RESEARCH ARTICLE

PROBIT ANALYSIS ON THE SOCIO-DEMOGRAPHIC CONSEQUENCE OF MATERNAL LIFESTYLE AMOMG PREGNANT WOMEN: AN EXPLANATORY STUDY OF KWABRE EAST DISTRICT (ASONOMASO GOVERNMENT HOSPITAL)

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ABSTRACT

Maternal lifestyle is a key determinant of maternal health in the global world. Maternal health has become the top most priorities for the United Nations, the World Health Organization, Governments and institutions around the world. As a result many attempts have been made in order to improve maternal health by educating the pregnant women on their way of life, nature of diet and the kind of activities they engage themselves in during the period of pregnancy. World including, Sub- Saharan African countries specifically, Ghana has worked harder in order to achieve the millennium development goal target of improving maternal health, thereby reducing maternal mortality ratio by ¾ in 2015 (Report from Ghana Millennium Development Goals, 2008). The researched work was a quantitative study; with the helped of probit model the field data was analyzed. The study used a sample size of 200 pregnant women. The study employed both purposive and random sampling technique in taking the data. Purposively the area under study was selected in order to get the required respondents at Kwabre East District: Asonomaso Government Hospital. But in selecting the pregnant women in the study area a simple random sampling techniques was used. The study found out that, there was a negative effects of the number of period females spend on education (i.e. knowledge or absent of ignorance) and age of the pregnant women on drinking lifestyle, smoking lifestyle but exhibited a positive effect on the use of mosquito net, regular exercise and visitation of antenatal care among pregnant women. The study recommended that the Government of Ghana and all other stakeholders which include NGOs, Ghana Health service should educate the pregnant women on the use of treated mosquito net and the need to do regular exercises as well as visiting the antenatal for care. Thus, all stakeholders should engage the mass media (i.e. radio stations, television and internet) massively, to campaign and promote education for females and also inform the public to widen their knowledge on the relevance of prenatal care, post natal care, and hospital delivery, in order to reduce maternal death during delivery. Again, the study recommended that, the Government of Ghana together with all stakeholders should institute affirmative measures and actions that will encourage ladies (i.e. girls) to attend school.

INTRODUCTION

Maternal lifestyle is a key determinant of maternal health in the global world. Maternal health has become the top most priorities for the United Nations, the World Health Organization, Governments and institutions around the world. As a result many attempts have been made in order to improve maternal health by educating the pregnant women on their way of life, nature of diet and the kind of activities they engage themselves in during the period of pregnancy.

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World including, Sub- Saharan African countries specifically, Ghana has worked harder in order to achieve the millennium development goal target of improving maternal health, thereby reducing maternal mortality ratio by ¾ in 2015 (Report from Ghana Millennium Development Goals, 2008). According to the World Health Organization (2011), maternal health refers to the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality. Maternal health continues to be an important precedence to the Government of Ghana in its attempt to achieve the millennium development goal (MDG) of convalescing maternal health in order to spruce down maternal mortality. According to World Health Organization report in 2010, maternal mortality is a

solemn quandary for where about 1000 women die from pregnancy or childbirth-related complications around the world on a daily basis. Also in 2008, about 358 000 women died during the period of pregnancy and time of giving birth. Almost all of these deaths occurred in developing countries, and most could have been prevented (World Health Organization, 2010). The Government of Ghana and other institutions have recognized the significance of maternal health in curbing maternal mortality and have since recognized the millennium development authority to carry out the millennium development goals in which the 5th goal is to improve maternal health. In the light of the problem above, this study seeks to bring to the notice of the government of Ghana on the effects of socio-demographic features such as age, income and education level of pregnant women's on their maternal life style and hence on their maternal health which would therefore transmit signals to the various stakeholders on how to educate the women or female child in order to scuffle against maternal mortality during pregnancy and child delivery.

LITERATURE REVIEW

This section talks about the various maternal lifestyles (i.e. smoking, drinking alcohol, regular physical exercises, usage of a treated mosquito net, and antenatal attendance) relationships with their socio-demographic factors (i.e. education, income, age e.t.c.) and their effects on maternal health. According to Slowik (2011) smoking in pregnancy is linked with premature birth and low birth weight, as well as higher rates of illness (colds, bronchitis, ear infections, etc.), problems with breathing and sudden infant death syndrome (SIDS). Birth deformities of the heart, brain, and face are also more seen among children born to mothers who smoke. Children whose mothers smoked during pregnancy tend to be physically smaller than children of non-smokers, and may continue to have higher levels of respiratory illness, such as asthma, for many years.

