

1 **Postpartum contraceptive use among low-income urban women: insights from Accra,**  
2 **Ghana**

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21 **Abstract**

22 **Background:** Postpartum contraceptives use (PPC) reduces unintended pregnancies and results in  
23 better health outcomes for children and women. However, in Ghana, there is a paucity of  
24 knowledge on PPC use, particularly among women in low-income urban settings. To shed light  
25 on strategies that might enhance access to postpartum family planning services in low-income  
26 urban settings, we examined contraceptive use among postpartum women in Accra, Ghana, at one,  
27 three, six and twelve months following the birth and the methods used. The predictors of modern  
28 contraceptive use in the 12 months postpartum period were also examined.

29 **Methods:** Data are from a cross-sectional survey that was conducted in 2018 among 624 women  
30 aged 16-44 years who reported to have given birth in the past 13-31 months prior to the interview.  
31 We generated descriptive statistics to examine the prevalence of contraceptive use among  
32 postpartum women at one, three, six and twelve months after birth. We further estimated a binary  
33 logistic regression to examine the predictors of 12 months postpartum modern contraceptive use.

34 **Results:** Data indicate that 40% of postpartum women never used any contraceptive method  
35 during one-year after birth and of those who used a method, 40% relied on traditional methods.  
36 Moreover, 29% of women started using a method in the immediate one month post-birth. Results  
37 further show that postpartum modern contraceptive uptake was positively associated with higher  
38 education, having more live births and being currently in a union.

39 **Conclusions:** Findings highlight the need to improve the quality of counselling during antenatal  
40 and postnatal care visits by clients. Community outreach by health providers/promoters or similar  
41 models should be promoted in low-income population settings to educate postpartum women on  
42 modern contraceptive use. Women who plan to use traditional methods should be provided with  
43 information on consistent and correct use of these methods.

44 **Keywords:** Postpartum contraceptive use, Low-income urban women, Ghana

45

## 46 **Background**

47 The benefits associated with the use of contraceptives are enormous and transcend health to  
48 economic and social empowerment of women and households [1]. According to the World  
49 Health Organization (WHO), postpartum women have the highest unmet need for contraception  
50 [2]. Studies show that about 70% of postpartum women who desire to prevent pregnancy for  
51 the next two years are not using any contraceptive method [2, 3]. Contraception uptake within  
52 the first 12 months of postpartum can significantly reduce unintended pregnancies, and is  
53 particularly important because women and children under-five years simultaneously achieve  
54 best health outcomes when pregnancy intervals are long [4-9]. A minimum of 24 months  
55 following live birth is recommended before next pregnancy whereas a six-month period is  
56 recommended for next pregnancy after miscarriage or abortion [6, 8]. Women who delay the  
57 next pregnancy after birth, miscarriage or abortion have a lower risk of maternal and child  
58 mortality, low birth weight and pre-term birth [8].

59 Certain fertility behaviours potentially increase or reduce the risk of pregnancy during 12  
60 months postpartum period and these include the use of contraceptives, resumption of sexual  
61 activity, breastfeeding and return of menstruation [4, 6]. Women who exclusively breastfeed  
62 for the first 6 months after birth and are amenorrhoeic are unlikely to become pregnant within  
63 the first 6 months postpartum period [4]. However, after 6 months their risk of becoming  
64 pregnant increases with time [4]. Postpartum women who use contraceptives in addition to

65 practicing exclusive breastfeeding without the return of menstruation have extra protection  
66 against unintended pregnancy [6, 10].

67 In most low- and middle-income countries (LMICs), the use of contraceptives, especially  
68 modern methods after birth is generally low [5]. A systematic review of literature between 1997  
69 and 2018 shows that the overall postpartum modern contraceptive prevalence rate (mCPR) in  
70 LMICs is about 41%, with West Africa having the lowest mCPR (36%) whereas South  
71 Asia/South East Asia have the highest rate (42%) [5]. Likewise, in Ghana, postpartum modern  
72 contraceptive uptake is low. Studies in the country reported postpartum modern contraceptive  
73 use among women varying between 25% and 26.5% based on the health facility studied and  
74 the location of the facility [5, 11, 12]. For instance, the reported postpartum modern  
75 contraceptive use for Tema General Hospital and Tema Polyclinic, Accra in 2018 was 26.3%  
76 whereas 26.5% was reported for a well-baby clinic of Komfo Anokye Teaching Hospital,  
77 Kumasi in 2011 [11, 12]. Some of the factors influencing the use of modern contraceptives by  
78 women in Ghana during postpartum period include prior use of contraceptives before  
79 pregnancy, return of menstruation, resumption of sexual activity and having received maternal  
80 health services such as family planning counselling during antenatal care (ANC) [11].

