. Methods of contraception include oral contraceptive pills, implants, injectables, patches, vaginal rings, intra uterine devices, condoms, male and female sterilization, lactational amenorrhea methods, withdrawal and fertility awareness-based methods. These methods have different mechanisms of action and effectiveness in preventing unintended pregnancy. Effectiveness of methods is measured by the number of pregnancies per 100 women using the method per year [32-37].

Smoking appears to be a risk factor for venous thrombosis with the greatest relative effect among young women using oral contraceptives. Women currently using hormonal contraceptive are more likely to smoke. It appeared the link between smoking and the lungs is well-known, but the link between smoking, contraception and women's ability to become pregnant is less. In fact, almost all studies support that smoking has a detrimental effect on both male and female reproductive system. Evidence suggests that smoking can reduce the success rate of fertility treatment. Even passive smoking (second-hand smoke) can affect a woman's chance of conceiving. Although smoking alone may not prevent you from getting pregnant, it can significantly harm your chances. Sadly, women who smoke are twice as likely to be infertile as non-smokers [38-40]. It is against this backdrop that this study attempts to investigate the influences of smoking and contraception on women's ability to become pregnant in Ghana by specifically assessing if smoking influences women's ability to become pregnant in Ghana and analysing whether contraception predicts women's ability to become pregnant in Ghana. The study further hypothesised that smoking, contraception, and socio-demographic factors do not influence women's ability to become pregnant in Ghana.

Methods
Sample Design
The 2022GDHS made use of stratified two-stage cluster sampling design. The design was carefully developed to yield representative results at the national level, urban and rural areas, and as well for each of the 16 regions, for most DHS indicators. The study selected 618 targeted clusters from a sampling frame with probability proportional to size (PPS) for urban and rural areas in each region.

Data Collection Procedure and Questionnaires
Data collection took place on 17th of October, 2022 and ended on 14th of January, 2023 with four different set of questionnaires. Namely: The Household Questionnaire; the Woman's

Questionnaire; the Man's Questionnaire; and the Biomarker Questionnaire. The questionnaires, were adapted to reflect the population and health issues relevant to Ghana. In addition, a self-administered Fieldworker Questionnaire collected information about the survey's fieldworkers. Further, tablet computers were used to collect the data by the fieldworkers. In all, 90 days were used to collect the data. The tablet computers used were equipped with Bluetooth technology to enable remote electronic transfer of files, such as assignments from the team supervisor to the interviewers, individual questionnaires to survey team members, and completed questionnaires from interviewers to team supervisors.

Data Analysis
To make meaning with the data extracted, SPSS version 27 was used to process the data. Frequency distribution was used to summarise information on smoking, contraception and fertility. Pearson's chi-squared test of independence was used to test the hypothesis postulated in the study to either confirm or nullify the null hypothesis and the binary logistic regression was used to identify the relationship that exist among smoking as well as contraception and fertility.

Ethical Consideration
The ethical clearance to conduct the 2022GDHS was taken from both Ghana Health Service Ethical Review Committee and ICF Institutional Review Board (IRB) after The ICF's data processing specialist had checked for all internal coherency of the questionnaires.

Results
Socio-Demographic Characteristics of Participants
The dominant age group category in the sample is 35-39years constituting 23.0% while the least category is 15-19year group (1.0%). Whereas 58.6% live in rural areas 41.4% live in urban areas. Nearly, forty-one per cent (40.6%) had no education compared to 4.6% who had higher education. More than sixty per cent (69.3%) in the sample cannot read at all compared to 0.1% who are blind/visually impaired.

Table 1: Socio-Demographic Characteristics of Participants

Variable	Frequency	Percentages
Age in 5year groups		
15-19	356	1.0
20-24	2032	5.9
25-29	4057	11.7
30-34	6519	18.8
35-39	7961	23.0
40-44	7632	22.0
45-49	6106	17.6
Place of residence		
Urban	14349	41.4
Rural	20314	58.6
Highest educational level		
No education	14056	40.6
Primary	6147	17.7
Secondary	12865	37.1
Higher	1595	4.6

Literacy		
Cannot read at all	24011	69.3
Able to read only parts of sentence	3237	9.3
Able to read whole sentence	7262	21.0
No card with required language	124	0.4
Blind/visually impaired	29	0.1
Total	34663	100.0

Source: GDHS (2022).

