Ghanaian Male Adolescents' Knowledge about Female Fertile Period

Patricia Mawufemor Baku[1*]

Samuel Harrenson Nyarko[2,3]

Abstract

Male adolescents seem to be excluded from pregnancy prevention programmes although they play a major role in sexual intercourse initiation. Information on the sociodemographic dynamics of male adolescents' knowledge about the female fertile period is currently virtually non-existent. This paper examines the level of knowledge and the sociodemographic factors that affect knowledge about female fertile period among male adolescents in Ghana. This study is based on secondary data from the 2004 National Survey of Adolescents (NSA) of Ghana, which included 1,137 respondents. Logistic regression analysis was performed to determine the factors affecting respondents' knowledge about the female fertile period. The result shows that about 70% of male adolescents reported that they have a knowledge about the fertile period of a woman's menstrual cycle. However, only 14.2% of them correctly identified the specific fertile period within the female menstrual cycle. Knowledge about the female fertile period was significantly related to the age of respondent ($p<0.008$), level of education ($p<0.002$), attendance of sex education classes ($p<0.007$), and region of residence ($p<0.002$) of respondents. In a nutshell, the level of accurate knowledge about the female fertile period is quite low among male adolescents in Ghana, and this is affected by some sociodemographic characteristics of the respondents. It is, therefore, essential to develop health and family life education programmes for adolescents, particularly the males, to empower them through knowledge about sexual and reproductive health matters.

Keywords: knowledge, female fertile period, male adolescents, Ghana.

[1] Health Promotion Department, Volta Regional Health Directorate, Ghana Health Service, Ho, Ghana.

[2]Department of Population and Behavioural Sciences, School of Public Health, University of Health and Allied Sciences, Hohoe, Ghana.

[3]Department of Demography, College of Public Policy, The University of Texas at San Antonio, San Antonio, Texas, United States.

*Corresponding author email address: patbaku@yahoo.com

Introduction

Globally, many young people encounter difficulties in accessing sexual and reproductive health information and services (Morris & Rushwan, 2015). In order to make healthy choices during their transitional years, young people need information, skills, services, and opportunities (Save the Children, 2007). Sometimes, such services may not be available, and where they exist, they may not be affordable or accessible to young people (Guttmacher Institute, 2006). Hughes and McCauley (1998) contend that young people do not avoid clinics simply because they have fulfilled their sexual and reproductive health needs. Rather, once they get sources of accurate and confidential information, they use them (Hughes & McCauley, 1998). However, it has been observed that young people often have inadequate or misleading information on sexuality and contraceptive use (Nyamekye, 2005). Furthermore, according to the Guttmacher Institute (1998), there has been a growing consensus on the need to adequately include adolescent boys and young men in sexual and reproductive health initiatives. Lungren (2000) also asserts that the focus on the role of men in the reproductive and sexual health of women and the importance of including them in reproductive health programmes should be renewed.

Male adolescents need health information and services, self-care skills, life skills, livelihood skills, and leadership skills to develop. Moreover, they need information about safe sex practices including sexual negotiation skills to protect themselves from potentially dangerous and abusive relationships (World Health Organisation, 1998). They also need accurate information on how to protect their health and development and practice healthy behaviours (Ghana Health Service, 2009). Furthermore, it has been observed that, in developing countries, young men appear to be neglected from pregnancy prevention and family life education programmes despite their substantial role in initiating sexual intercourse (Gage, 1998).

A document on Adolescent Reproductive Health Policy of Ghana was published in the year 2000 by the government of Ghana to provide an enabling environment and policy framework within which young people can access information and services on sexual and reproductive health, as well as exercise their reproductive rights (National Population Council [NPC], 2000). The policy reflects the essence of the International Conference on Population and Development (ICPD) programme of action, which explicitly refers to the right of young people to information, services, and involvement in planning (Luke, 1998). The policy primarily focuses on adolescents, including those in educational institutions, marginalized groups such as street children, street-involved adolescents, and physically and mentally disabled adolescents. The secondary focus is on parents, older spouses or partners of adolescents, teachers, community and religious leaders, service providers, and policy-makers that influence the behavior and opinion of adolescents (NPC, 2000). However, no formal structures have been put in place for monitoring or identifying spatial and socio-demographic variations in the targets (Awusabo-Asare, Abane, & Kumi-Kyereme, 2004). Also, it is apparent that no provision has been made for programmes or health care services specifically for male adolescents; consequently, the policy could not achieve much success.