81 Though a few postpartum contraceptive use studies have been carried out in Ghana, largely  
82 these studies are facility-based [6, 11, 12]. Moreover, Atiglo and Biney [13] who used a  
83 population-based data (Ghana Demographic and Health Survey) to assess postpartum  
84 contraceptive use among unmarried young women in Ghana did not give the context of the low-  
85 income urban population. Unlike other urban settings, urban poor women are predisposed to  
86 the effects of urbanization such as floods, congestions and other health hazards, and sometimes  
87 have inequitable access to health services [14, 15]. To shed light on strategies that might

88 enhance access to postpartum services and reduce unintended pregnancies in low-income  
89 settings of urban populations in Ghana, we examined the prevalence of immediate, one, three,  
90 six and twelve months postpartum contraceptive use among women who have had a live birth  
91 in Accra and the methods they used. Also, the predictors of modern contraceptive use in the 12  
92 months postpartum period were examined. The study hypothesizes that socio-economic  
93 attributes of women and their use of antenatal and postnatal care services affect their modern  
94 contraceptive uptake within 12 months postpartum period.

95

## 96 **Methods**

### 97 *Study setting*

98 This paper used data from a larger community representative cross-sectional study conducted in  
99 low-income urban settings of Accra, Ghana. The larger study, referred to as Willows Impact  
100 Evaluation (WIE), surveyed women living in two poor neighborhoods of Accra, Ghana. The first  
101 neighborhood include La, Teshie and Nungua communities which are located at the coastal part  
102 of Accra. The second neighborhood is inland and include La Nkwantanang-Madina, Abogba and  
103 Old Ashongman communities. All six communities share similar socio-economic, demographic  
104 and ethnic mix attributes. Unlike the formal settings of urban cities, the study area is relatively  
105 poor and often predisposed to the effects of urbanization such as floods, pollution, congestion and  
106 outbreak of diseases [14, 15].

### 107 *Sampling*

108 The WIE study employed a three-level cluster sampling technique. At the first level, 200 clusters  
109 (100 each for the coastal and inland communities) were randomly sampled from equally-divided

110 enumeration area maps of the study communities obtained from the Ghana Statistical Service  
111 (GSS). All women in their reproductive ages 16-44 years within the sampled clusters were  
112 subsequently listed. A total of 5,651 households with women aged 16-44 years were listed from  
113 the sampled clusters. At the second level of the sampling, an average of 25 households were  
114 randomly sampled from each cluster. The inclusion criteria for the sampled household was for  
115 each to have at least one woman within the ages 16-44 years. At the third level, one eligible woman  
116 was sampled and interviewed in the case where the sampled household had more than one eligible  
117 woman. A total of 4,184 women out of 4,323 contacted consented to be part of the WIE and had  
118 completed interviews. However, this paper used data for 624 women who reported in the  
119 contraceptive calendar section of the questionnaire to have given birth in the past 13-31 months  
120 prior the interview.

#### 121 *Data collection*

122 Data were collected with the use of electronic devices (tablets) which were programmed with a  
123 questionnaire using CommCare software application [16]. Data collection spanned from January  
124 to July 2018. Prior to data collection, field enumerators and supervisors were extensively trained  
125 for two weeks by an experienced research team from the University of Ghana, Ghana Health  
126 Service and Harvard T.H. Chan School of Public Health. The data collected include background  
127 characteristics and health information of women, including questions on their reproductive health  
128 such as contraceptive use, pregnancies and abortions. All interviews were conducted through a  
129 face-to-face interaction between enumerators and participating women in either English or local  
130 language.