In our pursuit to unravel smoking situation among women and how that influences their ability to become pregnant made us to extract data from the 2022GDHS which revolves items ranging from: smokes cigarettes; frequency smokes cigarettes; number of cigarettes smoked in the last 24hour; snuff by mouth; smokes by water pipe; smokes kreteks; snuffs by nose; chews tobacco; and smokes pipe full of tobacco. The results are presented in Table 2.

Table 2: Smoking Situation Among Women

Variable	Frequency	Percentage
Smokes cigarettes		
No	34394	99.2
Yes	269	0.8
Frequently smokes cigarettes		
Does not smoke	34394	99.2
Every day	87	0.3
Some days	182	0.5
Snuff by mouth		
No	34608	99.8
Yes	55	0.2
Snuffs by nose		
No	34621	99.9
Yes	42	0.1
Frequently uses other types of tobacco		
Does not smoke	34526	99.6
Every day	74	0.2
Some days	63	0.2
Total	34663	100.0

.
Source: GDHS (2022).

The study revealed that more than ninety-nine per cent (99.2%) of the participants do not smoke cigarettes while 0.8% smoke cigarettes (see Table 2). Concerning whether participants frequently smoke cigarettes or not, the results revealed that 99.2% of the participants do not smoke cigarettes frequently while 0.3% do smoke cigarettes every day. Whereas 99.8% of the participant do not snuff by mouth 0.2% snuff by mouth (see Table 2). Nearly, hundred per cent (99.9%) of the participants reported they do not snuff by nose 0.1% said they snuff by nose (see Table 2). Almost all the participants (99.6%) said they do not use other type of tobacco frequently while 0.2% indicated that they use other type tobacco frequently (see Table 2).

To be able to ascertain information on women's ability to become pregnant amidst smoking in Ghana, data on pregnancy situation among women of reproductive age (15-49) in Ghana were extracted from the 2022GDHS. After processing the data, the results are presented in Table 3.

Table 3: Pregnancy Situation in Ghana

Variable	Frequency	Percentage
Currently pregnant		
No or unsure	32241	93.0
Yes	2422	7.0
Total	34663	100.0

Source: GDHS (2022).

Participants were asked to indicate whether they were pregnant as at the time of the survey or not, the results revealed that 93.0% reported that they were not pregnant while 7.0% answered in affirmative (see Table 3). Among those 2422 participants who answered in affirmative, 15.2% of them indicated 8months as the duration of their pregnancy, 14.9% reported 4months, participants who were pregnant for 3months and 5months recorded 12.3%, 7months 12.2%, 6months 11.7%, 2months 9.4%, 9months 6.1% and the least was 1month 5.9%. Regarding whether the participants wanted the pregnancy or not, the results revealed that 64.3% indicated then (formerly wanted), 23.9% said later while 11.8% said not at all.

Table 4 has Pearson's chi-squared test of independence on the relationship between smoking and women's ability to become pregnant. This analysis was performed to test the hypothesis there is no statistically significant relationship between smoking and women's ability to become pregnant. Statistically significant relationships were found among; frequently smokes cigarettes [p=0.002], snuff by mouth [p=0.042] as well as snuff by nose [p=0.076] and women's ability to become pregnant. However, statistically significant relationships were not found among smokes cigarettes [p=0.313] as well as frequently uses other type of tobacco [p=0.128] and women's ability to become pregnant.

Table 4: Relationship between Smoking and Women's ability to become Pregnant

Variable	Not pregnant	Pregnant	Total n (%)	Chi-square	P-value
Smokes cigarettes				1.019	0.313
No	93.0	7.0	34394(100.0)		
Yes	91.4	8.6	269(100.0)		
Frequently smokes cigarettes				12.273	0.002
Does not smoke	93.0	7.0	34394(100.0)		
Every day	83.9	16.1	87(100.0)		
Some days	95.1	4.9	182(100.0)		
Frequently uses other type of tobacco				4.111	0.128
Does not smoke	93.0	7.0	34526(100.0)		
Every day	98.6	1.4	74(100.0)		
Some days	95.2	4.8	63(100.0)		
Snuff by mouth				4.138	0.042
No	93.0	7.0	34608(100.0)		
Yes	100.0	0.0	55(100.0)		
Snuff by nose				3.159	0.076
No	93.0	7.0	34621(100.0)		
Yes	100.0	0.0	42(100.0)		

Note: Row percentages in parenthesis, Chi-square significant at (0.01), (0.10), (0.05)

Source: GDHS (20222).

