

Use of Birth Control Products and Economic Welfare of Women: A Case Study of Amasaman Area Council, Accra, Ghana

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Abstract

Use of birth control products and contraceptives could improve the economic welfare of women, arising from adequate spacing of child births and reduced financial pressure and lower stress on women having fewer and well maintained children. In order to interrogate this assertion, a quantitative survey-based study was conducted that involved a diverse and heterogeneous population of 400 randomly selected women in all 39 settlements of the Amasaman Area Council in the Greater Accra Region of Ghana. The first objective of this study was to analyze the factors which influenced the current use of birth control products and contraceptives. The second objective ascertained whether women who had ever used birth control products and contraceptives, at least once in their reproductive lifespans, had higher economic welfare than those who had never used these products at all. The results of the analysis showed that the likelihood of using birth control products and contraceptives declined with increasing income of the women. Students were less likely to use birth control products and contraceptives than non-students. However, the degree of awareness of these products was influential in increasing the likelihood of use of these products by students and higher-income women. Other variables which influenced the likelihood of use of birth control products and contraceptives included the perceived quality of reproductive health information and the quality of health services provided by nurses and doctors at clinics. It was established that women who had ever used birth control products and contraceptives, over their reproductive lifespans, had significantly higher incomes than those who had never used these products.

Keywords: birth control products, contraceptives, economic welfare, family planning, Ghana, reproductive health

1. Introduction and Problem Statement

1.1 Background

The use of birth control (BC) products and contraceptives is an important component of modern reproductive health care. Modern reproductive health care (RHC) is about the provision of cost-effective health services encompassing various aspects of human reproduction. RHC covers health promotion, prevention and maternal services related to safe motherhood and adolescent reproductive health. Scholars in the field of reproductive health (RH) policies such as Apanga and Awoonor-Williams (2018) and Gopal et al. (2020) suggest that the absence of effective RHC policies affects the quality of reproductive health services and the quality of health of women in their child-bearing ages. Hindin et al. (2013) also note that many married women lack confidence to approach RHC facilities based on lack of approval by their partners due to perceptions of infidelity arising from suspicions emanating from their husbands and spouses. Other factors such as educational background also have direct impact on women's acceptance of RHC policies.

There is increasing recognition that good reproductive health results in improved economic welfare of an individual (for example, refer to the works of John et al., 2014; Government of Ghana Ministry of Health, 2015, 2018; Starbird et al., 2016; Chavane et al., 2017; Apanga & Awoonor-Williams, 2018; Thaci & Foster, 2018; Gopal et al., 2020). Despite the importance of reproductive health practices, it is only recently that researchers have started to deeply consider reproductive health as a key in advancing economic and social welfare of individuals. Economic and social welfare are processes that fluctuate over time as individuals pass through various life stages. The assessment of welfare impacts which fluctuate over time requires appropriate theories and methodologies to capture the changing dynamics and impacts.

1.2 Problem Statement

Ghana's population is growing at the rate of 2.1% annually (Ghana Statistical Service, 2021). This high population growth rate imposes negative socio-economic outcomes on the country including poor sanitation and frequent

occurrences of many acute diseases, which reduce the health vitality of much of the population. Given that the current size of population doubles every 33 years (Ghana Statistical Service, 2021), there is a need for policy makers to formulate effective reproductive health policies based on empirically-based scientific evidence. Some modest progress has been made in reproductive health systems in Ghana such as improvement in the maternal health quality indicators. For example, awareness of birth control methods especially contraceptives is high in Ghana. About 98 percent of women and about 99% of men are aware of at least one method of birth control (Government of Ghana Ministry of Health, 2015; 2018).

Further, maternal mortality rates in Ghana have shown a downward trend from 740 deaths per 100,000 live births in early 1990s to 380 per 100,000 live births in 2013, and further to 310 per 100,000 live births in 2017 (Government of Ghana Ministry of Health, 2018). However, the speed of decline in maternal mortality rates was low; hence, the country could not achieve the United Nations Millennium Development Goal target of 190 per 100,000 live births in 2015.

While the general awareness of BC products and contraceptives is high, the use of these products remains relatively low (Government of Ghana Ministry of Health, 2015; 2018). The limited impact from the use of RHC policies related to BC products and contraceptives could be due to the inadequate awareness of the impact of the use of these products on economic welfare and quality of life. The two objectives of the study were to investigate factors that influence the acceptance and use of Birth Control (BC) products and contraceptives in Amasaman Area Council, Greater Accra Region of Ghana and to explore whether use of the use of BC products and contraceptives products would lead to increased economic advancement of individuals.

2. Literature Review

2.1 Introduction to Family Planning, Reproductive Health Care and Population Policies

There are three strands or views concerning family planning (FP) and RHC policies adopted by countries around the world. These are the coercive or authoritarian; the liberal or consensus driven; and informal policies (Robinson & Ross, 2007). A fourth view of FP and RHC exists, which may be labeled as traditional, being derived from traditional cultural practices. The fourth view is often lumped together with the informal category. Bovill and Leppard (2006) argue that population policies around the world are driven and sponsored by developed countries and international organizations. These entities impose their ideas of population control on poor nations without considering local circumstances; and, therefore, create a source of disagreement. Thus, population control policies can also be classified as coercive or informal.

Although the coercive and informal policies seem to differ in modes of implementation, both are flexible as they allow for periodic reviews to ensure the rights of individuals are maintained while at the same time ensuring population control. In developed countries where some form of consensus on family planning exists, some scholars such as Womack (2000) indicate that some kind of coerciveness is incorporated in the implementation process to ensure conformity and compliance. Womack (2000) argues that in the United Kingdom, the government mounts pressure on its citizens to make them adhere to social norms that encourage small family sizes by using tools such as social pressure and incentives to encourage people to get sterilized. Similarly, Correa and Reichmann (1994) report on how the governments of the United States, Philippines and South Africa have used incentives to control the birth rates of poor people.

In China and Peru, coercive and arbitrary measures were adopted by the respective governments to ensure compliance. On the other hand, in the implementation of the mild form of coercive FP and RH policies, governments have incentivized families who comply with these policies such as in Singapore. However, the Chinese RH policy, which is the most studied by scholars, was described as extremist as it did not allow couples to take personalized informed decisions on their own family planning choices (Whyte et al., 2015). Under the one-child policy of China, couples who wanted to have children sought government approval. Government enacted laws to penalize couples who broke the law (Zhang, 2017).

Although some scholars have discredited the Chinese one-child policy, Zhang (2017) argued that the implementation of the policy was not arbitrary because the policy considered differences in rural requirements for more children and also considered the needs of ethnic minorities for having more children. However, China has since 2016, formally implemented a two-child policy that is much more flexible by incorporating inputs from stakeholders in order to bring the population of China out of below-replacement levels (Feng et al., 2016). The new Chinese population policy was adopted to correct information and misconceptions about the earlier one-child policy in the minds of the Chinese public and also to assist couples to make informed decisions on their family sizes and reproductive health (Feng et al., 2016).

2.2 Review of Factors Influencing the Use of BC products and Contraceptives by Women

2.2.1 Marital Status

An important factor that influences women to use BC products and contraceptives is marital status. A study conducted by Sedgh et al. (2016) suggested that although culture, religion and other socio-demographic factors, such as age and

level of education, are important drivers of contraceptive use, the marital status of an individual also affects the decision to use contraceptives or not. Sedgh et al. (2016) found in their study on contraceptive use in developing countries that married women are not predisposed to use contraceptives because they have infrequent sex. Malalu et al. (2014) indicate that women often need the approval of their partners in addition to their own personal choices to use contraceptives. Crissman et al. (2012) concurred that women who are in unmarried partnerships, are more likely to use contraceptives, a view also indicated by Beson et al. (2018).