Currently, there is a considerable dearth of empirical literature on knowledge among adolescents, particularly males, about the female fertile period. Knowledge of the female fertile period among male adolescents is expected to help prevent many unwanted female pregnancies since they play a substantial role in sexual initiation. Consequently, this study seeks to examine the knowledge level and the factors that

predict knowledge of the female fertile period among male adolescents in Ghana. To achieve this purpose, the study seeks to answer the following research questions: what is the level of accurate knowledge about the female fertile period among male adolescents in Ghana? Do sociodemographic characteristics affect knowledge about the female fertile period among male adolescents in Ghana?

Theoretical Framework and Literature Review

This paper is informed by the tenets of the life skills approach developed by the Pan American Health Organization [PAHO] (2001). This approach draws on a set of different but interrelated perspectives from the social and behavioural theories such as child and adolescent development (Eccles, 1999; Piaget, 1972, Tyler et al., 1991), social learning (Bandura, 1977), problem behaviour (Jessor, 1992), social influence (McGuire, 1964; Bandura, 1977), cognitive problem solving (Shure & Spivack, 1980), multiple intelligences (Gardner, 1993), and risk and resilience (Rutter, 1987). While some of these theories focus on behavioural outcomes, others concentrate on the acquisition of life skills such as competency in problem-solving, interpersonal communication, and resolving conflicts as crucial elements of healthy human development (PAHO, 2001). These theoretical perspectives view life skills as a way for adolescents to actively participate in the process of their own development and of constructing social norms by providing them with the tools for solving problems, making decisions and managing emotions as a means of empowerment (PAHO, 2001). Thus, the life skills approach works in three main categories: the development of social, cognitive and emotional coping skills (Edberg, 2008, Institute for Reproductive Health [IRH], 2013a). These three skill categories are said to be employed, not separately, but to complement and reinforce each other. For instance, a program aimed at promoting social competence in children would teach ways to communicate feelings (a social skill), to analyze different ways of handling social situations (a cognitive skill), and to manage their reactions to conflict (an emotional coping skill) (IRH, 2013a).

This approach looks at adolescents in totality, including their reproductive health, and it comprises strategies that are considered vital in addressing their sexual and reproductive health needs. In the context of this paper, it serves as a strategy that can provide access to accurate sexual and reproductive health information that allows male adolescents to gain fertility awareness concerning both males and females and to make informed choices about their sexual behaviours. It has been observed that fertility awareness, or in this context, female fertile period knowledge, is instrumental in enhancing one's personal perception of pregnancy risk, influencing sexual attitudes and behaviours, and for that matter, reducing unintended pregnancies (IRH, 2013a).

A comprehensive review of the literature shows that knowledge of the female fertile period has been broadly defined as fertility awareness by many studies (IRH, 2013a). Fertility awareness as it is frequently referred to in the literature has been found to be either low or nonexistent among adolescents, particularly males (Katz & Nare, 2002; Sydsjo et al., 2006; Parasuraman et al, 2009). For instance, in a study carried out in Senegal and the United States, only one-third of young men and women correctly identified the time of the menstrual cycle when a woman is most likely to get pregnant (Katz & Nare, 2002; Berger et al., 2012). It is observed that there is the need to increase young adults' fertility awareness to help them make more informed decisions about when to have sex and which methods of contraception to use, in order to reduce the rates of

unintended pregnancies among adolescents (Berger et al., 2012). It was also apparent that even though the majority of young people believe that they have enough knowledge to avoid unintended pregnancies, their level of fertility awareness means that they may not know as much as they think they do about this subject (Berger et al., 2012). While several studies have examined fertility awareness or knowledge of the female fertile period, only a limited number have gone further to examine the socio-demographic characteristics that affect fertility awareness, such as age, education level, sex education and place of residence, among others. A few studies have found that age has a significant effect on the fertility awareness of respondents (Berger et. al., 2012, Katz & Nare, 2002; Sydsjo et al., 2006). The studies found that older adolescents are more likely to be knowledgeable about fertility awareness than their younger counterparts. However, there is an indication that among men, fertility awareness is usually low irrespective of age (Berger et al., 2012).

