Prevalence and Causes of Infertility: Perspectives of Married Couples in the Southern Part of Volta Region

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Abstract

BACKGROUND: Infertility is the inability of a couple to conceive after one year of regular unprotected sexual intercourse. This study aimed to assess the prevalence and causes of infertility among couples in the southern part of the Volta Region of Ghana.

METHOD: We employed descriptive cross-sectional study involving 322 married couples in the Southern Volta. Structured questionnaire was used to collect data from the respondents. Data were collected between March and April 2019. This study included couples, 18 years and above who had stayed together for at least a year, were residing in the community for at least six months 'prior to the study and have consented to participate in the study. Couples who did not consent to participate in the study were excluded. We included the following ethnic groups, Ewe, Mafi, Avenor and Anlo.

RESULT: Of the 322 couples, 35 (10.9%) had primary infertility, and 13 (4.0%) had secondary infertility. The infertility prevalence was of 14.9%. In all, 51% of the respondents had good level of knowledge on the causes of infertility. Respondents from Mafi were 89% less likely to be infertile compared to couples who were Ewes [AOR= 0.11 (95%CI: 0.01 – 0.93), p=0.043]. Also, couples who had married for more than 20 years were 81% less likely to be infertile compared to those who were married for less than five years [AOR=0.19 (95%CI: 0.06 – 0.66), p=0.008]. Couples who did not smoke were 76% less likely to be infertile compared to those who smoked [AOR=0.24 (95%CI: 0.11 – 0.51), p<0.001]. However, couples who did not know that alcohol consumption was a risk factor of infertility were 58% less likely to be infertile [AOR=0.42 (95%CI: 0.18 – 0.95), p=0.038].

CONCLUSION: The prevalence of infertility in this study was within the global prevalence (13-15%). Approximately three in every twenty couples are infertile in the Southern part of the Volta Region. The overall level of knowledge of couples on causes of infertility was (51%). Knowledge on causes of infertility was influenced greatly by couple's educational level, ethnicity (tribe). Based on the WHO 2016 definition of infertility, respondents had misconception about witches and supernatural powers being causes of infertility. Most of the respondents were unaware that smoking and alcoholism are risk factors of infertility. Strategies should therefore be put in place by various stakeholders to reduce the prevalence of infertility and also to improve the knowledge of couples on the causes of infertility.

Introduction

The World Health Organization [WHO] (2016) defines infertility as a disease of the reproductive tract, which affects both males and females. It is the failure to achieve a clinical pregnancy after twelve months or more of regular unprotected sexual intercourse. There are two types of infertility; primary and secondary infertility. Primary infertility is a situation where a woman is unable to bear a child, due to the inability to become pregnant or give a live birth for more than one year during which they have not used any contraceptives. Secondary infertility is defined as the absence of a live birth for women who desire to have a child for at least one year since their last live birth, during which they did not use any contraceptives (WHO, 2016).

Infertility is a neglected global health problem in resource-poor environments. The scarce resources of health care were strategically distributed in the systems of maternal and child health care, leaving women and couples with forced childlessness little to none. In low-income countries, the negative psychosocial, socio-cultural and economic effects are serious. Family inheritance and survival are strongly attached to the number of children one has in many sub-Saharan African environments.

Childless women are also commonly stigmatized, leading to poverty, harassment, domestic violence, and polygamy (Dyer, 2015). Despite the local importance of infertility, however, few resources are committed to helping in this region advanced infertility care. The World Health Organization (WHO) recognizes infertility as a global health issue and has established universal access to reproductive health care as one of the Millennium Development Goals for 2015 for the United Nations. Access to infertility treatment a varied and is typically only available in low-income countries by the very wealthy (Asemota & Klatsky, 2015).

The prevalence of infertility is higher in the developing world than in the advanced world. For instance, in countries such as China, Denmark, and Britain infertility affects between 10% and 15% of the population, making it a major public health problem (Haervig et al., 2017; Cong, Li, Zheng & Tan, 2016; Datta et al.,2016).However, in sub-Saharan Africa, the burden of infertility is higher and is as high as 30% in some countries(Larsen, 2003). For instance, Geelhoed et al. (2002), reported prevalence of 27.6% in Ghana.