2.2.2 Cultural Factors

Cultural factors are cited reasons for the low levels of acceptance and use of FP services and BC products and contraceptives in developing countries. Some studies showed low usage of contraceptive and family planning methods within Roman Catholic and Muslim communities due to their religious beliefs (De Silva & Tenreyro, 2017; Titaley et al., 2017). Stephenson et al. (2007) disagreed and argued that, in recent times, when modern contraceptives are better, the association between religion and contraceptive use is weak. They argue that there are other socio-cultural or demographic factors pertaining to specific locations and cultures.

The pro-natal cultural belief held by some communities also affect the uptake of contraceptives in developing countries such as some countries in Sub-Saharan Africa because cultural beliefs encourage people to have large families (Caldwell & Caldwell, 1988). Wulifan et al. (2015) argue that in some communities that hold pro-natal beliefs, women who use contraceptives are regarded as being promiscuous by their husbands and members of their families and communities.

Furthermore, in some parts of Africa, the more children an individual has, the wealthier he or she is perceived by society. Additionally, in other parts of Africa including Ghana, children are a source of labour in economic activities such as farming. Hence, parents produce more children despite the availability of contraceptives, because the children contribute to economic wealth of the family and the community. According to Stephenson et al. (2007), the level of approval a woman gives to FP and contraceptive use affects decisions to use FP methods in parts of Africa.

Similarly, the level of approval from a woman's community members also affects the uptake of contraceptives in many communities. Thus, in communities where many influential women accept FP, many women tend to follow in their footsteps (Stephenson et al., 2007). For these reasons, Amin et al. (2002) concluded that the norms, perceptions and practices of the community influence the individual member's use of contraceptive through dissemination of information.

Culture is an important ingredient for advancement of business. Therefore, it is linked to the strategic decisions and directions of business. This is because, culture influences management decisions and the business functions. Culture matters in business. It has a direct effect on people related to factors such as personal behaviours, including consumption patterns, demand of business products such as food, clothes and personal services. Many businesses accept that cultural differences affect businesses and make decisions to develop appropriate products for various segments of the market.

2.2.3 Location

Other empirical researchers such as Hawkes and Hart (2000) found a relationship between location and adoption of contraceptive use. The majority of the studies showed that people living in urban areas use contraceptives more than those in the rural areas. Hawkes and Hart (2000) argued that because people living in urban areas have higher levels of education and economic status, uptake and utilization of RHC policies and services are higher than people living in the rural areas.

According to Hawkes and Hart (2000), these features also account for the disparities in male utilization of contraceptives in rural and urban areas. In support of Hawkes and Hart (2000), Pebley and Brackett (1982) posited that the nearness of a family planning outlet also affects the utilization of contraceptives. From their findings, travel time and distance affected the initial decision about the forms of contraceptives to use, and also the core decision to use contraceptives or not.

2.2.4 Age

Age was identified by Wulifan et al. (2015) as one of the factors that affect utilization of family planning policies. Wulifan et al. (2015) argued that due to biological factors, age is a very important determinant in a woman's decision to use family planning methods. Because as women get older, there is less need to prevent unwanted or unplanned pregnancies; therefore, reducing their need to use FP methods. A contrary view is suggested by Ochako et al. (2015).

2.2.5 Education

Education and one's educational level have a relationship with contraceptive use. Adanu et al. (2009) describe education as a key factor affecting acceptance of RH policies and contraceptive use. Women with higher levels of education are able to make better and informed decisions regarding contraceptives. Gizaw and Regassa (2011) observe that the higher the level

of education of a couple, the higher the likelihood of using contraceptives. Similarly, Pebley and Brackett (1982) observed that the higher the number of years women spend in school, the higher the likelihood that they opt for contraceptive use because of enhanced awareness of merits and demerits of contraceptives. Sedgh et al. (2016) are of the same views that education increases a woman's level of access to information for critical thinking about taking decisions for herself and family. Thus, women with higher education are more likely to use contraceptives as compared to the less educated.

Formal education has been found to go beyond the impact at the individual level and to affect community decisions on contraceptive use. The findings of Stephenson et al. (2007) likewise show that when many women within a particular community receive higher level of formal education, they look beyond socio-cultural and religious beliefs in taking reproductive health decisions. However, the findings of Ainsworth et al. (1996) show that although education is important as a decision-making tool for FP methods, it has varying effects among women with different levels of formal education. For instance, among women with only primary education, contraceptive use is low while contraceptive use is high among women with secondary school education.

2.2.6 Quality of Health Systems and Services

A good market for health technology exists where consumers are satisfied with services, from equipment to improved drugs which emanate from health technology. Good health systems are based on the availability of technological tools and products in areas such as anaesthetics, antibiotics, to innovations, social media support and new devices that can provide some satisfaction to people. The World Health Organization (WHO) describes health systems in terms of six core components including services delivery, health workforce and access to essential medicines (WHO, 2010). These components have direct bearing on the health condition of business workforce in terms of wellness by maintaining a sound substantial healthy status to perform prescribed jobs in a business enterprise. Therefore, improved health service delivery could lead to healthier workforce development for improved productivity, increased incomes and profits, reduced absenteeism, reduced medical expenditure, and better motivated business workforce.

2.2.7 Awareness of BC Products, Contraceptives and RHC Services

Evidence from earlier research indicated that knowledge and awareness of individuals on family planning methods and policies is very high in Sub-Saharan Africa. For instance, Eliason et al. (2014) worked in a district with low levels of usage of family planning techniques in Ghana and found that more than 90 percent of women within the communities studied were knowledgeable about modern family planning methods. On the contrary, access to information on contraceptives and family planning methods was observed by Beekle and McCabe (2006) to affect their uptake in several parts of the developing world as shown by other studies such as Titaley et al. (2017). Gizaw and Regassa (2011) and Stephenson et al. (2007) focused on the media as agents of change; thus, arguing that individuals, especially women, who have access to mass media and are exposed to FP information tend to adopt FP and RH policies than those without access to the mass media.

Titaley et al. (2017), on the other hand, examine all information sources on RH and FP policies to the consuming public in rural areas. Access to the mass media and formal health providers is generally low in rural areas. Hence, information sources on FP and RH within such geographic areas are also expected to be limited. Titaley et al. (2017) suggest that limited information affects the adoption of family planning choices because consistent lack of information and knowledge on contraceptives promotes or reinforces misconceptions and perceptions about the use of FP products and encourages the spread of stringent religious beliefs against the use of contraceptives.

2.3 Overview of the Ghanaian Literature on the Use of BC Products and Contraceptives

Several studies have been undertaken on issues related to the acceptance and use of birth control methods and related reproductive health policies in Ghana over the last two decades featuring both academic researchers and those from non-academic institutions. The nature and level of awareness of birth control methods and modern contraceptives are often assessed using simple statistical analysis of computing the mean values of awareness based on percentage of respondents interviewed. Logistic regression analysis and related statistical tools were often employed to determine factors influencing choice of contraceptives; choice is often designated as either using contraceptives or not using contraceptives.

The use of logistic regression analysis to identify factors influencing the use of modern contraceptives in Ledzokuku Krowor Municipality in the Greater Accra Region of Ghana relied on respondents who used the services of a particular centre (Beson et al., 2018). Consistent with another study in the Greater Accra Region of Ghana undertaken by Anaman and Okai (2016), there was very high awareness of modern contraceptives, almost close to 100%, yet the utilization rate was quite low around 21%.

Bawah et al. (2003) established the impact of family planning on gender relations in Northern Ghana. Data was drawn from focus group discussions with men and women in Navrongo. The authors showed that when family planning methods were well explained to both men and women within a community, they were more prepared to make informed

choices based on their socio-cultural settings. On the other hand, when newly introduced family planning methods and services were not well explained to the members of the community, acceptance and usage rates were very low; therefore, inadequate information and lack of consensus create tensions between couples and sometimes between couples and their in-laws regarding the desired number of children acceptable to the couples themselves and their in-laws.