Table 5 has binary logistic regression results on smoking and women's ability to become pregnant. It became prudent to run this analysis to identify factors studied under smoking those that influence women's ability to become pregnant and those that do not.

Table 5: Binary Logistic Regression Results on Smoking and Women's ability to become Pregnant

Variable	Odds ratio	P-value	95 CI	
Frequently smokes cigarettes (does not smoke=1.0)				
Every day	5.176	0.001	2.744	9.764
Some day	0.701	0.300	0.358	1.372
Frequently uses other type of tobacco (does not smoke=1.0)				
Every day	0.057	0.006	0.007	0.445
Some day	0.581	0.366	0.178	1.885
Constant	0.075	0.000		

Source: GDHS (2022), significant at (0.05)

It emerged in Table 5 that frequently smoking cigarettes every day was statistically significant related to women's ability to become pregnant at p<0.001, (OR=5.176, 95%CI ([2.744-9.764]). This variable has described women to have 5.2times more likely to become pregnant compared with participants that intimated that they do not frequently smoke cigarettes. Again, the study revealed frequently uses other type of tobacco every day as statistically significant at P=0.006, (OR=0.057, 95%CI [0.007-0.445]). This factor signifies that women that frequently use other type of tobacco every day have 0.06times less likely to become pregnant compared with those women that said they do not frequently use other type of tobacco every day (see Table 5). Moreover, statistically significant relationship was not found in the rest of the variables which could be as a result of chance.

The assessment of contraception situation among women in Ghana and how that affects their ability to become pregnant instigated us to extract data on contraception from the 2022GDHS. After processing the data, the results are presented in Table 6.

Table 6: Contraception Situation Among Women in Ghana

Variable	Frequency	Percentage
Current contraceptive method		
Not using	22964	66.2
Pill	1434	4.1
IUD	209	0.6
Injections	2746	7.9
Male condom	273	0.8
Female sterilization	1215	3.5
Male sterilization	8	0.0
Periodic abstinence	1249	3.6
Withdrawal	432	1.2
Other traditional	388	1.1
Implants/Norplant	2999	8.7
Lactational amenorrhea (LAM)	316	0.9
Emergency contraception	340	1.0
Other modern method	17	0.0
Standard days method (SDM)	73	0.2
Current use by method type		
No method	22964	66.2
Folkloric method	388	1.1
Traditional method	1681	4.8
Modern method	9630	27.8
Pattern of use		
Currently using	11699	33.8
Used since last birth	4361	12.6
Used before last birth	6962	20.1

Never used	11641	33.6
Contraceptive use and intention		
Using modern method	9630	27.8
Using traditional method	2069	6.0
Non-user - intends to use later	7289	21.0
Does not intend to use	15675	45.2
Total	34663	100.0

Source: GDHS (2022).

Table 6 revealed that more than sixty per cent (66.2%) of the participants were currently not using any contraceptive method while 0.0% reported other modern method. On current method use type, 66.2% reported no method while 1.1% said folkloric method (see Table 6). Concerning pattern of use, nearly, thirty-four per cent (33.8%) indicated that they are currently using while 12.6% of the participants said they used since last birth (see Table 6). Regarding contraceptive use and intention, 45.2% reported that they do not intend to use while 6.0% said they use traditional method (see Table 6).

The study further looked at the relationship between contraception and women's ability to become pregnant. This analysis deemed necessary because it was to test the hypothesis there is no statistically significant relationship between contraception and women's ability to become pregnant. Statistically significant relationships were found in all the variables namely: Current contraceptive method [p=0.001]; Current use by method type [0.001]; Pattern of use [p=0.000]; as well as Contraceptive use and intention [p=0.000] and women's ability to become pregnant.