131

132 *Measures*

133 The WIE study used a contraceptive calendar similar to that used in the Ghana Demographic and  
134 Health Survey (GDHS) to record retrospective information of women regarding their use of  
135 contraceptives, discontinuation, reasons for switching and as well as births, pregnancies and  
136 terminations. For this paper, data for women who reported in the contraceptive calendar to have  
137 had given birth between 13 to 31 months prior to the interview were included for analysis.  
138 Postpartum period in this study refers to 12 months period after birth. Contraceptive methods were  
139 broadly categorized into no method, traditional methods and modern methods. Traditional methods  
140 include withdrawal and rhythm. Methods considered modern include sterilization, intrauterine  
141 device (IUD), implants, injectables, oral contraceptive pills (OCP), condom, emergency  
142 contraceptive (EC) pill and lactational amenorrhea method (LAM).

143 Based on the review of other studies on postpartum contraceptive use in sub-Saharan Africa [4, 6,  
144 11, 12], a number of predictors were selected. Measurement for the selected predictors of  
145 postpartum modern contraceptive uptake is as follows: age of woman (16-24 years, 25-34 years  
146 and 35 years and above); marital status (never in union, currently in union, and formerly in union);  
147 educational level (no formal education, completed primary, completed middle/junior high school,  
148 completed secondary and tertiary/higher education); religion (Pentecostal, Catholic,  
149 Anglican/Methodist/presbyterian, other Christians, Moslem and no religion/other); parity (one live  
150 birth, two live births and three live births/more); received family planning (FP) counselling during  
151 antenatal care (ANC) (yes and no); ANC provider (nurse and physician); attended postnatal care  
152 (PNC) after birth (yes and no) and received FP counselling during PNC (yes and no). Having  
153 received ANC was dropped from the analysis because of collinearity.

154

## 155 *Analysis*

156 The prevalence of postpartum contraceptive use among women was estimated at one, three, six  
157 and 12 months following birth. A binary logistic regression model was also fitted to examine the  
158 predictors of postpartum modern contraceptive use. The binary logistic model was employed to  
159 examine associations with use of a modern method in the 12-month postpartum period: used a  
160 modern method in one or more months in the postpartum period versus never used a modern  
161 method in the postpartum period. Explanatory variables for the regression with p-values less than  
162 5% were considered statistically significant for the analysis and discussed.

163

## 164 **Results**

### 165 *Background characteristics of women*

166 Table 1 shows that majority (55%) of the women are within the age band 25-34 years and more  
167 than 79% reported being in a union with a partner at the time of the interview. Except for some  
168 (14%), most women had a form of formal education with over a third reporting to have completed  
169 secondary education or higher. Further, majority of the women are from the Akan (34%) and  
170 Ga/Dangme (33%) ethnic groups and a higher proportion also fall in the poorer (20%) and average  
171 (39%) wealth scale. Two-third (71%) of postpartum women had reported having two or more live  
172 births.

<b>Variable (n=624)</b>	<b>Frequency [%]</b>
<b>Age of woman</b>	
16-24	135 [21.5]
25-34	344 [55.1]
35+	145 [23.4]



<b>Marital status</b>		
	Never in union	98 [15.7]
	Currently in union	494 [79.3]
	Formerly in union	31 [5.0]
<b>Educational level</b>		
	No formal education	89 [14.3]
	Completed primary	91 [14.6]
	Completed middle/junior high school	230 [36.9]
	Completed secondary	146 [23.4]
	Higher	67 [10.8]
<b>Religion</b>		
	Catholic	18 [2.9]
	Anglican/Methodist/Presbyterian	75 [12.0]
	Pentecostal	340 [54.5]
	Other Christian	126 [20.2]
	Moslem	56 [9.0]
	other/no religion	9 [1.4]
<b>Ethnicity</b>		
	Akan	211 [33.8]
	Ewe	119 [19.1]
	Ga/Dangme	204 [32.7]
	Other Ghanaian	79 [12.7]
	Non Ghanaian	11 [1.7]
<b>Wealth</b>		
	Poorest	59 [9.5]
	Poorer	125 [20.0]
	Middle	241 [38.6]
	Richer	156 [25.0]
	Richest	43 [6.9]
<b>Parity</b>		
	One	183 [29.4]
	Two	207 [33.3]
	Three and more	232 [37.3]

173

174 ***Maternal health services women received and source of services***

175 Table 2 shows the services women received before and after birth, as well as providers of the  
176 services. Ninety-nine percent of women had reported to have received at least one ANC visit before  
177 their last birth and of these, about 85% received ANC services for at least four times. Eighty  
178 percent of women had obtained their recent ANC service from a public hospital/clinic and the  
179 providers (96%) were mostly nurses/midwives. Only a few (4%) had received their recent ANC

180 service from a physician. Slightly over a three-quarters (77%) of the women had ever received FP  
 181 counselling during ANC services. Apart from a few (3%) women who delivered at home, majority  
 182 (94%) had delivered in either a public (78%) or private (15%) hospital/clinic. Unlike ANC (99%),  
 183 a relatively lesser percentage of women (93%) had attended PNC after delivery. Further, majority  
 184 (87%) of the women had received FP counselling during PNC.