Addai (1999) conducted a study using data from the 1993 Ghana Demographic and Health Survey to examine the differences in the use of contraceptives among married women from various religious affiliations: Roman Catholics, Christian Protestants, other Christians, Muslims, adherents of various African traditional religions and those belonging to other religions. The author examined whether contraceptive use could partly be explained by religious affiliation. The data was analysed using logistic regression analysis. The results indicated that there were significant differences in the use of contraceptives among the various religious groups.

Dalaba et al. (2016) analysed the perceptions of people living in communities who had been exposed to contraceptive models in an earlier project called the Navrongo Project, which ran between 1994 to 2003. The study team conducted focus group discussions involving eight males and eight females as well as key informant interviews involving eight community leaders. Previous exposure of the community to family planning services increased the acceptance of contraceptives as indicated by the spacing based on the number of years between child births. However, the side effects of contraceptives were reported including perceived or real sterility cited most often. The low-level inclusion of males in family planning issues was cited as an important problem that needed to be tackled through an enhancement of the country's reproductive health policies.

Adjei and Billingsley (2017) investigated the factors that determined child bearing behaviour in Ghana before and after the population policies implemented in 1994. They analysed individual reproductive histories from 1969 to 2003 using the Ghana DHS data to bring out patterns by parity, calendar period and educational groups. The data was subjected to statistical analysis such as the exponential hazard regression models to determine the risk of birth. The authors established that women who had received secondary or tertiary education used family planning methods to delay childbirth in order to complete their education. The effect of education had increased over the years especially after the implementation of the population policy in 1994. The authors argued that social networking including the use of social media had helped with diffusion of knowledge on contraceptives for women with basic education. Derose and Adam (2007) held the view that the education of the male, in a sexual relationship, is important because men are usually the decision makers within the family unit.

Apanga and Adam (2015) undertook a study in the Talensi district of Northern Ghana on factors influencing the adoption of family planning methods and services in that district based on the use of cross-sectional survey involving systematic and simple random sampling methods. The survey involved 280 respondents between 15-49 years. Respondents had high level of awareness of family planning services. However, only eight percent of these respondents had actually used family planning services. The factors identified as encouraging the use of BC products were the educational level and the awareness of the need to prevent sexually-transmitted diseases and the spacing of child births. Those factors that discouraged the use of BC products included lack of support from partners, and misconceptions and poor knowledge about family planning, and inadequate reproductive health services and health centres.

2.4 Gaps in the Literature

The review of the literature revealed several issues which have not been fully resolved or integrated into existing research works. First, there is limited information of the effects and consequences of the use of BC products and contraceptives on general consumer behaviour and incomes of women. The linkage of use of BC products on the economic welfare of women is scarcely explored in details. Second, although access, use of health facilities and access to mass media have been advanced by several scholars to influence decisions to use BC products and contraceptives, awareness of these products as major driver of their use has not been integrated in RH research works, especially in developing countries.

Third, the use of BC products and contraceptives is considered to be a life-style choice in European and other Western countries in the general literature on the subject. In developing and non-Western countries, the use of BC products and contraceptives is substantially influenced and shaped by demographic patterns, cultural factors, religious factors, and the role of men. These factors are not fully integrated into models of use of these products in much of the existing Western-sourced literature. In general, the literature on RH policies in developing countries pays little attention to the role of men in RH policy formulation and practices. Fourth, the literature reviewed did not highlight the role of health technology and systems in the formulation, and implementation of RH policies. Lack of technology implementation could be a key factor that negatively affects the acceptance of RH policies. Finally, there is over emphasis in the literature on structural issues such as women rights as compared to women's consumer behaviour preferences for BC products and contraceptives.

2.5 Theoretical and Conceptual Frameworks of the Study

2.5.1 Introduction

A theoretical framework provides parameters to guide the context for conducting research, analyzing and interpreting the findings, and linking the variables together to organize ideas that align aspects of the research inquiry (Grant & Osanloo, 2014). The theoretical framework used in this study is based on the Life Cycle Theory. The theory suggests that a life cycle explains the series of changes that a human being experiences from the beginning of his/her life until death. The conceptual framework is linked to the theoretical framework and is the tool used to analyse the factors influencing the use of BC products and contraceptives by women.

2.5.2 History and Concept of the Life Cycle Theory

The Life Cycle Theory was developed by the 1985 Nobel Prize Winner in Economic Sciences, Professor Francis Modigliani, in 1957, as an economic theory that explains savings by individuals and the entire community or nation, over a period of time. The theory suggests that individuals seek to spread consumption expenditures over the course of their lifetimes – borrowing during periods of low incomes and saving during periods of high incomes. Variations of the original Life Cycle Theory have been developed across many social science disciplines such as anthropology, psychology, economics and sociology.

The core Life Cycle Theory indicates that a life cycle explains the series of changes that a living thing experiences from the beginning of its life until death. In general, a life cycle involves the developmental stages that occur during a person's life time to death. For humans, it is the major stages of a person's life span. For example, the life span, in a woman's life cycle starts from infancy, through the toddler years, childhood, puberty, adolescence, pregnancy periods, adulthood, middle age to twilight years and death. The Theory guides this study because it provides a pathway for the study of RH from the birth of a woman, puberty, adolescence through sexual relationships during adulthood, child bearing periods to old age and, eventually, death. The theory is appropriate for this study because RHC policies and birth control methods and practices are relevant for a person's personal development over time, and not just one point in time. Health status is a sequence of multiple determinants operating as a nested behavior, in social and economic contexts, and it evolves as a person develops over time.

2.5.2 Conceptual Model of the Study

The conceptual framework is presented in Figure 1. The framework identifies four independent variables: (1) demography, (2) culture, (3) quality of health systems and services, and (4) educational attainment level. The first dependent variable is the acceptance and use of BC products and contraceptives. The framework also indicates the underlying factors, influencing the use of BC products and contraceptives, proxied by the four broad independent variables. These underlying factors include age and marital status for *demography*, religious preferences for *culture*, level of formal educational attainment for *education*, and the perceived quality of health facilities and the quality of services provided by health personnel for *quality of health systems and health services*.

The researcher introduces a moderating variable, awareness of BC products and contraceptives. The researcher argues that the awareness variable amplifies the influence of the independent variables on the dependent variable. Awareness is a proper moderating variable because it provides information about BC products and contraceptives allowing women to make more informed choices as to whether to use the products. Further, the conceptual framework of this study suggests that the ever-use (at least once in a woman's life time use) of BC products and contraceptives could lead to improved economic welfare of women. The linkage of ever-use of BC products and contraceptives to improved economic welfare is underpinned by the Life-Cycle Theory of Human Behaviour which emphasizes the role of past life-long personal decisions on the current welfare of individuals.

