

Determinants of Antepartum Mental Complication

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Abstract:- Health is most important concept of every people. In this regard state has responsible for improve health facilities. When it is the women's context, the maternal care has been accorded top priority. Government have launched many health care programmes and appointed offices to care about the pregnant women and make sure their health condition. As the result of this, maternal mortality is relatively low. Even though, awareness about the complication is still remaining low in the society. Thus, most of the pregnancy women are faced several complications in the pregnancy period and after delivery. So that, 75.4% complications influence for the maternal mortality of Sri Lanka in 2011. Unfortunately, most of the infant were born with maternal and physically feeble and mothers had to face huge complications because of maternal complications as hypertension.

To identify the influential factors on mental complication during pregnancy period a sample of 200 pregnant mothers from Kaduwela and Homagama municipal areas were chosen using convenience sampling method, and collected data using structured questioners. Binary logistic data analysis method was utilizing to analyze the data due the dichotomize nature of the response variable.

The results have indicated that, in antepartum, mental complications were occurred due to the carelessness of the husband, mistrust on husband, due to the unplanned pregnancy, perception based on the gender of the unborn child and the family problems due to drugs.

Keywords:- Antepartum, Complications, Mental, Pregnancy.

I. INTRODUCTION

“Procreation is the biological process by which new "offspring" individual organisms are produced from their "parents". Reproduction is a fundamental feature of all known life. Each individual organism exists as the result of reproduction. The known methods of reproduction are broadly grouped into two main types are sexual and asexual” (Encyclopedia).

Both males and females become fertile in their teens following puberty. For girls, the beginning of their reproductive years is marked by the onslaught of ovulation and menstruation. It is commonly understood that after menopause women are no longer able to become pregnant. Generally, reproductive potential decreases as women get

older, and fertility can be expected to end 5 to 10 years before menopause (American society, 2012).

Having a baby is one of the most exciting things that can happen to women. Pregnancy also known as gravidity or gestation is the time during which one or more outcome develops inside a woman.

A pregnancy complication is health problems that occur during pregnancy. It can harm mother's as well as baby's health, or both. Complications can occur in three ways such as many women have health problems that emerge during pregnancy period, and other women have health problems before they become pregnant and some women have too complication after delivery. It is very important for women to receive health care before, after and during pregnancy to decrease the risk of pregnancy complications. However, most pregnancy complication can be effectively threaded.

There are different ways that people handle complication situation in pregnancy period in past and future. Even though complication of the pregnancy period were proper identification and the treatment for that matter began with development of medical facilities. In the past, they were doing some rituals for pregnant women like Ratayakuma and chanting Angulimala Piritha wish healthy for both mother and the baby, even they do not have knowledge about pregnancy complications. Because of this unidentified situation caused lot of maternal and infant mortality. It was in higher rate. The maternal and infant mortality is taking low level today, because of the development of the medical science. But the awareness about the complication is still remaining low in the society.

Sri Lanka being an eastern country has a higher concern towards motherhood and care during pregnancy. However current situation in Sri Lanka pregnancy complication is growing fast rate. Thus, complications are exigent impact for pregnancy women and unborn child. As a result of this impact occur maternal mortality, infant mortality and born deformed child.

The high risk pregnancy complications are increasing day by day in Sri Lanka. There was a 17% of high risk complications in 2012 and 21.2% of high risk complication in 2013. According to there is a growth of high risk complication in 2013 than the 2012 (Family Health Bureau in Sri Lanka).

Though this research will be conduct due to above mentioned factors. In this study consider only the complication problems that occur during pregnancy period

and after delivery. They may affect the woman, the fetus, or both and may occur at different times during the pregnancy. However, medicines are not enough for decrease pregnancy complications. Women in their pregnancy period who necessity more love, care and attention from the husband, family and neighbor. Then she will be able delivery healthy and perfect infant to the society. But the lack of having those factors (love, care and attention) cause to increase the complication of pregnancy women especially in hypertension. Pregnancy complication is hugely affected not only to the mother and the baby but also the social, economic sectors. It is a huge benefit to having healthy babies for a country socially and economically. The new born babies who are weak in healthy is problem in short term to the government expenditure and it's reduce the efficiency of parents to the labor force. In long term it will directly effect to the labor force and this will have caused to an economic depression.

