YANGON UNIVERSITY OF ECONOMICS

DEPARTMENT OF STATISTICS

FERTILITY DIFFERENTIALS AMONG THE EVER MARRIED WOMEN IN KAYAH STATE

BY

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M.P.S

Roll No. 4

NOVEMBER, 2019

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ABSTRACT

Fertility is an important component of population dynamics and plays a large role in changes in size and structure of population of a given area. This study discusses fertility differentials in Kayah State, the poorest state with the second highest fertility rate among the states and regions in Myanmar. It aims to describe the fertility differentials and to determine the demographic, socio-economic and environmental factors influencing fertility among ever married women in Kayah State. This study used secondary data from the 2014 Myanmar Population and Housing Census. In this study, 2,305 ever married women aged 15-49 in Kayah State were included in the analysis. Descriptive analysis, bi-variate analysis (one-way ANOVA) and multiple linear regression analysis are used in this study. The number of children ever born of ever married women aged 15-49 years are employed as the dependent variable and women's demographic, socio-economic and environmental factors that influencing fertility are identified as independent variables. The results showed that women's place of residence, educational level, head of household, employment status and experience of child death were significantly associated with the CEB. Women's place of residence in rural areas, employment status and experience of child death are found positively associated with the number of children ever born in this state. On the other hand, women's educational level is found negatively associated with the number of children ever born in this state.

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LIST OF ABBREVIATIONS

ANOVA	=	Analysis of Variance
CEB	=	Children Ever Born
IOM	=	International Organization of Migration
NDHS	=	Nepal Demographic and Health Survey
MR	=	Multiple Regression
PRB	=	Population Reference Bureau
SE	=	Standard Error
SPSS	=	Statistical Package for Social Sciences
TFR	=	Total Fertility Rate
VIF	=	Variance Inflation Factor
ZPRESED	=	Standardized Residuals
ZPRESID	=	Standardized Predicted Values

CHAPTER I

INTODUCTION

1.1 Rationale of the Study

Fertility is an important component of population dynamics and plays a large role in changing the rise and structure of population of a given area. In demographic point of view, fertility is the childbearing performance of a woman measured in terms of the actual number of children born. Fertility performance is biologically restricted to woman, normally of 15-49 years of age. In addition fertility rate is also the important factor of planning for the current and future needs of generations.

The most common measures of fertility, the total fertility rate (TFR), represents the average number of children that would be born to a woman during her reproductive age span (15-49 years). According to the latest data from US-based Population Reference Bureau (PRB), the 2018 worldwide TFR is 2.4 births per woman, down from around five in the 1960s. In the global context, fertility is different within developed and developing countries. TFR is high persistence in developing countries but it has below replacement level in some developed countries. Moreover, the least developed countries in the world continue to have the highest fertility and population growth.

In Myanmar, TFR of 4.7 children per woman in 1983 decreased to 2.5 children per woman in 2014. According to 2014 Population and Housing Census, the TFR was 2.5 births per woman for the whole countries, 3.0 in Kachin State, 3.5 in Kayah State, 3.4 in Kayin State, 5.0 in Chin State, 2.5 in Sagaing region, 3.3 in Taninthary Region, 2.4 in Bago Region, 2.3 in Magway Region, 2.1 in Mandalay Region, 2.5 in Mon State, 2.8 in Rakhine State, 1.9 in Yangon Region, 3.1 in Shan State, 2.8 in Ayeyarwady Region and 2.2 in Nay Pyi Taw. The 2014 census was found that large differences in fertility rates exist between States/ Regions. Chin State has the highest TFR, Kayah State ranks second, and Yangon Region has the lowest fertility in Myanmar.

At the international level, Myanmar’s TFR is similar to the average for developing countries. However, it is higher than other more developed countries in the region, including Malaysia, Thailand and Singapore and the average for South East Asia.

The highest TFR of Chin State in Myanmar was investigated by Ye Lin Naing in 2016. Hence, the second highest TFR of Kayah State was analyzed. The TFR in Kayah State is 3.5 children per woman, which is much higher than the Union level TFR of 2.5.
Socio-economic and demographic factors are likely to affect both directly and indirectly the fertility levels in any given State/Regions. Different socio-economic and demographic factors are also influenced the level of fertility. High fertility is generally considered as poor living standard and they are distressed with the basic needs and amenities. Therefore, this study intends to determine fertility differentials among the ever married women in Kayah State which has the second highest TFR.

1.2 Objectives of the Study

The objectives of the study are:

i. To study the demographic, socio-economic and environmental characteristics of the ever married women in Kayah State.
ii. To examine the fertility differentials among ever married women in Kayah State.
iii. To investigate the demographic, socio-economic and environmental factors influencing fertility in Kayah State.

1.3 Method of Study

Descriptive analysis is used to study the demographic, socio-economic and environmental characteristics of the ever married women in Kayah State. Moreover, multiple regression analysis is used to investigate some socio-economic and demographic factors that affect fertility for the ever-married women aged 15-49 years.

1.4 Scope and Limitations of the Study

In this study, the secondary data for demographic, socio-economic and environmental characteristics of the ever married women in Kayah State were collected from 2014 Population and Housing Census by Department of Population, Ministry of Immigration and Population. The contraceptive use, income and duration of breastfeeding are not included in this study because there are no such variables in census questionnaire. Moreover religion and ethnicity which are the significant factors influencing fertility level are not allowed to use and then, not included in this study since they are the sensitive issues in Myanmar.

1.5 Organization of the Study

This study is presented in five chapters. Chapter I presents the introduction to this study. It contains the rationale of the study, scope and limitations of the study, method of study and organization of the study. Chapter II describes literature review relating to factors associated with fertility. Theoretical perspectives and concepts are discussed in Chapter III. Chapter IV presents the application of multiple linear regression of fertility in Kayah State. Chapter V is the conclusion of the study with findings, suggestions and recommendations.

CHAPTER II

LITERATURE REVIEW

This chapter reviews the background information of Kayah State, the theoretical literature on fertility and women's demographic, socio-economic and environmental factors. The concept and theories are provided to formulate the conceptual framework and variables that possibly determine women's fertility differentials.

2.1 Background Information of Kayah State

Kayah state is Myanmar's smallest state by size (11,732 km^2) and by population (286,627 people). It is situated in the hilly eastern part of the country. The borders of this state are Thailand to the east, Shan State to the north, and Kayin State to the southwest. Compared to most areas of Myanmar, Kayah has a relatively low population density. The population density of Kayah State is 24.4 persons per square kilometer. For the population in urban and rural areas, the census results showed that for every 100 persons, 75 persons lived in rural areas while 25 persons live in urban areas. The 2014 Myanmar government census of Kayah State also found that labor force participation was higher in rural than urban areas (77% to 66%), with rural women's participation rate being 64% while urban women's participation rate was only 50% (2014 Myanmar Population and Housing Census, Kayah State).

Kayah State is divided into two districts such as Loikaw and Bawlake, and seven townships with 106 wards and villages. There is significant variation in geography and demographics across Kayah state's townships. There is also a significant divergence in development and livelihoods realities and needs across the seven townships of this small state. The state's seven townships are rich in natural resources, including mountainous areas of natural forest and fertile agricultural plains with access to irrigation water (Market Analysis for Rural Livelihoods in Kayah State).

Kayah state is very ethnically diverse; home to at least twelve different ethnic groups – Kayan, Kayin, Kayah, Shan, Kayaw, Bamar, Yintale, Yinbaw, Lahta, Gheko, Ghebar, Monu – speaking six different languages. Towns and villages in Kayah state are typically ethnically and religiously diverse; including Buddhists, Christians and animists.

Women in Kayah state face gender-based rights violations and institutionalized discrimination. Activists are organizing to change this situation; the first Women's Forum of Native Ethnic Races of Kayah was held in February 2018 (Market Analysis for Rural Livelihoods in Kayah State).

Kayah State is a primarily agriculture-based economy, producing crops such as rice, millet, maize, sesame, groundnut, garlic, and vegetables. Kayah farmers practice shifting agriculture. The land is famous for natural resources, which includes mineral products such as alabaster, tin, and tungsten. Kayah State also has valuable wood such as teak and pine. Both lowland and upland agriculture is practiced in Kayah state. Myanmar's largest and most important hydroelectric power plant has been constructed at BaluChaung Waterfals at LawPita some 12miles south of Loikaw, the capital of Kayah State. Although it is one of the poorer states in Myanmar, the heavily forested and mountainous state has rich mineral deposits and timber, tourism and hydroelectric potential (Kayah State Economic Overview, 2017).

'Economic development' is a complex term in Kayah State and has historically been associated with exploitation and opaque business activities. In order for economic development to lead to sustainable economic growth and prosperity for the people of Kayah, it will need to be implemented through transparent and open processes. Economic development also requires significant investments in transportation (roads), power, irrigation, water, and developing workforce skills. As with all development in Kayah, the future of economic growth also depends on a lasting peace (Kayah State Socio-economic Analysis, September 2013).

Socio-economic indicators are relatively low across the state. Infrastructure is generally underdeveloped; with limited access to paved roads in rural areas and low-levels of electrification across the state. The economic prospects of Kayah state are intimately connected to its size and demographics. Between 1989 and 2018, the total amount of official foreign investment in Kayah State was a very modest US$2.431 million. The small size of the state and the low population density mean that the local market can only grow so large; to achieve economies of scale and reach a larger market, businesses in Kayah will need to be export-oriented industrial projects such as cement factories (Market Analysis for Rural Livelihoods in Kayah State).

2.2 Fertility Differentials

Fertility Differentials is the fertility rate a group of compared to another group. It has been observed that the levels of fertility vary considerably in various sub-groups of the same population. These sub-groups may be based on residence, urban or rural, social and economic status in terms of educational attainment, occupation, income, religion, caste, race, contraception method uses, unmet need etc. (Myanmar fertility and reproductive health survey, 2001).

Sinha (1957) highlighted the fact that differential fertility is always basic to population analysis and it acquires all the more importance in a country which is passing through a phase of significant advances in different spheres of social life. Rele (1963) pointed out the importance of the study of fertility differentials with respect to economic development and national planning. Its utility lies in the fact that it may give indications regarding future trends in the birth rate. The fertility differentials in Kayah State (districts and townships) are shown in Table (2.1) and Figure (2.1).

Table (2.1) Total Fertility Rate in Kayah State

Kayah State	**TFR**
Kayah	3.5
Districts	
Loikaw	3.5
Bawlakhe	3.8
Townships	
Loikaw	2.7
Dimawso	4.2
Phruso	5.0
Shardaw	4.3
Bawlakhe	3.3
Parsaung	5.0
Meisi	3.9
Ywathit	2.9

Source: 2014 Myanmar Population and Housing Census

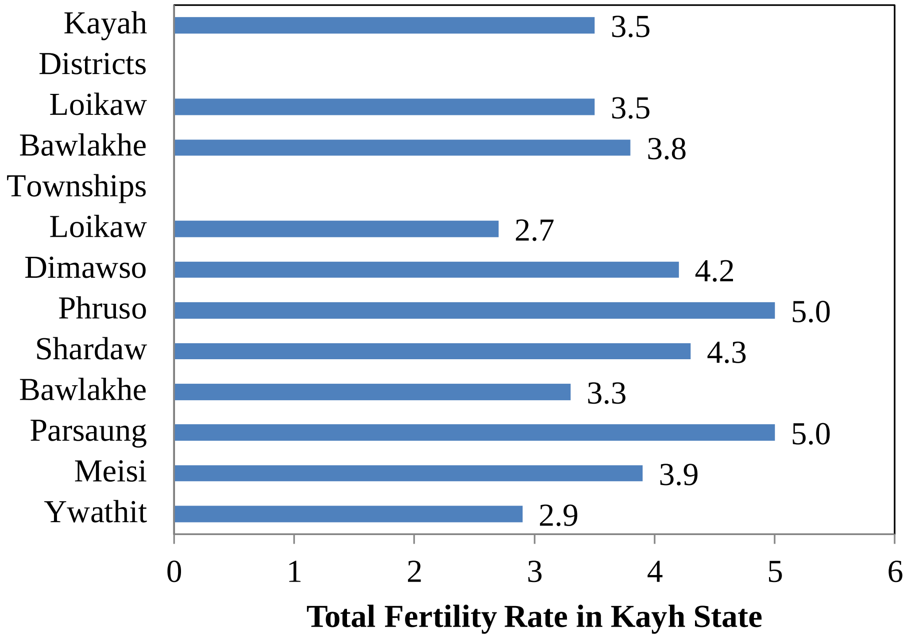

Figure (2.1) Total Fertility Rate in Kayah State

Source: Table (2.1)

In Table (2.1), TFR in Kayah State (3.5) is much higher than the Union level TFR (2.5). According to districts, TFR in Bawlakhe (3.8) is higher than Loikaw (3.5). Differences by townships show that Phruso and Parsaung have the highest TFR of 5.0 and Loikaw has the lowest (2.7).