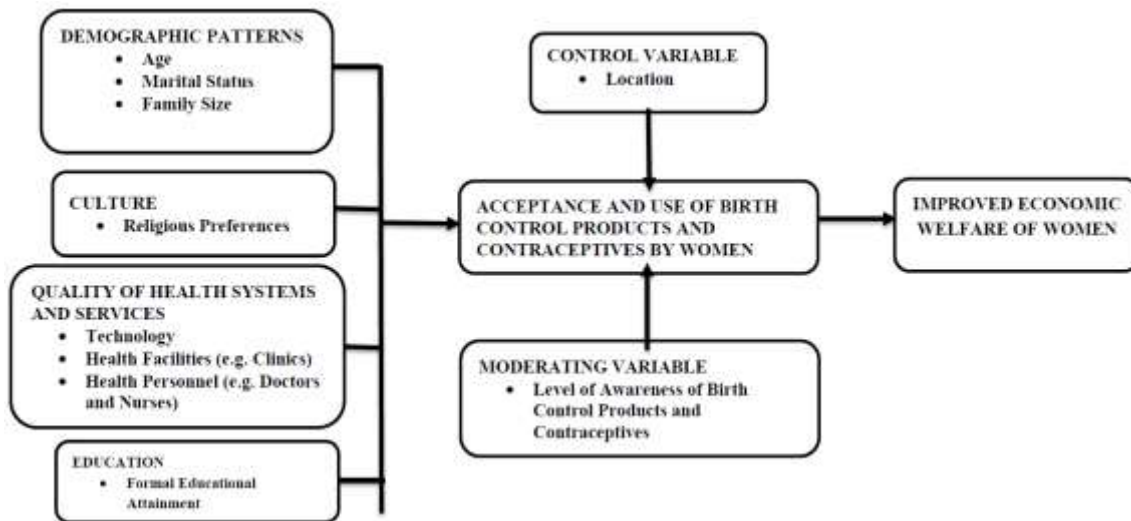


Figure 1. Conceptual framework of the study

Source: Developed by the Author, January 2020

3. Methodology of the Study

3.1 Survey Administration and Statistical Analysis of Survey Data

3.1.1 Choice of Survey Area

The study population is all individual or groups of individuals of interest based on the objectives of the study. The population of interest was all adult females aged 18 and above normally resident in the Amasaman Area Council in the Greater Accra Region of Ghana. The reasons for the choice of the population included the fact that the Amasaman Area Council is representative of heterogeneous population diverse in demography, culture, and informal educational attainment. Therefore, this heterogeneous population in the Amasaman Area Council allows for the research questions and research objectives to be tackled in a comprehensive manner within the reasonable period of one year.

The population of the Amasaman Area Council is large, demographically mixed, culturally diverse and geographically dispersed. Hence, the probability sampling was used as it was important to get a representative sample of the population that allows for an equal chance of every member being selected. The multi-stage cluster sampling that involves the use of all 39 residential settlements in the Amasaman Area Council is the probability sampling method used. The use of this type of probability sampling allows for valid and more precise conclusions to be derived using statistical analysis.

3.1.2 Survey Administration

The survey of adult females was conducted at Amasaman Area Council over a period of three months from January to March 2020 and involved random sampling procedures using private personal and confidential interviews with adult women living in randomly-chosen houses. This assumed that each residential house contained at least one adult female in her child bearing age, between the ages of 18 to 51. The optimal sample size of 400 was established based on statistical theory using the concepts of binomial and normal probability distribution using information suggested by Anaman (2014), De Vaus (2014) and Babbie (2020). All 400 respondents agreed to be interviewed. This 100% response rate was due to the extensive pilot survey conducted in May 2019 involving 100 respondents in the area.

For the purpose of this study, the Amasaman Area Council was divided into three strata made up of four urban communities, ten semi-rural communities, and 25 rural communities. Each of 39 communities in the three strata was involved in the survey with the number of randomly-selected houses derived based on the number of houses in each community as a proportion of the total number of houses in the entire Amasaman Area Council.

Based on the pilot survey, it was assumed that about 93% (p) of the adult females had ever used birth control methods and products. Hence, those who had never used birth control methods and products (q) constituted 7% of the population. Allowing for 2.5% maximum standard error (MSE) to be achieved with 95 percent confidence level (that is 1.96 standard errors from a normal distribution), the optimal sample size (n) was derived as follows:

$$\begin{aligned}
 \text{MSE} = 0.025 &= s * 1.96; \quad s = [(p * q)/n]^{0.5} & \quad s = 0.025/1.96 = 0.012755 &= [(0.93*0.07)/n]^{0.5} \\
 (0.012755)^2 &= (0.0651/n); \quad 6146.56=n/0.0651; & \quad n = 6146.56*0.0651 &= 400.14
 \end{aligned}$$

Where p is the proportion of adult females who had ever used birth control methods and products; q is the proportion of adult females who had never used birth control methods and products; s is the standard error of the estimate of the proportion; and n is the optimal or desired sample size; MSE is the maximum standard error.

3.1.3 Ethical Research

Sound ethical issues are required for all phases and components of surveys including the critical input of questionnaires (Resnick, 1998; Babbie, 2020). The questionnaire used for the survey was developed from those used by the Ghana Statistical Service, the official State statistics producing agency, for its national living standards household surveys. The Ghana Statistical Service has conducted seven periodic living standards surveys over the last three decades and its questionnaires have been vetted by leading international organizations such as the World Bank. The survey was based on the core ethics of protecting the respondent while politely eliciting the required data from them. The reporting of the results of the research study has been done by avoiding the specific mentioning of individuals but rather the focus has been on reporting of aggregate and average-type findings.

The very high response rate of the surveys (100%) was largely due to the high-level quality of the data collection processes buttressed by the implementation of reasonably large pilot survey covering a total of 100 women. In addition, the researcher showed respect to interviewees by requesting advance appointments with opinion leaders and officers of regulatory authorities and policy advisory institutions. Community entry procedures, as demanded by local customs, were followed in the survey. For the safe custody of research data and results is important, the researcher has transferred the analyzed data from digital equipment to a password-protected USB flash drive for storage in a safe. The original hardcopy questionnaires will be destroyed in 2030 after ten years after the completion of the survey.

3.2 Statistical Analysis of Survey Data

3.2.1 Introduction

The statistical analysis of the survey data was of two types: (1) binary logit regression analysis and (2) standard multiple regression analysis. The binary logit regression analysis was undertaken to determine socio-economic characteristics of the female respondents which significantly influenced the decision to use any of the 29 identified birth control methods over the previous 12 months before the survey. The standard multiple regression analysis involved establishing the relationship between personal income adjusted by household size, and the ever-use of birth control methods and products by the female respondents; this relationship is driven by the life cycle theory of behaviour.

3.2.2 Application of the binary regression model in this study

The theory of binary logit regression model is discussed by Gujarati and Porter (2009) and Hill et al. (2018) and it is discussed in the following section as it is used in the current study. It is assumed that the probability that a householder uses BC products and contraceptives would depend on her socio-economic characteristics. However, in the real world, this probability was latent or hidden. The real-world observation is that a householder either uses or does not use RH policies and products. This observation is captured as a dummy variable, which is assigned a value of 1 if the householder uses RH policies and products and zero if the householder does not use the product. The relationship is expressed in Equation 1 as follows:

$$P_i = \beta_0 + \beta_j \sum_{j=1}^k X_{ij} + U_i \tag{Equation 1}$$

where β_j was the coefficient of the j th socioeconomic characteristic;

X_{ij} was the j th socio-economic characteristic of the i th householder; and U_i was the error term;

The binary logit model used to estimate the probability of the event assumes that the error term is

in Equation 3.11 (E_i) is symmetric and its cumulative distribution logistic. The logistic regression equation is described as follows in Equation 2.

$$\log\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_j \sum_{j=1}^k X_{ij} + E_i \tag{Equation 2}$$

Equation 2 is estimated using maximum likelihood procedures. The left-hand side of Equation 3.2 is the log odds ratio and is a linear function of the explanatory variables. The log odds ratio describes the odds favoring the use of BC products and contraceptives. The right hand side of this equation are the independent variables. The specific model used in this study is

as follows denoted in Equation 3.

$$\text{USEBCMFEMALE} = f(\text{AGE}, \text{NCHILDREN}, \text{SINGLE}, \text{AFRICANTRADITIONALIST}, \text{ROMANCATHOLIC}, \text{OTHERCHRISTIAN}, \text{ISLAMREL}, \text{PINCOME}, \text{STUDENT}, \text{EDUFEMALE}, \text{AWARENESS}, \text{QUALITYOFCLINIC}, \text{QUALITYOFNURSES}, \text{QUALITYOFDOCTORS}, \text{QUALITYOFRHINFORMATION}) \quad \text{Equation 3}$$

Where USEBCMFEMALE was the dependent variable; a dummy variable taking a value of 1 if the female respondent used any one of the 29 identified contraceptives, birth control methods and products during the previous 12 months before the survey, and zero otherwise.