Knowledge of infertility in many parts of the world is inadequate. A global study of nearly 17, 5000 women (mostly from 10 countries) found poor knowledge of reproductive infertility and biology (Bunting & Boivin, 2008).Aside from poor knowledge of infertility there is widespread misconception about the causes of infertility. A study by Tabong & Adongo in Ghana in 2013 in Ghana found that most of the respondent thought infertility is caused by witches and supernatural powers.

In Ghana, in an attempt to provide a platform for childless couples to enjoy the benefits of marriage by dispelling myths associated with infertility, an association called Association of Childless Couples of Ghana (ACCOG) was formed in 2012. The association provides education; counseling and other support services to those divorced as a result of childlessness to enable them to have adequate knowledge of infertility to cope with their situation (Osei, 2014). This is an indication of the extent and consequences of a lack of knowledge on the causes of infertility in Ghana.

Despite the importance of issues of reproductive health, such as infertility, there is no available data on the subject matter in the Volta Region, hence the actual prevalence of infertility, especially among couples, and awareness of the causes of infertility remain scientifically unavailable. This study aimed to determine the prevalence of infertility, to assess the knowledge of infertility and to determine the risk factors associated with infertility among couples in the southern part of Volta region.

Materials and Methods

The study was a cross-sectional survey of 322 couples involving 213 female and 109 males.

The questionnaire was designed with questions on demographic characteristics, prevalence of infertility, knowledge on the causes of infertility and the risk factors associated with infertility. In determining the prevalence of primary infertility, the questionnaire included question on whether the respondents had children or not. If no, the question proceeded with the number of years respondents looked for a child. A response of looking for a child beyond one year was considered primary infertility. On the assessment of secondary infertility, respondents who agreed to have had a child or children but were facing difficulties having a child for over one year were classify secondary infertility. This was done based on the definition of infertility by WHO.

On the assessment of knowledge, ten questions on the causes of infertility and 11 questions on risk factors of infertility were combined. A correct response to each question was scored as one (1), and incorrect (no or I don't know) response was scored as zero (0). The scores were added together to generate a knowledge score from 0 to 21 and the overall score was dichotomized using a median of 12 as a cut-off value. Those who scored 12 and above were coded as 1 for good overall knowledge on causes of infertility, and those who scored below 12 were coded as 0 for poor overall knowledge on the causes of infertility. This approach of grading was adopted from Sima et al. (2019).

Data was analyzed using Stata version 14.0. Descriptive statistics were employed where appropriate to illustrate the characteristics of the studied population. Chi-square test was used to test association of the variables with knowledge. Those variables that were significant were then entered into multiple regression model to determine the strength of association. A significance level of 0.05 was used.

Results

A total of 322 respondents from three selected Districts in the Southern part of the Volta Region participated in the study. The mean age was 42.05 ±11.54 years and majority 101 (31.4%) out of the 322 respondents were aged 30-39 years. Most, 213 (66.2%) were females and majority, 94 (29.2%) had only primary level of education. More than half, 176 (54.7%) were self-employed. Majority, 258 (80.1%) were married with mean duration of marriage 4.58 ± 10.55 years (Table 1 and 2).

Table 1: Socio demographic characteristics of 322 respondents

Variable	Frequency (N=322)	Percent (%)
Age		
<30 years	36	11.2
30 – 39 years	101	31.4
40-49 years	96	29.8
50 years and above	89	27.6
Sex		
Male	109	33.8
Female	213	66.2
Educational level		
No formal education	70	21.7
Primary	94	29.2
JHS/Middle School	91	28.3

Secondary	34	10.6
Tertiary	33	20.2
Occupation		
Formal employment	40	12.4
Self-employed	176	54.7
Unemployed	106	32.9

Table 2: Socio demographic characteristics of respondent's cont...

| Variable	Number	(%)
Ethnicity		
Ewe	204	63.4
Anlo	47	14.6
Mafi	38	11.8
Avenor/Agave	24	7.4
Others	9	2.8
Religion		
Christian	282	87.6
Muslim	10	3.1
Traditionalist	30	9.3
Marital status		
Married	258	80.1
Co-habiting	64	19.9
Duration of marriage		
≤ 5 years	80	24.8
6 – 10 years	69	21.4
11 – 15 years	52	16.2
16 – 20 years	51	15.9
>20 years	70	21.7
Have taken alcohol before		
Yes	164	50.9
No	158	49.1
Have smoked before		
Yes	61	18.9
No	261	81.1

A total of thirty-five (10.9%) of the respondents did not have children; of which, majority 13 (37.1%) of them had tried for about 2-3 years to have a child. Among those who had a child, 13 (4.0 %) had tried having another child; among whom 6 (46.1%) had tried for periods between 3 and 4 years. Only 16 (33.3%) of those with infertility had find out the causes of their infertility as shown in table (Table 3).