<b>Table 2: Maternal health services women received for the last pregnancy and source of services</b>	
<b>Variable</b>	<b>Frequency [%]</b>
<b>Received any antenatal care <sup>ψ</sup></b>	
Yes	580 [98.8]
No	7 [1.2]
<b>Place of antenatal care</b>	
Home	2 [0.3]
Government hospital/clinic	461 [79.5]
Health post/CHPS/mobile clinic	4 [0.7]
Private hospital/clinic	100 [17.2]
Other private facilities (e.g. maternity home)	12 [2.1]
Others	1 [0.2]
<b>Antenatal care provider</b>	
Doctor/gynaecologist	21 [3.6]
Nurse or midwife	556 [95.9]
Community health nurse/officer	2 [0.3]
Traditional birth attendant (TBA) and others	1 [0.2]
<b>Frequency of antenatal care</b>	
One-three times	43 [7.4]
Four times and above	494 [85.2]
Don't know	43 [7.4]
<b>Received FP counseling during antenatal care</b>	
Yes	449 [77.4]
No	131 [22.6]
<b>Place of delivery</b>	
Home	19 [3.2]
Government hospital/clinic	460 [78.4]
Health post/community-based health planning and services/mobile clinic	2 [0.3]
Private hospital/clinic	90 [15.3]
Other private facilities (e.g. maternity home)	9 [1.5]
Others	7 [1.2]
<b>Attended postnatal care after birth <sup>ψ</sup></b>	
Yes	548 [93.4]
No	39 [6.6]
<b>Received family planning counseling during postnatal care</b>	
Yes	477 [87.0]
No	71 [13.0]

$\Psi = 37$  women had missing information on both antenatal and postnatal care

185

186

187 ***Contraceptive methods women used at months one, three and twelve after birth***

188 Table 3 shows the postpartum contraceptive methods women used at months one, three, six and  
189 12 after birth. About 40% of postpartum women never used any contraceptive method during 12  
190 months after birth. Of the women (152+223=375) who had used a traditional or modern  
191 contraceptive method during the 12 months postpartum period, 59% had used a modern method  
192 with 15% of the methods being long-acting (specifically, implants (10%), IUD (3%) and  
193 sterilization (2%)) and 44% being short-acting (specifically, injectables (16%), male condom  
194 (11%), LAM (8%), OCP (5%), EC (3%), and other (0.3%). Twenty-nine percent of women used  
195 a method in the immediate one month after abortion. Of these methods users (81+97=178), 54%  
196 used a modern method with 14% of the methods being long-acting and 40% being short-acting  
197 contraceptives. Again, of the modern method users (97 women) in month one post-birth, 23% were  
198 using LAM. Results further show that the uptake of contraceptives in general increased among all  
199 women during the 12 months postpartum period from 29% in the immediate one month to 60% in  
200 the 12th month following birth (Figure 1).

201

[Insert Figure 1 around here]

202 **Fig. 1: Percent of women using no method, a traditional method or a modern method, by**  
203 **month since birth**