The independent variables listed in the binary logit regression model are as follows:

AGE is the age of the female respondent in years.

NCHILDREN is the number of children of the female respondent.

SINGLE is a dummy variable with 1 for female respondents married and zero otherwise.

AFRICANTRADITIONALIST is a dummy variable with 1 for respondents who practice various African traditional religions, and zero otherwise.

ROMANCATHOLIC is a dummy variable with 1 for respondents who are Roman Catholics and zero otherwise. The Roman Catholic Church has a strict policy against use of certain BC products.

OTHERCHRISTIAN is a dummy variable for with a value of 1 for non-Roman Catholic Christians, and zero otherwise.

ISLAMREL is a dummy variable with 1 assigned for Muslims and zero for non-Muslims.

PINCOME is the monthly income of the respondent.

STUDENT is a dummy variable with 1 assigned for students and zero otherwise.

EDUFEMALE is the number of years of schooling of the female respondent.

AWARENESS is the average score of the level of awareness on a one-to-five Likert scoring scale of the 29 available contraceptives and BC methods and products.

QUALITYOFCLINIC is the average score of the perceived quality of the last clinic visited by the female respondent based on the one-to-five Likert scoring scale.

QUALITYOFNURSES is the average score of the perceived quality of the service provided by nurses at the last clinic visited by the respondent based on one-to-five Likert scoring scale.

QUALITYOFDOCTORS is the average score of the perceived quality of the service provided by doctors at the last clinic visited by the respondent based on one-to-five Likert scoring scale.

QUALITYOFRHINFORMATION is the average score of the perceived quality of the RH information received by the respondent based on the one-to-five Likert scoring scale.

3.2.3 Analysis of Economic Welfare and Ever-Use of BC Products and Contraceptives

A multiple regression model analysis was used to ascertain the relationship between personal economic welfare, indicated by personal income adjusted by household size, and the ever-use of birth control methods and products, plus other socio-economic characteristics of the 400 female respondents. The specific model used is specified as Equation 4.

$$\text{LPCINCOME} = D_0 + D_1 \text{LAGE} + D_2 \text{LAGESQUARED} + D_3 \text{EDUFEMALE} + D_4 \text{CUMARRIED} + D_5 \text{ISLAMREL} + D_6 \text{HSIZELARGE} + D_7 \text{EVERUSEDBCM} + D_8 \text{HSIZELARGE} * \text{EVERUSEDBCM} + W_i \quad \text{Equation 4}$$

Where LPCINCOME denotes the natural logarithm of the personal average monthly income of the female respondent adjusted for by her household size (HHSIZE) to establish economic welfare in terms of adult equivalence. This adjustment is based the scale relativity parameter using $\lambda = (\text{HHSIZE})^\sigma$ with σ being the scale relativity parameter. The scale parameter used in this study is 0.70. Other researchers have used the relativity parameter figures ranging from 0.65 to 0.75 (Buse & Salathe, 1978; Bellù & Liberati, 2005).

LAGE is the natural logarithm of the age of the female respondent in years.

LAGESQUARED is the square of LAGE. This variable is used to ascertain the possibility of a curvilinear relationship between economic welfare of the female respondent and her age. Using the logarithmic functional forms for age improved the power of the model as measured by R^2 and also the statistical significance of the parameters of the independent variables.

EDUFEMALE is the formal educational attainment of the female respondents measured by the number of years of schooling. EDUFEMALE has no relationship with the use of BC products and contraceptives and hence endogeneity problem does not exist in the regression model.

ISLAMREL is defined earlier.

CUMARRIED is a dummy variable taking the value of 1 if the female respondent was married at the time of the survey and zero if the respondent was not married.

HSIZELARGE is a dummy variable with a value of 1 if the household size is four or more, and zero if the nominal household size is less than four. The choice of four is based on a numerical simulation analysis of household size which yields four as the number corresponding to the optimal household size that affects behavior related to use of BC products and contraceptives.

EVERUSEDBCM is a dummy variable taking a value of 1 if the female respondent had ever used any BC products and contraceptives during her entire lifetime; this variable is particularly linked to the life cycle theoretical model employed in this study. The value of zero refers to the situation where the female respondent had never used any birth control methods and products. The survey results indicated that 59.0% of the female respondents had never used birth control methods and related products during their lifetimes.

HSIZELARGE*EVERUSEDBCM is an interaction term, between the two variables that evaluates the effect of the use of birth control methods and products, in larger-sized households of four or more, on the economic welfare of the female respondent. Given that the household size of four represents a household with a head, spouse and two children, this variable measures the welfare effect on the female respondent from the use of BC products.

D_i (where $i = 0, 1, 2, 3, 4, 5, 6, 7$ and 8) are parameters to be estimated; and W is the equation error term, initially assumed to have zero mean and constant variance.

4. Results

4.1 Summary Information on Socio-Economic Characteristics of Respondent

Various characteristics of the 400 sampled respondents are presented in Table 1. The interviewed respondents were all in the 18-59 age group. A slight majority (51%) of the respondents were in the 30-39 age group. Slightly over three out of 10 (31.3%) respondents were aged between 20 to 29 years. The smallest of the three age groups was the 50 to 59 years' group, which consisted of 1% of all the respondents. Twenty (20) (5%) of the 400 respondents had never attended school. About one in three of the respondents (32.5%) had completed senior high school or its equivalent, and about one-seventh of the interviewees (13.8%) had completed university degree programs.

The dominant religious affiliation of the respondents was Christianity with 55.4% of the respondents indicating that they were adherents of this religious faith (including 2.5% who describe themselves as Jehovah Witnesses). The second most popular religious affiliation was related to mixed religious preferences with Traditional African religions as the core. This was practised by 30.5% of the respondents. However, Traditional African religions were solely practised by only 2.5% of the respondents. Atheists were the third largest group accounting for 8.3% of the respondents. The largest broad ethnic group was the Dangme/Ga group who made up 30% of the respondents, followed by the Akans (27.3%) and Ewes (22.8%).

Self-employment was the biggest source of employment with about 38.5% of the respondents indicating that they owned their businesses. The next biggest source of employment was working for private sector businesses (20.5%), and then for the government (18.8%). Students made up 9% of the respondents. Over three-quarters of the respondents (77.5%) were married. Cohabitation arrangements were practised by about one in ten of the respondents (9.8%). The majority of the respondents (56.3%) did not belong to any organization.

Table 2 summarizes various socio-economic characteristics based on average figures. The average age of the 400 respondents was 32.4 years with the age range between 18 and 51. The years of schooling completed averaged 11.6 years with the range from 0 to 18. The average household size was 5.9 with the range between two to nine. The average monthly personal income was 494.63 Ghana cedis with the entire monthly income range being from zero to 950 Ghana cedis. The yearly expenditures on BC methods and products averaged 68.80 Ghana cedis with the range between zero and 600 Ghana cedis. As shown in Table 1, about 40.2% of the respondents were using contraceptives and BC products at the time of the survey; 41.0% had ever used those products at least one in their lifetimes.