2.3 Children Ever Born

Children ever born (CEB) is defined as the total number of children a woman has ever given in her lifetime (Department of Population, 1997). The number of children ever born to a particular woman is a measure of her lifetime fertility experience up to the moment at which the data are collected. This also includes those children whom a woman has born as live births but who died before the date of enumeration (UNFPA-India, 2012). Data on number of children ever born by age group of women are used to analyze the levels and trends of fertility. It reflects the cumulative outcome of childbearing of women up to the time of the census. The mean number of CEB to women aged 40-49 is an indicator of completed fertility (Department of Population, 1997).

2.4 Women's Age and Fertility

A woman's age is the most important demographic factor affecting her fertility and her chance of having a child. Fertility changes with women's age. Among women reproductive age (15-49 years), young women are more likely to have higher fertility rate than older women because the reproductive potential decreases as women get older. One study found that age would influence the capacity of women to conceive (Schmidt, Sobotka, Bentzen, & Andersen, 2011). Fertility declines with increasing maternal, as early as 32, and especially after the mid-30's. For this reason delayed child-bearing is traditionally defined as pregnancy occurring in women over 35 years of age (Johnson & Tough, 2012).

A study in Nigeria conducted by Farooq and Simmons (1985) found that age can be strongly effect on fertility level. Malthus (1960) pointed out that a rise in the age at marriage tends to affect the level of fertility, and the resulting rate of population growth, because marriage marked the formed entry of a couple into sexual union and the reproductive life. Navin Adhikari (2014) also found that age at marriage and fertility have inverse relationship that is higher age at marriage and lower fertility and lower age at marriage and higher fertility. Similarly, high age at first marriage is associated with fertility reduction (Oyefara, 2012; Weeks, 2008). Therefore, this study assumes that women's age may influence the level of fertility in Kayah State.

2.5 Women's Migration Experience and Fertility

Migration is the movement of people from one area to another area. It is also the factor influencing fertility. Migration happens for a range of reasons. These can be economic, social, political or environmental. Ribe and Schultz (1980) have observed that empirical findings on migrant and non-migrant fertility differ somewhat from study to study and region to region. Lee and Farber (1985) examining the Korean data obtained from personal migration and birth histories of currently married women aged 20-49 also concluded that adaptation of rural-urban migrants is a significant phenomenon. Another study in the context of African countries demonstrated that migrants' fertility in the urban areas is lower than native population (Brokerhoff, 1995).

Several studies undertaken by both economists and demographers have attempted to examine the relevance of the various theories in explaining migrants and non-migrants fertility differentials. Nowadays, women have increasingly migrated for jobs or education. According to the International Organization of Migration (IOM), it is reported that more than half of global migrants are women who migrate independently mainly due to being (IOM 2008, cited in Ghosh, 2009). Migrant women have lower fertility than non-migrant women because migrant women may probably give priority to the better economic status of family. A study of the relationship between migration and fertility in Kenya finds that the migration patterns in general differently affect fertility's levels, patterns and behavior. Therefore, this study assumes women's migration experience may affect fertility in Kayah state.

2.6 Experience of Child Death and Fertility

Infant and child mortality is one of the most important factors to determine fertility. There is close relationship between infant mortality and fertility. Casterline (2001) suggests that where mortality declines more rapidly, the pace of fertility decline will also be more rapid. Similar results can also be found in many other studies which show that child mortality had a significant positive effect on fertility, that is, that an increase in the child mortality rate would significantly increase fertility (Dust 2003, Hossain 2005, and Alene, 2008).

The study of Nepal Demographic and Health Survey (2006) found that children born to woman who have completed secondary or above experience an infant rate of 13 deaths per 1000 live births, compared with 69 deaths per 1000 live births for those whose mothers are not educated at all. Another study found that the relation between fertility and child mortality experienced by mothers was found to be very strong and positive. Women who had child death experience were likely to have children than those who had no such experience. As the number of children who died increased, women were exposed to a risk of uncontrolled fertility. Hence, this study considers that the experience of child death may determine the fertility level in Kayah state.

2.7 Women's Education and Fertility

Education is one of significant variable affecting the differential of fertility. The role of education changes the fertility behavior of a woman (Bbaale, 2011). Female education actually drives a decline in the fertility rate. Martin (1995) analysed the Demographic and Health Surveys from 26 countries. This analysis confirmed the fact that higher education is consistently associated with lower fertility. However, diversity exists in the magnitude of gap between upper and lower educational strata. Education having an inverse relationship with fertility means education reduces fertility in countries where education is prevalent (Dejene, 2000; Vilaysook, 2000; Weeks, 2008). Akmam (2002) also probed women's education and fertility in developing countries and observed that education does have a major impact on fertility even after controlling for other relevant factors.

Education is a recurring theme in studies related to fertility analysis. Omariba (2003) concluded that there was a strong theoretical and empirical relationship between educational attainment and fertility behavior. Bongaarts (2003) investigated the role of educational differences in completing the fertility transition in developing world. He concluded that educational composition of population remains the key predictor of overall fertility in late transitional countries and that low levels of schooling can be a cause of stalling fertility.

A study in Indonesia found that the increase in level of education of a couple can reduce age at first marriage and early births (McCrary & Royer, 2006). Myanmar Fertility and Reproductive Health Survey (2007), Justin Mc.crary & Royer (2011) and Tsegaye (2011) also found that fertility has a negative relationship with education and the more increase in level of education of couple can reduce age at first marriage and early births. Jara (2013) concluded that women spend in school more time, reduces their fertility. Another study in Myanmar found that fertility had a negative relationship with education (Mar Lar Htun, 2015). Therefore, this study considers women's education may influence the fertility in Kayah State.

2.8 Women's Employment Status and Fertility

The relationship between fertility and women's labour force participation is a long standing issue in demography. Some studies recognize that women's employment plays an important role involving in the changing fertility levels within and between countries (Rindfuss & Brewster, 1996). Engelhardt et al (2004) perceived that decreasing fertility is associated with increasing employment. The negative association between them is evidence for incompatibility of rearing children and staying in the work force in today's society, where the place of work and home are spatially separated.

Women's employment involves an important role in changing fertility levels within and between countries (Beguy, 2009). Beguy argued that female employment is inversely related to fertility, due to the presumed conflict between women's work and their reproductive roles. Tsegaye (2011) also found that relation between women's employment and fertility is consistent. Tsegaye said that "women's employment will have a negative impact on the fertility level of women" but "the relationship between women's employment and fertility behaviour is also varied in the regions of a given nation as well". Another study in Myanmar found that women's employment had a negative impact on the fertility level of women, but it is not significant in all states and region (Mar Lar Htun, 2015). Hence, this study assumes that employment status of women may have influence on fertility in Kayah State.

2.9 Place of Residence and Fertility

Place of residence is mainly classified into two categories: urban areas and rural areas. Urban-Rural Residence is also considered as a factor influencing the fertility differential in a population. The place of residence represents the living conditions which are related to the education, employment status, quality of health care and medical health care services etc (Goldstein and Goldstein, 1983 cited in Omondi & Ayiemba, 1999). Many studies found that rural fertility was higher than urban fertility (Myanmar Fertility Reproductive and Health Survey; 1997, 2001, 2007). However, David Shapiro (2000) pointed that there is no consistent fertility differences by rural and urban place of residence in developing countries. Another studies have pointed that urban women are more likely to use contraceptives than are rural women; therefore, the fertility levels in urban and rural areas tend to be different (Sisouphanthong; 2000 and Retherford; 2003).

Demographic factors such as place of residence (urban or rural) have been found to have association or effects on fertility (Derebssa, 2002 and Azhar and Pasha, 2008). Urban residents have been discovered to have low fertility compared to rural residents, and this has been as a result of access to health facilities, modern contraceptive methods and the harsh living conditions associated with urban residency (Weeks, 2008; Boupha et al., 2005). They have shown that urban dwellers have higher educational attainment than their rural counterparts, therefore urban dwellers tend to report lower fertility compared to their rural counterparts. Asad Ali Khan (2013) also said that rural and urban fertility was found to be more or less identical in Pakistan. Mar Lar Htun (2015) also concluded that urban- rural residence is both positive and negative effect on child ever born in Myanmar. Thus this study assumes that the place of residence (Urban/Rural) may effect on fertility level in Kayah State.

2.10 Women Head of Household and Fertility

Women head of household is also associated with the determinants of fertility. Women who are head of household are more likely to obligate for their family's socioeconomic responsibility. This may affect their decision to have more children. The possible explanation could be that women who have autonomy in decision making are more likely to have higher level of contraceptive use, which might ameliorate their reproductive behavior risks and results in longer birth intervals and low fertility (Dyson and Moore,1983). A study in Sri Lanka also found that women in households headed by females used health services more frequently than those in male-headed households (Wickrama and Keith, 1990).

Larsen and Hollos (2003) concluded that the higher decision making a woman has, the less children she has. A study from Eritrea (East Africa) showed that women's decision making is significantly associated with ever-use of modern contraception methods (Woldemicael, 2009). In one of the study in sub-Saharan Africa, women's decision making are associated with both a larger ideal number of children and with limiting fertility to their desired number of children (Upadhyay & Karasek, 2010).

Another interesting finding of this study was that women from female-headed households had fewer children than women from male-headed households. During the recent period of conflict in Nepal, many people, especially males, have left their villages and have gone to other countries for employment. The low fertility among female-headed households could be due to the extended separation of women from their husbands (Ramesh Adhikari, 2010). Therefore, this study tries to find out whether women head of household is associated with fertility in Kayah state.

2.11 Conceptual Framework

In this study, the conceptual framework deals with different demographic, socio-economic and environmental variables relating to fertility in Kayah State, Myanmar. The number of children ever born (CEB) has been taken as a dependent variable where demographic, socio-economic and environmental factors consider as independent variables.

Bogue defined demography as a study by statistical methods of human populations, involving primarily the measurement of the size and growth of numbers of people, the proportions living, being born and dying within an area and the related functions of fertility, mortality, marriage and migration In this study, the demographic variable is women's age.

The socio-economic factors reflect the level of living of individuals in that society. These factors are like education, employment, income, housing, health, food and nutrition, sanitation, clothing and social security, etc. In this study, the socio-economic variables are place of residence (urban-rural), women's educational level, women's employment status, women as head of household, women's migration experience, experience of child death and media exposure.

Environment is a fundamental requirement for the well-being, healthy and economic prosperity. Environment plays an important role in the healthy living of human beings. Environmental factors may affect living things either directly or indirectly. These factors include soil, water, climate, natural vegetation and land forms. In this study, the environmental factor is source of drinking water (unimproved water and improved water).

The conceptual framework of dependent and independent variables are shown in Figure (2.2).

