

## Article

# Trends and determinants of contraceptive use among female adolescents in Ghana: Analysis of 2003–2014 Demographic and Health Surveys

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## ABSTRACT

**Introduction:** Thirty percent (30%) of all deliveries in 2014 were recorded among adolescents in Ghana, whom contraceptive use has been found to be low. Our study, therefore, aimed to retrospectively look at the trends and determinants of contraceptive use (modern and traditional) among female adolescents in Ghana.

**Materials and methods:** We used data from the 2003, 2008 and 2014 Ghana Demographic and Health Surveys. The sample for this study comprised sexually active female adolescents aged 15–19 for each of the rounds thereby resulting in a sample of 426 in 2003, 389 in 2008 and 726 in 2014. We calculated the proportion of adolescents using contraceptives (either traditional or modern) for each of the three surveys. We computed the use of contraceptives among adolescents and the type of contraceptives used with respect to their socio-demographic characteristics. Multinomial Logistic Regression was used to assess the determinants of contraceptive use at 95% confidence interval and Odds Ratios (OR) and p-values were reported.

**Results:** Contraceptive use declined from 22.1% in 2003 to 20.4% in 2014. Adolescents who were married had lower odds [OR = 0.09, 95% CI = 0.03–0.96] of using traditional methods of contraception compared to those who were not married. Those who read newspapers at least once a week were more likely to utilize modern contraceptives [OR=1.84, CI = 1.05–4.78] compared to adolescents who did not read newspapers at all. Similarly, those who watched television at least once a week were more likely to use modern contraceptives than those who did not watch television at all [OR = 2.25, CI = 1.06–4.78].

**Conclusion:** These findings imply that intensifying educational messages on contraceptive use among adolescents using various newspapers and television stations to convey the messages and emphasizing the importance of using modern contraceptive is worthwhile.

## 1. Introduction

Every year, an estimated 21 million girls aged 15–19 become pregnant (Darroch, Woog, Bankole, & Ashford, 2016; UNFPA, 2015a; WHO, 2018). Approximately 16 million girls aged 15 to 19 give birth in low- and -middle-income regions (Neal et al., 2012; UNFPA, 2015a). In Ghana, out of the total births recorded in 2014, 30% were by adolescents, and 14% of adolescents aged between 15 and 19 had begun childbearing (Ghana Statistical Service, Ghana Health Service, & ICF International, 2015). Low and inconsistent use of contraceptives (such as condom) present several negative health outcomes including the risk of contracting sexually transmitted infections (Morris & Rushwan, 2015).

The effects of such sexual and reproductive health outcomes reflect the annual 4 million unsafe abortions among girls aged 15 to 19 and the high global maternal mortality rates (Darroch et al., 2016). Pregnant adolescents face greater emotional, psychological and social challenges than pregnant women in advanced age groups (Mangeli, Rayyani, Cheraghi, & Tirgari, 2017). Adolescent mothers are also more likely to experience higher risks of puerperal endometritis, eclampsia, and systemic infections compared to women who are at least in their twenties (Ganchimeg et al., 2014).

To address early pregnancy and Sexually Transmitted Infections (STIs) among adolescents, UNFPA (2014) recommends providing adolescents easy access to comprehensive sexuality education; services to prevent, diagnose and treat STIs; and counselling on contraceptives.

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WHO (2011) adds that increasing the use of contraception by sexually active adolescents can contribute to a reduction in adolescent pregnancy. Unfortunately, contraceptive use among adolescents in Ghana has been found to be low (Abdul-Rahman, Marrone, & Johansson, 2011; Nketiah-Amponsah, Arthur, & Abuosi, 2012a, ; Nyarko, 2015). To identify innovative and result-oriented approaches for improving contraceptive use among adolescents, there is a need for comprehensive empirical investigation into the situation on the national scale. However, previous studies on contraceptive use among adolescents in Ghana (Abdul-Rahman et al., 2011; Darteh & Nnorom, 2012; Marrone, Abdul-Rahman, De Coninck, & Johansson, 2014; Nyarko, 2015) have not extensively addressed the issue of contraceptive use among adolescent girls.