Table 7: Relationship Between Contraception and Women's ability to become Pregnant

Variable	Not Pregnant	Pregnant	Total n (%)	Chi-square	P-value
Current contraceptive method				1326.579	0.001
Not using	89.5	10.5	22964(100.0)		
Pill	100.0	0.0	1434(100.0)		
IUD	100.0	0.0	209(100.0)		
Injections	100.0	0.0	2746(100.0)		
Male condom	100.0	0.0	273(100.0)		
Female sterilization	100.0	0.0	1215(100.0)		
Male sterilization	100.0	0.0	8(100.0)		
Periodic abstinence	100.0	0.0	1249(100.0)		
Withdrawal	100.0	0.0	432(100.0)		
Other traditional	100.0	0.0	388(100.0)		
Implants/Norplant	100.0	0.0	2999(100.0)		
Lactational amenorrhea (LAM)	100.0	0.0	316(100.0)		
Emergency contraception	100.0	0.0	340(100.0)		
Other modern method	100.0	0.0	17(100.0)		
Standard days method (SDM)	100.0	0.0	73(100.0)		
Current use by method type				1326.579	0.001
No method	89.5	10.5	22964(100.0)		
Folkloric method	100.0	0.0	388(100.0)		
Traditional method	100.0	0.0	1681(100.0)		
Modern method	100.0	0.0	9630(100.0)		
Pattern of use				3252.923	0.000
Currently using	100.0	0.0	11699(100.0)		
Used since last birth	74.2	25.8	4361(100.0)		
Used before last birth	93.0	7.0	6962(100.0)		

Never used	93.0	7.0	11641(100.0)		
Contraceptive use and intention				2711.665	0.000
Using modern method	100.0	0.0	9630(100.0)		
Using traditional method	100.0	0.0	2069(100.0)		
Non-user - intends to use later	80.3	19.7	7289(100.0)		
Does not intend to use	93.7	6.3	15675(100.0)		

Note: Row percentages in parenthesis, Chi-square significant at (0.01), (0.10), (0.05)

Source: GDHS (20222).

Discussion

Smoking can prolong a woman's ability to become pregnant. Therefore, if a woman smokes, it may take her a longer time to become pregnant than a woman who does not smoke. Even low levels of smoking thus between five and nine cigarettes a day can make it more difficult. As a result of this, the study revealed that majority of Ghanaian women do not smoke. The reason for this finding could probably be that these women are aware of the repercussion of smoking which prevents them from engaging in it. This finding is in line with assertion that although smoking is uncommon among Ghanaian women. Knowing the consequences of smoking cigarettes, overwhelming majority of the women reported that they do not smoke let alone doing it frequently [41]. Few of them advanced that they frequently smoke. The reason for this finding could be that they are not abreast of the side effects of smoking. Snuff by mouth is one of the ways through which some women smoke. Per the study, it was revealed that only few (0.2%) of the women snuff by mouth. The reason for this finding could be that these women enjoy it and have become addicted. For those that do not snuff by mouth reason could be that the consequences of snuff by mouth is the same as smoking so they do not see the need to do it.

Almost all the women graciously cited that they do not snuff by nose. The reason could be that these women will want to have babies therefore, they try to desist from anything that could prolong their chances of conception. Those that intimated they snuff by nose reason could be that they do not want to experience labour ward or to become parent which is why they snuff by nose to delay their conception chances.

The study revealed a statistically significant relationship between smoking and women's ability to become pregnant. Therefore, the null hypothesis was not confirmed. The relationship has demonstrated that the observed effect was not due to chance or random variation. Per the coefficients of the significant variables, it can be deduced that the more and more women engage in smoking it is the more and more it enhances their ability to become pregnant. This finding refutes assertion that studies have reported that there is no significant relationship between smoking and fertility outcomes in humans [42].

It emerged in the study that women who every day, smoke cigarette frequently were 5.2times more likely to become pregnant compared with their counterparts that intimated they do not smoke cigarette frequently every day. This finding has brought to light that smoking does not delay conception. Therefore, any woman that engages in smoking has the ability to become pregnant. However, if conception delays, it could be attributed to abnormality but not the smoking.

Women that smoke every day and frequently uses other types of tobacco were found to have delayed or prolonged chances of becoming pregnant. It means that the more and more such women use other types of tobacco frequently every blessed day, it is the more and more they find it difficult to conceive which invariably might lead to infertility. This finding implies that smoking itself does not reduce a woman's ability to become pregnant but frequently using other types of tobacco every blessed day makes it possible for the delay.