204

205

206

207

**Table 3: Postpartum contraceptive methods used at months one, three, six and twelve post-birth**

Methods (n=624)	Month 1	Month 3	Month 6	Month 12
	Frequency [%]	Frequency [%]	Frequency [%]	Frequency [%]
<b>No method</b>	446 [71.5]	389 [62.3]	311 [49.8]	249 [39.9]
<b>Traditional</b>	81 [13.0]	103 [16.5]	133 [21.3]	152 [24.4]
<i>Rhythm</i>	55 [8.8]	70 [11.2]	93 [14.9]	107 [17.1]
<i>Withdrawal</i>	24 [3.8]	28 [4.5]	35 [5.6]	40 [6.4]
<i>Other traditional</i>	2 [0.3]	5 [0.8]	5 [0.8]	5 [0.8]
<b>Modern</b>	97 [15.5]	132 [21.2]	180 [28.8]	223 [35.7]
<i>Female Sterilization</i>	7 [1.1]	7 [1.1]	7 [1.1]	7 [1.1]
<i>Intrauterine device</i>	4 [0.6]	9 [1.4]	10 [1.6]	11 [1.8]
<i>Implants</i>	15 [2.4]	24 [3.8]	29 [4.6]	39 [6.3]
<i>Injectables</i>	19 [3.0]	24 [3.8]	41 [6.6]	62 [9.9]
<i>Pills</i>	10 [1.6]	13 [2.1]	18 [2.9]	20 [3.2]
<i>Male condom</i>	16 [2.6]	23 [3.7]	36 [5.8]	42 [6.7]
<i>Emergency contraceptive</i>	4 [0.6]	5 [0.8]	8 [1.3]	11 [1.8]
<i>Lactational amenorrhea method</i>	22 [3.5]	27 [4.3]	30 [4.8]	30 [4.8]
<i>Other modern</i>			1 [0.2]	1 [0.2]

208

209 ***Factors associated with the uptake of modern contraceptives in postpartum period***

210 Table 4 shows results for both adjusted and unadjusted logistic model fitted for the predictors of  
 211 modern contraception uptake in the 12 months period post-birth. For the unadjusted model,  
 212 postpartum modern contraceptive use is significantly associated with parity, educational level and  
 213 postnatal counseling. For instance, postpartum women with record of only one live birth were less  
 214 likely to use a modern method compared with those with three or more live births (OR=0.6,  
 215  $p<0.05$ ). Also, women who reported that they had not received FP counseling during the  
 216 postpartum period had lower odds of using a modern method relative to their counterparts who  
 217 had received FP counseling (OR=0.6,  $p<0.05$ ). Postpartum women with tertiary education or  
 218 higher were 2.3 times as likely to use modern contraceptive compared with those with no formal

219 education. Even after adjusting for other factors, women with tertiary education or higher were 2.9  
 220 times as likely to use a modern method compared with those with no formal education. However,  
 221 after accounting for other factors, postnatal FP counseling did not significantly predict postpartum  
 222 modern contraceptive use. The adjusted model further shows that women formerly in a union with  
 223 a partner were less likely to use a modern contraceptive during the postpartum period compared  
 224 with those currently in a union (OR=0.3, p<0.05). Like the unadjusted, results for the adjusted  
 225 model shows that postpartum women with just one live birth are less likely to use a modern  
 226 contraceptive during the postpartum period. Further, results from the adjusted model show that  
 227 women with higher age had lower odds of using modern methods in the postpartum period.  
 228 Religion of woman, whether woman received family planning counselling during ANC or not, the  
 229 type of ANC provider and whether woman attended PNC after birth were not significantly  
 230 predicting postpartum modern contraceptive uptake. Having received ANC or otherwise was  
 231 dropped from the regression analysis because of collinearity.

<b>Table 4: Predictors of modern contraceptive use in postpartum period</b>									
<b>Variable</b>	<b>UOR</b>	<b>P-value</b>	<b>95% CI</b>		<b>AOR</b>	<b>P-value</b>	<b>95% CI</b>		
<b>Age of woman</b>									
16-24 (Ref)									
25-34	0.92	0.68	0.61	1.38	0.64	0.08	0.39	1.06	
35+	0.84	0.49	0.52	1.37	0.41	0.01	0.21	0.78	
<b>Marital status</b>									
Currently in union (Ref)									
Never in union	0.65	0.08	0.41	1.05	0.70	0.20	0.40	1.21	
Formerly in union	0.47	0.09	0.20	1.12	0.27	0.02	0.09	0.84	
<b>Educational level</b>									
No formal education (Ref)									
Completed primary	1.97	0.04	1.04	3.70	1.98	0.05	0.99	3.96	
Completed middle/junior high school	1.68	0.06	0.98	2.90	1.76	0.06	0.97	3.18	
Completed secondary	1.36	0.30	0.76	2.45	1.60	0.16	0.83	3.08	
Higher	2.33	0.01	1.18	4.57	2.87	0.01	1.37	6.04	
<b>Religion</b>									
Pentecostal (Ref)									
Catholic	1.26	0.64	0.48	3.34	1.24	0.68	0.44	3.47	
Anglican/Methodist/Presbyterian	1.56	0.09	0.94	2.59	1.51	0.14	0.87	2.60	