A common gap characterising previous studies is that, they did not focus on the trend of contraceptive use among female adolescents. Although the title of the study by Abdul-Rahman et al. (2011) indicated trends in contraceptive use among female adolescents in Ghana, the researchers conducted a comparative study on contraceptive use among Ghanaian female adolescents between 2003 and 2008. Some previous studies have found age, educational level, work status and marital status (Marrone et al., 2014; Nyarko, 2015) as determinants of contraceptive use in general. However, some contrasting evidence indicate that predictors of modern contraceptive use may differ from the predictors of traditional contraceptive use (Izale, Govender, Fina, & Tumbo, 2014; Mutumba, Wekesa, & Stephenson, 2018a; Subedi, Jahan, & Baatsen, 2018).

Our study aims to fill the gap in previous studies in Ghana on contraceptive use among adolescent girls by retrospectively investigating the trend and determinants of contraceptive use among female adolescents using data from 2003, 2008, and 2014 Ghana Demographic and Health Surveys (GDHS). The study is motivated by two main research questions: (1) What has been the trend in contraceptive use among adolescents aged 15–19 in Ghana? (2) What are the determinants of contraceptive use (modern and traditional) among adolescents aged 15–19 in Ghana? Such a trend analysis with specific emphasis on the determinants of modern and traditional contraceptive use will give a better picture of the situation, provide reasons for the variability in contraceptive use and give more meaning to the factors that influence both modern and traditional contraceptive use, which are essential for specific interventions.

## 2. Materials and methods

### 2.1. Study setting

Ghana is located on the West African coast and lies about 750 km north of the equator between latitudes 4° North and 12° North as well as longitudes 4° West and 2° East. It is bordered by three francophone countries: Burkina Faso to the north, Ivory Coast to the west and to the east by Togo. The Gulf of Guinea forms a coastline of 560 km (Atlantic Ocean) to the south (see Fig. 1). The country accounts for 238,537 km<sup>2</sup> (92,100 sq. miles) of land with a stretch of 672 km north to south and 357 km east toward the west (Ghana Investment Promotion Centre [GIPC], 2011). Demographic profile of the country indicates that adolescents constitute a significant proportion of the Ghanaian population. For instance, the 2010 Population and Housing Census of the country reported that slightly less than a quarter of all Ghanaians were adolescents aged 10–19 as they made up 23 percent of the total population (Ghana Statistical Service [GSS], 2013).

### 2.1. Data

We used data from the 2003, 2008, 2014 GDHS (Ghana Statistical Service [GSS], Ghana Health Service (GHS), and ICF International, 2015; Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF Macro, 2009; Ghana Statistical Service (GSS), Noguchi Memorial

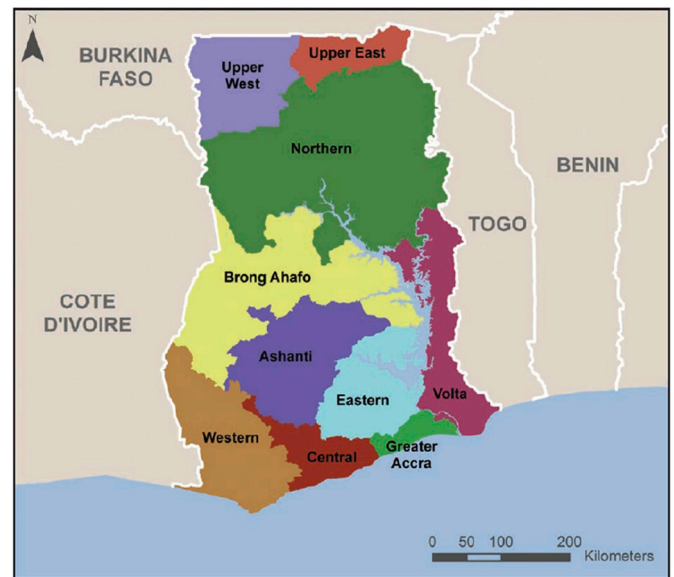


Fig. 1. Map of Ghana  
Source: Ghana Maternal Health Survey, 2017.