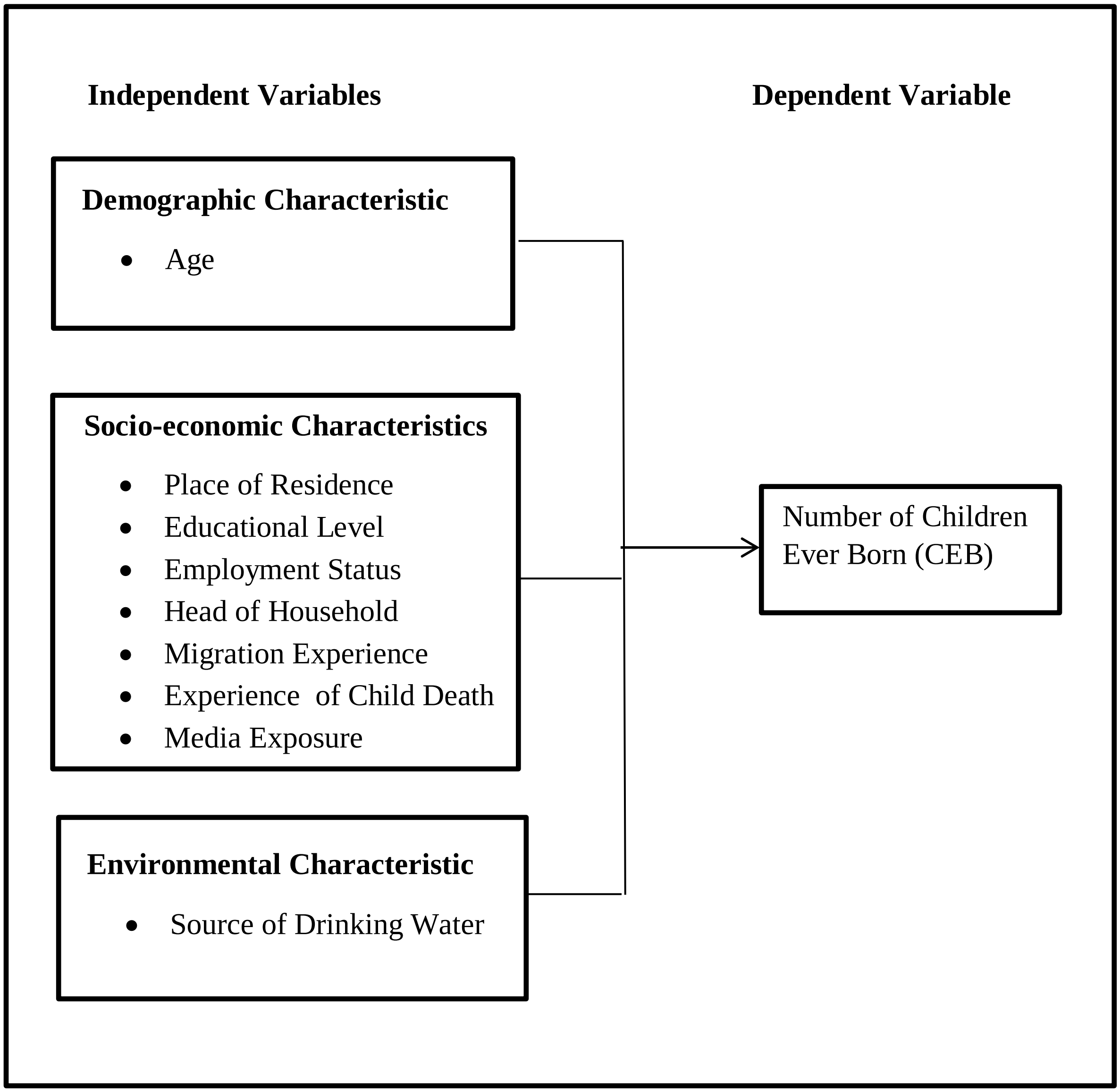

Figure (2.2) Conceptual Framework

CHAPTER III

STATISTICAL METHODOLOGY

This chapter presents the statistical methodology used in the study. It is divided into two sections. The first section explains the description of data source and sample population. The second section discusses the analysis of multiple linear regression model.

3.1 Source of Data

This study used the secondary data from 2014 Myanmar Population and Housing Census (2014 MPHC). The main objectives of the 2014 Census are to provide the Government and other stakeholders with essential information on the population, regarding demographic, social and economic characteristics, and housing conditions and household amenities. By generating information at all administrative levels, it is also intended to provide a sound basis for evidence-based decision-making and to evaluate the impact of social and economic policies and programmes in the country.

3.1.1 The Sample Population

The study area was Kayah State, both urban and rural areas. In Kayah State, there were total of 57,274 households with 286,627 that distributed in 2 districts and 8 townships. A sample of 2305 ever married women aged 15-49 was analyzed in this study. The sample women included married, divorce and widow. The questions in the census questionnaire covered the important information such as women's fertility, numbers of children ever born, age, education level, employment or working status, place of residence or respondent's locality, etc.

3.1.2 Operational Definition of the Dependent and Independent Variables

The response variable is the number of children ever born among ever married women aged (15-49). The explanatory (independent) variables in this study are demographic, socio-economic and environmental variables. These variables are women's age, place of residence, education level, employment status, head of household, migration experience, experience of child death, media exposure and source of drinking water.

Table (3.1) Descriptions of Variables and Scale of Measurement

Variable	Operational Definition	Scale of Measurement
Dependent Variable Children Ever Born (CEB)	The total number of children a women has ever given birth to in her life time	Ratio
Independent Variables Age	The completed age of respondent	Ratio
Place of residence	The place of the residence where respondent currently lives	Nominal 0= Urban 1= Rural
Educational level	The completed highest standard passed of respondent	Ordinal 0= Illiterate 1= Literate
Employment Status	Whether the respondent is currently working since the last 12 months	Nominal 0= Not working 1= Working
Head of Household	The respondent who is head of household	Nominal 0= Not head of household 1= Head of household
Migration Experiences	The respondent who has migrated	Nominal 0=No migration experience 1= Migration experience
Experience of Child Death	Respondent who ever experienced of giving birth but later the child was death	Nominal 0= No experience of child death 1= experience of child death

Table (3.1) Descriptions of variables and scale of measurement (Continue)

Variable	**Operational Definition**	**Scale of Measurement**
Media Exposure	Respondent who has exposed to media which are classified according to the radio, television, mobile phone and computer in households	Nominal 0= Not media exposure 1= Media exposure
Source of Drinking Water	Respondent who has improved water in the household	Nominal 0= unimproved water 1= improved water

Source: 2014 Myanmar Population and Housing Census, Kayah State

3.2 Multiple Linear Regression Model

Multiple linear regression analysis is an extension of simple linear regression analysis, used to assess the association between two or more independent variables and a single continuous dependent variable. Multiple Regression (MR) is used both for predicting outcomes (prediction) and for investigating the causes of Outcomes (causal analysis). Dependent variable is a variable being predicted or explained by the set of independent variables whereas independent variable is variable selected as predictors and potential explanatory variables of the dependent variable. Dependent variable is also known as response variable and outcome variable whereas independent variable is also called predictor variable, explanatory variable, regressor variable or covariates (Hair. Anderson, Tatham and Black, 1998).

Multiple regression analysis is an extension correlation. The result of regression is an equation that represents the best prediction of a dependent variable from several independent variables. Regression analysis is used when independent variables are correlated with one another and with the dependent variable. In regression, dependent variables have only one in proposed estimating equation. However, the independent variables are used more than one variable. The independent variables are adding to the model, improve the accuracy of prediction that is being studies. The regression equation is the algebraic formula by which the estimated value of the dependent or response variable is determined.

A dependent variable is modeled as a function of several independent variables with corresponding coefficients, along with the constant term. Multiple regression requires two or more predictor variables, and it is called multiple regression. The multiple regression equation takes the following form:

$$Y_i = \beta_o + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_k X_{ki} + e_i \qquad (3.1)$$

where,

Y_i = value of the dependent variable in the i^{th}trial.

β_o= constant in the regression equation, which indicates the value of Y when all $X_{ki} = 0$.

$\beta_1, \cdots, \beta_k$ = regression coefficients associated with each of the X_k independent variable.

X_{ij} = value of the j^{th} independent variable in the i^{th} trial, or observation.

e_i = the random error in the ith trial or observation.

Multiple regression analysis studies the relationship between a dependent (response) variable and k independent variables (predictors, regressors, IV's). The sample multiple regression equation is

$$\hat{Y}_i = \hat{\beta}_o + \hat{\beta}_1 X_{1i} + \hat{\beta}_2 X_{2i} + \cdots + \hat{\beta}_k X_{ki} \qquad (3.2)$$

Where $\hat{\beta}_o, \hat{\beta}_1, \hat{\beta}_2, \cdots, \hat{\beta}_k$ are the estimated values for the parameters and $\hat{Y}_i$ is the estimated value of the dependent variable. The estimation procedure for multiple linear regression model is nearly identical to simple regression.

3.3 Assumptions of the Multiple Linear Regression Model

The validity of the regression model rests on the satisfaction of all or some of the assumptions given below.

1. Multiple linear regression needs the relationship between the independent and dependent variables to be linear. It is also important to check for outliers since multiple linear regression is sensitive to outlier effects. The linearity assumption can best tested with scatter plots.

2. The multiple linear regression analysis requires that the error between observed and predicted values (i.e., the residuals of the regression) should be normally distributed.
3. The multiple linear regression analysis makes homoscedasticity. The scatter plot is good way to check the homoscedasticity.
4. There is no linear relationship among the explanatory variables. That means no multicollinearity. Multicollinearity may cause the algebraic signs of the coefficients to be the opposite of what logic may dictate while greatly increasing the standard error of the coefficients.

3.4 Testing For Significance

The significance tests for the simple regression model were the t test and F test. In the simple regression model, these tests always generated the same conclusion. If the null was rejected, concluded that not equal to zero. In multiple regression analysis, the t test and F test have different purposes.

1. The F test is used to determine whether there exists a significant relationship between the dependent variable and the entire set of independent variables in the model; thus the F test is a test of the overall significance of the regression.
2. If the F test shows that the regression has overall significance, the t test is then used to determine whether each of the individual independent variables is significant. A separate t test is used for each of the independent variables; thus the t test is a test for individual significance.

3.5 Test for the Significance of Overall Multiple Regression Model

The overall F-test is used to test for the significance of overall multiple regression model. The ANOVA procedure tests the null hypothesis that all the β-values are zero against the alternative that at least one β is not zero.

The hypothesis for the F test takes the following form

Null Hypothesis : $\beta_1 = \beta_2 = \cdots = \beta_k = 0$ (3.3)

Alternative Hypothesis : At least one β_i is not zero.

If the null hypothesis is not rejected, there is no linear relationship between Y and any of the independent variables. On the other hand, if the null is rejected, then at least one independent variable is linearly related to Y.

F-test is used to make the determination.

The ratio of test statistics is

$$F = \frac{MSR}{MSE} \quad (3.4)$$

Where, the MSR is the mean square error which is equal to

$$MSR = \frac{SSR}{k} \quad (3.5)$$

And, the MSE is the mean square error which is equal to

$$MSE = \frac{SSE}{n-k-1}$$

Where, n-k-1 is the degree of freedom and k is the number of independent variables. The decision rule for the F-test takes the following form;

Reject the null hypothesis : if $F > F_{\alpha,k,n-k-1}$ (3.6)

Do not reject null hypothesis : if $F \leq F_{\alpha,k,n-k-1}$

Where, $F_{\alpha,k,n-k-1}$ is based on the F distribution with k degree of freedom in the numerator, n-k-1 degrees of freedom in the denominator, and a probability of the upper-tail of the probability distribution. The existence of a regression relation by itself does not ensure that useful predictions can be made by using it.

3.6 Test for Individual Partial Regression Coefficient

An individual partial regression coefficient, β_i in the multiple regression model is tested to determine the significance of relationship between X_i and Y.