Contraception helps women to prevent pregnancies, plan the number and spacing of children. Absolutely, it permits them to choose if and when they want to have a child. The study unearthed that most women in Ghana are currently not using any contraceptive method. The reason for this finding could be that these women are aware of the side effects of contraception which deter them from using. It could also be that these women love, cherish and uphold children in high esteem and that do not want to do anything that will prevent them from becoming pregnant. This finding corroborates to study that a higher percentage of sexually active unmarried adolescents and young women in Ghana do not use contraceptives, appropriate [43].

We found that few of the Ghanaian women use folkloric method. The reason for this finding could be that these women trust this method compared with others. The finding confirms study that overall contraceptive prevalence in Ghana has been characterized by a persistence of traditional method use [44]. However, regarding pattern of use, some of the women did mention that they are currently using. The reason for this finding could probably be that these women want to prevent unintended pregnancies, plan and space the number of children they want to have. It emerged that some of the women do not intend to use contraception. The reason for this finding could be that their doctrine does not accept the use of contraception.

The study identified statistically significant relationship between contraception and women's ability to become pregnant. Therefore, the null hypothesis was refuted. This finding signifies that both the explanatory and the outcome variables are not independent of each other and that the effect did not occur by chance. Moreover, per the chi-square's coefficients, it can easily be deduced that when Ghanaian women adopt contraception, it enhances their ability to

become pregnant. This finding disagrees to a submission by that recent evidence from high-income settings suggests that some hormonal contraceptive methods are associated with delays in return of fecundity [45-47].

Conclusion
The study investigated the influences of smoking and contraception on women's ability to become pregnant. To satisfy our curiosity about the phenomena, data were extracted from the 2022 DHS. Frequency distribution, Pearson's chi squared test of independence and binary logistic regression were adopted as the analytical tool. The study revealed that majority of Ghanaian women do not smoke. It appeared most women in Ghana are currently not using any contraceptive method. Associations were found in the two hypotheses postulated in the study thus, smoking as well as contraception and women's ability to become pregnant.

Recommendation for Policy
The study recommends that a law should be made to permit pharmacists to prescribe tobacco cessation medications to people that indulge in smoking.

It is recommended that laws and policies should be enacted to support and ensure comprehensive contraceptive information and services dissemination to all segments of the population especially disadvantaged and marginalised populations in their access to these services.

Declaration
Ethical Approval
The study used DHS data therefore, ethical approval was not necessary.

Competing Interests
The authors did not encounter any conflict of interest.

Funding
No funding was obtained.

Availability of Data and Materials
The data were extracted from the DHS therefore, it is publicly available online.