Institute for Medical Research [NMIMR], and ORC Macro, 2004). Individual recode files of all these survey rounds were used. The GDHS is a five-year interval nationwide survey, which has a representative sample of Ghanaian adolescents. The survey is conducted by the Ghana Statistical Service and Ghana Health Service with technical assistance from the ICF International. The GDHS is intended to provide adequate data to monitor the population and health situation in the country (GSS, GHS & ICF International, 2015; GSS, GHS & ICF Macro, 2009; GSS, NMIMR & ORC Macro, 2004). The survey focuses on various aspects of demography and health by gathering data on family planning, fertility, nutrition, tuberculosis, HIV/AIDS and maternal health. The sample for this study comprised sexually active adolescents aged 15–19 for each of the survey rounds thereby resulting in a sample of 426 in 2003, 389 in 2008 and 726 in 2014. Permission to use the dataset was granted by Measuredhs after assessing the intent for the request of the dataset.

Use of contraceptives among sexually active female adolescents (aged 15–19) was the outcome variable for the study. This variable was derived from the question “Are you currently doing something or using any method to delay or avoid getting pregnant?” with a follow up question “Which method are you using?” In the dataset, the four responses were: “using modern method”, “using traditional method”, “intends to use later” and “does not intend to use.” For the purpose of this study, contraceptive use was recoded into “No contraception = 0” for those who reported that they intend to use later and do not intend to use, “Traditional = 1” for adolescents who said they were using traditional method and “Modern = 2” representing adolescents who reported that they were using modern methods.

Sixteen independent variables were used. These are age, residence (coded as urban = 1 and rural = 2), wealth quintile (coded as poorest = 1, poorer = 2, middle = 3, richer = 4 and richest = 5) and parity (coded as 0 = 1, 1 = 2, 2 = 3 and 3 = 4). Frequency of reading newspaper was coded as not at all = 0, less than once a week = 1, at least once a week = 2 and almost every day = 3, frequency of watching television (coded as not at all = 0, less than once a week = 1, at least once a week = 2 and almost every day = 3), frequency of listening to radio (coded as not at all = 0, less than once a week = 1, at least once a week = 2 and almost every day = 3), heard of family planning on radio last few months (coded as no = 0 and yes = 1), heard of family planning in newspaper/magazine last few months (coded as no = 0 and yes = 1), heard family planning on TV last few months (coded as no = 0 and yes = 1). Ethnicity was coded as Akan = 1, Ga/dangme = 2, Ewe = 3, Guan = 4, Mole-

dagbani = 5, Grusi = 6, Gurma = 7, Mande = 8 and Other = 9, region (coded as Western = 1, Central = 2, Greater Accra = 3, Volta = 4, Eastern = 5, Ashanti = 6, Brong Ahafo = 7, Northern = 8, Upper East = 9 and Upper West = 10). The following variables were recoded; formal education (recoded as no education = 0, primary = 1, and secondary+ = 2), marital status (recoded as not married = 0 and married = 1), religion (recoded as 'Other' = 0 and Christianity = 1), health decision-making (recoded as alone = 1 and not alone = 2). We also controlled for the time variation by using the years of the surveys.

2.1. Statistical analysis

All analyses were carried out with STATA version 13. At the descriptive level, we calculated the proportion of adolescents using contraceptives (either traditional or modern) for each of the three surveys as illustrated in Fig. 2. After this, we pooled the datasets and computed for adolescents using contraceptives and the type of contraceptives used with respect to their socio-demographic characteristics (see Table 1). Multinomial Logistic Regression was used to assess the determinants of contraceptive use at 95% confidence interval (CIs) and odds ratios (ORs) were reported (see Table 2). Sample weights were used to offset the effects of under and over sampling.

3. Results

3.1. Trend of contraceptive use among Ghanaian adolescents: 2003–2014

Fig. 2 presents a pictorial view of the trends in contraceptive use among female adolescents aged 15 to 19 in Ghana. Generally, it was found that contraceptive use declined from 22.1% in 2003 to 20.4% in 2014.

