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PRECONCEPTION KNOWLEDGE AND PRACTICES AMONG WOMEN IN FERTILITY AGE IN THE TAMALE TEACHING HOSPITAL OF GHANA

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ABSTRACT

Purpose: The aim of this study was to assess preconception knowledge and practices and its effect on birth outcomes among puerperal women in the Tamale Teaching Hospital.

Methodology: The study employed analytic cross-sectional study design with a quantitative approach. A semi-structured questionnaire was used where questions on knowledge of preconception were adopted from Southampton Women's Survey, 2006. Puerperal women in the postnatal unit of the Tamale Teaching Hospital, who were yet to be discharged, including referred cases, were selected as target population for this study. The exclusion criteria were women who have never delivered and menopausal women. The sample size was 363 puerperal women. Purposive sampling method was used to attain the required sample. Data was analyzed using SPSS version 25. In the analyses, a p -value <0.05 was considered statistically significant when variables were cross-tabulated.

Findings: The results of the study revealed a high proportion of puerperal women 161 (44.3%) were above 30 years. The mean age was 30.56 ± 6.44 years. The study found that 37.2% women had knowledge on preconception care. There was a significant association between folic acid intake and postpartum haemorrhage ($r=-0.183$, $p<0.0001$). There was no statistical association between birth outcomes and concurrent loss of pregnancy and number of pregnancies lost except for birth weight ($r=0.202$, $p=0.000$). Albeit preconception care knowledge was low among puerperal women, it significantly influenced postpartum haemorrhage and pregnancy induced hypertension but not antepartum hemorrhage and birth weight.

Recommendation: At the community level the study recommended to the Ghana Health Service that a mother-to-mother support group be formed among women in their reproductive age and this could help encourage one another to discuss about their health before pregnancy and share success stories on birth outcomes and report to the facility in case of any problems.

Key words: *Preconception, Knowledge, Practices, Tamale Teaching Hospital*

INTRODUCTION

The expansion of access to preconception knowledge and counseling among women in fertility age is proposed as a strategy for achieving progressive women's health as captured in the third Sustainable Development Goal (Chuang, Velott, & Weisman, 2010). Preconception care involves provision of biomedical, behavioral and social health interventions to women and couples before conception occurs, aimed at improving their health status, reducing behaviours and individual and environmental factors that could contribute to poor maternal and child health outcomes (Al-Akour, Sou'Ub, Mohammad, & Zayed, 2015; Harellick, Viola, & Tahara, 2011).

Maternal, newborn and child health (MNCH) care approach is important during the preconception period since the health and well-being of women, newborns and children are closely linked and ought to be managed in a unified manner (Kinney et al., 2010). The achievement of MNCH include interventions directed at improving nutritional status through balanced energy-protein supply, folic acid supplementation/fortification, micronutrient supplementation among others and maintaining healthy lifestyle (Frey & Files, 2006; Gunaratna et al., 2015; Lassi, Dean, Mallick, & Bhutta, 2014).

Preconception care includes a set of interventions that aims to identify and modify biomedical, behavioural and social risks to women's health or pregnancy outcome through prevention and management (Seshadri, Nelson-Piercy, & Chappell, 2012). This statement was affirmed by the World Health Organization (WHO) which added that the ultimate aim of preconception care is to improve maternal and child health, in both the short and long term (WHO, 2013). It is, therefore, an essential and vital practice, as it lays the foundation for future health of the mother, her child and her family (Mitchell, Levis, & Prue, 2012). Besides, it is an ongoing component of healthcare services that must be provided for both men and women in their reproductive age to ensure that they are healthy (WHO, 2013). In view of this the act of embracing preconception care serves as a golden opportunity that can identify health risk factors in pregnancy and enable healthcare givers to conduct any required interventions earlier before pregnancy occurs to prevent harmful exposures from affecting the developing foetus (Dandekar & Hessler, 2014; Kinney et al., 2010; Mittal et al., 2016).