Theoretically, there is a negative effect of drinking alcohol during pregnancy on maternal health. According to Slowik (2011), drinking of alcohol during pregnancy is the leading cause of birth deformities. Drinking during pregnancy can lead to Fetal Alcohol Syndrome (FAS) which is a combination of defects that may include any combination of reduced growth (before or after birth), a small head (likely related to reduction of brain size), abnormal behavioral development and facial defects. According to Kakkilaya (2011), the usage of mosquito treated net especially during pregnancy is very important because pregnant women form the main adult risk group for malaria and 80% of their mortalities which occurs in Africa is due to malaria. He further argued that, among the pregnant women the morbidity due to malaria includes anaemia, fever illness, hypoglycemia, cerebral malaria, pulmonary edema, puerperal sepsis and mortality. The defects in the new born include low birth weight, prematurity, and mortality. In Grossman (2006) productive efficiency hypothesis, a rise in education raises the efficiency of the production mechanism in the non-market goods such as health. That is a rise in the level of education increases the efficiency of health production.

According to Deaton (2002), education increases an individual's ability to produce health by contributing immensely into their health capital stock. However,

Rosenzweig and Schultz (1982) has questioned as to how education can affect the marginal products of inputs to produce health without altering the input mix. In the allocation of time model postulated by Becker (1965), the model postulated that increase in education (number of years of formal schooling) and knowledge capital, in general, raise efficiency in the nonmarket sector, thus time spent on seeking medical, exercising e.t.c. the model further argued that, a rise in education will raise efficiency in the production of non market outcomes such as health.

MATERIALS AND METHODS

The study employed primary source of data through the help of questionnaires administration. The study used a sample size of 200 pregnant women. The study employed both purposive and random sampling technique in taking the data. Purposively the area under study was selected in order to get the required respondents at Kwabre East District: Asonomaso Government Hospital. But in selecting the pregnant women in the study area a simple random sampling techniques was used. The study used the simple random sampling techniques because each pregnant woman at the Hospital in the district stood up an equal chance of being included or excluded in the sample. Closed-ended questionnaires were administered but were centred on the whether pregnant women smoke or not, drink alcohol or not, use mosquito treated nets or not, do regular physical exercises or not and also visit or attend antenatal care (i.e. clinics/hospitals) during the pregnancy or not. Also pregnant women were asked to indicate their number of years spent on education, quantitative value of age and income l. STATA was used to analysis the field data with the help of probit regression model to establish the relationships between the socio-demographic features of the pregnant women and their maternal lifestyle (i.e. maternal health).

Model Design

A conceptualized probit model was used to assess the effect of socio-demographic consequence on maternal lifestyle and health. The dependent variable is qualitative/ binary variable which takes into accounts yes or no responses. It would be useful to capture the dependency of Y on X as a simple function, particularly when there are several explanatory variables. For example, in ordinary multiple regressions, the link function is called the identity link since

$g(\mu_i) = \mu_i$ and so $\mu_i = \eta_i$, or

$$E(y_i) = x_i' \beta = \mu_i = \eta_i$$

The usual assumption

$$Y_i = \beta_0 + \beta_1 X_1 + \quad + \beta_k X_k + \varepsilon_k$$

where $\varepsilon_k \sim N(0, \sigma_\varepsilon^2)$ and ε_i and ε_k are independent for $i \neq k$. The expectation of Y i.e

$E(Y_i) = E(\beta_0 + \beta_1 X_1 + \quad + \beta_k X_k + \varepsilon_k)$ and so $\pi_i = \beta_0 + \sum \beta_k X_k$

For this reason, the regression model to a dummy response variable is called the probability model. For a Probit model

$$P_r\ (Q=1) = \phi^{-1}(p_i) = \sum_{k=0}^{k=n} \beta_k X_{ik} = \phi(X'\beta)$$

Hence the probit model for the study is given as;

$$P_k\ (Q_i = 1) = \Phi\ (\beta_0 + \beta_1 Age + \beta_2 Income + \beta_3 Education + \varepsilon_k)$$

Where Q_i = Qualitative dependent variable: if respondents engage in the various maternal lifestyle =1; if not=0. The dependent variables ranges from one (1) to five (5) for where 1= smoking lifestyle, 2= drinking of alcohol, 3= visiting antenatal, 4= regular exercise and 5= use of treated mosquito net.