3.1. Table 1: contraceptive use among Ghanaian adolescents: 2003–2014

As shown in Table 1, 22.2% adolescents aged 18–19 used contraceptives. Contraceptive use was 24.7% among adolescents with secondary level of education. Among adolescents who were unmarried, 8.5% used contraceptives and 8.6% of those in urban areas had used contraceptives. It was noted that 10.8% of them were in the middle wealth quintile. Contraceptive use peaked among those at parity 2 (23.4%) and those who do not read newspaper at all (8.9%). It was observed that 10.0% of those who were using contraceptives watched television at least once a week whereas 8.7% of those who used contraceptives listened to radio less than once a week. The paper further unearths that 13.0% of adolescents who make decisions on their health with other people use contraceptives. Contraceptive use was high among those who had heard family planning on TV within the last few months

Table 1  
Contraceptive use among Ghanaian adolescents: 2003–2014.

Variable	Uses Contraceptive		Type of Contraceptive		
	Yes		None	Traditional	Modern
	N	%	%	%	%
<b>Age</b>					
15–17	112	19.3	81.1	5.1	13.9
18–19	209	22.2	77.6	5.6	16.8
<b>Formal Education</b>					
No Education	12	4.0	96.0	0.9	3.1
Primary	69	7.8	93.0	1.6	5.5
Secondary <sup>+</sup>	249	9.2	90.7	2.5	6.8
<b>Marital Status</b>					
Not Married	317	8.5	91.8	2.2	6.0
Married	13	7.9	89.6	0.5	9.8
<b>Residence</b>					
Urban	163	8.3	92.2	2.4	5.3
Rural	166	8.6	91.3	1.9	6.8
<b>Religion</b>					
Other	31	5.5	94.0	1.7	4.3
Christianity	296	8.9	91.2	2.2	6.5
<b>Wealth Quintile</b>					
Poorest	43	6.5	93.2	0.8	6.0
Poorer	70	9.4	90.4	2.4	7.2
Middle	84	10.8	90.4	3.2	6.4
Richer	69	8.5	90.6	3.4	6.0
Richest	63	7.1	93.1	1.4	5.5
<b>Parity</b>					
0	249	7.4	92.8	2.1	5.1
1	62	17.1	82.6	2.8	14.6
2	9	23.4	77.8	0.0	22.2
3	1	17.4	50.0	0.0	50
<b>Frequency of Reading Newspaper</b>					
Not at all	238	8.9	91.7	2.1	6.2
Less than once a week	38	7.4	91.8	2.5	5.7
At least once a week	48	7.8	91.4	2.0	6.6
Almost everyday	6	8.0	90.3	1.6	8.1
<b>Frequency of Watching Television</b>					
Not at all	66	6.4	93.3	1.6	5.1
Less than once a week	61	8.2	91.7	2.2	6.1
At least once a week	137	10.0	90.3	2.4	7.3
Almost everyday	66	8.9	90.9	2.7	6.4
<b>Frequency to Listening to Radio</b>					
Not at all	36	5.5	94.2	1.2	4.6
Less than once a week	72	8.7	91.4	2.0	6.6
At least once a week	118	8.2	91.8	2.0	6.2
Almost everyday	104	11	89.6	3.1	7.3
<b>Health Decision Making</b>					
Not alone	108	9.8	90.1	2.2	7.7
Alone	16	13.0	85.9	3.1	10.9
<b>Heard family planning on radio last few months</b>					
No	127	6.4	93.6	1.3	5.1
Yes	194	10.8	89.3	3.2	7.6
<b>Heard family planning in Newspaper/Magazine last few months</b>					
No	270	8.2	92.0	2.1	5.9
Yes	50	11.2	88.2	2.6	9.3
<b>Heard family planning on TV last few months</b>					
No	158	7.3	92.7	1.4	5.9
Yes	163	10.2	89.8	3.4	7.0
<b>Ethnicity</b>					
Akan	203	10.3	89.7	3.1	7.3
Ga/dangme	22	8.5	90.6	2.3	7.0
Ewe	40	8.6	90.8	1.8	7.4
Guan	3	3.2	97.9	1.0	1.0
Mole-dagbani	28	4.6	94.8	1.1	4.1
Grusi	15	13.9	84.5	2.5	13.0
Gurma	6	3.3	97.6	0.47	1.9
Mande	3	5.5	93.3	2.22	4.4
Other	2	3.8	94.1	0.0	0.0
<b>Region</b>					
Western	53	12.6	88.1	4.0	7.8
Central	26	7.5	92.1	1.6	6.4
Greater Accra	42	7.1	93.0	1.4	5.5
Volta	26	8.7	90.6	2.0	7.4
Eastern	33	9.2	91.0	2.9	6.1
Ashanti	65	8.5	91.6	4.0	4.4