These interventions include birth spacing and prevention of teenage pregnancy as young mothers often are not physically mature enough to deliver a baby, leaving them and their children at risk for death or disability from obstructed labor, fistulas, premature birth, or low birth weight. At the same time, early childbearing negatively affects educational and economic opportunities; women with lower educational attainment have greater risks of adverse pregnancy outcomes, are less knowledgeable about health-prevention activities, and family planning. Their children have fewer options for education, optimal growth and development and have a higher risk of mortality (Lassi et al., 2014). Seshadri et al. (2012) were right when their study concluded that preconception care was interventions characterized by the need to start and sometimes complete a designated intervention before conception occurs.

Preconception care knowledge and practices could have multiple positive impacts on birth outcomes as its ultimate aim is to improve maternal and child health, in both the short and long term. This was to reiterate the World Health Organization's assertion that there is widespread consensus that to reduce maternal and childhood mortality, a continuum of care needs to be

provided through pregnancy, childbirth, the postnatal period (addressing both mothers and infants), infancy, childhood, adolescence and adulthood. There is also widespread agreement that actions are needed at the community, primary care and referral care level to deliver this continuum of care (WHO, 2013).

Preconception knowledge of women is focused on women's ability to identify medical and social conditions that may put the mother or fetus at risk. Therefore, the notion of preconception knowledge among women aims to provide understanding to the existing risks before pregnancy, whereby resources may be used to improve reproductive health of women, men and couples in order to optimize health and knowledge before conceiving a pregnancy (Ojukwu, Patel, Stephenson, Howden & Shawe, 2016).

Counseling administered to influence knowledge and attitudes about preconception and its effects on a potential pregnancy is shown to manifest large impact (Mittal, Dandekar, & Hessler, 2014). It is therefore important to note that a reproductive life plan is a brief, cost effective preconception and contraception counseling tool in the primary care setting for women. This means that increasing knowledge about reproductive health is incomplete when preconception knowledge is not present. In view of this lack of knowledge about common preconception risk factors seems to be one of the critical factors hindering the widespread application of the practice.

In a population study in Rotterdam, half of the non-pregnant study population (n=631) were unaware of the adverse effect of smoking and being overweight on fertility. Although, this outcome is in contrast with other results, specific preconception health knowledge, e.g., folic acid use, was also scarce ($p < 0.001$) (Gunaratna et al., 2015). Notwithstanding, several studies have shown that there is positive correlation between women's preconception care knowledge and effective reproductive health outcomes (Singh et al., 2010).

In terms of preconception practices, Stephenson and colleagues (2014) reported that despite the high level of pregnancy planning in their survey of not less than 1000 sample size in three North London hospitals, and previous miscarriage, stillbirth or termination for fetal abnormalities, 34% of all women reported acquiring no information about preconception health behaviours and 49% reported no practice of preconception care knowledge. Just over half (51%) of all women, and fewer than two thirds (63%) of women with planned pregnancies, took folic acid before pregnancy.

Since maternal assessment before pregnancy encompasses family history, obstetric history and general physical examination of the potential mother; family history of chronic disorders, first-degree consanguineous (relationship by descent) marriages and planning pregnancy has been shown to be associated with awareness of preconception care. It was reported by Al-Akour and colleagues (2015) in their study on awareness of preconception care among women and men from Jordan that close to 50% of participants were aware of the serious impact that a woman's and man's family history can have on the health of their babies. They concluded that a significant number of their respondents recommended changes be made prior to conception.

Though the world has made significant improvement in saving the lives of mothers and children since the adoption and implementation of major programmes such as the Millennium Development Goals 4 and 5 in 2000 (Gunaratna et al., 2015), there were still 287,000 maternal

and 2.9 million newborn deaths each year, with an additional 2.6 million stillbirths worldwide (UNICEF, 2010). However, data from the Tamale Teaching Hospital (TTH) showed that the dynamics of specific maternal and neonatal health outcomes are not pointing in the right direction. For instance, the prevalence of still birth decreased slightly from 313 to 251 between 2015 and 2016, it later hiked to 342 in 2017 and further increased to 379 in 2018; low birth weight increased from 1516 to 1708 between 2015 and 2016 but reduced from 2098 to 1602 from 2017 to 2018. Antepartum hemorrhage (APH), postpartum hemorrhage (PPH) and pregnancy induced hypertension (PIH) was also rife in 2015 where 58,101 and 257 was recorded respectively. Despite data on APH and PPH were lacking in 2018, PIH which was available indicated massive increase of 52 cases from the previous year (2017) (Source: TTH Data – 2015, 2016 & 2017). The information, however, gathered may be due to poor preconception knowledge among women.