Table 3: Determination of infertility among respondents

Variable	Frequency (N=322)	Percent (%)
Have a child		
Yes	287	89.1
No	35	10.9
Number of years you have tried to have a child (n=35)		
2-3 years	13	37.2
4-5 years	11	31.4
>5 years	11	31.4
Number of children (n=287)		
One	30	10.5
2-3	106	36.9
4-5	89	31.0
>5	62	21.6
Have tried to have a second child (n=287)		
Yes	13	4.5
No	274	95.5
Number of years you have tried to have a 2nd child (n=13)		
1-2 years	3	23.1
3-4 years	6	46.1
5 years & above	4	30.8
Found out the cause of infertility(n=48)		
Yes	16	33.3
No	32	66.7
Cause of infertility (n=16)		
Disease	4	25.0
Pregnancy related conditions	3	18.8
Abnormal sperm/impotence	5	31.2
Spiritual/Witchcraft	2	12.5
Don't know	2	12.5
Where you found out about infertility(n=16)		
Herbalist/Spiritualist	4	25.0
Hospital	11	68.8
No where	1	6.2

Of the 322 respondents, 35 (10.9%) had primary infertility, and 13 (4.0%) had secondary infertility (Figure 1). Thus, overall infertility was 14.9%.

Figure 1: Prevalence of infertility among couples
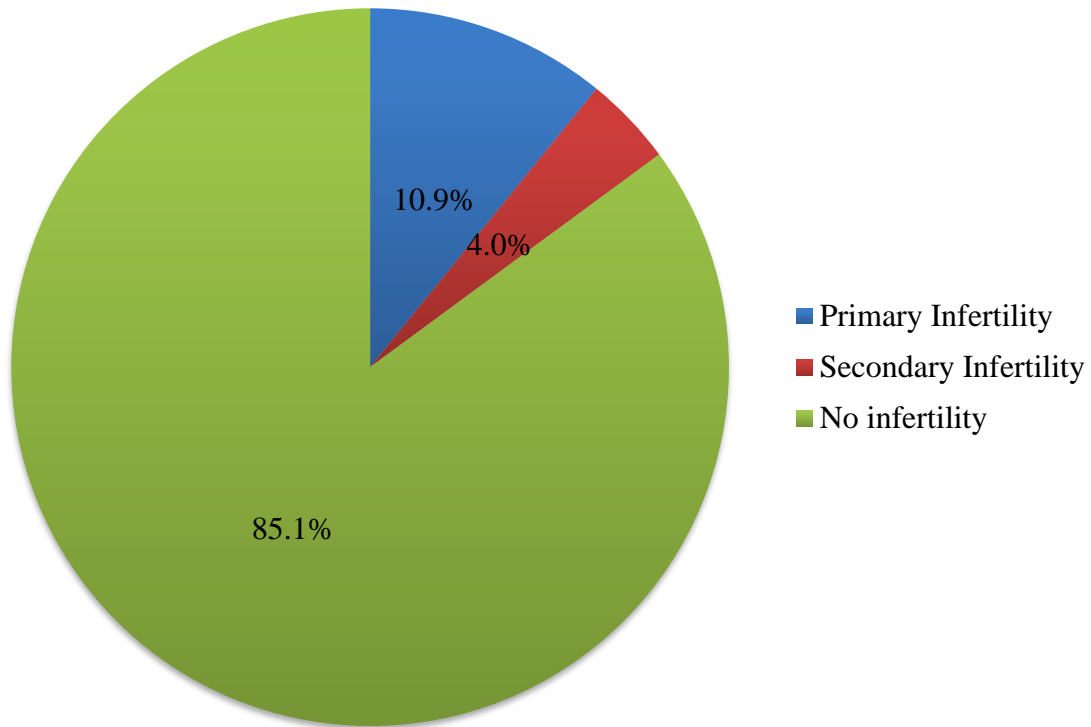
Majority, 274 (85.7%) knew that sperm abnormality could cause infertility whiles 244 (75.8%) and 228 (70.8%) also knew that tubal blockage and abnormal menstruation could cause infertility respectively. Most, 220 (68.3%) thought that infertility could be caused by witches and 241 (74.8%) also thought it could be caused by supernatural powers (Table 4).