Furthermore, the effect of education level on fertility awareness has been documented by a few studies (Katz & Nare, 2002; Berger et al., 2012; IRH, 2013a), while others did not find any effect whatsoever. Berger et al. (2012), in the United States, found that education level has a significant effect on knowledge about the fertile period, with respondents who had a college degree or higher being more likely to have accurate knowledge about the female fertile period than their counterparts who had some college education or high school education or less. This effect has also been observed in India where young men who had higher education tended to have a higher knowledge of the fertile days (Bloom et al., 2000). Additionally, in an analysis of demographic and health survey (DHS) data from six developing countries (Philippines, Democratic Republic of Congo, Morocco, Azerbaijan, Cameroon, and Bolivia), it was found that education has a significant effect on knowledge, and that highly educated respondents are more likely to respond "halfway between two periods" when asked when a woman is most likely to be fertile (IRH, 2013b). Thus, education really plays a considerable role in improving fertility awareness among young people and helps them to gain the required life skills regarding sexual and reproductive health. The effect of sex education on fertility awareness among adolescents is not well established in the literature. However, a few studies such as Roth (1993), Breuner et al. (2016) and Jaramillo et al. (2017) have all observed a positive effect of sex education on fertility awareness among adolescents. Breuner et al. (2016) contend that appropriate and evidence-based sexuality education provided over time is important to help children and adolescents make informed, positive, and safe choices about healthy relationships, responsible sexual activity, and their reproductive health. They further maintain that sexuality education helps to prevent and reduce the risks of adolescent pregnancy and sexually transmitted infections (Breuner et al., 2016). Roth (1993), on the other hand, found that fertility awareness is significantly improved when adolescents are provided with sexuality education. In sum, it appears that the sociodemographic dynamics of female fertile period knowledge is not adequately explored in the literature, and is, therefore, an area for further research.

Methods

Source of Data

Data for the study were extracted from the 2004 National Survey of Adolescents (NSA) of Ghana. The Survey was conducted by the Institute of Statistical, Social and Economic Research of the University of Ghana, the ORC Macro, the Department of Geography and Tourism of the University of Cape Coast and the Guttmacher Institute. Launched in four sub-Saharan African countries: Ghana, Burkina Faso, Malawi, and

Uganda in 2004, the survey sought to investigate a wide range of issues relating to sexual and reproductive health among adolescents aged 12 to 19 (Awusabo-Asare, Biddlecom, & Zulu, 2008). The Ghanaian version was administered between January and May 2004 across the ten regions of the country. The sample for the survey comprised adolescents living in private residences in Ghana. The survey used a two-stage stratified sampling technique to select the respondents. Thus, regional clusters were first selected in all the ten regions of the country and households were then chosen from each selected cluster using household listings (Awusabo-Asare et al., 2008).

The number of adolescents who participated in the survey was 4,430. However, since this study was conducted among male adolescents, only the 2,229 male adolescents who participated in the survey were targeted. Moreover, since the survey focused on many issues concerning the sexual and reproductive health of adolescents, only the 1,137 respondents who were involved in the female fertile period aspect were included in the study. In obtaining the data for the study, an official application was written to The Alan Guttmacher Institute for permission to use their data. Access was subsequently granted, and the data downloaded for the study.

Study Variables

The outcome variable of the study is knowledge about days on which a female is likely to become pregnant, which is a dichotomous variable in the form of "Yes and No". Several predictor variables were considered in this study. Age of the respondents was re-coded into younger adolescents (12-15 years) and older adolescents (16-19 years). Education was categorized as no formal education, primary school education, and secondary school/higher education while ethnicity was measured as Akan, Ga-Dangme, Ewe, Mole-Dagbani, and others. Also, religious affiliation was re-coded as Christian, Muslim, Traditionalist, no religion, and others. These variables were re-coded to suit the purpose of the study. Other predictor variables that were examined include the use of the internet, attendance of sex education classes, and type and region of residence of the respondent.

Data Processing and Analysis

The Statistical Package for Social Sciences (SPSS version 21) was used to process and analyze the data. Frequency tables were used to present the background characteristics of the respondents as well as their level of knowledge about the female fertile period. A logistic regression model was used to examine the predictors of knowledge of the female fertile period. The results are presented in tables in the form of odds ratios, p-values, and confidence intervals.