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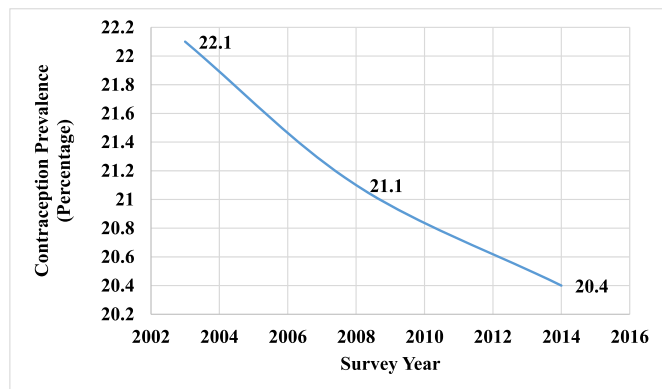


Fig. 2. Contraceptive use among Ghanaian adolescents: 2003–2014  
Sources: GDHS 2003, 2008, 2014.

**Table 1** (continued)

Variable	Uses Contraceptive		Type of Contraceptive		
	Yes		None	Traditional	Modern
	N	%	%	%	%
Brong Ahafo	54	15.4	85.2	2.7	12.1
Northern	3	0.96	98.9	0.0	1.1
Upper East	10	5.4	93.9	0.8	5.3
Upper West	8	6.4	92.5	0.6	6.9

Sources: GDHS 2003, 2008, 2014.

(10.2%). In Brong Ahafo, 15.4% were using contraceptives (see Table 1).

**3.1. Multinomial logistic regression on type of contraception: 2003–2014**

Table 2 presents the results on the multinomial logistic regression on type of contraceptive used among female adolescents in Ghana. Marital status was associated with contraceptive use. Those who were married had lower odds [OR = 0.09, 95% CI = 0.03–0.96] of using traditional methods of contraception compared to those who were not married. Those at parity three were over five-fold probable to use traditional contraceptives as compared to their counterparts at parity zero [OR = 5.98, 95% CI = 2.88–7.29]. Frequency of reading newspaper was associated with modern contraceptive use. Specifically, adolescents who read newspapers at least once a week were more likely to utilize modern contraceptives [OR = 1.84, 95% CI = 1.05–4.78] compared to adolescents who do not read newspapers at all. Similarly, those that watched television at least once a week were more likely to use modern contraceptives than those who did not watch television at all [OR = 2.25, 95% CI = 1.06–4.78]. It was evident that the Mole-Dagbani adolescents had lower odds of using modern contraceptives compared with the Akan adolescents [OR = 0.11, 95% CI = 0.03–0.50]. Finally, residents in the Upper East region were over eight fold probable to utilize modern contraceptives compared to those in Western region [OR = 8.10, 95% CI = 1.44–12.76], as can be seen from Table 2.

**4. Discussion**

This study assessed the trends and determinants of contraceptive use among adolescents in Ghana from 2003 to 2014 using the Demographic and Health Surveys. It was found that there has been a steady decline in contraceptive usage for the past decade. The observed decline in contraceptive use among female adolescents is dissimilar to what the Ghana Health Service indicated in their report (GHS, 2013). The results also contradicts what has been found in other settings. For example, other countries such as Nepal recorded an increase of more than three folds over 2 decades in contraceptive use among female adolescents (Subedi et al., 2018). Worku, Tessema, and Zeleke (2015) in Ethiopia also recorded an increase in contraceptive use among young women from 2000 to 2011 (Worku et al., 2015). Despite these, other countries such as Benin and Nigeria recorded only 2.8% and 0.7% increase over a ten-year period respectively (Blanc, Tsui, Croft, & Trevitt, 2009).