Notwithstanding, little has been done to examine women's knowledge and health behaviors before and after receipt of targeted preconception education and counseling in Ghana. Besides, the prevalence of the problems associated with ineffective preconception knowledge on the part of the reproductive age woman in the country remains unclear. More so, lack of preconception knowledge is an assumed contributor to several causes of poor pregnancy outcomes most especially in the Northern sector of the country. As Frey and Files (2006) have observed that the concept of preconception care has been articulated for a long time, but unfortunately have not become part of the routine practice especially knowledge and practices on preconception care among reproductive age women. It is in the light of this that this study intended to determine the knowledge level and practice of preconception among reproductive age women in the Tamale Metropolis of Ghana.

METHODOLOGY

The study employed analytic cross-sectional study design with a quantitative approach. The study was conducted at the Tamale Teaching Hospital in the Tamale Metropolis in the Northern Region of Ghana. A semi-structured questionnaire which has both open-ended and close-ended questions was used for data gathering. Questions on knowledge of preconception were adopted from Southampton Women's Survey (2006).

Puerperal women in the postnatal unit of the Tamale Teaching Hospital, who were yet to be discharged, including referred cases, were selected as target population for this study. The exclusion criteria were women who have never delivered and menopausal women. The sample size was 363 puerperal women.

Purposive sampling method was used to attain the required sample size. The participants were recruited during their early puerperal stage. Data was analyzed using SPSS version 25, and represented by frequencies and percentages. In the analyses, a p -value < 0.05 was considered statistically significant when variables were cross-tabulated.

FINDINGS

Socio-demographic characteristics

The most represented age category of puerperal women was above 30 years (44.3%), followed by the 25 to 30 years group (40.5%) and 15.2% were less than 25 years. The mean age was 30.56 ± 6.44 years. More than three fourth (84.8%) of the respondents were married and almost 75% had formal education, but 24.8% of their partners had no formal education. Almost half (49.6%) of the respondents were Muslims and 42.1% of them were Dagombas. While respondents' partners were predominantly public/civil servants (49.0%), the data showed 35.5% women were petty traders. Most of them (66.1%) also resided in the urban area of the Tamale Metropolis. Table 1 below gives detail of the background of respondents.

Table 1: Socio-demographic characteristics of respondents (N=363)

Background information	Frequency (N)	Percentage (%)
Age		
<25	55	15.2
25-30	147	40.5
>30	161	44.3
Mean \pm standard deviation of age	30.56 \pm 6.44	
Marital status		
Single	36	9.9
Married	308	84.8
Co-habiting	18	5.0
Divorced	1	.3
Maternal educational status		
No formal education	91	25.1
Primary	32	8.8
JHS	44	12.1
SHS/Vocational	64	17.6
Tertiary	132	36.4
Educational status of partner		
No formal education	90	24.8
Primary	21	5.8
JHS	33	9.1
SHS/Vocational	36	9.9
Tertiary	179	49.3
Others (missing due to divorce or death)	4	1.1
Religion		
African Tradition	21	5.8
Islam	180	49.6
Christianity	162	44.6
Tribe		
Dagomba	153	42.1
Gonja	53	14.6
Mamprusi	33	9.1
Akan	79	21.8
Others (Frafra, Ewe, etc.)	45	12.4

Source: Field data, 2019

Table 1: Socio-demographic characteristics of respondents (N=363) – cont'd

Background information	Frequency (N)	Percentage (%)
Occupation of woman		
Farming	55	15.2
Petty trading	129	35.5
Public/civil servant	135	37.2
Others (seamstress, charcoal burning etc.)	44	12.1
Occupation of partner		
Farmer	91	25.1
Petty trading	55	15.2
Public/civil servant	178	49.0
Others (drivers, butchers, etc.)	25	6.8
Missing (due to divorce, etc.)	14	3.9
Residence		
Urban	240	66.1
Rural	123	33.9

Source: Field data, 2019

Maternal Obstetric History

When the gestational age at birth was assessed, it was realized that higher percentage (76%) (276/363) of the respondents delivered between 36 to 40 weeks, the post term women were 19.3% of the respondents, and the preterm group 4.7%.