Results

Background Characteristics of Respondents

The background characteristics of the respondents who were included in this study have been summarised in Table 1. More than half (56.4%) of the respondents were aged 16 to 19 (older teenagers), while 43.6% were aged 12 to 15 (younger teenagers). About 60.0% of the respondents had secondary school or higher education and 33.1 % had primary school education; only a few (7.4%) had no formal education. Concerning respondents' ethnicity, 47.8% of them were Akan, 17.3% were Mole-Dagbani while only 7.1% were Ga-Dangme. On religious affiliation, the majority were Christians (73.4%); Muslims represented 20.1%,

while only a few (1.2%) had other miscellaneous religious affiliations. Further, the majority (83.6%) of the respondents reported that they had never used the internet, with just 16.4% having ever done so. Also, the majority (79.2%) of the respondents had ever attended sex education classes while 20.8% had not. More than half (52.9%) of them lived in rural areas while 47.1% lived in urban areas. In terms of region of residence, 18.6% were from the Greater Accra region, followed by 17.9% from the Ashanti region, and 12.0% from the Brong Ahafo region.

Table 1: Background characteristics of respondents

Variable	Frequency	Percentage
Age		
12-15	496	43.6
16-19	641	56.4
Level of education		
No education	84	7.4
Primary school	376	33.1
Secondary school/Higher	677	59.5
Ethnicity		
Akan	543	47.8
Ga-Dangme	81	7.1
Ewe	135	11.9
Mole-Dagbani	196	17.3
Others	181	15.9
Religious affiliation		
Christian	835	73.4
Muslim	228	20.1
Traditional religion	22	1.9
No religion	38	3.3
Others	14	1.2
Ever use the internet		
Yes	172	16.4
No	879	83.6
Attended sex education classes		
Yes	510	79.2
No	134	20.8
Type of residence		
Urban	536	47.1
Rural	601	52.9
Region		
Western	81	7.1
Central	71	6.2
Greater Accra	212	18.6
Volta	99	8.7
Eastern	95	8.3
Ashanti	204	17.9
Brong Ahafo	136	12.0
Northern	84	7.4
Upper East	58	5.1
Upper West	97	8.5

Source: National Survey of Adolescents, 2004

Level of Knowledge about Female Fertile Period among Respondents

In order to assess the level of knowledge on the female fertile period, the male adolescents were asked whether they know when a female is likely to be fertile and if yes, to indicate the specific time that a female is likely to become pregnant during the menstrual cycle. A summary of the results has been presented in Table 2. Almost 70% of the respondents reported that they know the days a female is likely to become pregnant. However, when asked to indicate the specific time, about 14 % of the younger adolescents (12-15 years) and 18.2 % of the older adolescents (16-19 years) indicated that pregnancy is likely to occur just before a woman's period begins, while 30.2 % of the younger adolescents (12-15 years) and 23.6 % of the older adolescents (16-19 years) reported that a woman is likely to be fertile during her menstrual period.

Table 2: Knowledge of specific time for pregnancy occurrence

	Age group		
Knowledge of female fertile period	12-15	16-19	Total
Days more likely to become pregnant			
Yes	291(58.7)	501(78.2)	792 (69.7)
No	205(41.3)	140(21.8)	345(30.3)
Specific time to become pregnant			
Just before the period begins	40(13.9)	91(18.2)	131(16.6)
During her period	87(30.2)	118(23.6)	205(26.0)
Right after her period has ended	78(27.1)	145(29.0)	223(28.3)
Halfway between two periods	33(11.4)	79(15.8)	112(14.2)
Don't know	50(17.4)	67(13.4)	117(14.9)

Source: National Survey of Adolescents, 2004

NB: Percentages are in the brackets

Also, about 27% of the younger adolescents and 29% of the older ones indicated that a woman is likely to become pregnant right after her menstrual period ends.

Moreover, 17.4% of the younger adolescents and 13.4% of the older adolescents reported that they did not know when a woman is likely to become pregnant. Only 11.4% of younger adolescents and 15.4% of older adolescents rightly reported that a woman is likely to become pregnant halfway between her two menstrual periods. On the whole, 26% of the respondents reported "during her period" and 28.3% reported "right after her period has ended' as the likely time for a woman to become pregnant; 14.9% reported that they did not know. In total, only 14.2% of the respondents rightly reported that a woman is most likely to be fertile halfway between her two menstrual periods.