Table 4: Knowledge of respondents on causes of infertility

Variable	Frequency (N=322)	Percent (%)
Tubal blockage		
No	78	24.2
Yes	244	75.8
Abnormal menstruation		
No	94	29.2
Yes	228	70.8
Sperm abnormality		
No	46	14.3
Yes	276	85.7
Reproductive tract infection		
No	137	42.6
Yes	185	57.4
Previous use of contraceptive		
No	173	53.7
Yes	149	46.3
STIs		

No	155	48.1
Yes	167	51.9
Pelvic adhesion		
No	159	49.4
Yes	163	50.6
Witches		
No	102	31.7
Yes	220	68.3
Supernatural powers		
No	81	25.2
Yes	241	74.8
Psychological distress		
No	149	46.3
Yes	173	53.7

Regarding risk factors of infertility, majority 256 (79.5%) knew that a woman who is 45 years and above is at risk of infertility. Majority, 272 (84.5%) and 210 (65.2%) had knowledge that fibroid and hernia could predispose women and men respectively to infertility. About 288 (89.4%) knew that abortion could lead to infertility (Table 4.5).

Table 5: Knowledge of couples on risk factors of infertility

Variable	Frequency(N=322)	Percent (%)
45+years is a risk factor of infertility for women		
Yes	256	79.5
No	36	11.2
Don't know	30	9.3
Alcohol drinking as a predisposing factor of infertility		
Yes	83	25.8
No	94	27.6
Don't know	150	46.6
Smoking can lead to infertility		
Yes	59	18.3
No	94	29.2
Don't know	169	52.2
Obesity can cause infertility		
Yes	112	34.8
No	129	40.0
Don't know	81	25.2
Underweight can cause infertility		
Yes	100	31.1
No	142	44.1
Don't know	80	24.8

Lack of exercise can lead to infertility		
Yes	106	32.9
No	138	42.9
Don't know	78	24.2
Chronic disease can lead to infertility		
Yes	145	45.0
No	89	27.7
Don't know	88	27. 3
Fibroid can predispose women to infertility		
Yes	272	84.5
No	36	11.2
Don't know	14	4. 3
Hernia predisposes men to infertility		
Yes	210	65.2
No	82	25.5
Don't know	30	9. 3
Abortion can lead to infertility		
Yes	288	89.4
No	15	4.7
Don't know	19	5.9

Overall knowledge on causes of infertility among respondents

Figure 2 show that, 51% of the respondents had good knowledge regarding the causes of infertility.

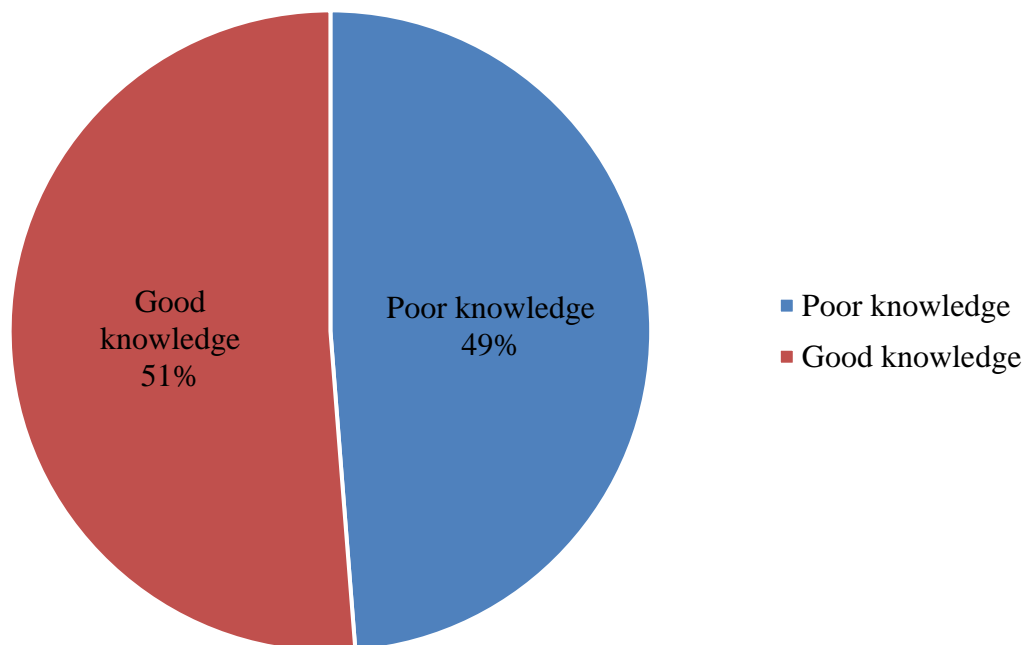Figure 2: Knowledge of couples on infertility