The hypothesis for the t-test takes the following form:

Null Hypothesis : $\beta_i = 0$ (3.7)

Alternative Hypothesis : $\beta_i \neq 0$

The test statistic for this test uses a t-distribution. The t-test statistic is

$$t = \frac{b_i - \beta^*}{s_{b_i}} \quad (3.8)$$

Where, there is the null's claim about which in this case means and

$$t = \frac{b_i}{s_{b_i}} \quad (3.9)$$

where b_i = the individual coefficient being tested

S_{b_i} = the standard error of b_i

The decision rule for this test,

Reject the null hypothesis : if $|t| > t_{\alpha/2,n-k-1}$ (3.10)

Do not reject null hypothesis : if $-t_{\alpha/2,n-k-1} \leq t_{\alpha/2,n-k-1}$

3.7 Coefficient of Multiple Determination

The coefficient of multiple determination, denoted by R^2, is a statistical measure that represents the proportion of the variance for a dependent variable that's explained by an independent variable or variables in a regression model. Whereas correlation explains the strength of the relationship between Y and independent variables, R-squared explains to what extent the variance of one variable explains the variance of the second variable.

The coefficient of multiple determinations is defined as follows:

$$R^2 = \frac{\sum(\hat{Y}_i - \bar{Y})^2}{\sum(Y_i - \bar{Y})^2} = 1 - \frac{\sum(Y_i - \hat{Y})^2}{\sum(Y_i - \bar{Y})^2} \quad (3.11)$$

The numerator of the middle term is the explained sum of squares, or the sum of squares due to regression, SSR, as it is sometimes called. The denominator is the total sum of squares, SST. The subscription of R^2 indicates the Y is the dependent variable and $X_1, X_2, \cdots, X_k$ is one independent variable.

In the simple linear regression, the total sum of squares, the total variation in the dependent variables (SST), can be broken into parts; the sum of squares due to regression (SSR) and the sum of squares due to error (SSE). This same partition works for multiple linear regressions.

$$SST = SSR + SSE \quad (3.12)$$

The quality of the fit for the regression can be calculated by computing the coefficient of determination. The coefficient of determination is still computed as

$$R^2 = \frac{SSR}{SST} \quad (3.13)$$

The value of R^2 can only be between zero and one, where R^2=0, the regression model cannot explain anything about the variation in the dependent variable or the estimated model does not fit the data. The case of R^2=1 represents a perfect fit of the estimated model of the data. A high value of R^2 shows good fit and a low value of R^2 shows a poor fit.

3.8 The Adjusted Coefficient of Multiple Determination

With a multiple regression made up of several independent variables, the R-squared must be adjusted. The adjusted R-squared compared the descriptive power of regression models that include diverse numbers of predictors. Every predictor added to a model increases R-squared and never decreases it. Thus, a model with more terms may seem to have a better fit just for the fact that it has more terms, while the adjusted R-squared compensates for the addition of variables and only increases of the new term enhances the model above what would be obtained by predictor enhances the model less than what is predicted by chance.

The adjusted R^2 is a modification of the R^2 that adjusts for the number of independent variables. The adjusted R^2 is always less than or equal to the original R^2, and the discrepancy gets longer as the number of independent variables increases. Therefore, it is a common practice in multiple regression and correlation analysis to report the adjusted coefficient of determination.

The adjusted coefficient of determination is

$$\overline{R}^2 = \frac{\Sigma\left(Y_i-\hat{Y}\right)^2}{(n-k-1)} \Big/ \frac{\Sigma(Y_i-\overline{Y})^2}{(n-1)} \qquad (3.14)$$

3.9 Detection of Autocorrelation

One of the basic properties of the OLS model is that the errors be uncorrelated. The Durbin-Watson Statistic is used to detect autocorrelation. This statistic measure the correlation between each residual and the residual for the time period immediately preceding the one of interest.

The Durbin-Watson statistic is defined as:

$$d = \frac{\Sigma(e_t-e_{t-1})^2}{\Sigma(e_t)^2} \qquad (3.15)$$

where; e_t= residual at the time period

To better understand the Durbin-Watson statistic d, examine the composition of the statistic presented in Equation (3.15). The numerator $\sum e_t^2$ represents the sum of the squared residuals.

Table (3.2)

Durbin-Watson Test: Decision Rules

Null hypothesis	Decision	If
No positive autocorrelation	Reject	$0 < d < d_L$
No positive autocorrelation	No decision	$d_L \leq d \leq d_U$
No negative correlation	Reject	$4 - d_L < d < 4$
No negative correlation	No decision	$4 - d_U \leq d \leq 4 - d_L$
No autocorrelation, positive or negative	Do not reject	$d_U < d < 4 - d_U$

Durbin-Watson tests can also be used to see if adjacent observations are correlated. This statistics ranges in value from 0 to 4. If there is no correlation between successive residuals, the Durbin-Watson statistic should be close to 2. Values close to 0 indicate that successive residuals are positively correlated, while values close to 4 indicate strong negative correlation.

3.10 Multicollinearity

Multicollinearity problem arises when one of the independent variables is linearly related to one or more of the other independent variables. Such a situation violates one of the conditions for the conditions for multiple regression. Specially, multicollinearity occurs if there is a high correlation between two independent variables, X_i and X_j if the correlation coefficient r_{ij} between X_i and X_j in the multiple linear regression model is high, multicollinearity exists.

The most direct way of testing for multicollinearity is to produce a correlation matrix for all variables in the model. If a correlation is greater than 0.7 or less than 0.7, the independent variables are highly correlated. If a correlation is less than 0.5, it can be concluded that multicollinearity is not a problem.

Another way to detect multicollinearity is to use the value of Tolerance. Tolerance is the extent to which an independent variable cannot be predicted by the other independent variables. Tolerance is calculated as (1-R^2) where the variable being considered is used as the dependent variable in a regression analysis and all other variables are used as independent variables. Tolerance varies between zero and one. A tolerance value of zero for a variable means that it is completely predictable from the other independent variables and that there is a perfect collinearity. If a variable has a tolerance value of one, this means that the variable is completely uncorrelated with the other independent variables. Therefore, a tolerance value will require close to one. Variance Inflation Factor is closely related to the Tolerance.

The third way to detect multicollinearity is to use the variance inflation factor (VIF). The VIF associated with any X-variable is found by regression it on all the other X-variables. The resulting R^2 is then used to calculate that variable's VIF. The VIF for any X_i represents that variable's influence on multicollinearity. The VIF for any independent variable is a measure of the degree of the multicollinearity contributed by that variable.

The VIF for any independent variable X_i is

$$\text{VIF}\ (X_i) = \frac{1}{1-R^2} \tag{3.16}$$

Multicollinearity produces an increase in the variation, or standard error, of the regression coefficient. VIF measures the increase in the variation regression coefficient over that which occurs if multicollinearity were not present. It relates to the amount that the standard error of the variable has been increased because of collinearity. The increase in standard error (SE) is equal to the square root of the VIF. Therefore, a VIF value should be less than two.

CHAPTER IV

RESULTS AND FINDINGS

This chapter describes the fertility differentials, indicated by number of children ever born of women, and factors affecting the fertility differentials in Kayah State, Myanmar. The results and findings of descriptive analysis, one-way ANOVA test, multiple linear regression analysis are presented in this study.

4.1 Descriptive Analysis for Characteristics of Sample Women

The general characteristics of ever married women are described according to demographic, socio-economic and environmental characteristics. This study consisted of 2305 ever married women respondents in reproductive aged 15-49 years old from the 2014 Myanmar Population and Housing Census in Kayah State including not only those who have children ever born but also those who have no children.

4.1.1 Children Ever Born

The descriptive statistics based on 2305 observations for the children ever born are shown in Table (4.1).

Table (4.1)

Background Characteristics of Children Ever Born

Children ever born	Number	Percent
0	291	12.6
1	396	17.2
2	395	17.1
3	379	16.4
4	288	12.5
5	195	8.5
6	129	5.6
7	82	3.6
8	77	3.3
9	33	1.4
10+	40	1.7
Total	2305	100
Mean=3.1 Median=3 S.D=2.4 Minimum=0 Maximum=15		

Source: 2014 Myanmar Population and Housing Census

Table (4.1) shows the background characteristics of children ever born in Kayah State. The mean number of children ever born to ever married women age 15-49 years old in Kayah State is 3.1 and the standard deviation is 2.4. Table (4.1) shows that only 12.6% of ever married women had no children. The slightly more than one-thirds (34.3%) had one or two children ever born and 28.9% had three or four children ever born. However, almost one-fourth of the women respondents (24.1%) had five or more children ever born.

4.1.2 Demographic, Socio-economic and Environmental Characteristics of Ever Married Women

The descriptive statistics of demographic, socio-economic and environmental characteristics of ever married women's aged 15-49 years old are described in Table (4.2).

Table (4.2) Demographic, Socio-economic and Environmental Characteristics of Ever Married Women

Demographic Characteristic		Number	Percent
Age	15-19	68	3.0
	20-24	301	13.1
	25-29	381	16.5
	30-34	455	19.7
	35-39	390	16.9
	40-44	373	16.2
	45-49	337	14.6
Socio-economic Characteristics			
Place of Residence	Urban	594	25.8
(Rural/Urban)	Rural	1711	74.2
Educational level	Illiterate	449	19.5
	Literate	1856	80.5
Employment status	Not working	852	37.0
	Working	1453	63.0
Head of household	Not head of household	2049	88.9
	Head of household	256	11.1
Migration experience	Not migration experience	2054	89.1
	Migration experience	251	10.9
Experience of child death	Not experience of child death	1862	80.8
	Experience of child death	443	19.2
Media exposure	Not media use	2011	87.2
	Media use	294	12.8

Table (4.2) Demographic, Socio-economic and Environmental Characteristics of Ever Married Women (Continue)

Environmental Characteristic			
Source of drinking water	Unimproved water	975	42.3
	Improved water	1330	57.7
	Total	2305	100.0

Source: 2014 Myanmar Population and Housing Census

According to Table (4.2), the respondents are found of age ranging from 15 years to 49 years. Overall age of respondents is quite high in this study. Nearly two-third (67.4%) of the respondents is 30 years old and older. Concerning the place of residence, the majority of ever married women aged 15-49 years old lived in rural areas (74.2%), about a quarter lived in urban areas (25.8%).

With regard to level of education, a large percentage of ever married women (80.5%) was literate and only (19.5%) was illiterate. For employment status, most of the respondents of ever married women aged 15 to 49 years old (63%) were working and (37%) were not working in Kayah State.

On average, the majority of women (88.9%) in this study were not-head of household and only (11.1%) women were head of household. Regarding the women's migration experience in this study, most of the respondents were non-migrant women (89.1%). Only (10.9%) had migration experience.

According to the experience of child death, most of the ever married women age 15 to 49 years old did not have experience of child death. It showed that nearly three-fourths of them (80.8%) never experienced the death of a child and about (19.2%) had experienced on child death. Concerning media exposure, a large percentage of the ever married women (87.2%) had not been exposed to media but only (12.8%) exposed to media. For the source of drinking water, most of the respondents of ever married women aged 15 to 49 years old (57.7%) were improved water and slightly more than two-fifth (42.3%) were unimproved water in Kayah State.

4.2 Bi-variate Analysis for One-way ANOVA

The one-way ANOVA test was carried out to examine the significance of association between them. The mean number of children ever born among the ever married women age (15-49) was three children. Several demographic, socio-economic and environmental variables were correlated with children ever born. The relationship between independent variables and dependent variable are shown in Table (4.3).