On maternal obstetrics characteristics, majority of the respondents (69.7%) had more than one live birth (multiparous) while about 30.3% were primiparous (single parity). More so, it was found among the 64 women who claimed to have lost a pregnancy, 76.6% had a single pregnancy lost, 10 (15.6%) had lost two pregnancies, while 7.8% had lost three. Pregnancies that were lost within the first six months after conception represented 87.5% of the respondents. It was found that all birth outcomes recorded was significantly associated with parity, there was no association between the outcome variables and concurrent loss of pregnancy and number of pregnancies lost except for birth weight ($r=0.202$, $p=0.000$). Table 2 highlights the details of the above information.

Table 2: Maternal obstetrics characteristics (N=363)

Variables	N (%)	Pregnancy outcomes (<i>r</i> , <i>p</i> -value)			
		PPH	APH	PIH	Birth weight
Parity					
Primiparous	110 (30.3%)	-0.121, 0.021	0.110, 0.037	-0.125, 0.017	0.202, 0.000
Multiparous	253 (69.7%)				
Ever lost pregnancy					
Yes	64 (17.6%)	-0.003, 0.953	-0.004, 0.937	-0.010, 0.846	-0.003, 0.953
No	299 (82.4%)				
Number of pregnancies lost					
	N=64				
One	49 (76.6%)				
Two	10 (15.6%)	-0.042, 0.738	-0.042, 0.738	0.116, 0.356	0.202, 0.000
Three	5 (7.8%)				
Month at which baby was lost					
At least six months	56 (87.5%)				
More than six months	8 (12.5%)	0.047, 0.711	-0.047, 0.738	0.116, 0.356	-0.024, 0.852
Mode of delivery					
**SVD	288 (79.3%)	0.037, 0.476	0.028, 0.590	0.010, 0.848	0.004, 0.940
**C/S	75 (20.7%)				

Source: Field data, 2019

****Key**

C/S=Caesarian Section

SVD=Spontaneous Vaginal Delivery

Knowledge of puerperal women on preconception care

When respondents were asked if they had heard of preconception care, 37.2% (n=135/363) claimed to have heard about it, while majority 228 (62.8%) denied any hearing of preconception care. However, when the respondents were asked to describe preconception care, 77.0% of the respondents who claimed to have heard of preconception care said it is the preparation and care given to women by health workers before pregnancy. A few (11.9%) said it is care given to pregnant women and those who stated knowledge of women on conception represented 11.1%.

In view of this the respondents' idea on preconception health was assessed to evaluate their knowledge. Majority of the respondents (78.2%) knew it was important to live a healthy life before conception with a 211 of the participants acquiring the information from health workers among other sources. A little more than half of the respondents (50.7%) did not know that folic acid and vitamin supplements were significant for a successful pregnancy. This is shown in Table 3.

Table 3: Knowledge on preconception health (N=363)

Question	Response Rate (N=363)	
	Yes (%)	No (%)
Good health life before conception important for you and the baby	284 (78.2%)	79 (21.8%)
Source of information on the importance of good health before conception		
- Health worker	211 (74.3%)	-
- Family/Friend	21 (7.4%)	-
- Radio/TV	22 (7.7%)	-
- School	27 (9.5%)	-
- Pharmacist	3 (1.1%)	-
Folic acid and vitamin supplements were good for conception	179 (49.3%)	184 (50.7%)

Source: Field data, 2019

Observation from the above data showed that the study's participants tended to have a fair knowledge on preconception care.

However, the correlation between knowledge on the importance of folic acid and vitamin supplements in pregnancy and birth outcomes showed no significant relationship, except PPH which showed a strong correlation ($r=-0.183$, $p=0.000$). This is shown in Table 4.