Income = Monthly Income/earnings
Age = quantitative value of age
Education = Number of years spent on education
Φ= Cumulative standard normal distribution function
ε=Error-term

STUDY HYPOTHESES

According to Grossman (2000) knowledge (i.e. education level) is positively related to health status of an individual. This implies that as people attain higher level of education they become more concern about their health by consuming more healthcare through regular exercise, demanding more preventive care (i.e. sleeping in mosquito nets and avoiding smoking and drinking). Therefore, the study hypothesized that as pregnant women attained higher level of education, they would be more concern about their health status which will in effect influence them to adopt a good lifestyle. Again, age and income are also expected to be positively related to the following maternal lifestyle (i.e. doing regular exercise, sleeping in mosquito nets, avoiding smoking and drinking), if the various lifestyle is a normal good to the inhabitants.

RESULTS

The Quantitative Analysis of the Probit Regression Results for Maternal Lifestyle Equation

Table 1 summarizes the computations for parameter estimates for the probit working correlation assumptions with respective to maternal health lifestyle equation. The analyses of the table takes into accounts five maternal lifestyle equation for smoking, drinking of alcohol, antenatal attendance, regular exercise and the use of treated mosquito nets among the pregnant women respectively. The standard errors are the values presented in parentheses. The coefficients of the independent variables (i.e. age, income and education) are the values with the asterisked and their effect on the maternal lifestyle and health is the sign the value possesses. Figures that has been asterisked (*), (**) and (***) denote significance at the 10%, 5% and 1% level, respectively for each model.

The independent variables (age, income and educational level) with respect to specific time point's interaction with respondents' responses on whether they smoke, drink alcohol, attend antenatal, do regular exercises, and sleep in mosquito nets as dependent variables were all tested to be significant at $\alpha = 0.1\ and\ 0.05$ respectively. About 86% of the data points were explained and taken into consideration the analyses as seen from our R-squared estimate of 0.86 to one (1) decimal place (86%). This implies that about 86% fluctuation or variation in the maternal lifestyle and health equation was explained by the changes in the independent variables (i.e. age, income and educational level).The parameter estimates for the models are approximately the same for all the assumptions when we consider estimation at 1 decimal point.

Table 1. Probit Results for the Maternal Lifestyle Equation

Variables	Smoking	Drinking alcohol	Visiting antenatal	Regular exercising	Mosquito net
AGE	-0.0131617**	-0.0103887**	0.0207111**	0.0117102**	0.0107104**
	(0.0010012)	(0.0037416)	(0.0028127)	(0.0028128)	(0.0027127)
INCOME	0.0315388*	0.0376001*	0.0481412**	0.0371412**	0.0371412**
	(0.02470212)	(0.02461301)	(0.01513042)	(0.01613032)	(0.01513012)
EDUCATION	-0.0314386*	-0.03863012*	0.0321412***	0.0330312***	0.0321411***
	(0.0266021)	(0.02531143)	(0.00412030)	(0.00514030)	(0.00416032)
OBSERVATION	200	200	200	200	200
R-Squared	0.8580	0.8604	0.8591	0.8583	0.8570

Note: Standard errors are presented in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively. Source: Field data, February, 2016

In consideration to an output revealed from the analyses (see from table 1), the study tested the appropriateness or otherwise of each of the model parameters such that one of the coefficient of the

$$\beta_i \neq 0 \qquad for\ at\ least\ one\ i\ .$$

The appropriate hypothesis is given as

$H_0:\ \beta_1 = \beta_2 = \quad = \beta_k = 0\ against\ t\ e\ alternative\ t\ at$
$H_1:\ \beta_i \neq 0 \qquad for\ at\ least\ one\ i$
$At\ \alpha = 0.01, 0.05\ and\ 0.1\ \ level\ of\ significance\ respectively.$
Where β_i are the model parameters or coefficients of the independent variables.