According to this, study discuss what are the determinants of mental complication during pregnancy period and investigate how pregnancy complications are impact to unborn child and pregnancy women's health.

II. STATEMENT OF PROBLEM

Health is most important concept of every people. People are always tried to live with happy. People cannot live happily without good health. Government has responsible for improve health facilities. By those womens' health and maternal care has been accorded top priority. Government have launched many health care programmes and appointed offices like midwife to care about the pregnant women and make sure their health condition. As the result of this maternal mortality are low rate in today. Even though, awareness about the complication is still remaining low in the society. Most of the pregnancy women are faced several complications in the pregnancy period and after delivery. As the result of that 75.4% complications influence for the maternal mortality of Sri Lanka in 2011. Unfortunately, most of the infant were born with maternal and physically feeble and mothers had to face huge complications because of maternal complications such as hypertension (Family Health Bureau in Sri Lanka). Pregnancy complication is hugely affected not only to the mother and the baby but also the social, economic sectors in country. It caused to economic depression in developing countries.

III. SIGNIFICANCE OF THE STUDY

This research is mainly considered about the factors effect on complications in during pregnancy period and after the delivery. The main significance is doing this research gain the knowledge about that complication for pregnancy women, government and people who interested in this field. In which someone will be able to get a real idea about the situation regarding these pregnancy complications. Such as diseases, social effects (occupation problem, family barriers) and mentally effects.

In current situation of Sri Lanka, Government have launched many health care programmes and appointed offices like midwife to care about the pregnant women and make sure their health condition. Even though, awareness about the complication is still remaining low in the society. So thought this research can investigate what are the factors which effect to pregnancy complications. It is most important to government and non-government organizations for improve their maternal care programs.

So though this research the government and society can get many decision for protected that pregnancy women. This research is also important to the academic field. Such as university students, another academic field researcher. So it will be able to get real idea about current situation of pregnancy complications in Sri Lanka and can identify what is the high risk factors effect of pregnancy complication.

IV. OBJECTIVES OF THE STUDY

The objective of this study is determining the factors which are affected on mental complications during pregnancy period and after delivery.

V. MATERIALS AND METHODS

Data is a collection of facts, such as values or measurements and it can be numbers, words, measurements, observations or even just descriptions of things. In this study, both quantitative and qualitative data were collected through primary and secondary sources. This study basically bases on the primary data and the researcher has employed the questionnaire method and observation method to collect the required primary data. The questionnaire, which included four main components, namely general information; socio demographic and pregnancy related data, details on occupation and environmental exposures and general health questions.

The term "population" is used in statistics to represent all possible measurements or outcomes that are of interest to in a particular study. The selected population of this study is total number of pregnant and lactating mothers who are admitted Homagama base hospital and participated two Medical Officer of Health areas (MOH) of Kaduwela municipal council. A sample is a part of the population of interest and a sub collection selected from a population. A population commonly contains too many individuals to study conveniently, so an investigation is often restricted to one or more samples drawn from it. Within this study, 200 women were selected for the sample from total population.

Sampling is the selection of part of an aggregate of material to represent the whole aggregate. There are many methods of sampling and the choice of the method will be determined by the purpose of sampling. In Statistics, mainly there are 2 types of sampling techniques such as probability and non-probability sampling. In this research non probability sampling had been used. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher.

This study was done by antenatal clinics and parity matched control sample to compare the outcomes was selected by convenient sampling method. All pregnant and lactating mothers eligible to participate in the study were recruited during gestation and 3 months before after delivery. The sample of this study was combination of 200 gestation women and lactating mothers. In this study conveniently selected by 125 gestation women and lactating mothers.

Data Analysis is the process of systematically applying statistical and or logical techniques to inspecting, cleaning, transforming and modelling data with the goal of discovering useful information, suggesting conclusions and supporting decision making. In many cases, socio economic variables are categorical rather than interval scale and most of the researches focus on models where the dependent variable is categorical. In such a situation Logistic Regression analysis can be carried out.