Table 6 presents association between demographic characteristics and knowledge on the causes of infertility. There was significant association between age and level of knowledge on causes of infertility ($\chi2$=12.85, p=0.005). Educational levels of the respondents were significantly associated with their levels of knowledge ($\chi2$=23.61, p<0.001). The study found that ethnicity was associated significantly with the levels of knowledge on causes of infertility ($\chi2$=42.30, p<0.001). Duration of marriage was also significantly associated with knowledge on causes of infertility ($\chi2$=13.73, p=0.008). Alcohol consumption ($\chi2$=31.18, p<0.001) and smoking status ($\chi2$=4.26, p=0.039) were also found to be significantly associated with knowledge on causes of infertility.

Multivariable logistic regression revealed that couples who had tertiary education were 3.38 times more likely to have good knowledge on causes of infertility compared to those who had no formal education [AOR=3.38 (95%CI: 1.13 – 10.11), p=0.029]. Respondents from Anlo, Mafi and Avenor/Agave were 67%, 91% and 63% times less likely to have knowledge on causes of infertility compared to couples who were Ewes [AOR=0.33 (95%CI: 0.15 – 0.71), p=0.005; AOR=0.09 (95%CI: 0.03 – 0.26), p<0.001; AOR=0.37 (95%CI: 0.14 – 0.98), p=0.046] respectively. Respondents who did not consume alcohol were twice more likely to have good knowledge on causes of infertility compared to those who consumed alcohol [AOR=2.29 (95%CI: 1.31 – 4.02), p=0.004].

Table 6: Association between demographic characteristics and knowledge on the causes of infertility

Variable	Poor knowledge N=157 (%)	Good knowledge N=165 (%)	Total (N=322)	$\chi2$	p-value	COR [95%CI] p-value	AOR [95%CI] p-value
Age							
<30 years	17 (10.8)	19 (11.5)	36 (11.2)				
30 – 39 years	39 (24.9)	62 (37.6)	101 (31.4)			1.42 [0.66 – 3.06] 0.368	1.32 [0.51 – 3.38] 0.560
40-49 years	44 (28.0)	52 (31.5)	96 (29.8)			1.06 [0.49 – 2.28] 0.887	0.95 [0.33 – 2.74] 0.926
50 years and above	57 (36.3)	32 (19.4)	89 (27.6)	12.85	**0.005**	0.50 [0.23 – 1.10] 0.085	0.85 [0.24 – 3.08] 0.809
Sex							
Male	60 (38.2)	49 (29.7)	109 (33.8)				
Female	97 (61.8)	111 (70.3)	213 (66.2)	2.61	0.106	1.46 [0.92 – 2.33] 0.107	
Educational level							
No formal education	32 (20.4)	38 (23.0)	70 (21.7)				
Primary	40 (25.5)	54 (32.7)	94			1.14 [0.61 –	0.70 [0.33 –

						2.12] 0.687	1.49] 0. 355
JHS/Middle School	62 (39.5)	29 (17.6)	91 (28.3)			0. 39 [0.21 – 0.75] **0.005**	0.47 [0.22 – 1.00] 0.051
Secondary	15 (9.5)	19 (11.5)	34 (10.6)			1.07 [0.47 – 2.43] 0.878	1.05 [0. 39 – 2.83] 0.917
Tertiary	8 (5.1)	25 (15.2)	33 (10.2)	23.61	**<0.001**	2.63 [1.04 – 6.63] **0.040**	3. 38 [1.13 – 10.11] **0.029**
Occupation							
Formal employment	16 (10.2)	24 (14.6)	40 (12.4)				
Self-employed	89 (56.7)	87 (52.7)	176 (54.7)			0.65 [0. 32 – 1. 31] 0.229	
Unemployed	52 (33.1)	54 (32.7)	106 (32.9)	1.46	0.481	0.69 [0. 33 – 1.45] 0. 329	