References
1. Dhage VD, Nagtode N, Kumar D, Bhagat AK (2024) A Narrative Review on the Impact of Smoking on Female Fertility. Cureus16: e58389.
2. Kipling L, Bombard J, Wang X, Cox S (2024) Cigarette Smoking Among Pregnant Women During the Perinatal Period: Prevalence and Health Care Provider Inquiries-Pregnancy Risk Assessment Monitoring System, United States, 2021. MMWR Morb Mortal Wkly Rep 73: 393-398.
3. Miyake K, Kushima M, Shinohara R (2023) Maternal smoking status before and during pregnancy and bronchial asthma at 3 years of age: a prospective cohort study. Sci Rep 13: 3234.
4. Sequí-Canet JM, Sequí-Sabater JM, Marco-Sabater A, Corpas-Burgos F, Collar Del Castillo, et al. (2022) Maternal factors associated with smoking during gestation and consequences in newborns: Results of an 18-year study. J Clin Transl Res 8: 6-19.
5. Hendriks E, Rosenberg R, Prine L (2020) Ectopic Pregnancy: Diagnosis and Management. Am Fam Physician 101: 599-606.
6. Delcroix M, Delcroix-Gomez C, Marquet P, Gauthier T, Thomas, D, et al. (2023) Active or passive maternal smoking increases the risk of low birth weight or preterm delivery: Benefits of cessation and tobacco control policies. Tobacco Induced Diseases 21: 72.
7. He S, Wan L (2023) Associations between smoking status and infertility: a cross-sectional analysis among USA women aged 18-45 years. Front. Endocrinol 14: 1140739.
8. Wells AC, Lotfipour S (2023) Prenatal nicotine exposure during pregnancy results in adverse neurodevelopmental alterations and neurobehavioral deficits. Adv. Drug Alcohol Res 3: 11628.
9. Yang L, Wang H, Yang L, Pascal Bovet, Bo Xi, et al. (2022). Maternal cigarette smoking before or during pregnancy increases the risk of birth congenital anomalies: a population-based retrospective cohort study of 12 million mother-infant pairs. BMC Med Jan 11: 4.
10. de Angelis C, Nardone A, Garifalos F (2020) Smoke, alcohol and drug addiction and female fertility. Reprod Biol Endocrinol 18: 21.
11. Tarasi B, Cornuz J, Clair C (2022) Cigarette smoking during pregnancy and adverse perinatal outcomes: a cross-sectional study over 10 years. BMC Public Health 22: 2403.
12. Trapphoff T, Ontrup C, Krug S (2024) Consumption of hookahs, e-cigarettes, and classic cigarettes and the impact on medically assisted reproduction treatment. Sci Rep 14: 9597.
13. Taniguchi R, Hatakeyama S, Ohgi S, Yanaihara A (2024) Effect of Male Cigarette Smoking on In Vitro Fertilization (IVF) Outcomes and Embryo Morphokinetic Parameters. Cureus 16: e52788.
14. Houda A, Peter Michael J, Romeo M, Mohamad Eid H (2022) Smoking and Its Consequences on Male and Female Reproductive Health. Intech Open 104941.
15. Omolaoye S, El Shahawy O, Skosana BT (2022) The mutagenic effect of tobacco smoke on male fertility. Environ Sci Pollut Res 29: 62055-62066.
16. Rahimi-Madiseh M, Mohammadi M, Hassanvand A (2020) Assessment of the toxicity effects of nicotine on sperm and IVF and the potential protective role of silymarin—an experimental study in mice. Middle East Fertil Soc J 25: 14.
17. Carson SA, Kallen AN (2021) Diagnosis and Management of Infertility: A Review. JAMA 326: 65-76.
18. Firns S, Cruzat VF, Keane KN (2015) The effect of cigarette smoking, alcohol consumption and fruit and vegetable consumption on IVF outcomes: a review and presentation of original data. Reprod Biol Endocrinol 13: 134.
19. Cinar O, Dilbaz S, Terzioglu F, Karahalil B, Yücel, C, et al. (2014) Does cigarette smoking really have detrimental effects on outcomes of IVF? Eur J Obstet Gynecol Reprod Biol 174: 106-110.
20. Ji JS, Liu L, Huang H, (2024) The body mass index and the risk of ectopic pregnancy: a 5-year retrospective case-control study. BMC Pregnancy Childbirth 24: 143.
21. Xue Y, Zhang F, Zhang H, (2022) Time to pregnancy in women with previous ectopic pregnancy undergoing in vitro fertilization treatment: a retrospective cohort study. Sci Rep 12: 8820.
22. Ghana Statistical Service (GSS) and ICF (2023) Ghana Demographic and Health Survey 2022: Summary Report. Accra, Ghana, and Rockville, Maryland, USA: GSS and ICF.
23. James PB, Osborne A, Babawo LS (2022) The use of condoms and other birth control methods among sexually active school-going adolescents in nine sub-Saharan African countries. BMC Public Health 22: 2358.

24. Agbaglo E, Agbadi P, Tetteh JK (2022) Trends in total fertility rate in Ghana by different inequality dimensions from 1993 to 2014. BMC Women's Health 22: 49.

25. Ashore A, Erkalo D, Prakash R (2022) Dual contraceptives and associated predictors in HIV positive women: a case–control study. Reprod Health 19: 168.

26. Paulman PM, Taylor RB, Nasir LS, Menning M, Schindler P, et al. (2022) Family Planning, Birth Control, and Contraception. In (eds) Family Medicine. Springer, Cham.

27. Kungu W (2023) Contraceptive use and discontinuation among women aged 15–24 years in Kenya. Front. Reprod. Health 5: 1192193.

28. Asrat D, Copas A, Olubukola A (2024) Exploring the association between unintended pregnancies and unmet contraceptive needs among Ugandan women of reproductive age: an analysis of the 2016 Uganda demographic and health survey. BMC Pregnancy Childbirth 24: 117.