Table (4.3) Mean Number of CEB (dependent variable) and Characteristics of Ever Married Women (independent variables)

Independent Variables	Mean number of CEB	Std. Deviation	P-value
Age			0.000
15-19	0.41	0.696	
20-24	0.96	0.928	
25-29	1.99	1.451	
30-34	2.86	1.782	
35-39	3.88	2.205	
40-44	4.43	2.500	
45-49	4.66	2.648	
Place of Residence			0.000
Urban	2.37	1.91	
Rural	3.33	2.49	
Educational Level			0.000
Illiterate	4.41	2.69	
Literate	2.76	2.20	
Employment Status			0.000
Not working	2.75	2.20	
Working	3.28	2.48	
Head of Household			0.048
Not head of household	3.05	2.41	
Head of household	3.36	2.23	

Table (4.3) Mean Number of CEB (dependent variable) and Characteristics of Ever Married Women (independent variables) (Continue)

Independent Variables	Mean number of CEB	Std. Deviation	P-value
Migration Experience			0.031
Not migration experience	3.12	2.39	
Migration experience	2.78	2.39	
Experience of child death			0.000
Not experience of child death	2.46	1.95	
Experience of child death	5.71	2.29	
Media Exposure			0.000
Not media exposure	3.20	2.42	
Media Exposure	2.31	2.00	
Source of Drinking Water			0.000
Unimproved Water	3.29	2.442	
Improved Water	2.94	2.346	
Total =2305			

Source: 2014 Myanmar Population and Housing Census

Table (4.3) showed that the mean number of children ever born increased as age of women increased. The mean number of children ever born of married women in the younger age group was lower than the older age group. The mean numbers of children ever born for the age groups 15-19, 20-24, 25-29, 30-34, 35-39 and 40-44 were 0.41, 0.96, 1.99, 2.86, 3.88 and 4.43 respectively. The mean number of children ever born for the age group (45-49) was 4.66 numbers of children ever born which was highest in the oldest age-group. The test for statistical difference by one way ANOVA showed that the average numbers of children ever born of ever married women were different between age group. The women at different age groups had different number of children ever born. The relationship was statistically significant at 1% level.

The mean numbers of children ever born were varied by women's place of residence (urban/rural). The women who lived in urban area had 2.37 children ever born compared to 3.33 children ever born of those who lived in rural area. This finding shows that the women's place of residence (urban/rural) had association with the number of children ever born. Rural women have higher numbers children ever born than urban women. The one way ANOVA shows the significance of the relationship between women's place of residence and number of children ever born at 1% level.

In addition, the mean numbers of children ever born were varied by respondent's educational level. It showed that the mean number of children ever born of illiterate women was the largest (4.41 children). The mean number of children ever born (2.76) was women who were literate. This finding showed that the women's education had association with the number of children ever born. As the women's educational level increased, the number of children ever born also decreased. The one way ANOVA showed that the relationship between women's education and number of children ever born was significant at 1% level.

Regarding the women's employment status and number of children ever born, the women who were not working had average 2.75 children ever born. The mean number of children ever born of those who were working was the largest (3.28 children). It showed that the average numbers of children ever born of ever married women were different by working status of the women. The women who had different working status had different number of children ever born. The one way ANOVA showed that the relationship between women's employment status and number of children ever born was statistically significant at 1% level.

The mean numbers of children ever born were different by women's head of household status. The women who were not head of household had 3.05 children ever born compared to 3.36 children ever born of women who were head of household. This finding showed that the women's head of household status was associated with the number of children ever born. Women who were head of household had higher numbers children ever born than those who were not head of household. The one way ANOVA showed that the relationship between women's head of household status and number of children ever born was statistically significant at 5% level.

In addition, the mean numbers of children ever born were different by women's migration experience. The women who had never migrated had 3.12 children ever born while those who had migration experience had 2.78 children ever born. This finding shows that the women's migration experience has association with the number of children ever born. Women who were non-migrant had higher numbers children ever born than those who were migrants. There was statistically significant relationship between women's migration experience and number of children ever born at 5% level.

The finding showed the difference in mean number of children ever born according to experiences of child death. The women who had no experience of child death had 2.46 children ever born while those who had experience of child death had 5.71 children ever born. The finding reflected that the experience of child death was associated with the number of children ever born. Women who had experiences of child death had higher number of children ever born than those who have no experiences of child death. The one way ANOVA test showed the statistically significance of relationship between experience of child death and number of children ever born at 1% level.

Concerning the women's media exposure and number of children ever born, the mean number of children ever born of those who were not exposed to media was 3.2. The women who were exposed to media had average 2.31 children ever born. It showed that the average numbers of children ever born of ever married women were different by media exposure of the women. The one way ANOVA showed that the relationship between women's media exposure and number of children ever born was statistically significant at 1% level.

This result also showed the difference in mean number of children ever born according to source of drinking water. The women who had unimproved drinking water had 3.29 children ever born while those who had improved drinking water had 2.94 children ever born. The finding reflected that source of drinking water was associated with the number of children ever born. Women who had unimproved drinking water had higher number of children ever born than those who had improved drinking water. The one way ANOVA test showed the statistical significance of relationship between source of drinking water and number of children ever born at 1% level.

4.3 Multiple Regression Model for CEB

This study used multiple regression method by taking the demographic, socio-economic and environmental factors into consideration. In this study, the number of children ever born of reproductive women (15-49) has been taken as a dependent variable where women's age, place of residence, educational level, employment status, head of household, migration experience, experience of child death, media exposure and source of drinking water consider as independent variables.

The Multiple Linear Regression Equation is:

$$\mathrm{Y_i} = \beta_0 + \beta_1\mathrm{X}_1 + \beta_2\mathrm{X}_2 + \beta_3\mathrm{X}_3 + \beta_4\mathrm{X}_4 + \beta_5\mathrm{X}_5 + \beta_6\mathrm{X}_6 + \beta_7\mathrm{X}_7 + \beta_8\mathrm{X}_8 + \beta_9\mathrm{X}_9 + e_i$$

where

$\mathrm{Y_i}$ = Number of Children Ever Born

β_0 = Constant (coefficient of intercept)

X_1 = Women's age

X_2 = Women's place of residence

X_3 = Women's educational level

X_4 = Women's employment status

X_5 = Women's head of household

X_6 = Women's migration experience

X_7 = Women's experience of child death

X_8 = Women's media exposure

X_9 = Women's source of drinking water

e_i = Random Error

4.3.1 Estimated Results of Regression Model for CEB

The estimated regression results are described in Table (4.4).

Table (4.4) Significance of Variables

Variables	Unstandardized Coefficients		Standardized Coefficients	95% Confidence Interval for B		P-value
	B	Std. Error	Beta	Lower Bound	Upper Bound	
Constant	0.581	0.161		0.266	0.897	0.000
Age	0.613	0.023	0.437	0.569	0.657	0.000
Place of residence	0.531	0.089	0.097	0.357	0.706	0.000
Educational level	-0.421	0.095	-0.07	-0.608	-0.234	0.000
Employment status	0.108	0.075	0.022	-0.039	0.256	0.151
Head of household	-0.382	0.116	-0.05	-0.609	-0.154	0.001
Migration experience	-0.138	0.115	-0.018	-0.364	0.088	0.231
Experience of child death	2.288	0.097	0.377	2.097	2.478	0.000
Media exposure	-0.444	0.114	-0.062	-0.669	-0.22	0.000
Source of drinking water	-0.069	0.076	-0.014	-0.218	0.079	0.361
Total = 2,305, R^2 = 0.487, SEE = 1.718, F = 242.027, P-value = 0.000						

Source: 2014 Myanmar Population and Housing Census

According to Table (4.4), the estimated multiple regression model is stated as follows:

$$\widehat{Y}_i = 0.581 + 0.613\ X_1 + 0.531\ X_2 - 0.421\ X_3 - 0.382\ X_5 + 2.288\ X_7 - 0.444\ X_8$$

Table (4.4) presents the result of multiple regression analysis of independent variables that determined the number of children ever born of ever married women in Kayah State, after controlling other variables. R^2 expresses the percentage of variation in the dependent variable that could be explained by all independent variables in the model. In this study, from the analysis result, the R^2 value is 0.487 which means that the independent variables in the model explain about 49 percent of variation in the number of children ever born. An estimate of the standard deviation of the error term (Std. Error of the Estimate) showed that the mean absolute deviation as 1.718 number, which is small considering that the number of children ever born range 0 to 10^+ per women.

Starting from women's age, when other variables are controlled, age of women has positive relationship with the number of children ever born (B = 0.613). It means that when age of women one year increase then the number of children ever born will significantly increase about 0.613 children. It is statistically significant at 1% level. The 95% confidence interval suggests that β_1 lies between 0.596 and 0.657, thereby indicating a positive relationship between women's age and number of children ever born.

In the case of the place of residence, compared between urban and rural, ever married women who lived in rural area has significantly nearly 0.5 more number of children ever born (B = 0.531) than those who lived in urban area after controlling for other variables. This study confirmed that place of residence (urban/rural) is significantly effecting the number of children ever born at 1% level. The 95% confidence interval suggests that β_2 lies between 0.357 and 0.706, thereby indicating a positive relationship between women's place of residence and number of children ever born.

The educational status of the women was also significantly associated with the number of children ever born. Women with education has 0.4 lower number of children ever born (B = -0.421) than those who has no education after controlling for other variables with statistically significant at 1% level. The 95% confidence interval suggests that β_3 lies between -0.608 and -0.234, thereby indicating a negative relationship between women's educational level and number of children ever born.

In employment status of respondent, it is not significantly associated with the number of children ever born. The respondent who were working have 0.1 lower number of children ever born (B = 0.108) than those who were not working.

Considering head of household, when compared between the women who were head of household and those who were not head of household, it was found that head of household women had 0.4 lower number of children ever born (B = -0.382) than those who were not head of household after controlling for other variables with significance level at 1%. The 95% confidence interval suggests that β_5 lies between -0.609 and -0.154, thereby indicating a negative relationship between women's head of household and number of children ever born.

For the migration experience, when compared between the women who had migration experience and those who did not have migration experience, women's experience of migration is found not significant with the number of children ever born. The migrant women have 0.1 lower number of children ever born (B = -0.138) than those who did not have migration experience.

Regarding the experience of child death, when compare between the women who had experience of child death and those who did not have experience of child death, it was found that women who had experience of child death are affecting fertility comparing to those who did not have experience of child death. The result indicates among the ever-married women who had experience of child death, the number of children ever born was generally higher at 2.3 children compared to those who did not have experience of child death (B = 2.288) after controlling for other variables with significant at 1% level. The 95% confidence interval suggests that β_7 lies between 2.097 and 2.478, thereby indicating a positive relationship between women's experience of child death and number of children ever born.

Considering the media exposure, when compare between the women who were exposed to media and those who were not exposed to media, it was found that media exposure of women had 0.4 lower number of children ever born (B = -0.444) than those who were not exposed to media after controlling for other variables with significant at

1% level. The 95% confidence interval suggests that β_8 lies between -0.669 and -0.22, thereby indicating a negative relationship between women's media exposure and number of children ever born.

In addition, the women's source of drinking water was not significantly associated with the number of children ever born. The respondent who were improved water have 0.1 lower number of children ever born (B = -0.069) than those who were unimproved water.

Finally, the results in Table (4.4) showed that except for variables of employment status, migration experience and source of drinking water, the other independent variables contributed significantly to children ever born in Kayah State. Age has the highest contribution on the number of children ever born amongst the independents variables (standardized b = 0.437). The experience of child death has the second highest contribution on the number of children ever born (standardized b = 0.377). Considering factors those negatively determined the number of children ever-born, the women's education appeared to have the highest magnitude of influence (standardized b = -0.07). The women's media exposure appeared to have the second strongest negative influence on the number of children ever born of the ever married women (standardized b= -0.062).

4.3.2 Checking for Assumptions

Linearity

As regression analysis is based on the concept of correlation, the linearity of the relationship between dependent and independent variables is important. Linearity can easily be examined by residual scatterplots which are shown in Figure (4.1).