The explanatory variable Age was statistically significance at 5% and 10% significance level for all the maternal lifestyle equations. Age variable was negatively related to the smoking and alcohol drinking behaviour of the pregnant women. This implies that as people ages their health stock depreciates overtime, so the individual will want to protect the minimum health stock left for survival in the next period. Also, if females get older before getting pregnant, they will be knowledgeable old how to keep, sustain, protect and invest into their health stock. By so doing, they will always avoid any lifestyle which can deteriorate their health stock by avoiding smoking, drinking and eating late. However, age was positively related to regular exercise, attendance of antenatal and the use of treated mosquito net among the pregnant women. This implies that as

age increases people tends to demand more of healthcare or engage in activities that can improve their health stock since health of an individual depreciate over time. The implication is that if females wait for sometime patiently to reach their maturity stage ready for marriage, then in their period of pregnancy, they will demand more of healthcare as a physiological need in order to improve their health. This findings buttress on the Grossman (2000) argument on age in the human capital model that health depreciates overtime, so as people ages they tend to demand more healthcare to improve upon their health stock.

Income was not statistically significant to smoking and drinking of alcohol equation at 5% significance level. This implies that, at 5% significance level, income has no influence on the behaviour of pregnant women to smoke and drink alcohol. Conversely, it was positively related to smoking and drinking of alcohol at 10% significance level. This could be as a result of habitual factors and appetite problem that calls for pregnant women to engage in such bad lifestyle. However, income was statistically significant at 5% and 10% significance level in antenatal attendance, regular exercise and the use of treated mosquito net equation.

Income was positively related to antenatal attendance, regular exercise and the use of treated mosquito net equation. This implies as income levels or earnings of the pregnant women increases, their ability to afford fee for service for antenatal attendance, gate fee for gym centres to ensure regular exercises and can also buy treated mosquito net for use. Education was not statistically significant to smoking and drinking of alcohol equation at 5% significance level. This implies that, at 5% significance level, education has no influence on the behaviour of pregnant women to smoke and drink alcohol. Conversely, it was negatively related to smoking and drinking of alcohol at 10% significance level. Education was statistically significance at 5% and 10% significance level for all the maternal lifestyle equations except smoking and drinking of alcohol. Education variable was negatively related to smoking and alcohol drinking behaviour of the pregnant women.

This implies that as people attain higher level they become knowledgeable in how to protect their minimum health stock left for survival in the next period. Also, if females become well educated before getting pregnant, they will be knowledgeable enough through the training skills acquired in the class on how to keep, sustain, protect and invest into their health stock. By so doing, they will always avoid any lifestyle which can deteriorate their health stock by avoiding smoking, drinking and bad eating habit. However, education was positively related to regular exercise, attendance of antenatal and the use of treated mosquito net among the pregnant women. This implies that as the education level among the pregnant women increases, they become more sensitive to demand more of healthcare or engage in activities that can improve upon their health stock since health of an individual depreciate over time. The implication is that the period of pregnancy, education will help them to read instructions and follow medications rightfully as prescribed by the physician after attending antenatal, read and follow instruction at the gym centres, and demand more of preventive healthcare as a physiological need in order to improve their health (i.e. demand of treated mosquito net as

against malaria morbidity). This findings buttress on the Grossman (2000) argument on education in the human capital model that education helps the individual to produce both non-market and market inputs efficiently. In the nut-shell, level of education has a greater influence on maternal lifestyle of people through literacy rate in understanding the need to use mosquito net, do regular exercise and seeking for antenatal care during pregnancy for save delivery.

Conclusion and Policy recommendation

1.The study recommends that, the Government of Ghana together with the Ghana Education service should institute measures and affirmative action's that will encourage ladies (i.e. girls) to attend school and this will in effect increase enrolment among females in the education sector. The implication is that education will have a significant positive impact on pregnant women attitudinal behaviour by engaging in physical exercises regularly and using mosquito treated net. These life styles will in effect, improves the probability rate pregnant women to free from maternal morbidity and mortality by preventing hypertension and malaria infection. The study recommends that the Government of Ghana and all other stakeholders which include NGOs, Ghana Health service should educate the pregnant women on the use of treated mosquito net and the need to do regular exercises as well as visiting the antenatal for care. Thus, all stakeholders should engage the mass media (i.e. radio stations, television and internet) massively, to campaign and promote education for females and also inform the public to widen their knowledge on the relevance of prenatal care, post natal care, and hospital delivery, in order to reduce maternal death during delivery.

2. The study recommends that stakeholders of maternal health should prescribe the use of the physiotherapy department for the pregnant women and also subsidize its accessibility for the pregnant women to make it affordable for the low income earners. This will enables them to do regular physical exercises in order to invest into their health stock. The study recommends that the government should subsidize antenatal service for the pregnant women or making it free, in order to entice them to visit the health care facilities regularly. In doing this will reduce the maternal mortality rate and morbidity among pregnant women.

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