Other Christian	1.26	0.28	0.83	1.93	1.57	0.06	0.98	2.52
Moslem	0.73	0.32	0.39	1.37	0.66	0.23	0.33	1.31
other/no religion	2.48	0.18	0.65	9.41	2.33	0.27	0.53	10.29
<b>Parity</b>								
One	0.61	0.02	0.40	0.92	0.43	0.00	0.25	0.73
Two	0.89	0.54	0.60	1.30	0.64	0.05	0.41	1.01
Three (ref)								
<b>Received family planning counseling during antenatal care</b>								
Yes (Ref)								
Otherwise <sup>Ψ</sup>	0.66	0.05	0.44	1.00	0.65	0.06	0.42	1.02
<b>Attended postnatal care after birth</b>								
Yes (Ref)								
No	0.60	0.17	0.28	1.25	0.63	0.35	0.23	1.68
<b>Received family planning counseling during postnatal care</b>								
Yes (Ref)								
Otherwise <sup>ΨΨ</sup>	0.58	0.02	0.37	0.93	0.75	0.34	0.41	1.36
<b>Adjusted odd ratios: Observations=585, LR Chi2 (18)= 43.04, Prob&gt;Chi2=0.00</b>								
<i>NB: Having received antenatal care or otherwise was dropped from the model because of collinearity.</i>								
<i>Ψ=The 7 women who reported had not received antenatal care are included</i>								
<i>ΨΨ=The 7 women who reported had not received postnatal care are included</i>								

232

## 233 Discussion

234 The study found that two in five postpartum women were not using any form of contraceptive  
235 during the one-year postpartum period, and were at risk of unintended pregnancy and likely to be  
236 lopped-off from the health benefits associated with postpartum contraception uptake. Moreover,  
237 among the women who used any method during the 12 months postpartum period, about 40 percent  
238 had used a traditional method. Traditional methods are often associated with high failure rates and  
239 thus, traditional method users are also at risk of unintended pregnancy though less than non-users  
240 of any method. Less than a third of women initiated the use of contraceptives in the immediate one  
241 month following birth. Studies show that about 52% of women often resume sex five to six weeks  
242 following birth and 90% would have had resumed sexual activity by the third month post-birth  
243 [17-19]. With this, some of the remaining two-third of women who had not used any method in

244 the first month after birth might get pregnant. Our findings further show that only a few of the  
245 women who used a modern method in month one post-birth had used a long-acting contraceptive.  
246 Though, the fertility intentions of women were not ascertained in this study, the use of a long-  
247 acting methods generally enable women to effectively achieve best health outcomes in postpartum  
248 period through long pregnancy intervals [20].

249 On postpartum method mix, it is observed that rhythm (17%) was predominantly used by  
250 postpartum women and followed by injectables (10%). The use of rhythm/calendar method is  
251 largely based on one's knowledge of her menstrual cycle, especially the last menstruation. As such,  
252 women's use of rhythm is an indication that their menses had probably returned. Biologically,  
253 ovulation precedes menstruation and most of the women who reported using rhythm in the first  
254 month post-birth could potentially be fertile even before the method was used. The use of  
255 injectables by nearly a third (28%) of modern method users is not surprising as this is consistent  
256 with a recent study conducted in the urban settings of Ghana. Coomson and Manu studied  
257 postpartum women who visited health facilities in Tema, an urban city in Ghana and indicated that  
258 close to 30% of women who reported using modern methods had used injectables [11]. In fact, the  
259 health facility survey, a component of the WIE study showed that most urban-poor women who  
260 covertly used contraceptives preferred injectables. Similar to findings of Coomson and Manu, less  
261 than a tenth of postpartum method users had used LAM. Seven women had opted for sterilization.  
262 It is most likely that these women had achieved their fertility intentions as further analysis (not  
263 reported here) showed that they all had three or more live births and are in their mid-thirties or  
264 above.