Table 1. Characteristics of survey respondents using frequency analysis in percentages

Item/ group	(%)
Age group	
➤ 18-19	1.3
➤ 20-29	31.3
➤ 30-39	53.5
➤ 40-49	13.0

➤ 50-59	1.0
Educational Level	
➤ No schooling	5.0
➤ Primary school	6.0
➤ Graduated from junior high school	14.5
➤ Some senior high school	5.5
➤ Post-junior high school vocational institute	1.5
➤ Senior high school graduate	11.5
➤ Technical school or equivalent senior high school	21.0
➤ Diploma	7.5
➤ Higher National Diploma	12.5
➤ Bachelor degree	13.8
➤ Postgraduate degree	1.3
Religious Affiliation	
➤ Traditional African religions only	2.5
➤ Mixed religious preferences: Traditional African religions combined with Christianity	10.0
➤ Mixed religious preferences: Traditional African religions combined with Islam	20.5
➤ Christianity only	52.9
➤ Islam only	1.8
➤ Hare Krishna	1.5
➤ Buddhist	0.3
➤ No religion (Atheist or Non-believer in a Supreme God)	8.3
➤ Jehovah Witnesses	2.5
Ethnicity (Broad Ethnic Group)	
➤ Akan	27.3
➤ Dangme/Ga	30.0
➤ Ewe	22.8
➤ Guan	6.8
➤ Gurma	3.7
➤ Grusi	0.8
➤ Mole-Dagbani	4.3
➤ Mande	1.1
➤ Other groups originating from outside Ghana	3.5
Occupation	
➤ Self-employment	38.5
➤ Students and others	19.3
➤ Employee of private sector firms and organizations	20.5
➤ Unemployed	1.3
➤ Employee of government institutions	18.8
➤ Artisan	14.8
➤ Farmers	6.3
➤ Students	9.0**
Marital Status	
➤ Currently Married	77.5
➤ Cohabitation arrangement	9.8
➤ Divorced	2.0
➤ Widowed	1.5
➤ Single	9.3
Membership of Non-Political Community Associations, Groups and Organizations	
➤ No association	56.3
➤ Women Fellowship (Church)	40.8
➤ Ghana Markets Association	1.3
➤ Others	1.6
Current Use of Addictive Substances	
➤ Alcohol	13.0
➤ Cannabis	0.0
➤ Cigarettes	0.0
Usage of Contraceptives and BC Products (% of respondents)	
➤ Usage within the previous 12 months before the survey	40.2
➤ Past use (over one year ago)	41.0
Satisfied with the Number of Female Children (% of respondents)	
➤ Yes	85.3
➤ No	14.7
Satisfied with the Number of Male Children (% of respondents)	
➤ Yes	83.5
➤ No	16.5

Source: Survey data, January to March 2020

Table 2. Average values of key demographic characteristics of the female respondents

Item	Average	SD	Range
Age in years	32.41	6.18	18 to 51
Years of formal schooling	11.64	3.85	0 to 18
Monthly personal income (Ghana cedis)	494.63	175.48	0 to 950
Size of household	5.93	1.27	2 to 9
Number of living female children	2.04	1.35	0 to 5
Number of dead female children	0.08	0.27	0 to 1
Number of living male children	1.87	1.03	0 to 5
Number of dead male children	0.08	0.27	0 to 1
Total expenditures on birth control methods during the past 12 months in Ghana cedis	68.80	106.58	0 to 600

Note: SD denotes standard deviation

Source: Survey data, January to March 2020

4.3 Assessment of the Quality of Health Services and Health Systems by Respondents

Table 3 provides information about the degree of access and the quality of services at health clinics and centers, and the quality of reproductive health information during the last visit of the respondent. The health clinic was generally assessed to be of good quality by the respondents including the perceived reasonable distance from the home of the respondent to the health clinic or center. The only exception is the availability of toilet and urinary facilities, which were regarded as poor with a score of 1.23 out of a maximum score of 5.0.

Respondents on average ranked much better their interactions with medical doctors as compared to those that they received from nurses and pharmacists. For example, for the quality attribute, knowledge of the health condition of the respondent, the average score for doctors was 4.55 as compared to 3.80 for nurses and 3.52 for pharmacists. Not surprisingly, the overall usefulness and assessment was ranked highest by the respondents for doctors (average score of 4.52) as compared to those of nurses (2.93) and pharmacists (2.31) (refer to Table 4.3). The general gap between the perceived trust for doctors and that for nurses and pharmacists is clear and needs some policy attention.

Table 4.3. Quality assessment scores of health services and systems by the female respondents

Item	Average	SD	Ranking
Health Centre or Clinic			
Distance to the Health Centre or Clinic	3.37	1.11	3
Time to the Health Centre or Clinic	3.46	1.11	2
Ease of Access to the Facility on Arrival	4.39	0.70	1
Availability of Comfortable Seating Arrangements	3.02	0.86	4
Availability of Toilet and Urinary Facilities	1.23	0.83	5
Health Centre (Nurses)			
Knowledge of my health condition	2.93	0.37	2
Willingness to help treat my health condition	2.79	0.53	3
Provision of information concerning my health condition	2.63	0.52	4
Level of friendliness and care from personnel	2.46	0.64	5
Overall usefulness of interaction with Nurse(s)	3.10	0.37	1
Health Personnel (Pharmacists)			
Knowledge of my health condition	2.31	0.49	3
Willingness to help treat my health condition	2.32	0.56	2
Provision of information concerning my health condition	2.28	0.49	4
Level of friendliness and care from personnel	2.28	0.49	4
Overall usefulness of interaction with Pharmacist(s)	2.48	0.57	1
Health Personnel (Doctors)			
Knowledge of my health condition	4.52	0.51	3
Willingness to help treat my health condition	4.73	0.45	2
Provision of information concerning my health condition	4.36	0.36	5
Level of friendliness and care from personnel	4.45	0.59	4
Overall usefulness of interaction with Doctor (s)	4.82	0.39	1
Quality of Information and Knowledge on BC Products and Contraceptives			
What is your level of private knowledge about birth control methods	4.67	0.82	1
Provision of Information on RH by personnel of center or clinic	0.20	0.61	2
Personal access to RH information from clinic	0.04	0.28	3
Diversity of information provided by center or clinic	0.003	0.05	4

Notes: The assessment of the quality of services that the respondent received at the health center that he/she last visited based a Likert scale of 1 to 5 denoting excellent quality, 4 very good quality, 3 moderate quality, 2 low quality, 1 very low quality and zero for no quality at all. SD is the standard deviation of the mean score.

Source: Survey data, January to March 2020.

4.4 Evaluation of BC Methods and Products and Contraceptives

Table 4 summarizes information concerning the ranking of awareness of the 29 known BC products and contraceptives. The three highest and equally ranked products, with an average score of 5.0, were injectable medicine, traditional method of abstinence, and the breastfeeding method. The next two highly-ranked and equally-ranked BC methods, based on the awareness by respondents, were withdrawal before ejaculation and legal abortion. Surprisingly, the rhythm method was the lowest-ranked BC method based on awareness.

Information from peers and friends was identified as the key source of information for 27 products (refer to Table 5). Male condom and the breastfeeding method were the two exceptions. Television was the most popular means of awareness for male condom; this source was indicated by almost nine of ten respondents (89.8%). For the breastfeeding method, the dominant source of information was information obtained from parents, carers and older relatives. Friends and peers being the dominant source of information for the majority of the contraceptives and BC products (27 out of 29 products) could indicate a failure of public institutions responsible for dissemination of information about these products to potential users.

The assessment by survey respondents of the quality attributes desired in their preferred BC methods and products is summarized in Table 6. The most important attribute was the reliability and effectiveness of the product in preventing pregnancy. This attribute had a score of 4.71 out of the maximum score of 5.0 indicating its overwhelming importance. The next two most important attributes were the price of the products (average score of 3.77) and the ease of inserting the products into the human body (average score of 3.65). The acceptance of the products by the male partner was the fourth most important out of the 12 attributes evaluated with an average score of 3.38.