Factors Affecting Female Fertile Period Knowledge among Respondents

In this section, predictors of respondents' knowledge about the female fertile period were examined as per their background characteristics. A summary of the results is presented in Table 3. From the logistic regression model, the age of respondent, level of education, attendance of sex education classes, and region of residence were found to have a significant relationship with knowledge of the female fertile period among the respondents. However, religious affiliation, ethnicity, use of the internet and the type of residence had no significant relationship with knowledge about the female fertile period. The odds of female fertile period knowledge were higher (1.89 times) among respondents aged 16 to 19 compared to those aged 12

to 15 (p<0.008). Also, the odds of female fertile period knowledge were 2.0 times for respondents who had primary school education (p<0.006), and 4.12 times for respondents with secondary school or higher education (p<0.002) compared to their counterparts who had no formal education.

Table 3: Logistic regression analysis of female fertile period among male adolescents.

Variables	Odds Ratio (OR)	P- value	95% Conf. Interval
Age			
12-15 (Ref)	1		
16-19	1.89	0.008***	1.186 – 3.022
Level of education			
No formal education (Ref)	1		
Primary	2.00	0.006***	1.225 - 3.260
Secondary/higher	4.12	0.002***	1.717 - 9.867
Religious affiliation			
Christian (Ref)	1		
Muslim	0.53	0.142	0.223 - 1.239
Traditional/spiritualist	1.56	0.706	0.155 - 5.710
No religion	0.66	0.492	0.202 - 2.158
Others	2.72	0.363	0.316 - 3.328
Ethnicity			
Akan (Ref)	1		
Ga/Dangme	0.91	0.855	0.338 - 2.457
Ewe	1.07	0.874	0.455 - 2.524
Mole-Dagbani	2.12	0.561	0.168 - 6.700
Other	1.63	0.272	0.683 - 3.869
Ever use the internet			
Yes (Ref)	1		
No	0.66	0.218	0.338 - 1.281
Attended sex education classes			
Yes (Ref)	1		
No	0.48	0.007***	0.281 - 0.814
Place of residence			
Urban (Ref)	1		
Rural	1.29	0.281	0.810 - 2.063
Region of residence			
Western (Ref)	1		
Central	1.99	0.240	0.632 - 6.237
Greater Accra	2.67	0.061	0.957 - 7.428
Volta	1.16	0.786	0.397 - 3.388
Eastern	2.02	0.150	0.775 - 5.275
Ashanti	2.71	0.017*	1.197 - 6.151
Brong Ahafo	4.85	0.002***	1.781 - 13.228
Northern	2.13	0.559	0.168 - 7.164
Upper East	3.06	0.375	0.258 - 6.259
Upper West	0.11	0.108	0.008 - 1.622

Source: National Survey of Adolescents, 2004

NB: Ref= Reference category; * p≤0.05; **p≤0.01; *** p≤0.001

Furthermore, the odds of female fertile period knowledge were higher for traditionalists and 'other' respondents, but lower for Muslim respondents and for those who had no religion compared to respondents who are Christian, although the effect is not significant. Similarly, the odds of female fertile period knowledge were higher for the Ewe, Mole-Dagbani, and 'others' categories, but lower for Ga-Dangme compared to Akan respondents. However, the relationship between the two variables is weak. The odds were also lower for respondents who had never used the internet compared to those who had, but the effect was insignificant. Additionally, respondents who had never attended sex education classes had lower odds (OR=0.48; $p<0.007$) of female fertile period knowledge compared to those who had attended such classes. Even though the relationship between knowledge of female fertile period and type of residence was weak, the odds of knowledge were higher for respondents from the rural settings than for those from urban settings.

Regarding the region of residence, knowledge of female fertile period was significantly related to the Ashanti region ($p<0.017$) and the Brong Ahafo region ($p<0.002$). The odds of female fertile period knowledge were 2.71 times for respondents from the Ashanti region and 4.85 times for respondents from the Brong Ahafo region compared to their counterparts from the Western region. Except for respondents from the Upper West region, respondents from all the other regions had higher odds of female fertile period knowledge compared to respondents from the Western region, although the associations were weak.