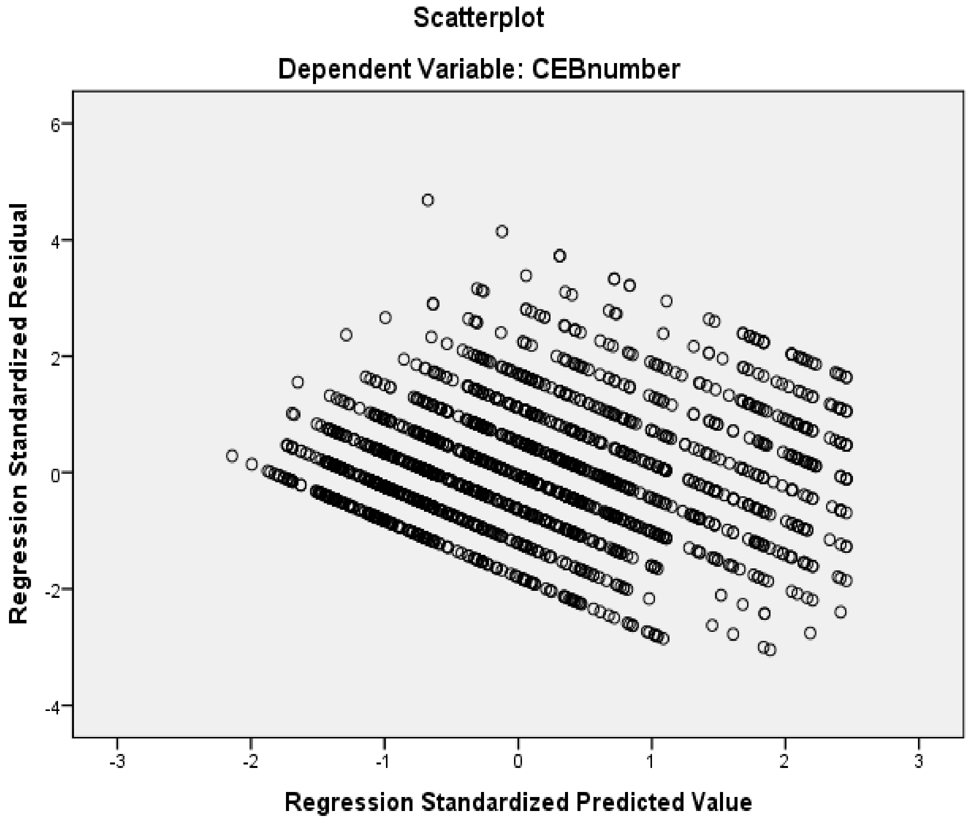

Figure (4.1) The Scatter Plot for Linearity and Homoscedasticity

According to Figure (4.1), the scatter plot of standardized residuals (ZRESID) against the standardized predicted values (ZPRED) shows that there exist some definite patterns. Therefore, there is not consistent with the assumptions of linearity.

Normality

The next assumption to be checked is the normality of the error term with both the normal p-p plot and the histogram of the distribution of the residuals which are described in Figure (4.2) and Figure (4.3).

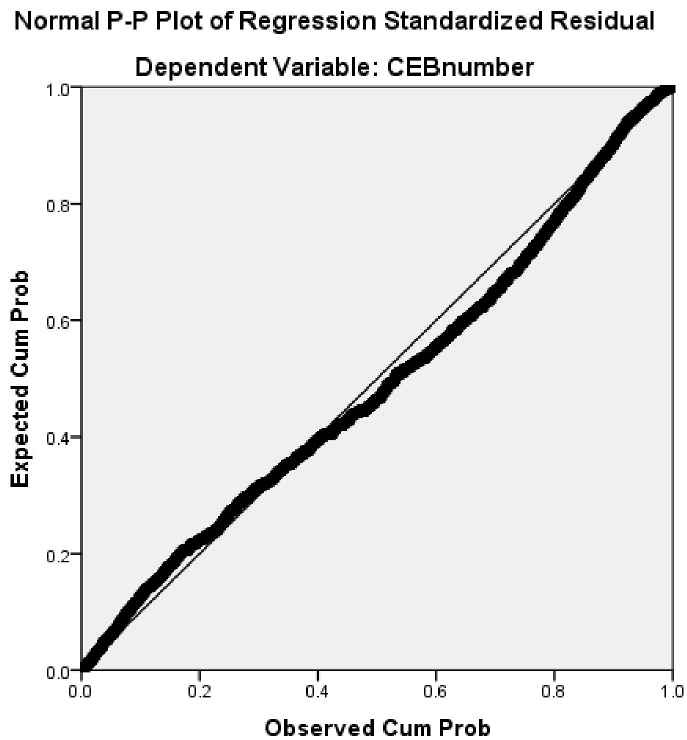

Figure (4.2) The P-P Plot of Normality Test

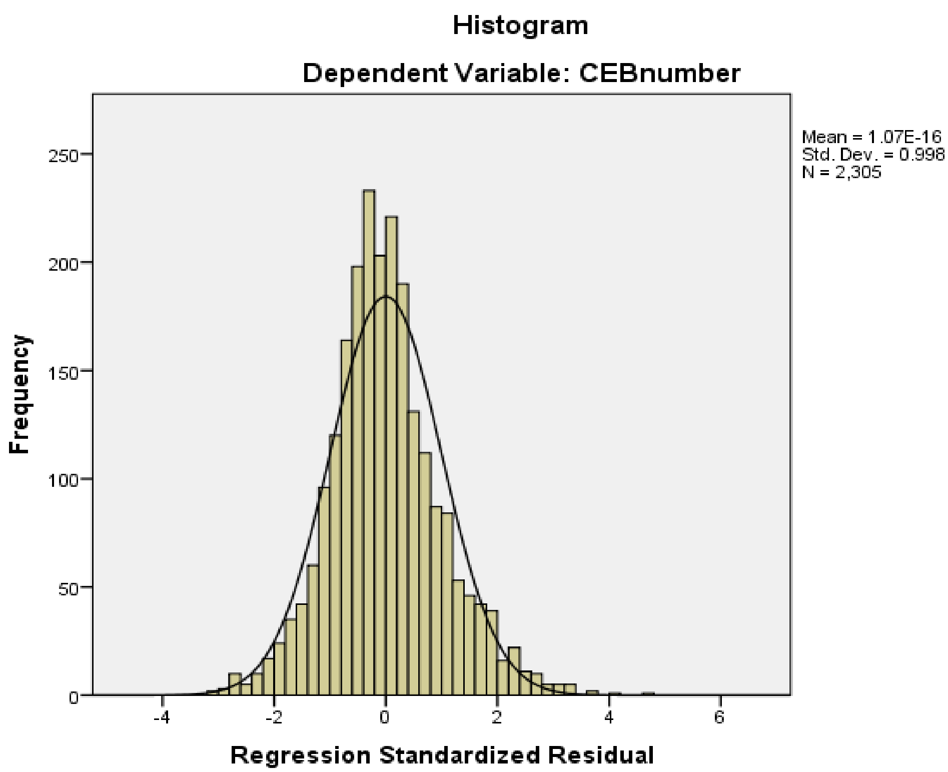

Figure (4.3) Histogram of Normality Test

According to Figure (4.2) and Figure (4.3), Normal P-P plot and Histogram are used to judge whether the distribution of variables is consistent with a specified distribution. If the standardized residuals are normally distributed, the scatters should fall on or tightly close to the normal distribution line. Figure (4.2) showed that the scatters of the residuals are basically fall straightly on the normal distribution line, indicating a normal distribution of residual.

Homoscedasticity

The residual scatterplots could also be used to test the assumption of homoscedasticity. If there is no clear relationship between the residuals and predicted values, the assumption of homoscedasticity should also be met. In this study, by plotting the standardized residuals against the predicted values as shown in Figure (4.1). The results showed that the assumption of homoscedasticity is not met in this study.

Detection of Multicollinearity

Multicollinearity test is important because if multicollinearity exists between two or more independents variables it can deteriorate the results of multiple regression. In this study, multicollinearity has been examined between the independents variables using VIF as shown in Table (4.5).

Table (4.5) Tolerance Value and the VIF of Independent Variables

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Age	0.86	1.162
Place of residence	0.842	1.188
Educational level	0.895	1.117
Employment status	0.967	1.035
Head of household	0.964	1.038
Migration experience	0.995	1.005
Experience of child death	0.874	1.144
Media exposure	0.879	1.138
Source of drinking water	0.915	1.093

Source: 2014 Myanmar Population and Housing Census

The results in Table (4.4) indicate that multicollinearity does not exist among all independent variables because the Tolerance values are more than 0.10 and VIF values are less than 10. The results pointed out that this study does not have any problem with multicollinearity and this allows for standard interpretation of the regression coefficients.

4.4 Estimated Results of Fitted Model for CEB

The OLS model is not met the assumption of homoscedasticity. Therefore, age can be transformed by taking the log values. The fitted regression results are described in Table (4.6).

Table (4.6) Significance of Variables

Variables	Unstandardized Coefficients		Standardized Coefficients	95% Confidence Interval for B		P-value
	B	Std. Error	Beta	Lower Bound	Upper Bound	
(Constant)	3.18	0.57		2.063	4.298	0.000
Log age	-0.239	0.359	-0.011	-0.944	0.465	0.505
Place of residence	0.41	0.102	0.075	0.209	0.611	0.000
Educational level	-0.873	0.108	-0.144	-1.084	-0.661	0.000
Employment status	0.222	0.087	0.045	0.052	0.391	0.01
Head of Household	0.085	0.132	0.011	-0.174	0.343	0.521
Migration experience	-0.204	0.132	-0.027	-0.463	0.056	0.123
Experience of child death	2.95	0.108	0.486	2.738	3.162	0.000
Media exposure	-0.188	0.131	-0.026	-0.445	0.069	0.151
Source of drinking water	-0.006	0.087	-0.001	-0.177	0.164	0.942
Total = 2305, R^2 =0.323, SEE =1.973,F = 121.448, P-value = 0.000						

Source: 2014 Myanmar Population and Housing Census

According to Table (4.6), the value of R^2 is 0.323 which means that the independent variables in the model explain about 32 percent of variation in the number of children ever born. An estimate of the standard deviation of the error term (Std. Error of the Estimate) showed that the mean absolute deviation is 1.973 number. Women's log age, head of household, migration experience, media exposure and source of drinking water are not associated with the number of children ever born.

In the case of the place of residence, compared between urban and rural, ever married women who lived in rural area significantly has nearly 0.4 more number of children ever born (B = 0.41) than those who lived in urban area after controlling for other variables. This study confirmed that place of residence (urban/rural) is significantly effecting number of children ever born at 1% level. The 95% confidence interval suggests that β_2 lies between 0.209 and 0.611, thereby indicating a positive relationship between women's place of residence and number of children ever born.

The educational status of women was also significantly associated with the number of children ever born. Women with education has 0.8 lower number of children ever born (B = -0.873) than those who has no education after controlling for other variables with statistically significant at 1% level. The 95% confidence interval suggests that β_3 lies between -1.084 and -0.661, thereby indicating a negative relationship between women's education level and number of children ever born.

In employment status of respondent, it is significantly associated with the number of children ever born. The respondent who were working have 0.2 higher number of children ever born (B = 0.222) than those who were not working with statistically significant at 5% level. The 95% confidence interval suggests that β_4 lies between 0.052 and 0.391, thereby indicating a positive relationship between women's and number of children ever born.

Considering head of household, when compared between the women who were head of household and those who were not head of household, it was found that head of household women had 0.4 lower number of children ever born (B = -0.382) than those who were not head of household after controlling for other variables with significance level at 1%. The 95% confidence interval suggests that β_5 lies between -0.609 and -0.154, thereby indicating a negative relationship between women's head of household and number of children ever born.

Regarding the experience of child death, when compare between the women who had experience of child death and those who did not have experience of child death, it was found that women who had experience of child death are affecting fertility comparing to those who did not have experience of child death. The result indicates among the ever-married women who had experience of child death, the number of children ever born was generally higher at 3 children compared to those who did not have experience of child death (B = 2.95) after controlling for other variables with significant at 1% level. The 95% confidence interval suggests that β_7 lies between 2.738 and 3.162, thereby indicating a positive relationship between women's experience of child death and number of children ever born.

Finally, the results in Table (4.6) showed that except for variables of employment status, migration experience and source of drinking water, the other independent variables contributed significantly to children ever born in Kayah State. Experience of child death has the highest contribution on the number of children ever born amongst the independents variables (standardized b = 0.486). Considering factors those negatively determined the number of children ever-born, the women's education appeared to have the highest magnitude of influence (standardized b = -8.078).

4.4.1 Checking for Assumptions

Linearity

As regression analysis is based on the concept of correlation, the linearity of the relationship between dependent and independent variables is important. Linearity can easily be examined by residual scatterplots which are shown in Figure (4.4).