Table 4. Respondents' expressed degree of awareness of contraceptives and BC products

Method	Number	Average	SD	Ranking
Injectable medicine	400	5.00	0.00	1
Traditional - planned abstinence	400	5.00	0.00	1
Breastfeeding method	400	5.00	0.00	1
Withdrawal before ejaculation	400	4.99	0.11	4
Legal abortion	400	4.99	0.14	4
Implant	400	4.98	0.16	6
Intra uterine device (IUD)	400	4.96	0.20	7
Female pill	400	4.61	0.49	8
Illegal abortion	400	4.56	0.55	9
Condom used by males	400	4.47	0.59	10
Deliberate overdose of chloroquine after sex	400	4.42	1.13	11
Female sterilization	400	4.38	1.20	12
Lemon and lime	400	4.07	1.45	13
Half cup of sugar with coke or Guinness drink or coffee and drink after sex	400	4.01	1.33	14
Self-care using oxytocin	400	3.88	1.26	15
Vasectomy (male sterilization)	400	3.64	1.39	16
Amenorrhoea (LAM)	400	3.07	1.62	17
Jatropha	400	3.02	1.49	18
Foaming tablets	400	2.81	1.48	19
Alcohol after sex	400	2.68	1.24	20
Female condom	400	2.44	1.17	21
Traditional herbs	400	2.42	1.13	22
Spiritual beads synchronized with withdrawal	400	1.94	1.77	23
Emergency contraception	400	1.85	1.17	24
Contraceptive drugs used by men	400	1.73	1.47	25
Dried pawpaw leaves plus salt petre	400	1.68	1.22	26
Piece of cotton inserted into vagina as barrier	400	1.62	1.48	27
Alum as a barrier method	400	1.47	1.41	28
Rhythm or calendar method	400	1.52	0.89	29

Notes: Very high, high, moderate, low, and very low levels of awareness of the contraceptives and products are represented as 5, 4, 3, 2, and 1, respectively, on a Likert continuum scale. A value of zero denotes total lack of awareness of a product. SD denotes standard deviation.

Source: Survey data, January to March 2020.

Table 5. The most important source of information for various contraceptives and BC methods and products including percentage of respondents declaring the source as the most important

No.	Method	No.	Most Important Source of Information	Percent of respondents
1	Male condom	400	Advertisement through television	89.8
2	Illegal abortion	400	Information from peers and friends	92.3
3	Female pill	400	Information from peers and friends	75.3
4	Withdrawal before ejaculation	400	Information from peers and friends	80.0
5	Rhythm or calendar	400	Information from peers and friends	86.0
6	Injectable medicine	400	Information from peers and friends	79.5
7	IUD	400	Information from peers and friends	73.0
8	Implant	400	Information from peers and friends	75.3
9	Traditional - planned abstinence	400	Information from peers and friends	44.0
10	Female condom	400	Information from peers and friends	53.5
11	Traditional herbs	400	Information from peers and friends	54.0
12	Emergency contraception	400	Information from peers and friends	86.0
13	Female sterilization	400	Information from peers and friends	70.0
14	Alcohol after sex	400	Information from peers and friends	85.0
15	Foaming tablets	400	Information from peers and friends	71.5
16	Breastfeeding method	400	Information obtained from parents, carers and older relatives	50.7
17	Legal abortion	400	Information from peers and friends	85.0
18	Half cup of sugar with coke or Guinness drink or coffee and drink after sex	400	Information from peers and friends	93.8
19	Self-care using oxytocin	400	Information from peers and friends	96.8
20	Dried pawpaw leaves plus salt petre	400	Information from peers and friends	89.0
21	Vasectomy (male sterilization)	400	Information from peers and friends	74.3
22	Jatropha	400	Information from peers and friends	79.8
23	Piece of cotton inserted into vagina as barrier	400	Information from peers and friends	57.5
24	Lemon and lime	400	Information from peers and friends	98.5
25	Deliberate overdose of chloroquine after sex	400	Information from peers and friends	100.0
26	Amenorrhoea (LAM)	400	Information from peers and friends	71.5
27	Spiritual beads synchronized with withdrawal	400	Information from peers and friends	77.8
28	Contraceptive drugs used by men	400	Information from peers and friends	86.0
29	Alum as a barrier method	400	Information from peers and friends	71.5

Source: Survey data, January to March 2020.

Table 6. Female respondents' assessment scores for the quality attributes desired for BC products and contraceptives

Attribute	Number	Average	SD	Ranking
Reliability and effectiveness of the product in preventing pregnancy	168	4.71	0.53	1
The price of the product	145	3.77	1.31	2
Ease of physically inserting item into the body	162	3.65	1.31	3
Acceptance of the product by my male partner	170	3.38	1.31	4
Confidentiality in using the product	168	3.36	0.86	5
Peer pressure to use the product from friends	170	3.36	1.25	5
Comfortability of having item inside the body	162	3.35	1.13	7
Safety in terms of minimal side effects to my body	168	3.29	1.05	8
Low travel cost to a place to get product	167	2.90	0.88	9
Affordability of the product based on my income	167	2.88	1.21	10
Access to adequate information about the product	167	2.86	0.96	11
Availability of the product locally	167	2.70	1.06	12

Notes: The number 5 represents very high level of importance, 4 high level of importance, 3 moderate level of importance, 2 low level of importance, 1 very low level of importance and zero meaning that the attribute is of no importance in the decision to use the product.

Source: Survey data, January to March 2020.

4.6 Results of the Regression Analysis Dealing with Factors Influencing the Current Usage of Contraceptives and BC Products by Respondents

The results of the binary logit regression analysis of the variables influencing the current use of BC products and contraceptives are presented in Table 7. At the maximum 10% acceptable significance level, only seven of the 18 independent variables were statistically significant in influencing the likelihood of usage of contraceptives and BC products. The significant variables were: (1) PINCOME; (2) STUDENT; (3) AWARENESS*PINCOME; (4) AWARENESS*STUDENT; (5) QUALITYOFNURSES; (6) QUALITYOFDOCTORS; and (7) QUALITYOFRHINFORMATION.

Decreasing likelihood of using BC products and contraceptives occurred with increasing personal income of a woman. The likelihood of using these products was lower for students as compared to non-students. This finding is similar to the result obtained by Anaman and Okai (2016) at Abokobi in the Greater Accra Region of Ghana. This particular result also reflected abstinence from sex exercised by some students and/or their inadequate information about these products. While awareness per se did not influence the likelihood of using these products, it acted as a positive moderating variable when combined with increasing personal income and student status, in increasing the likelihood of the use of these products.

The combination of increasing awareness and personal income led to increased likelihood of a woman using the products. This result suggested that there was increased likelihood of using BC products and contraceptives for higher-income earning women when they had more awareness of these products. Similarly, students' increased awareness of BC products and contraceptives led to increased likelihood of them using these products.

Demographic factors such as age, the number of children, single marital status and formal educational attainment of the female respondents did not have any significant effect on the likelihood of them using contraceptives and related products. Further, all the four religious group preference independent variables, introduced in the model, as dummy variables, representing adherents of African traditional religions, Roman Catholics, Other Christians and follower of the Islamic Faith, respectively, had no significant effect on the likelihood of a respondent using BC products and contraceptives. This particular result suggested that the likelihood of using contraceptives and related products was not driven by the religious preference of an individual; this likelihood was driven by other factors beyond religiosity.

An important hypothesis tested in this study was the linkage between the quality of health systems and health services and the use of BC products and products. The results summarized in Table 7 showed that the quality of the clinic, based on its physical infrastructure and its distance from the respondents' homes, did not have any significant effect on the likelihood of using BC products and contraceptives. However, the quality of nurses and doctors, as measured by the degree of knowledge of respondents' conditions by these professionals, and their willingness to treat these conditions, was positively linked to increased likelihood of using BC products and contraceptives. Finally, the quality of RHC information given to respondents by the clinic also had significant positive effect on their likelihood of them using these products.