VI. BINARY LOGISTIC REGRESSION MODEL

Logistic Regression is a special type of regression where binary response variable is related to a set of explanatory variables, which can be discrete and or continuous. Binary data is a statistical data type which takes one of only two possible values representing success and failure, or more generally the presence or absence of an attribute of interest. These binary response variables can be takes numerical values 0 and 1 and generally considered to exist on a nominal scale.

VII. MODEL SELECTION PROCEDURE

If there are many predictors in the study, it is necessary to identify the important predictors. There are some selection procedures to choose the best model such as backward selection procedure, forward selection procedure and Stepwise selection procedure. Among those selection procedures, forward selection procedure was utilized in this study. In this research Forward selection procedure is had been used.

VIII. SIGNIFICANCE TESTING

A. Wald Statistics

In logistic regression model, Wald statistics has been used to determine whether the value of the parameter β is meaningful or not. When the sample size is sufficiently large this can be applicable.

B. Likelihood Ratio Statistics

The Likelihood ratio test for a particular parameter compares the likelihood of obtaining the data when the parameter is zero (L_0) with the likelihood (L_1) of obtaining the data evaluated at the Maximum Likelihood Estimators (MLE) of the parameter. Likelihood Ratio Statistics are compared with a χ^2 distribution with 1 degree of freedom and if the test statistic is greater than the χ^2 (1) value, the explanatory variable is significant.

IX. GOODNESS OF FIT OF THE MODEL

The goodness of fit of the model measures how well the model describes the response variable. Assessing goodness of fit involves investigating how close values predicted by the model are to the observed values. Mainly there are three methods for test the goodness of fit of the model.

- Deviance Statistic
- Generalized Pearson's Chi Square Statistic
- Hosmar Lemshous Statistic

This study used above first two methods to measure the goodness of fit of the model, because only categorical variables were included in the models.

X. DEVIANCE STATISTICS

$$D^* = -2 [\log lc - \log lf]$$

This measure the extent to which the current model deviance from the saturated model. The small value of D^* means current model is a good model. Large value of D^* indicate current model to be improved.

XI. RESULTS

In this study, Binary Logistic Regression Model has been utilized as main analyzing technique, because the dependent variable pregnancy and postpartum complication is classified into 2 categories as complication yes and complication no and most of the explanatory variables are categorical and has two or more categories. Forward selection procedure was applied to identify the suitable model for explaining the data set.

XII. IDENTIFYING THE INFLUENTIAL FACTORS FOR ANTEPARTUM MENTAL COMPLICATIONS

- Chi Square (χ^2) Analysis and Multi co linearity

Under the Chi Square analysis, 18 explanatory variables have been studied to check whether which explanatory variables are associated with the mental complications of pregnant women.

According to the results of the Chi Square analysis, only 16 explanatory variables were associated with mental complications of pregnant women and remaining 2 variables did not show a considerable relationship with the response variable, because the p value is greater than 0.05 significance level. In here, other children problem, physical complications have been recognized as non-influential factors with the response variable. After identifying the influential factors, it is important to test the multi collinearity among the selected variables by using contingency coefficient and the variables which have multi collinearity should remove from the model.

XIII. FITTING THE MODEL FOR ANTEPARTUM MENTAL COMPLICATION

When fitting the logistic model for mental complication of pregnant women, several steps should be followed.

The first step of the analysis is to fit the null model.

$$\text{logit}(\pi_i) = \beta_0$$

Null model is significant at 5% level of significance, because the p value of the intercept (0.000) is less than 0.05. When the null model is significance, the standard error is 0.174. However, the Null model is not an adequate model to describe the model. Therefore, the selected variables through the Chi Square analysis should include to the model separately and it is essential to structure the relationship between those variables and the intercept.