Discussion

As children grow into adolescents and adults, they may become more aware of sex and may engage in sexual intercourse due to the biological changes that take place in their bodies. As a result, they are exposed to sexually transmitted infections (STIs) and unintended pregnancies. Hence, providing them with information, skills, and services they need to protect themselves and their partners is key to reducing the incidence of unintended pregnancies and subsequently unsafe abortions. This study has found that the majority of the male adolescents believe that they have knowledge about the time a woman is likely to become pregnant during her menstrual cycle. However, the study further found that, on the whole, the level of accurate knowledge of the female fertile period among the respondents was quite low. It was found that, even though the majority of the male adolescents indicated that they have knowledge about the female fertile period, most of them failed to correctly identify the specific period in which a female is likely to become pregnant. The majority of the respondents either responded incorrectly about the female fertile period or stated that they did not know, which is consistent with the findings of Ajayi et al. (1991). Berger et al. (2012) also contend that the low level of fertility awareness suggests that adolescents may not know as much about the subject as they think they do. Furthermore, it has long been established that most adolescents know little about the menstrual cycle and human fertility. More importantly, this lack of knowledge directly encourages contraceptive risk-taking behaviours among adolescents (Roth, 1993).

The low level of knowledge about the female fertile period among male adolescents is an indication that male adolescents lack adequate and accurate information about the subject, hence, the need for life skills to help adolescents achieve optimum sexual and reproductive health. This limited knowledge among young males in Ghana about the specific time of conception has also reflected in the 2014 Ghana Demographic and Health Survey, where knowledge about the rhythm method of contraception is higher among women

than among the men (Ghana Statistical Service et al., 2015). It would be quite fair to indicate that the lack of knowledge about the female fertile period may be a consequence of lack of workable Health and Family Life Education (HFLE) in the national curriculum at the basic education level. If HFLE is added to the national education curriculum, male adolescents can be taught lessons on when and how pregnancy happens, contraception, abstinence, and sexually transmitted infections. Men play an important role in sexual and reproductive health as well as in childbearing decisions (Dudgeon, & Inhorn, 2004), and with their lower level of fertility awareness, it is important to ensure that reproductive health programmes, including fertility awareness campaigns, are more male inclusive (Pedro et al., 2018).

Apart from this, a few factors that affect the level of knowledge about the female fertile period have also been identified by this study. Age of respondent was a significant predictor of the currently observed level of female fertile period knowledge, with older adolescents (16-19 years) having a higher likelihood of knowing the female fertile period than their younger counterparts (12-15years). Hessburg et al. (2007) also observed in a study done in Ghana that only 21.0% of older male adolescents and 6.0% of younger male adolescents had in-depth knowledge about the female fertile period. The younger male adolescents may be less knowledgeable about the timing of conception than older male adolescents, possibly because of longer sexual experiences among the older male adolescents, or because they are more informed through sex education than the younger ones.

Additionally, education level was found to have a significant effect on female fertile period knowledge among male adolescents in Ghana. Consequently, male adolescents who had secondary school or higher education are found to be more likely to be knowledgeable about the female fertile period than those who had no formal education. Thus, education becomes a protective factor for having accurate knowledge about the female fertile period, even for respondents who have primary school education. This may be because most respondents with senior high school education may likely have some form of sex education that involves the timing of conception and other female fertility awareness issues.

Further findings also show that male adolescents' female fertile period knowledge is considerably influenced by sex education classes. As a corollary, male adolescents who had attended sex education classes are found to have a higher likelihood of having accurate knowledge about the female fertile period than their counterparts who had never attended such classes. Comprehensive sex education has been touted as the most effective way of promoting safer sex and reproductive health practices among adolescent males (Jaramillo et al., 2017). This is because it influences adolescents' knowledge, attitude and contraceptive use (Visser & van Bisel, 1994). Hence, it is obvious that most male adolescents who had attended sex education classes had received some form of accurate information on the female fertile period, unlike their male counterparts who did not take advantage of any of these resources.

As well, the study found some regional effects on knowledge about the female fertile period as male adolescents from the Ashanti and Brong Ahafo regions have a significantly higher accurate knowledge compared with their peers from the Western region. These significant regional variations in the knowledge that are associated with these regions could be a result of the provision of accurate information on sex education. However, none of these findings could be related to the literature, as there is currently a dearth of literature on this phenomenon. In effect, factors affecting male adolescents' knowledge about the female

fertile period constitute the least explored area in adolescent reproductive health. Therefore, it is believed that this study will serve as a foundation or reference point for further studies. A notable limitation of this study is the fact that it describes the results of a survey that is more than a decade old; as a result, current knowledge levels may have changed considerably. Nevertheless, based on what is found in the limited literature, the findings of this study still seem to be relevant in providing the required information on this important phenomenon. In spite of the age of the data, the findings of this study provide relevant information on Ghanaian male adolescents' level of awareness of the female fertile period and factors affecting their knowledge.