Table 7. Summary of binary logit statistical analysis results dealing with the likelihood of female respondents using contraceptives and related BC products versus selected socio-economic characteristics

Dependent Variable is USEBCM (Current usage of BC products and contraceptives defined as usage of the products during the 12 months prior to the survey)

Variable	Numerical Estimate of the Value of the Parameter	Computed Wald Statistic	Significance Probability
CONSTANT	-0.642	0.005	0.941
AGE	-0.023	0.648	0.421
NCHILDREN	0.053	0.123	0.726
SINGLE	-0.088	0.036	0.849
AFRICANTRADITIONALIST	1.122	1.684	0.194
ROMANCATHOLIC	0.384	0.701	0.403
OTHERCHRISTIAN	-0.111	0.086	0.769
ISLAMREL	-0.267	0.453	0.501
PINCOME	-0.035	3.863	0.049**
STUDENT	-21.316	4.022	0.045**
EDUFEMALE	1.174	1.972	0.160
AWARENESS	-1.602	0.440	0.507
AWARENESS*PINCOME	0.010	3.872	0.049**
AWARENESS*STUDENT	5.970	4.004	0.045**
AWARENESS*EDUFEMALE	-0.335	1.999	0.157
QUALITYOFCLINIC	0.248	0.509	0.476
QUALITYOFNURSES	0.739	2.922	0.087*
QUALITYOFDOCTORS	0.706	3.130	0.077*
QUALITYOFRHINFORMATION	0.534	5.455	0.020**

Notes: Percentage of observations classified as correct was 69.9

*** 1% level statistical significance

** 5% level statistical significance

* 10% level statistical significance

4.7 Regression Results of the Relationship between Economic Welfare and Usage of BC Products and Contraceptives

Table 8 is a summary of the results of a regression analysis that related economic welfare of the female respondents with a number of their characteristics, including their usage of contraceptives and related BC products. The explanatory power of the model as measured by the R^2 was very strong with a value of 0.880 indicating that 88% of the variation in the dependent variable was explained by the 12 independent variables. The model was adequately specified using the probability value of 0.109 from the Ramsey Reset test, which was higher than the 0.10 probability value for the rejection of a null hypothesis used for this study (refer to Table 4.13). The equation error term was assumed to be normal based on the large randomly-selected sample size based on invoking the central limit theorem of statistics.

Heteroscedasticity was analyzed using the Lagrange Multiplier (LM) test. The LM test regresses the estimated equation error term against the estimated predicted value of the model to identify any significant relationship between the two variables. Lack of significant relationship between two variables indicates the absence of significant heteroscedasticity. The computed value of the LM test was 0.867, far above the maximum critical value of 0.10 used for this study. This result indicated that there was no significant heteroscedasticity problem.

All the parameters of the independent variables, with the exception of DISABLED, CHRISTIAN, and ISLAMREL, were significant. Based on the standardized regression estimates, the unemployment status of the female respondent affected her economic welfare the most. Economic welfare status of females clearly increased with employment. There was no statistically significant difference in economic welfare between disabled and non-disabled female respondents, given the insignificance of the parameter of the DISABLED variable.

The relationship between the economic welfare of the female respondent and her age was negative statistical significance of the AGE parameter; this indicated the decline in economic welfare with advancing age of the female respondent, assuming all other things constant. The number of years of formal educational attainment had a direct positive significant effect on the economic welfare of the female respondent. Female respondents who were adherents of African traditional religions had higher economic welfare than non-practitioners of these religions. Christian and Muslim respondents did not have higher economic welfare than other people practicing different faiths.

Women who had ever used BC products and contraceptives (at least once in their lifetimes) had significantly higher economic welfare than those women who had never used these products in their lifetimes. Further, the combined effect of the use of BC products and contraceptives in larger-sized households was also established, based on the statistical significance of the parameter of the interaction term. There was significant decrease in the economic welfare for women using BC products and contraceptives who had household sizes above four as compared to women using these products but with less than four children. Increasing household size burden from large families overwhelmed the economic welfare gains arising from use of BC products and contraceptives.

Another important result was that on average currently married women had higher economic welfare than those women who were not currently married. The relatively larger household sizes, indicated by the HSIZE_LARGE variable, when combined with currently married status, led to reduced economic welfare. This result indicated that increasing household size of currently married women led to decreasing economic welfare of the female respondent.

Table 8. Regression results of the relationships between a woman's economic welfare indicated by her adjusted personal income versus her ever lifetime use of BC products and contraceptives and other socio-economic characteristics as additional independent variables

Dependent Variable is the natural logarithm of the average monthly personal income of female respondent adjusted for by household size (LPCINCOME)

Variable	Numerical Estimate of the Value of the Parameter	Numerical Estimate Value of the Standardized Parameter	T Value	Significance Probability
CONSTANT	4.638	0.000	46.777	0.000***
AGE	-0.011	-0.087	-4.218	0.000***
EDUFEMALE	0.056	0.260	13.559	0.000***
DISABLED	0.247	0.028	1.432	0.153
UNEMPLOYED	-6.226	-0.902	-47.083	0.000***
AFRICANTRADITIONALIST	0.170	0.035	1.734	0.084*
CHRISTIAN	0.011	0.007	0.277	0.782
ISLAMREL	0.038	0.020	0.823	0.411
CUMARRIED	0.187	0.094	2.041	0.042**
EVERUSEDBCM	0.383	0.232	4.185	0.000***
EVERUSEDBCM*HSIZE_LARGE	-0.455	-0.272	-4.835	0.000***
CUMARRIED*HSIZE_LARGE	-0.179	-0.095	-1.957	0.051*

Notes: Significance level of Ramsey Reset test of correct model specification was 0.107

Significance level of Lagrange Multiplier (LM) test of heteroscedasticity was 0.915

*** 1% level statistical significance

** 5% level statistical significance

* 10% level statistical significance

5. Conclusions and Recommendations

5.1 Summary of Study and Conclusions

The study dealt with a quantitative survey and involved 400 randomly selected women in all 39 settlements of the Amasaman Area Council in the Greater Accra Region of Ghana. The objectives of the study were to establish the factors which influenced the use of BC products and contraceptives and to ascertain whether women who had ever used birth control (BC) products and contraceptives, over their reproductive lifespans, had higher economic welfare than those who had never used these products. The results of the study showed that the likelihood of using BC products and contraceptives declined with increasing personal income of the women. Further, students were less likely to use these products than non-students. However, the degree of awareness of these products was influential in the increased likelihood of use of these products by students and also by higher-income women.

Other variables which influenced the likelihood of use of contraceptives and BC products and contraceptives included the quality of reproductive health information supplied to women and the quality of services provided by nurses and doctors at clinics. It was established that women who had ever used BC products and contraceptives, over their reproductive lifespans, had significantly higher incomes than those who had never used these products at all.

5.2 Recommendations

The study established that awareness of BC products and contraceptives increased their use, especially for students and higher-income women. Further, the perceived quality of nurses, doctors and RH information provided by their clinics improved their likelihood of using BC products and contraceptives. This result suggests the need for increased efforts by State and Community agencies and institutions in creating greater awareness for students and adult women about the use of BC products and contraceptives. The government should set up special family health clinics in all communities with a population of 5,000 and over and resource them adequately with well-trained personnel and adequate tools and machinery. Second, the State should provide education on family planning for policy makers, traditional authorities, religious bodies, implementers at all levels on the need to integrate family planning into their programs. Finally, the government could provide incentives such as tax rebates to business organisations and other stakeholders that take up the role of RH as a social responsibility.

5.3 Limitations of the Study

The limitations of the study are two-fold – theoretical and methodological limitations. First, the theory guiding the study was limited to the life cycle theory (LCT). However, LCT could not fully explain all the factors that influence the acceptance and use of birth control products and contraceptives. Given the complexity of human beings and human systems, it is sometimes suggested an interdisciplinary approach is used in research work which combines different theories into an ensemble model in an attempt to explain complex situations. The methodological limitation was related to the choice of the survey design approach for the study; this method was particularly useful to the researcher as it provided a cost-effective means of conducting relatively large study involving women concerning reproductive health choices. Nevertheless, other approaches such as detailed field research studies that allow for the actual decision-making processes of women would have provided more accurate accounts of their choices. Yet, these approaches are often not practical given the large amounts of resources required to undertake even modestly successful field research studies.

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