Considering the massive ongoing campaigns in Ghana about contraceptives on several platforms by various organization, the observed decline in contraceptive use among adolescent is less expected. Cleland and Ali (2006) indicated that contraceptive use is linked to an adjustment in behavior which implies that, regardless of the mass campaign, if Ghanaian adolescents have not fully developed a positive attitude and behavior towards contraceptive use, the tendency not to use them will be high. Theoretically, observing female adolescents have a choice over a particular behaviour in this study does not guarantee their exhibition of such behaviour (Ajzen, 1991). Several determinants such as subjective norms (explained as an individual’s perception about whether or not referents such as husbands and relatives think a person should perform a behaviour) could restrict their relative ease of using contraceptives (Ajzen, 1991).

**Table 2**

Multinomial Logistic Regression on type of contraception: 2003–2014.

Variable	Traditional vs No Contraception		Modern vs No Contraception	
	OR	95% CI	OR	95% CI
<b>Age</b>				
15–17	1	[1,1]	1	[1,1]
18–19	1.35	[0.49–3.67]	1.31	[0.73–2.36]
<b>Formal Education</b>				
No Education	1	[1,1]	1	[1,1]
Primary	0.79	[0.15–4.01]	1.59	[0.65–3.92]
Secondary <sup>+</sup>	0.48	[0.09–2.33]	1.32	[0.53–3.30]
<b>Marital Status</b>				
Not Married	1	[1,1]	1	[1,1]
Married	0.09*	[0.03–0.96]	0.99	[0.52–1.91]
<b>Residence</b>				
Urban	1	[1,1]	1	[1,1]
Rural	1.77	[0.55–5.52]	1.24	[0.75–2.08]
<b>Religion</b>				
Other	1	[1,1]	1	[1,1]
Christianity	0.98	[0.97–5.35]	0.81	[0.39–1.69]
<b>Wealth Quintile</b>				
Poorest	1	[1,1]	1	[1,1]
Poorer	1.56	[0.34–9.51]	0.65	[0.29–1.45]
Middle	1.81	[0.35–9.15]	0.94	[0.41–2.14]
Richer	4.53	[0.87–10.15]	1.02	[0.38–2.71]
Richest	2.80	[0.25–9.7]	0.93	[0.30–2.81]
<b>Parity</b>				
0	1	[1,1]	1	[1,1]
1	1.48	[0.98–4.21]	2.56**	[1.31–5.04]
2	2.02**	[1.04–6.72]	2.96	[0.93–9.43]
3	5.98**	[2.88–7.29]	4.87	[0.15–15.48]
<b>Frequency of Reading Newspaper</b>				
Not at all	1	[1,1]	1	[1,1]
Less than once a week	0.89	[0.45–4.79]	1.14	[0.42–2.07]
At least once a week	0.66	[0.29–3.49]	1.84*	[1.05–4.78]
Almost everyday	1.52	[0.30–1.98]	1.79	[0.40–7.95]
<b>Frequency of Watching Television</b>				
Not at all	1	[1,1]	1	[1,1]
Less than once a week	0.40	[0.07–2.38]	0.94	[0.42–2.07]
At least once a week	1.71	[0.44–6.68]	2.25*	[1.06–4.78]
Almost everyday	0.71	[0.16–3.22]	1.09	[0.46–2.62]
<b>Frequency to Listening to Radio</b>				
Not at all	1	[1,1]	1	[1,1]
Less than once a week	0.09	[0.02–1.08]	0.88	[0.40–2.23]
At least once a week	0.30	[0.06–1.33]	0.89	[0.46–2.06]
Almost everyday	1.62*	[1.15–2.61]	1.60	[0.68–3.75]
<b>Health Decision Making</b>				
Not alone	1	[1,1]	1	[1,1]
Alone	0.72	[0.19–2.62]	1.07	[0.53–2.15]
<b>Heard family planning on radio last few months</b>				
No	1	[1,1]	1	[1,1]
Yes	5.36*	[1.23–7.32]	1.19	[0.67–2.11]
<b>Heard family planning in Newspaper/Magazine last few months</b>				
No	1	[1,1]	1	[1,1]
Yes	1.34	[0.40–4.44]	1.36	[0.66–2.80]
<b>Heard family planning on TV last few months</b>				
No	1	[1,1]	1	[1,1]
Yes	0.78	[0.24–2.59]	0.66	[0.34–1.28]
<b>Ethnicity</b>				
Akan	1	[1,1]	1	[1,1]
Ga/dangme	1.15	[0.17–7.87]	0.18*	[0.04–0.86]
Ewe	0.37	[0.04–3.12]	0.63	[0.25–1.60]
Guan	1.07	0.73–5.62	0.18	[0.02–1.61]
Mole-dagbani	0.45	[0.05–4.14]	0.11**	[0.03–0.50]
Grusi	1.91	[0.08–42.50]	0.70	[0.13–3.64]
Gurma	4.61	[0.89–7.32]	0.14	[0.01–1.36]
Mande	9.73	[0.99–15.21]	0.23	[0.02–2.51]
Other	1.47	[0.71–6.33]	1.49	[0.09–2.56]
<b>Region</b>				
Western	1	[1,1]	1	[1,1]
Central	0.36	[0.04–3.86]	1.32	[0.48–3.61]
Greater Accra	0.13	[0.01–1.72]	0.89	[0.30–2.68]
Volta	0.95	[0.05–18.26]	2.24	[0.64–7.92]
Eastern	1.43	[0.30–6.83]	1.64	[0.62–4.54]
Ashanti	0.94	[0.22–3.96]	0.98	[0.40–2.38]
Brong Ahafo	1.49	[0.33–6.62]	1.81	[0.70–4.67]