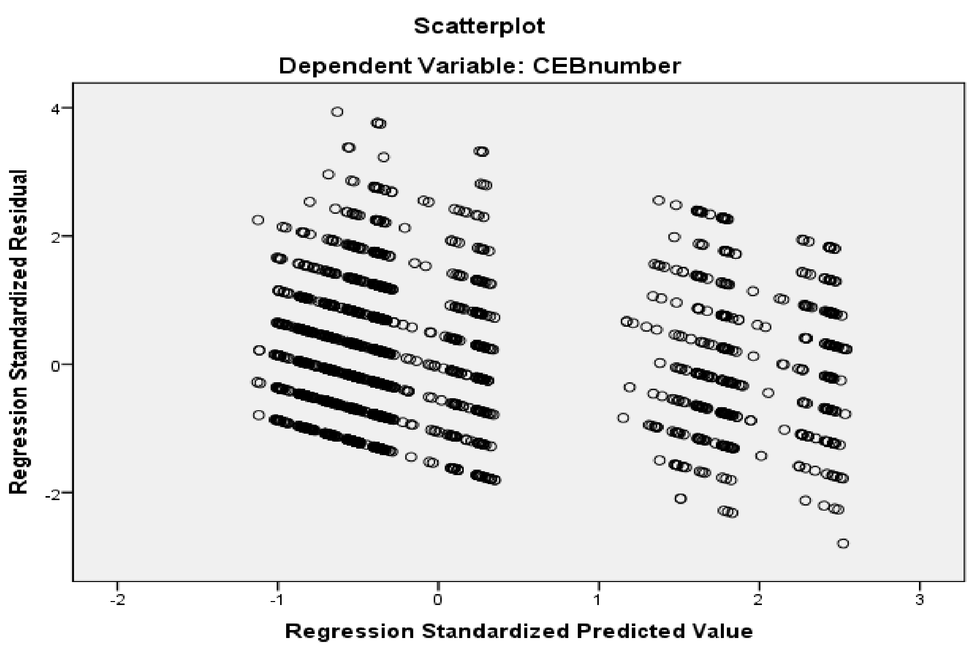

Figure (4.4) The Scatter Plot for Linearity and Homoscedasticity

According to Figure (4.4), the scatter plot of standardized residuals (ZRESID) against the standardized predicted values (ZPRED) shows that there is consistent with the assumptions of linearity.

Normality

The next assumption to be checked is the normality of the error term with both the normal p-p plot and the histogram of the distribution of the residuals which are described in Figure (4.5) and Figure (4.6).

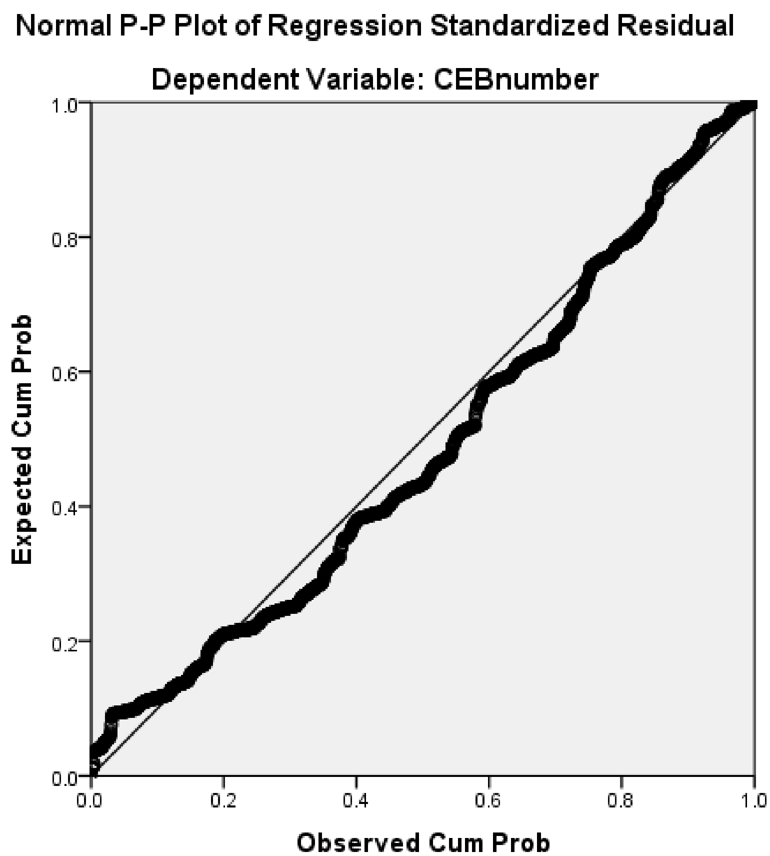

Figure (4.5) The P-P Plot of Normality Test

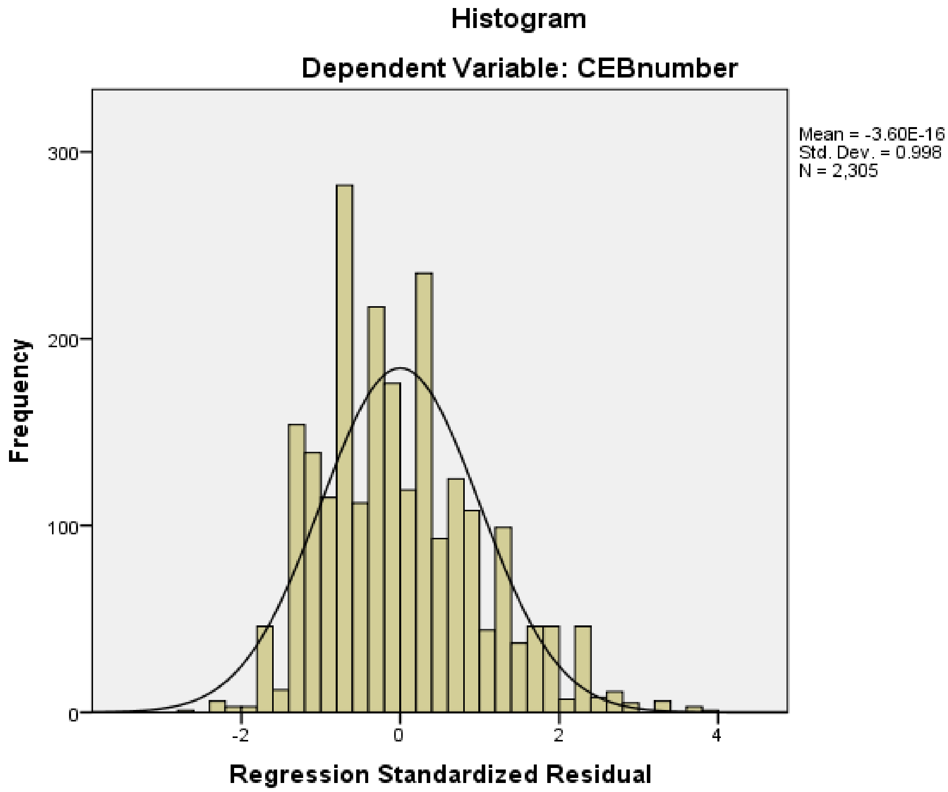

Figure (4.6) Histogram of Normality Test

According to Figure (4.5) and Figure (4.6), Normal P-P plot and Histogram are used to judge whether the distribution of variables is consistent with a specified distribution. If the standardized residuals are normally distributed, the scatters should fall on or tightly close to the normal distribution line. Figure (4.5) showed that the scatters of the residuals basically fall straightly on the normal distribution line, indicating a normal distribution of residual.

Homoscedasticity

The residual scatterplots could also be used to test the assumption of homoscedasticity. If there is no clear relationship between the residuals and predicted values, the assumption of homoscedasticity should also be met. In this study, by plotting the standardized residuals against the predicted values as shown in Figure (4.4). The results showed that the assumption of homoscedasticity is met in this study.

Detection of Multicollinearity

Multicollinearity test is important because if multicollinearity exists between two or more independents variables it can deteriorate the results of multiple regression. In this study, multicollinearity has been examined between the independents variables using VIF as shown in Table (4.7).

Table (4.7) Tolerance Value and the VIF of Independent Variables

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Age	0.996	1.004
Place of residence	0.844	1.185
Educational level	0.923	1.083
Employment status	0.969	1.032
Head of household	0.985	1.015
Migration experience	0.995	1.005
Experience of child death	0.933	1.071
Media exposure	0.885	1.130
Source of drinking water	0.913	1.095

Source: 2014 Myanmar Population and Housing Census

The result in Table (4.7) indicates that multicollinearity does not exist among all independent variables because the Tolerance values are more than 0.10 and VIF values are less than 10. The results pointed out that this study does not have any problem with multicollinearity and this allows for standard interpretation of the regression coefficients.

CHAPTER V

CONCLUSION

Kayah State is Myanmar's smallest state by size and population, yet boasts a wide range of economic development opportunities. The total population for Kayah State as of 29 March 2014 was 286,627 persons. Of these, 143,213 were males and 143,414 were females. The total population of Kayah State represents 0.56 percent of the total population of Myanmar. The population density was 24.4 persons per square kilometer. This is much lower than Union level population density of 76 persons per square kilometer. The total fertility rate (TFR) for all women aged 15-49 in Kayah State is 3.3 children per woman, which is much higher than the Union level TFR of 2.3 (2014 Myanmar Population and Housing Census).

This study focused upon the fertility differentials among ever married women in Kayah State, Myanmar. The fertility in this study was measured by the number of children ever born. This study used the secondary data from 2014 Myanmar Population and Housing Census. The 2,305 ever married women aged 15-49 of Kayah State were taken out of this 2014 Myanmar Census for the analysis. The dependent variable was the number of children ever born (CEB) while the independent variables were women's demographic, socio-economic and environmental factors. To achieve the study objectives, descriptive analysis, bi-variate analysis by using one way ANOVA and Multiple Linear Regression Analysis were carried out to examine significant effects of independents variables on the dependent variable.

According to one-way ANOVA, women's age, place of residence, educational level, employment status, experience of child death, media exposure and source of drinking water have major influence on number of children ever born. The relationships were statistically significant at 1% level. However, women's head of household and migration experience were statistically significant at 5% level.

The results from Multiple Linear Regression Analysis showed that women's age, place of residence, educational level, head of household status, experience of child death and media exposure are associated with the number of children ever born. However employment status, migration experience and source of drinking water are not associated with the number of children ever born. Women's age, place of residence in rural areas, experience of child death are found positively associated with the number of children ever born in this state and the effects of these variable are statistically significant. On the other hand, women's education level, head of household status and media exposure are found negatively associated with the number of children ever born in this state and the effects of these variables are statistically significant. Women's age, experience of child death, education level and head of household status were found to be the most important variables affecting the number of children ever born in Kayah State.

In fitted multiple regression model, women's place of residence, educational level, employment status and experience of child death are associated with the number of children ever born. However women's log age, head of household, migration experience, media exposure and source of drinking water are not associated with the number of children ever born. Women's experience of child death and educational level were found the most important variables affecting the number of children ever born in Kayah State.

According to these findings, this study makes several suggestions and recommendations for relevant policy. According to women age, it is found that married women would have more number of children ever born when they get older. Therefore, the government needs to provide priority in terms of the provision of reproductive health service, contraceptive knowledge and family planning service to reduce fertility level at every age of women in Kayah State.

In regard to women's place of residence, this finding shows that women who live in rural area have more number of children ever born; government should consider the education and health programs that focus more to the rural area. For women's education, it is found that the majority of ever-married women in Kayah State have low educational level. On this issue the government should improve education infrastructure and teacher to get higher education, especially in rural areas of Kayah State.

For employment status of women, working women were found to have less number of children that those who were not working. A possible recommendation might be that the government needs to provide more job opportunity for the women in this state. Regarding women's head of household, this findings shows that women's head of household had lower number of children ever born than those who were not head of household. Therefore, the government should promote equal access to opportunities such as education, jobs and decision making etc. for the women, especially for those who are not head of the household in this state.