Table 6: Association between demographic characteristics and knowledge on the causes of infertility cont…

Variable	Poor knowledge N=157 (%)	Good knowledge N=165 (%)	Total (N=322)	χ^2	p-value	COR [95%CI] p-value	AOR [95%CI] p-value
Ethnicity							
Ewe	74 (47.1)	130 (78.8)	204 (63.4)				
Anlo	31 (19.8)	16 (9.7)	47 (14.6)			0.29 [0.15 – 0.57] **<0.001**	0. 33 [0.15 – 0.71] **0.005**
Mafi	33 (21.0)	5 (3.0)	38 (11.8)			0.09 [0.03 – 0.23] **<0.001**	0.09 [0.03 – 0.26] **<0.001**
Avenor/Agave	15 (9.6)	9 (5.5)	24 (7.4)			0. 34 [0.14 – 0.82] **0.016**	0. 37 [0.14 – 0.98] **0.046**
Others	4 (2.5)	5 (3.0)	9 (2.8)	42.30	**<0.001**	0.71 [0.18 – 2.73] 0.620	0.60 [0.13 – 2.83] 0.523
Religion							
Christian	134 (85.3)	148 (89.7)	282 (87.6)				
Muslim	5 (3.2)	5 (3.0)	10 (3.1)			0.90 [0.25 – 3.20] 0.877	
Traditionalist	18 (11.5)	12 (7.3)	30 (9.3)	1.70	0.428	0.60 [0.28 – 1. 30] 0.197	
Marital status							
Married	124 (79.0)	134 (81.2)	258				

			(80.1)			
Co-habiting	33 (21.0)	31 (18.8)	64 (19.9)	0.25	0.616	0.87 [0.50 – 1.50] 0.616	
Duration of marriage							
≤ 5 years	35 (22.3)	45 (27.2)	80 (24.9)				
6 – 10 years	26 (16.6)	43 (26.1)	69 (21.4)			1.28 [0.66 – 2.48] 0.453	1.26 [0.55 – 2.88] 0.598
11 – 15 years	25 (15.9)	27 (16.4)	52 (16.2)			0.84 [0.42 – 1.69] 0.626	0.87 [0. 34 – 2.22] 0.774
16 – 20 years	24 (15.3)	27 (16.4)	51 (15.8)			0.88 [0.43 – 1.77] 0.711	1.07 [0. 38 – 3.02] 0.899
>20 years	47 (29.9)	23 (13.9)	70 (21.7)	13.73	**0.008**	0.38 [0.19 – 0.74] **0.004**	0.59 [0.18 – 1.90] 0. 376
Alcohol consumption status of respondents							
Yes	105 (66.9)	59 (35.8)	164 (50.9)				
No	52 (33.1)	106 (64.2)	158 (49.1)	31.18	**<0.001**	3.63 [0.29 – 5.75] **<0.001**	2.29 [1. 31 – 4.02] **0.004**
Smoking status of respondents							
Yes	37 (23.6)	24 (14.6)	61 (18.9)				
No	120 (76.4)	141 (85.4)	261 (81.1)	4.26	**0.039**	1.81 [1.03 – 3.20] **0.041**	1.53 [0.77 – 3.04] 0.223

Discussion

The primary infertility in this study was (10.9%), and 13 (4.0%) had secondary infertility. Thus, overall infertility was 14.9%. The finding of this study is in line with the global infertility about 13% to 15% (Kamel, 2010). The prevalence of the current study of 14. 9%, shows an increase from 6.4% of previous study in Iran Craig et al., 2019. The previous study was systematic review of secondary data. In our study, primary data was used.

However, a study conducted by Bushnik et al. (2012) in Canada revealed a prevalence of 31.5% which was higher than the prevalence of the current study. The inconsistency between the current study and the study Bushnik and colleagues could be as a result of the fact that in their study, data was collected throughout the year while in this current study, data was collected within six weeks. Also, public education on the causes of infertility and the establishment of infertility centers could play roles in reducing the prevalence over the years.