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Table 2 (continued)

Variable	Traditional vs No Contraception		Modern vs No Contraception	
	OR	95% CI	OR	95% CI
Northern	3.10	[0.98–3.56]	1.67	[0.30–9.24]
Upper East	2.62	[0.17–39.02]	8.10**	[1.44–12.76]
Upper West	0.59	[0.02–14.11]	5.16	[0.88–29.97]
<b>Survey wave</b>				
2003	1	[1,1]	1	[1,1]
2008	2.82	[0.68–11.56]	0.44	[0.16–1.16]
2014	0.83	[0.12–5.52]	1.08	[0.50–2.37]

Sources: GDHS 2003, 2008, 2014, OR=Odds Ratio, CI=Confidence Interval in square brackets; 1 = Reference Category; \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

Another finding of interest was the influence of marital status on contraceptive usage. It was found that adolescents who were married had lower odds to use traditional method of contraception than those who were not married. The probable explanation to this finding could be that married young women may not have the capacity to use any form of contraception due to cultural values or if their partners are not in support of the use of such methods (Adams, Salazar, & Lundgren, 2013; Dynes, Stephenson, Rubardt, & Bartel, 2012). Some scholars also argue that women who use traditional methods of contraception are mostly unmarried young women who are exposed to higher propensity of unanticipated pregnancy (Singh, Darroch, & Ashford, 2014; Sullivan, Bertrand, Rice & Shelton Sullivan, 2006). On the other hand, societal pressure on married adolescents to conceive and give birth after marriage compels them to despise the use of contraceptives in order to actualise societal expectation (UNFPA, 2015a). Another possible reason for the high prevalence of traditional methods of contraception among unmarried adolescents could be that adolescents who are not married can face several barriers to access and use modern contraceptives because sexual activity is only considered acceptable within marriage in many settings (Coll, Ewerling, Hellwig, & de Barros, 2019) including Ghana.

The study also indicated that those at parity three had higher likelihood to use traditional contraceptives compared to their counterparts at parity zero. A Jordan-based study noted that parity is a significant predictor of modern contraceptive use and that as the number of children increase, women are more likely to rely on modern contraceptive methods than traditional ones (Almalik, Mosleh, & Almasarweh, 2018). A study across 73 countries found that within low -and -middle income countries, female adolescents who are married with no children have the lowest median modern contraceptive prevalence (Coll et al., 2019).