265 Regarding the predictors of postpartum modern contraception, results indicate that women with  
266 higher parity and higher educational level are more inclined to have used a modern method during

267 the postpartum period. Women with higher education are expected to have better insights of the  
268 various contraceptive methods and would opt for more effective methods. Analysis of  
269 demographic and health survey data from 43 developing countries including Ghana showed that  
270 higher education positively influence uptake of postpartum family planning methods [21],  
271 corroborating our findings. Additionally, most women with higher parity are likely to have  
272 achieved or probably surpassed their fertility intentions and would, therefore, use modern methods  
273 that are effective for preventing unintended pregnancies. Findings also suggests that postpartum  
274 women currently in a union with a partner are inclined to use modern contraceptive relative to  
275 those formerly in union. Women currently in union are more likely to be sexually active and  
276 therefore exposed to the risk of pregnancy than women who were formerly in union. The use of  
277 maternal health services was not significantly influencing postpartum modern contraceptive  
278 uptake. However, the direction of the odd ratios seemingly suggests a positive influence on the use  
279 of modern contraceptives post-birth.

## 280 **Conclusion**

281 In conclusion, findings indicate that about 40% of postpartum women never used any  
282 contraceptive method in the one-year period following birth and even of the women who used a  
283 method, about 40% had used a traditional method. Moreover, a much smaller proportion (29%) of  
284 women started using a method in the immediate one-month post-birth. The methods women  
285 predominantly used in the 12 months postpartum period were rhythm and injectables. Results  
286 further indicate that postpartum modern contraceptive use is positively associated with higher  
287 education, having more live births and being currently in a union. The outcomes of the study  
288 suggest that most postpartum women in low-income urban settings are at risk of unintended



289 pregnancy and likely to be lopped-off from the health benefits associated with optimal birth  
290 spacing.

291 Given that ANC and PNC visits are not significantly related to the use of modern contraceptive  
292 indicate that either the content or the process of such counselling are weak and require  
293 improvements. Such counselling may overlook the importance of postpartum contraception for  
294 maternal and child health, number of contraceptive methods available and their relative advantages  
295 and disadvantages or the counselling may have been brief. Therefore, improving the quality of  
296 counselling and the manner in which this is delivered during ANC and PNC visits require  
297 improvements. Also, community outreach by health providers/promoters or similar models should  
298 be promoted in low-income population settings to educate postpartum women on modern  
299 contraceptive use. Women who plan to use traditional methods should be provided with  
300 information on consistent and correct use of these methods. In particular, women who plan to use  
301 the rhythm method should be correctly informed of the fertile days in the cycle.

302

### 303 **Abbreviations**

304 ANC: Antenatal Care; EC: Emergency Contraceptive; FP: Family Planning; GDHS: Ghana  
305 Demographic and Health Survey; GSS: Ghana Statistical Service; IUD: Intrauterine Device; LAM:  
306 Lactational Amenorrhea Method; LMICs: Low- and Middle-Income Countries; mCPR: modern  
307 Contraceptive Prevalence Rate; OCP: Oral Contraceptive pill; PNC: Postnatal Care; PPC:  
308 Postpartum Contraceptives; WHO: World Health Organisation; WIE: Willows Impact Evaluation.

309 **Declarations**

310 **Ethical approval and consent to participate**

311 Ethical approvals were obtained from Ghana Health Service Ethical Review Committee (GHS-  
312 ERC #: 005/08/2017), University of Ghana Ethics Committee for the Humanities (ECH #: 020/17-  
313 18) and the Institutional Review Board (IRB) of Harvard T.H. Chan School of Public Health before  
314 the study. Written informed consent was obtained from all respondents before participation in the  
315 study. No parental/guardian consent was required since data were collected from women aged 16  
316 to 44 years. In Ghana, persons under the age of 16 years are considered as minors.

317 **Consent for publication**

318 Not applicable.

319 **Availability of data and materials**

320 The data used in this paper are available from the corresponding author upon reasonable request.

321 **Competing interest**

322 The authors declare that there is no competing interest.

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325 **Authors' contributions**

326 CA substantially contributed to the conception of the study, methods, analysis and drafted the  
327 manuscript. EGH contributed to the conception of the study, methods, analysis and reviewed the  
328 manuscript for substantial intellectual content. POA contributed to the methods and reviewed the

329 manuscript for important intellectual content. AOD, TT and MWA contributed to revising the  
330 manuscript for important intellectual content. IS and AAB contributed to the methods,  
331 interpretation of the data and reviewed the manuscript as lead investigators of the study. All authors  
332 read and approved the final manuscript.

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