29. Hussain R (2016) Unmet Need for Contraception in Developing Countries: Examining Women's Reasons for Not Using a Method, New York: Guttmacher Institute.

30. Fotso JC, Cleland JG, Kouo Ngamby M, (2023) Pregnancy risks and contraceptive use among postpartum mothers in Cameroon: implications for improving the coverage of postpartum family planning services. Reprod Health 20: 2.

31. Alenezi GG, Haridi HK (2021) Awareness and use of family planning methods among women in Northern Saudi Arabia. Middle East Fertil Soc J 26: 8.

32. Osborne A, Bangura C, Ahinkorah BO (2024) Trends and inequalities in modern contraceptive use among women in Sierra Leone, 2008–2019. Reprod Health 21: 167

33. Sen S, Banerjee A, Ali A (2024) Modern contraceptive use among currently married non-pregnant women (aged 15–49 years) in West Bengal, India: a reflection from NFHS-5. Contracept Reprod Med 9: 63.

34. Adde KS, Ameyaw EK, Mottey BE (2022) Health decision-making capacity and modern contraceptive utilization among sexually active women: Evidence from the 2014–2015 Chad Demographic and Health Survey. Contracept Reprod Med 7: 21.

35. Boadu I (2022) Coverage and determinants of modern contraceptive use in sub-Saharan Africa: further analysis of demographic and health surveys. Reprod Health 19: 18.

36. Kantorová V, Wheldon MC, Ueffing P, Dasgupta ANZ (2020) Estimating progress towards meeting women's contraceptive needs in 185 countries: A Bayesian hierarchical modelling study. PLoS Med 17: e1003026.

37. Ukoji VU, Anele PO, Imo CK (2022) Assessing the relationship between knowledge and the actual use of contraceptives among childbearing women in South-South Nigeria: evidence from the 2018 Nigeria demographic and health survey. BMC Public Health 22: 2225.

38. Teal S, Edelman A (2021) Contraception Selection, Effectiveness, and Adverse Effects: A Review. JAMA 326: 2507-2518.

39. Pomp ER, Rosendaal FR, Doggen CJ (2008) Smoking increases the risk of venous thrombosis and acts synergistically with oral contraceptive use. Am J Hematol 83: 97-102.

40. Stewart SA, Peltier MR, Roys MR, Copeland AL (2022) The association between hormonal contraceptive use and smoking, negative affect, and cessation attempts in college females. Drug Alcohol Depend Rep 3: 100063.

41. Ryan KS, Bash JC, Hanna CB, Hedges JC, Lo JO (2021) Effects of marijuana on reproductive health: preconception and gestational effects. Curr Opin Endocrinol Diabetes Obes 28: 558-565.

42. Kyei-Gyamfi S, Kyei-Arthur F (2023) Assessment of prevalence, predictors, reasons and regulations of substance smoking among children in Ghana. BMC Public Health 23: 2262.

43. Sarokhani M, Veisani Y, Mohamadi A, Delpisheh A, Sayehmiri K, et al. (2017) Association between cigarette smoking behavior and infertility in women: a case-control study. Biomedical Research and Therapy 4: 1705-1715.

44. Oppong FB, Logo DD, Agbedra SY (2021) Determinants of contraceptive use among sexually active unmarried adolescent girls and young women aged 15–24 years in Ghana: a nationally representative crosssectional study. BMJ Open 11: e043890.

45. Ivy FO, Susannah H, Mayhew LB, Martine C (2014)The ECAF Team Fertility Decisions and Contraceptive Use at Different Stages of Relationships: Windows of Risk Among Men And Women in Accra. International Perspectives on Sexual and Reproductive Health. 40: 135-143.

46. Yland JJ, Bresnick KA, Hatch EE (2020) Wesselink A K, Mikkelsen E M, Rothman K J et al. Pregravid contraceptive use and fecundability: prospective cohort study BMJ 371: 3966.

47. Osborne A, Bangura C, Aboagye RG, Wongnaah FG, Seidu AA, et al. (2024) Spatial distribution and factors associated with high completed fertility among women aged 40-49 years in Ghana: evidence from the 2022 Ghana Demographic Health Survey. Reprod Health 21: 104.