The prevalence reported in the current study is higher than that reported in a study conducted in a tertiary facility among couples, 8.1% (Chethana & Shilpa, 2016) in India, and also lower than that

reported among married women, 7% (Nayak, Ramakrishna, Venkateswar and Vijayshree, 2017). The discrepancy between the current study and the study by Chethana and Shipa (2016) in India could be as a result of the settings of the studies. The study in India was a facility-based study involving infertile couples who had sought infertility treatment which might reduce the prevalence among the couples while the current study is non-facility-based study.

However, the prevalence of the current study is lower than that reported by (Polis, Cox, Tunçalp, McLain& Thoma, 2017) in Nigeria; Cong et al. (2016) in China, as well as Geelhoed et al. (2002), also reported prevalence higher than that found in this study. The difference in the prevalence of the current study and the prevalence by Polis et al. (2017) in Nigeria could be because a larger sample was used in their study while in this study, comparatively, a smaller sample was used. Also in this study, three districts were included while the study by Polis involved different countries.

The current study also found a 10.9% prevalence of primary infertility and 4.0% prevalence for secondary infertility. Comparing the findings with that of Polis et al. (2017), they found a higher prevalence (17.4%) of primary infertility and higher secondary infertility prevalence of 34.1%. The prevalence rates of primary and secondary infertility found in this current study were also different from the findings of Elhussein et al. (2019) in Sudan who found higher primary infertility (68.9%) and higher secondary infertility prevalence of 31.1%. Similarly, Bushni et al. (2012) in Canada, reported a higher prevalence of primary infertility of 25.5% as compared to the primary prevalence recorded in this study. Cong et al. (2016) also found a higher prevalence of secondary infertility (12.1%) in China. However, across the African continent, a lower prevalence of primary infertility (4.98%) was found in India by Kazmi et al., (2018). The higher prevalence of primary and secondary infertility in other studies compared to primary infertility in this study could be a result of country variability. The higher prevalence of secondary infertility could also be due to respondents involved in birth control practices after birth that could have affected their chances of having a baby in the future.

This cross-sectional study revealed that 51% of the couples had a good knowledge regarding the cause of infertility. This finding was a greater improvement compared to the findings by Dattijo et al. (2016) in Nigeria among 406 respondents with good knowledge on the causes of infertility of 19.2%. Similarly, poor knowledge of infertility poor knowledge of 25% was reported in India by Kulkarni,(2018). Also a cross-sectional by (Ayobami, Olajumoke & Ogungbayi, 2019) from Nigeria, found a good knowledge of 44% and poor knowledge of 56% about the causes of infertility. The improved level of knowledge on infertility recorded in this study could be as a result of improved educational programs in the Southern part of the volta region that educated the public on infertility. In this study (75.8%) and (70.8%) of the respondents knew that tubal blockage and abnormal menstruation could cause infertility respectively. These agree with a study by Pathak and Yadav, 2019, which reported that 68% of the respondents correctly identify tubal blockage and abnormal menstruation as causes of infertility. Findings in their study also found out that most of the respondents believed that supernatural powers are causes of infertility which is similar to the finding of this study where 74.8% of the respondents mentioned supernatural powers to be causes of infertility. Besides, 68.2% in the current study thought witches were responsible for infertility. In Ghana Geelhoed et al. (2002) also found most of the respondents thought infertility was caused by witches. Finding of this current study is in line with a study by Abolfotouh (2013), which reported 59% knowledge level of infertility.

There was a significant association between age and level of knowledge on causes of infertility ($\chi2$=12.85, p=0.005). This finding agrees with the finding of Buting and Bovin (2008), which reported

that young people were aware that negative lifestyles are causes of infertility. Again, the duration of marriage was also significantly associated with knowledge on causes of infertility ($\chi2$=13.73, p=0.008). This maybe because couples, who are experiencing infertility, may have tried to know the causes of infertility hence have adequate knowledge on the causes of infertility.

Concerning factors that were associated with knowledge on infertility, couples who had tertiary education were more likely to have good knowledge on causes of infertility compared to those who had no formal education [AOR=3.38 (95% CI: 1.13 – 10.11), p=0.029]. This was consistent with Dattijo et al. (2016) who found that participants who had secondary education or higher had good knowledge about the causes of infertility as compared to those who had lower education. This similarity implies that the level of knowledge of couples is greatly influenced by their educational level, which in turn would influence their choice of treatment methods and practices. Couples from Anlo, Mafi and Avenor/Agave were less likely to have good knowledge on causes of infertility compared to couples who were Ewes [AOR=0.33 (95%CI: 0.15 – 0.71), p=0.005; AOR=0.09 (95%CI: 0.03 – 0.26), p<0.001; AOR=0.37 (95%CI: 0.14 – 0.98), p=0.046] respectively. This could have been as a result of the beliefs various ethnicities attached to causes of infertility in the Southern part of the Volta Region. Couples who did not consume alcohol were twice more likely to have good knowledge on causes of infertility compared to those who consumed alcohol [AOR=2.29 (95%CI: 1.31 – 4.02), p=0.004]. This could be that these couples were somehow informed about the role alcohol could play in causing infertility and therefore did not consume alcohol.