It was also found from this current study that exposure to mass media (frequency of reading newspaper and watching television) was related with modern and traditional contraception use. Specifically, adolescents who read newspapers almost every day were more probable to utilize modern contraceptives as opposed to adolescents who do not read newspaper at all. This finding confirms reports from other settings in sub-Saharan Africa on the influence of mass media on contraceptive use. For example, in Senegal (Jacobs, Marino, Edelman, Jensen, & Darney, 2017), Mali (Zamawe, Banda, & Dube, 2016) and Nigeria (Ajaero, Odimegwu, Ajaero, & Nwachukwu, 2016; Bajoga, Atagame, & Okigbo, 2015), it was found that a positive link exists between family planning messaging and use of modern contraceptives. Ajaero et al. (2016) explained that gaining access to family planning messages is effective in changing people's negative attitude with respect to contraception. Similarly, those that watched television at least once a week were more likely to use modern contraceptives than those who did not watch television at all. Sharma, Pratap and Ghimire (2011) in the same vein observed that exposure of women to family planning messages through health facilities, family planning workers, radio, and television increased the probability of using modern contraceptives in Nepal.

The present study revealed that the Mole-Dagbanis were less likely to use modern contraceptives compared with the Akans. The Mole-Dagbani

ethnic group which is predominantly northern-based are basically muslim dominated and this possibly make them receptive to contraceptives due to faith and belief systems. Adjei, Owusu and Asiedu (2014) similarly observed a less likelihood of contraceptive use among Mole-Dagbanis and explained that since Islam is the dominant religion which generally accepts large families, women within that religion are not likely to use contraceptive methods compared to those living in the southern part of the country because of the faith's position on procreation. In relation to the above, adolescents in the Upper East region were over eight fold probable to utilize modern contraceptives compared to those in the Western. Generally, contraceptive use is influenced by community level factors (Ochako et al., 2015). Some scholars also argue that cultural values and gender norms strongly influence fertility desires and family planning needs, and in many places women are expected to give birth to at least one child before adopting contraception (Adams et al., 2013; Dynes et al., 2012; Kane et al., 2016). Therefore, if these factors including societal norms on contraceptives are less restrictive and favourable, higher demand and the use of contraceptives are bound to occur as observed among adolescent in the Upper East. They might not be under societal influence to give birth.

#### 4.1. Strength and limitations

We acknowledge that the study has a number of drawbacks and the findings should be interpreted against these drawbacks. First, the cross-sectional nature of the DHS data precludes analyses of causal relationships between the independent variables and contraceptive use (Zamawe et al., 2016). Second, owing to the self-reporting of both exposure and health behaviours, we cannot rule out recall and social desirability biases. Some authors have also raised concerns about the quality of data in earlier DHS surveys, particularly with regard to indicators of sexual activity among young people (Mutumba et al., 2018a); this could lead to bias in survey estimates. Despite these limitations, these analyses provide valuable insights on the potential mechanism which may shape contraceptive use among young women in low -and-middle-income countries.

## 5. Conclusion

The trend analysis of the DHS from 2003 to 2014 revealed a decrease in contraceptive use among adolescents in Ghana. Reading of newspapers and watching television are associated with modern contraceptive use whereas marital status was associated with traditional method of contraception. . These findings imply that it is worthy to carryout educational messages on contraceptive use among adolescents using various newspapers and television stations. Also, both married and single women need to be sensitized about the need to use contraceptives especially the modern type since they are proven to be more effective than the traditional methods.

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## Ethical statement

The 2003, 2008 and 2014 Ghana Demographic and Health Surveys were conducted under the scientific guidance of the Ghana Statistical Service (GSS), Ghana Health Service (GHS), National Public Health Reference Laboratory of GHS and Noguchi Memorial Institute for Medical Research. ICF International through the DHS program approved the survey and provided technical assistance. Prior informed consent was obtained from all the respondents before the commencement of interviews with each respondent.

## Declaration of competing interest

None.

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