Then a series of models fitted in order to assess whether all fourteen variables are necessary for prediction or whether any could be dropped. For that, it should identify the most important determinant among these fourteen significant determinants. The variable ‘‘Husband’s protection for pregnant mother’’ is the most important one because that variable has the lowest AIC. Then the fitted model is,

$$\text{Logit}(\Pi_i) = \beta_0 + \beta_i^{\text{Protection}}$$

Keeping the variable protection in the model, the remaining thirteen factors were added one by one to the model and checked the significance of additional variable. The results were judged using likelihood ratio test and Akaike’s information criterion. After the variable Mistrust about husband added to the current model it suggested that variable is needed to the model in addition to protection. Here, p-value of the variable protection is significant after adjusting for the variable mistrust about husband. The fitted model is shown in bellow.

$$\text{Logit}(\Pi_{ij}) = \beta_0 + \beta_i^{\text{Protection}} + \beta_j^{\text{Mistrust}}$$

When ‘protection’ and ‘mistrust’ are already in the model, the significance of other variables was checked. Additional variable was checked using likelihood ratio and test whether those variables are necessary for prediction or any could be removed. Among significant models, variable ‘Stress due to gender of child’ showed the lowest AIC value when protection and mistrust about the husband were already included in the model.

$$\text{Logit}(\Pi_{ijk}) = \beta_0 + \beta_i^{\text{protection}} + \beta_j^{\text{mistrust}} + \beta_k^{\text{stress}}$$

To investigate, further important variables which should be included in the fitted model and to exclude the unnecessary variables, it was tried to develop model when the variables ‘protection’, ‘mistrust’, and ‘stress due to gender of the child’ exist already in the model. Then the variable ‘fear about delivery’ was significant. The model with all those four variables is as follows.

$$\text{Logit}(\Pi_{ijkl}) = \beta_0 + \beta_i^{\text{protection}} + \beta_j^{\text{mistrust}} + \beta_k^{\text{stress}} + \beta_l^{\text{fear}}$$

Among the models with five variables, the model with Husband’s protection for pregnant mother, mistrust about husband, stress due to gender of child, fear for delivery and family problem due to drugs were recognized as the best fitted model due to highest G2 value and lowest p value. The selected model is,

$$\text{Logit}(\pi_{ijklm}) = \beta_0 + \beta_i^{\text{protection}} + \beta_j^{\text{mistrust}} + \beta_k^{\text{stress due to gender of child}} + \beta_l^{\text{fear about delivery}} + \beta_m^{\text{family problem due to drugs}}$$

To investigate, further important variables which should be included in the fitted model and to exclude the unnecessary variables, it was tried to develop model with six variables. Then, the model with husband’s protection for pregnant mother, mistrust about husband, stress due to gender of child, fear for delivery and family problem due to drugs and unexpected pregnancy has recorded highest G2 value. Therefore, this model can be considered as the best model of the logistic regression procedure and as well as the saturated model.

$$\text{Logit}(\pi_{ijklmn}) = \beta_0 + \beta_i^{\text{protection}} + \beta_j^{\text{mistrust}} + \beta_k^{\text{stress due to gender of child}} + \beta_l^{\text{fear about delivery}} + \beta_m^{\text{family problem due to drugs}} + \beta_n^{\text{unexpected pregnancy}}$$

All the main effects are considered and it can be concluding that, none of the models significant after the model with six variables.

Then, check the significance of the models with interaction terms. According to those outcomes following model with interaction terms was significant.

$$\text{Logit}(\pi_{ijklmn}) = \beta_0 + \beta_i^{\text{protection}} + \beta_j^{\text{mistrust}} + \beta_k^{\text{stress due to gender of child}} + \beta_l^{\text{fear about delivery}} + \beta_m^{\text{family problem due to drugs}} + \beta_n^{\text{unexpected pregnancy}} + \beta_{jl}^{\text{Mistrust about husband* Fear for delivery}}$$

Referring to the results of the two way interaction terms, there is no any three-way interaction term is significant for the final model due to higher p values. Therefore, above mentioned model could be identified as the best fitted logistic model for identifying the influential factors for mental complication of pregnant women.

Results of the best fitted logistic regression model explain that,

All of the significant variables have positive relationship with the mental complication of pregnant women.