In the present study, respondents 84.5% and 79.5% referred to fibroid and old age (45 above) years being risk factors of infertility. These go with the assertion by (Fertility Society of Australia 2018; American Congress of Obstetrician Gynecology, 2017; Tabong & Adongo, 2013 in Ghana) which found out old age and fibroid as a risk factor of infertility respectively. This study also revealed that respondents, 65.2% mentioned hernia as a risk factor of infertility. Contrary to this finding, Daumler et al. (2016) in Canada found 24.4% of hernia, a risk factor of infertility. In the current study, it was found that (89.4%) of the respondents listed abortion as a risk factor for infertility. This is consistent with a study by Atijosan, Adeyeye & Ogungbayi from Nigeria (Ile Ife) (2019), which found 81.1% were documented as a risk factor for infertility.

Considering infertility-related factors, this study revealed that Mafi couples were 89 percent less likely to be infertile compared to Ewe couples (couples not belonging to any tribe in the study communities). This means that Mafi's couples could have engaged in practices that improved fertility more than those that were Ewes. This finding could also explain why Ewe couples were more knowledgeable about the causes of infertility as compared to those from the other ethnic groups. It could be argued that as they are more likely to be infertile, they seek more information about the subject compared to other ethnicities. This also suggests that there could be differences in practices that improve fertility in different ethnic groups.

Generally, a woman's fertility gradually declines with age and men over age 40 are also less fertile than younger men (American Congress of Obstetrician Gynecology, 2017). However, couples who were married for more than 20 years were less likely to be infertile compared to those who were married for less than five years [AOR=0.19 (95%CI: 0.06 – 0.66), p=0.008]. This may be as a result of couples' deliberate intentions to delay childbearing which might be a result of lack of adequate resources to take care of new-borns when nearly married or it could also be their intentional delays as a result of further education or work restrictions.Couples who did not smoke were 76% less likely to be infertile compared

to those who smoked. This is in line with the assertion of The Fertility Society of Australia (2018) which stated that female and male smokers were more likely than non-smokers to be infertile. This implies that smoking lessens the chance of achieving a pregnancy and can result in infertility. Finding in the current study also agree with a study from Korea by Harley et al. (2015), which found an association between smoking and infertility. Their finding shows that leukocytospermia, a major endogenous source of reactive oxygen species (ROS), was associated with smoking. It was found that tobacco smoke produces ROS at levels capable of disrupting the endogenous antioxidant defense. Increased seminal levels of ROS in smokers expose their sperm to oxidative stress, thereby impairing the role of sperm and eventually undermining male fertility (Harlev, Agarwal, Gunes, Shetty& du Plessis, 2015).

This study also revealed thatcouples who did not know that alcohol consumption was a risk factor of infertility were less likely to be infertile [AOR=0.42 (95%CI: 0.18 – 0.95), p=0.038]. The use of alcohol by either a woman or a man lessens the chance of achieving a pregnancy. It also has a negative impact on how effective fertility treatments are (American congress of Obstetrician Gynecology, 2017). It is expected that improved knowledge on the role of alcohol and tobacco play in causing infertility could encourage couples to desist from such risky behaviors.

Conclusions

The prevalence of infertility in this study was within the global prevalence (13-15%). Approximately three in every twenty couples are infertile in the Southern part of the Volta Region. The overall level of knowledge of couples on causes of infertility was (51%). Knowledge on causes of infertility was influenced greatly by the couple's educational level, ethnicity (tribe). Respondents had misconceptions about witches and supernatural powers being the causes of infertility. Most of the respondents were unaware that smoking and alcoholism are risk factors of infertility. This study found strong positive association between consumption of alcohol and infertility. Effective pre-conception clinic care should be implemented, where people would be taught about infertility and couples screened for it.

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