For the migration experience, it was found that women who had migration experience had fewer children than those who had no migration experience. The reason could be that most of the migratory women were to get better opportunity to earn more income to support their family. Regarding experience of child death, women who had experiences of child death had higher fertility than those who had not experience of child death. Therefore, government should try to expand immunization programs to cover all children, to get the births delivered in health facility, to promote access to quality ante-natal care because it can reduce not only child mortality but also fertility level.

Women's media exposure was found as a negative determining factor of number of children ever born and women who were exposed to media had fewer children ever born than those who were not exposed to media. Therefore, government should be conducted the reproductive health information through the media to reduce fertility level in Kayah State.

Based on this study, further study should include the proximate intermediate variables such as contraceptive use, income, breastfeeding, religion and ethnicity that influence on fertility. Also, further study should employ fertility differentials relating to husband characteristics with demographic and socio-economic factors such as age, education, employment status and migration experiences etc. that affect fertility level.

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APPENDIX

Number of Children Ever Born

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	291	12.6	12.6	12.6
	1	396	17.2	17.2	29.8
	2	395	17.1	17.1	46.9
	3	379	16.4	16.4	63.4
	4	288	12.5	12.5	75.9
	5	195	8.5	8.5	84.3
	6	129	5.6	5.6	89.9
	7	82	3.6	3.6	93.5
	8	77	3.3	3.3	96.8
	9	33	1.4	1.4	98.3
	10+	40	1.7	1.7	100.0
	Total	2305	100.0	100.0	

Age-Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-19	68	3.0	3.0	3.0
	20-24	301	13.1	13.1	16.0
	25-29	381	16.5	16.5	32.5
	30-34	455	19.7	19.7	52.3
	35-39	390	16.9	16.9	69.2
	40-44	373	16.2	16.2	85.4
	45-49	337	14.6	14.6	100.0
	Total	2305	100.0	100.0	

Place of Residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	594	25.8	25.8	25.8
	Rural	1711	74.2	74.2	100.0
	Total	2305	100.0	100.0	

Educational Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Illiterate	449	19.5	19.5	19.5
	Literate	1856	80.5	80.5	100.0
	Total	2305	100.0	100.0	

Employment Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not working	852	37.0	37.0	37.0
	Working	1453	63.0	63.0	100.0
	Total	2305	100.0	100.0	

Head of Household

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No head of household	2049	88.9	88.9	88.9
	Head of household	256	11.1	11.1	100.0
	Total	2305	100.0	100.0	

Migration Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No migration	2054	89.1	89.1	89.1
	Migration	251	10.9	10.9	100.0
	Total	2305	100.0	100.0	

Child Death Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No child death	1862	80.8	80.8	80.8
	Child death	443	19.2	19.2	100.0
	Total	2305	100.0	100.0	

Media Exposure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No media exposure	2011	87.2	87.2	87.2
	Media exposure	294	12.8	12.8	100.0
	Total	2305	100.0	100.0	

Source of Drinking Water

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unimproved water	975	42.3	42.3	42.3
	Improved water	1330	57.7	57.7	100.0
	Total	2305	100.0	100.0	

Age-Group
Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
15-19	68	0.41	0.696	0.084	0.24	0.58	0	3
20-24	301	0.96	0.928	0.053	0.85	1.06	0	4
25-29	381	1.99	1.451	0.074	1.84	2.14	0	10
30-34	455	2.86	1.782	0.084	2.69	3.02	0	10
35-39	390	3.88	2.205	0.112	3.66	4.1	0	10
40-44	373	4.43	2.5	0.129	4.18	4.69	0	10
45-49	337	4.66	2.648	0.144	4.38	4.95	0	10
Total	2305	3.09	2.393	0.05	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4090.473	6	681.746	172.068	.000
Within Groups	9104.860	2298	3.962		
Total	13195.334	2304			

Place of Residence
Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Urban	594	2.37	1.910	.078	2.21	2.52	0	10
Rural	1711	3.33	2.492	.060	3.22	3.45	0	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	410.632	1	410.632	73.970	.000
Within Groups	12784.702	2303	5.551		
Total	13195.334	2304			

Education Level
Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Illiteracy	449	4.41	2.688	.127	4.16	4.66	0	10
Literacy	1856	2.76	2.200	.051	2.66	2.86	0	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	981.923	1	981.923	185.155	.000
Within Groups	12213.411	2303	5.303		
Total	13195.334	2304			

Employment Status
Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Not working	852	2.75	2.197	.075	2.60	2.90	0	10
working	1453	3.28	2.481	.065	3.15	3.41	0	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	149.593	1	149.593	26.408	.000
Within Groups	13045.740	2303	5.665		
Total	13195.334	2304			

Head of Household
Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No head of household	2049	3.05	2.410	.053	2.95	3.15	0	10
Head of household	256	3.36	2.235	.140	3.09	3.64	0	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.296	1	22.296	3.898	.048
Within Groups	13173.037	2303	5.720		
Total	13195.334	2304			

Migration Experience
Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No migration	2054	3.12	2.392	.053	3.02	3.23	0	10
Migration	251	2.78	2.388	.151	2.48	3.07	0	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.745	1	26.745	4.677	.031
Within Groups	13168.589	2303	5.718		
Total	13195.334	2304			

Child Death Experience
Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No child death	1862	2.46	1.951	.045	2.37	2.55	0	10
Child death	443	5.71	2.295	.109	5.50	5.93	1	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3781.759	1	3781.759	925.195	.000
Within Groups	9413.575	2303	4.088		
Total	13195.334	2304			

Media Exposure

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No media exposure	2011	3.20	2.425	.054	3.09	3.30	0	10
Media exposure	294	2.31	2.004	.117	2.08	2.54	0	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	200.892	1	200.892	35.604	.000
Within Groups	12994.442	2303	5.642		
Total	13195.334	2304			

Source of Drinking Water

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Unimproved water	975	3.29	2.442	.078	3.13	3.44	0	10
Improved water	1330	2.94	2.346	.064	2.81	3.06	0	10
Total	2305	3.09	2.393	.050	2.99	3.18	0	10

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	69.752	1	69.752	12.239	.000
Within Groups	13125.582	2303	5.699		
Total	13195.334	2304			

Multiple Linear Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.698	0.487	0.485	1.718	0.487	242.027	9	2295	0	1.505

a. Predictors: (Constant), Water source, Age group, Migration, Occupation, Head of household, Media exposure, Education, Child death, Place of residence

b. Dependent Variable: CEB

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6425.456	9	713.940	242.027	.000[b]
	Residual	6769.877	2295	2.950		
	Total	13195.334	2304			

a. Dependent Variable: CEB

b. Predictors: (Constant), Water source, Age group, Migration, Occupation, Head of household, Media exposure, Education, Child death, Place of residence

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.581	.161		3.614	.000	.266	.897		
	Age group	.613	.023	.437	27.124	.000	.569	.657	.860	1.162
	Place of residence	.531	.089	.097	5.962	.000	.357	.706	.842	1.188
	Education	-.421	.095	-.070	-4.411	.000	-.608	-.234	.895	1.117
	Occupation	.108	.075	.022	1.438	.151	-.039	.256	.967	1.035
	Head of household	-.382	.116	-.050	-3.290	.001	-.609	-.154	.964	1.038
	Migration	-.138	.115	-.018	-1.199	.231	-.364	.088	.995	1.005
	Child death	2.288	.097	.377	23.562	.000	2.097	2.478	.874	1.144
	Media exposure	-.444	.114	-.062	-3.885	.000	-.669	-.220	.879	1.138
	Water source	-.069	.076	-.014	-.914	.361	-.218	.079	.915	1.093

a. Dependent Variable: CEB

Collinearity Diagnostics

Model		Eigen value	Condition Index	Variance Proportions									
				(Constant)	Age group	Place of residence	Education	Occupation	Head of house hold	Migration	Child death	Media exposure	Water source
1	1	5.375	1.000	.00	.01	.01	.00	.01	.00	.00	.01	.00	.01
	2	1.046	2.267	.00	.00	.01	.00	.00	.08	.01	.16	.38	.02
	3	.892	2.455	.00	.00	.00	.00	.00	.01	.87	.04	.05	.00
	4	.854	2.509	.00	.00	.00	.00	.00	.83	.02	.07	.04	.00
	5	.688	2.794	.00	.00	.02	.01	.01	.01	.08	.53	.27	.00
	6	.408	3.628	.00	.00	.04	.00	.17	.01	.01	.02	.15	.60
	7	.300	4.231	.00	.01	.09	.08	.73	.00	.00	.00	.01	.13
	8	.212	5.034	.00	.05	.31	.45	.03	.00	.00	.09	.05	.05
	9	.186	5.372	.00	.64	.25	.01	.01	.04	.00	.09	.05	.09
	10	.038	11.827	.99	.30	.29	.45	.04	.00	.00	.00	.00	.10

a. Dependent Variable: CEB

Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.49	7.19	3.09	1.670	2305
Residual	-5.234	8.043	.000	1.714	2305
Std. Predicted Value	-2.142	2.456	.000	1.000	2305
Std. Residual	-3.048	4.683	.000	.998	2305

a. Dependent Variable: CEB

Fitted Multiple Linear Regression Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.568[a]	.323	.320	1.973	1.391

a. Predictors: (Constant), VAR00001, media exposure, Migration, head of household, occupation, child death, water source, Edu, place of residence

b. Dependent Variable: CEB

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4257.012	9	473.001	121.448	.000[b]
	Residual	8938.322	2295	3.895		
	Total	13195.334	2304			

a. Dependent Variable: CEB

b. Predictors: (Constant), VAR00001, media exposure, Migration, head of household, occupation, child death, water source, Edu, place of residence

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	3.180	.570		5.579	0.000	2.063	4.298		
Log age	-.239	.359	-.011	-.667	0.505	-.944	.465	0.996	1.004
Place of residence	.410	.102	.075	4.008	0.000	.209	.611	0.844	1.185
Educational level	-.873	.108	-.144	-8.078	0.000	-1.084	-.661	0.923	1.083
Employment status	.222	.087	.045	2.562	0.010	.052	.391	0.969	1.032
Head of household	.085	.132	.011	.642	0.521	-.174	.343	0.985	1.015
Migration experience	-.204	.132	-.027	-1.541	0.123	-.463	.056	0.995	1.005
Child death	2.950	.108	.486	27.320	0.000	2.738	3.162	0.933	1.071
Media exposure	-.188	.131	-.026	-1.435	0.151	-.445	.069	0.885	1.130
Water source	-.006	.087	-.001	-.073	0.942	-.177	.164	0.913	1.095

a. Dependent Variable: CEB

Collinearity Diagnostics

Model		Eigen value	Condition Index	Variance Proportions									
				(Constant)	Log age	Place of residence	Education	Occupation	Head of household	Migration	Child death	Media exposure	Water source
1	1	5.507	1.000	.00	.00	.01	.00	.01	.00	.00	.01	.00	.01
	2	1.042	2.299	.00	.00	.01	.00	.00	.09	.00	.18	.39	.02
	3	.887	2.491	.00	.00	.00	.00	.00	.02	.88	.04	.03	.00
	4	.856	2.536	.00	.00	.00	.00	.00	.85	.03	.06	.05	.00
	5	.698	2.809	.00	.00	.01	.01	.01	.01	.07	.61	.28	.00
	6	.408	3.672	.00	.00	.03	.00	.16	.01	.01	.02	.15	.61
	7	.306	4.241	.00	.00	.06	.07	.74	.01	.00	.00	.01	.13
	8	.210	5.117	.00	.00	.48	.37	.03	.00	.00	.04	.07	.09
	9	.082	8.214	.02	.02	.38	.53	.05	.01	.00	.04	.02	.12
	10	.003	44.655	.98	.98	.01	.01	.00	.00	.00	.00	.00	.01

a. Dependent Variable: CEB

Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.55	6.54	3.09	1.359	2305
Residual	-5.514	7.770	.000	1.970	2305
Std. Predicted Value	-1.130	2.542	.000	1.000	2305
Std. Residual	-2.794	3.937	.000	.998	2305

a. Dependent Variable: CEB