Probability of having mental pregnancy complication is greater than 66% for pregnant women who has unexpected pregnancy relative to the women who have expected pregnancy. This means mental pregnancy complication is increased by 4.295 times women who has unexpected pregnancy compare to the women who have expected pregnancy.

Probability of having mental pregnancy complication is greater than 60% for pregnant women whose husband provide a normal protection relative to pregnant women whose husband provide a superb protection and mental pregnancy complication is greater than 70% for pregnant

women whose husband does not provide a protection relative to pregnant women whose husband provide a superb protection.

Probability of having mental pregnancy complication is greater than 64% for pregnant women who have stress due to gender of child relative to the women who don't have a stress due to the gender of the child. This means mental pregnancy complication is increased by 3.953 times for women who have stress due to the gender of the child relative to the women who don't have stress due to gender of the child.

Results of the Binary Logistic Model have explained mental pregnancy complication has been increased by 3.128 times of women who are suffering family problems due to drugs relative to the women who haven't family problems due to drugs. This illustrates that probability of having mental complication is greater than 59% for women who have family problems due to drugs relative to women without family problems due to drugs.

Finally, mental complication is 15.655 times higher for women who mistrust about her husband and also woman who fear for delivery relative to woman who don't mistrust about her husband and women who don't fear for delivery. This highlighting that probability of having mental complication of pregnant women is 88 % higher for women who mistrust about her husband and fear about delivery relative to woman who don't mistrust about her husband and don't fear for delivery.

XIV. ASSESSING THE GOODNESS OF FIT OF THE BEST FITTED LOGISTIC REGRESSION MODEL

- Hypothesis

H0: model is adequate fit.

H1: model is not adequate fit.

Method	Chi- Square	P value
Pearson	62.1216	0.092
Deviance	54.2460	0.427

Table 2: Results of Goodness of Model Fit

P values of all the methods are greater than 0.05 significance level indicating that there is sufficient evidence to claim that the model fit the data adequately.

XV. CONCLUSION

Considering the analysis, Protection of husband during pregnancy, stress due to gender about the embryo, unexpected birth, fear for delivery, family problem due to drugs and mistrust about the husband as identified influential factors for antepartum mental complication.

It has identified that physical connection is the main factor of the mental complication during this period. 80% of pregnant women who were not maintaining a physical connection with their husband have shown doubt regarding with their husband.

The results have explained mental pregnancy complication has been increased women who are suffering family problem due to drugs relative to the women who are in without family problem due to drugs. This illustrates that the probability of having mental complication is greater than 59% of family problem due to the drug category respecting to without a family problem due to drugs.

Protection of husband during pregnancy was identified as a critical factor to the mental complication. Comparing women who have proper protection and consideration from their husband were having lower mental complications. But it was higher than normal protection and non- protection women relative to proper protection category.

Gender about the embryo was also mentally stressed for pregnant mothers. The mental stress of this woman has identified 64% higher than women without this problem. □ Unexpected birth was also impacted to the mental complication. It was 66% higher than women who have planned birth.

Antepartum mental complication is 15.655 times higher than women who mistrust about husband and fear for delivery relative to women who don't mistrust about husband and don't fear for delivery. This highlighting that probability of having mental complication is greater than 88 % for pregnant women who mistrust about husband and fear for delivery relative to women who don't mistrust about husband and don't fear for delivery.

XVI. RECOMMENDATIONS

Alcohol addiction of husband is inversely affected for the mental complication of pregnant women and it greatly influences to having family conflicts and reducing the income level. Therefore, a strict legal framework should be imposed to eliminate the illegal liquor at low cost and as well as it is essential to enhance the special program for reduction of alcohol consumption.

Unexpected pregnancy is a key determinant of mental complication of pregnant and lactating mothers. Millions more are using family planning to avoid pregnancy but fail, for a variety of reasons. They may not have received clear instructions on how to use the method properly, could not get a method best suited to them, were not properly prepared for side effects, or supplies ran out. These people need better help now. Therefore, knowledge of contraceptive methods should be enhanced more and the facilities for education should be expanded how to use the method properly.

It must need to provide advices to both husband and wife about family planning methods, how to manage family life and other medical supervision by suitable medical service.

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