Conclusions

This study finds that most male adolescents believe that they have knowledge about the period females are likely to conceive during their menstrual cycle. However, only a few have accurate knowledge about the specific period in the menstrual cycle when women become fertile and are likely to conceive. Even though they claim to know the female fertile period, only a few male adolescents can correctly identify the middle of the menstrual cycle as the likely time for conception. Knowledge about the female fertile period is significantly lower among younger male adolescents, those without formal education, and those who have not attended any sex education classes, but significantly higher for those from the Ashanti and Brong Ahafo regions. Following from these findings, it will be crucial to address this issue by adopting the life skills approach developed by PAHO in order to develop and extend adolescent health and family life education to both first and second cycle schools in the country as well as to adolescents who are not in school. Moreover, as part of the HFLE, a sex education curriculum can include lessons on the conception process, contraception, sexual abstinence and prevention of sexually transmitted infections. This will help to substantially reduce the unmet need for education on adolescent reproductive health, which includes the prevention of unwanted teenage pregnancies. Improvement in formal education can also help to alleviate the significant regional variation in male adolescents' knowledge about the female fertile period.

Acknowledgments

Data for this study were obtained from the Guttmacher Institute.

References

Ajayi, A.A., Marangu, L.T., Miller, J., & Paxman, J.M. (1991). Adolescent sexuality and fertility in Kenya: A survey of knowledge, perceptions, and practices. *Studies in Family Planning*, *22*(4): 205-216.

Awusabo-Asare, K., Abane, A.M., & Kumi-Kyereme, A. (2004). Adolescent sexual and reproductive health in Ghana: A synthesis of research evidence. Occasional Report No. 13, New York: Alan Guttmacher Institute.

Awusabo-Asare, K., Biddlecom, A., & Zulu, E. (2008). *National Survey of Adolescents, 2004: Ghana*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Berger, A., Manlove, J., Wildsmith, E., Peterson, K., & Guzman, L. (2012). *What young adults know—and don't know—about women's fertility patterns: Implications for reducing unintended pregnancies.* Child Trends Research Brief, No. 2012-26. Washington DC: Child Trends.

Bloom, S. S., Tsui, A. O., Plotkin, M., & Bassett, S. (2000). What husbands in northern India know about reproductive health: correlates of knowledge about pregnancy and maternal and sexual health. *Journal of Biosocial Science, 32*(2), 237-251.

Breuner, C. C., Mattson, G., AAP Committee on Adolescence, & AAP Committee on Psychosocial Aspects of Child and Family Health. (2016). Sexuality education for children and adolescents. *Pediatrics, 138*(2), e20161348.

Dudgeon, M., & Inhorn, M. (2004). Men's influences on women's reproductive health: medical anthropological perspectives. *Social Science and Medicine, 59*, 1379–95.

Eccles, J. (1999). The development of children ages 6 to 14. *The Future of Children*, *9*(2), 30-44.

Edberg, M. (2008). *Final revised draft development of UNICEF Latin America/Caribbean (LAC) well-being indicators. Part 1: background. Part 2: domains and indicators*. Department of Prevention and Community Health, The George Washington University.

Gage, A.J. (1998). Sexual activity and contraceptive use: The components of the decision making process. *Studies in Family Planning, 29*:154-166.

Gardner, H. (1993). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books

Ghana Health Service. (2009). *Ghana strategic plan on health and development of young people, 2009-2015*. Accra, Ghana: Ghana Health Service.

Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF International. (2015). *Ghana Demographic and Health Survey 2014.* Rockville, MD, USA: GSS, GHS, and ICF International.

Guttmacher Institute. (1998). *Into a new world: Young women sexual and reproductive lives*. New York: Guttmacher Institute.

Guttmacher Institute. (2006). *Sexual and reproductive health services for adolescents*. New York: Guttmacher Institute.

Hessburg, L., Awusabo-Asare, K., Kumi-Kyereme, A, et al. (2007). *Protecting the next generation in Ghana: New evidence on adolescent sexual and reproductive health needs.* New York: Guttmacher Institute.