Table 4: Bivariate analysis between knowledge on the importance Folic acid and Birth outcomes

Variables	Knowledge on Folic acid and Vitamin supplements		<i>r</i> , <i>p</i> -value
	Yes (%)	No (%)	
Maternal birth outcome			
PPH	99 (27.3%)	264 (72.7%)	-0.183, 0.000
APH	35 (9.6%)	328 (90.4%)	0.014, 0.793
PIH	100 (27.5%)	263 (72.5%)	-0.09, 0.086
Child birth outcome			
	N	(%)	
Low birth weight	48	13.2	
Normal birth weight	302	83.2	-0.043, 0.412
Macrosomia	13	3.6	

Source: Field data, 2019

Association between preconception care knowledge and birth outcomes

The study found 27.3% prevalence of PPH, 9.6% of APH and 27.5% PIH among the puerperal women. Bivariate analysis of correlation between knowledge on preconception care and PPH showed an inverse relation, implying that as maternal knowledge on preconception care increases, the prevalence of PPH decreases, while PPH would decrease among women with high knowledge level on preconception care on the other hand ($r=-0.138$, $p=0.008$). This observation was different in APH women where there was no significant association with preconception care knowledge showed by Pearson r of 0.00. Similarly, there was no significant relation to the birth weight of neonates, but the association between the independent variable and PIH was significant showing inverse relation ($r=-0.104$, $p=0.047$). This is shown in Table 5.

Table 5: Association between preconception care knowledge and birth outcomes

Variables	Knowledge on preconception care among women (N=363)		<i>r</i> , <i>p</i> -value
	Yes (%)	No (%)	
Maternal birth outcomes			
PPH	99 (27.3%)	264 (72.7%)	-0.138, 0.008
APH	35 (9.6%)	328 (90.4%)	0.000, 0.995
PIH	100 (27.5%)	263 (72.5%)	-0.104, 0.047
Childbirth outcomes			
	N	(%)	
Low birth weight	48	13.2	
Normal birth weight	302	83.2	-0.04, 0.412
Macrosomia	13	3.6	

Source: Field data, 2019

Practices of preconception care

In terms of practice on preconception care, 73.8% did not modify their diet before conception, alcoholic beverages consumption before conception was a little higher than smoking among women. More than half of the respondents (51.2%) were screened for either STIs or genetic disorders before conception, while 79.3% sought for fertility advice. Though 77.4% halted the use of contraception before they conceived, surprisingly, 90.6% continued to use caffeinated products.

When it comes to preparations made before pregnancy, it was detected that out of the 363 respondents, 37.5% (n=136/363) prepare for their pregnancies while the 62.5% made less attempts to prepare for their pregnancies. For those who prepare before conception, 7.4% sought preconception care services, 38.9% claimed to purchase their materials or items in wait for the unborn baby and themselves, and 18.4% took folic acid as a vitamin supplement among other responses. Table 6 shed light on the preconception practices.

Table 6: Preconception practices among pregnant women

Variables	Response Rate (N=363)	
	Yes (%)	No (%)
Practices by respondents		
Modified diet	95 (26.2%)	268 (73.8%)
Took steps to change weight	120 (33.1%)	243 (66.9%)
Consumed alcohol	12 (3.3%)	351 (96.7%)
Smoking	9 (2.5%)	354 (97.5%)
Vaccinated against infectious diseases	148 (40.8%)	215 (59.2%)
Screened for STIs and genetic disorders	186 (51.2%)	177 (48.8%)
Dental checks	38 (10.5%)	325 (89.5%)
Used contraceptives	82 (22.6%)	281 (77.4%)
Sought fertility advice	75 (20.7%)	288 (79.3%)
Stopped caffeine intake	34 (9.4%)	329 (90.6%)
Preparations made before conception		
	N (%)	-
Financial preparation	22 (16.2%)	-
Folic acid intake	25 (18.4%)	-
Halt contraception	6 (4.4%)	-
Healthy diet intake	11 (8.1%)	-
Purchase items	53 (38.9%)	-
Medical checkups	7 (5.1%)	-
Moderate activities	2 (1.5%)	-
Seek for preconception care	10 (7.4%)	-
Total	136 (100%)	

Source: Field data, 2019

Critically looking at the data above on the practices on preconception by the respondents of this study, majority gave negative responses pointing to the fact that their answers were wrong as against the few who replied in the affirmative. However, 53 (38.9%) out of the 136 respondents

purchased household items as a means of preparing towards conception with few (5.1%) having medical checkups and preparing financially (16.2%) before conception. Consequently, these assertions pointed to the fact that participants for this study had poor practices of preconception care.