Hughes, J., & McCauley, A.P. (1998). Improving the fit: Adolescents' needs and future programmes for sexual and reproductive health in developing countries. *Studies in Family Planning, 29*, 233-245.

Institute for Reproductive Health (2013a). *Fertility awareness across the life course: A comprehensive literature review.* FAM Project. Washington, DC. Institute for Reproductive Health, Georgetown University.

Institute for Reproductive Health (IRH). (2013b). *Fertility awareness and pregnancy intentions: analysis of Demographic and Health Surveys in six countries*. Washington, D.C.: IRH, Georgetown University for the U.S. Agency for International Development (USAID).

Jaramillo, N., Buhi, E.R., Elder, J.P., & Corliss, H.L. (2017). Associations between sex education and contraceptive use among heterosexually active, adolescent males in the United States. *Journal of Adolescent Health, 60*(5): 534-540.

Jessor, R. (1992). Risk behavior in adolescence: A psychosocial framework for understanding and action. In: D. Rogers & E. Ginzburg (Eds.), *Adolescents at risk: Medical and social perspectives* (pp. 19–34). Boulder, CO: Westview Press.

Katz, K. & Naré, C. (2002). Reproductive health knowledge and use of services among young adults in Dakar, Senegal. *Journal of Biosocial Science, 34*, 215–231.

Luke, N. (1998). Reproductive health: Case study in Ghana. New York: The Futures Group International.

Lungren, R. (2000). *Research protocols to study the sexual and reproductive health of male adolescents and young adults in Latin America*. Washington, DC: PAHO.

McGuire, W. (1964). Inducing resistance to persuasion: Some contemporary approaches. In: L. Berkowitz (Ed.), *Advances in experiential social psychology* (pp. 191–229). New York: Academic Press.

Morris, J. L., & Rushwan, H. (2015). Adolescent sexual and reproductive health: The global challenges. *International Federation of Gynecology and Obstetrics. 131*, S40–S42.

National Population Council. (2000). *Adolescent reproductive health policy*. Accra, Ghana: NPC

Nyamekye, G. (2005). *Knowledge, attitude and use of contraceptives among young people aged 15-24 years in Ghana* (Master's thesis). University of Ghana, Legon, Ghana.

Pan American Health Organization [PAHO]. (2001). *Life skills approach to child and adolescent healthy human development.* Adolescent Health and Development Unit, Division of Health Promotion and Prevention. Washington, DC: Pan American Health Organization.

Parasuraman, S., Kishor, S., Singh, S. K., & Vaidehi, Y. (2009). *A profile of youth in India*. National Family Health Survey (NFHS-3), India, 2005-06. Mumbai: International Institute for Population Sciences; Calverton, Maryland, USA: ICF Macro.

Pedro J., Brandão, T., Schmidt, L., Costa, M. E., & Martins, M. V. What do people know about fertility? A systematic review on fertility awareness and its associated factors. *Upsala Journal of Medical Sciences, 123*(2), 71-81.

Piaget, J. (1972). Intellectual evolution from adolescence to adulthood. *Human Development, 15,* 1-12.

Roth, B. (1993). Fertility awareness as a component of sexuality education. Preliminary research findings with adolescents. *The Nurse Practitioner, 18*(3):40-48.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*(3), 316-331.

Save the Children. (2007). *Adolescent reproductive and sexual health update*. http://www.iywg.org /youth/ resources /savethechildren. Accessed 24 Feb 2016.

Shure, M. B., & Spivack, G. (1980). Interpersonal problem solving as a mediator of behavioral adjustment in preschool and kindergarten children. *Journal of Applied Developmental Psychology, 1*(1), 29-44.

Sydsjo, G., Selling, K. E., Nystrom, K., Oscarsson, C., & Kjellberg, S. (2006). Knowledge of reproduction in teenagers and young adults in Sweden. *The European Journal of Contraception and Reproductive Health Care, 11*(2), 117–125.

Tyler, F. B., Ridley Brome, D., & Williams, J. E. (1991). Ethnic validity, ecology, and psychotherapy: A psychosocial competence model. New York: Plenum Press.

Visser, A.P., & van Bisel, P. (1994). Effectiveness of sex education provided to adolescents, *Patient Education and Counseling, 43*: 147-160.

World Health Organization. (1998). *Delay childbearing: World health day*. http://who.ch/ whday/1998/ whd98-04.html. Accessed 24 Feb 2016.