When the participants' preparedness for conception was cross-tabulated against maternal and child birth outcomes respectively, the findings had no statistical association among the variables. This is shown in Table 7 below.

Table 7: Association between preparations made before pregnancy and birth outcomes

Birth Outcomes	Response Rate (N=363)		Test-statistic <i>r</i> , <i>p</i> -value
	Preparedness for conception		
	Yes	No	
Maternal birth outcomes			
PPH	99 (27.3%)	264 (72.7%)	-0.078, 0.139
APH	35 (9.6%)	328 (90.4%)	-0.060, 0.254
PIH	100 (27.5%)	263 (72.5%)	-0.095, 0.070
Childbirth outcome	N	%	
Low birth weight	48	13.2	-0.044, 0.398
Normal birth weight	302	83.2	
Macrosomia	13	3.6	

DISCUSSION

The study assessed the preconception knowledge and practices among women in fertility age in the Tamale Teaching Hospital of Ghana.

When participants of the study were asked if they had heard of preconception care as part of evaluating their knowledge, 37.2% (n=135/363) claimed to have heard about it, whilst majority 228 (62.8%, n=363) denied any hearing of preconception care. This report was in agreement with Al-Akour and colleague's (2015) study that indicated 50% of their participants showed awareness of preconception care among women and men. More so, 74.3% (n=211/263) of this research had their information on the importance of good health before conception from the health worker; contrary to this view, only 34% of all women reported acquiring no information about preconception health behaviours (Stephenson et al., 2014). Mittal and colleagues (2014) said knowledge about preconception care and its effects on a potential pregnancy manifests large impact. Gunaratna and colleagues (2015) reported that lack of knowledge about common preconception care seems to be one of the critical factors hindering widespread application of the practice and consequently having negative impacts ($p < 0.001$). However, 78.2% of the participants of this study knew it was important to live a healthy life before conception.

In terms of description of preconception care, 77.0% of this study respondents said it is the preparation and care given to women by health workers before pregnancy. A few (11.9%) described it as care given to pregnant women. This implied that some of the respondents were of

the view that preconception care is the same as antenatal care. It was, therefore, explained in another study that preconception care was interventions characterized by the need to start and sometimes complete a designated intervention before conception occurs (Seshadri et al., 2012). In conclusion, preconception care is the provision of biomedical, behavioural and social health interventions to women and couples before conception occurs aiming at improving their health status, and reducing behaviours and individual and environmental factors that contribute to poor maternal and child health outcomes. Its ultimate aim, therefore, is to improve maternal and child health, in both the short and long term (WHO, 2013).

As part of the practices made towards preconception care, women are to make preparations prior to conception. Among this study's participants, 39% of them purchased household items for the baby and themselves, whilst 18.4% took folic acid and other vitamin supplements, 16.4% made financial preparations towards their conception, and 7.4% sought preconception care. These findings were in agreement by a comment that suggested that resources may be used to improve reproductive health of women, men and couples in order to optimize health and knowledge before conceiving a pregnancy (Ojukwu et al., 2016). However, the idea of practicing preconception care has not been a concept acknowledged among most reproductive age women (Frey & Files, 2006).

CONCLUSION

Women in fertility age attending the Tamale Teaching Hospital in the Northern Region of Ghana tended to have a fair knowledge and poor practices on preconception care.

RECOMMENDATIONS

1. At the community level the study recommended to the Ghana Health Service (GHS) that a mother-to-mother support group be formed among women in their reproductive age and this could help encourage one another to discuss about their health before pregnancy and share success stories on birth outcomes and report to the facility in case of any problems.
2. The knowledge gap of preconception care in this part of the country requires the Ministry of Health, and the GHS in particular, to put in place at the various health delivery levels, including encouraging women in their reproductive age to seek information about their health and impending pregnancy.
3. Preconception care needs to be integrated into other social services, such as the adolescent reproductive health services, and/or social franchises for easy accessibility to practice but not only assigning to healthcare providers as their duty at the health post.
4. Women and children protecting agencies, such as the Ministry of Gender, Children and Social Protection in collaboration with the GHS, should publish more information on the need to seek preconception care before conception.

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