Effect of Socio-economic and demographic variables on fertility in far western Nepal (A case study of kanchanpur)

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ABSTRACT

This study examines the effect of socio-economic and demographic characteristics on fertility rates using a household level survey. Fertility is one of the main components of population growth. In societies where childbearing prior to marriage is not socially acceptable, postponement of marriage contributes significantly to a reduction in fertility level by shortening the total reproductive life of women. This, in turn, reduces the number of children a woman is likely to have and has a negative impact on the population growth rate of a country. A major part of this paper attempts to study the effect of various socio-economic variables such as literacy, caste, employment, and age at marriage on fertility. In order to examine the differentials in fertility of women in study area, a regression model approach is used to measure the extent of the interaction of different type of effects of various socio-economic and demographic variables. The estimated results showed that an increase in age at marriage significantly reduced total fertility of women. The estimation results emphasized the role of female education in reducing total fertility and increasing age at marriage. Moreover, female educational effect had a strong inter-generational effect on age at marriage, and this effect was stronger than the effect of male educational attainment. The relationship between the fertility levels and socio-economic variables shows that female literacy and the number of females attending school were negatively related to fertility of the study area, whereas the other socio-economic variables showed a positive relationship. One implication of these results is that from the policy point of view, all other things being equal, government should accord a significant priority to female education and, in particular, a higher priority compared to male schooling.
Keywords: Fertility; Socioeconomic variables; Age at marriage; Literacy; Nepal.

INTRODUCTION

Fertility levels are one of the most important factors that determine the size and structure of the population of a country. The study on fertility is of immense importance as it is one of the major positive forces for the balance of vital processes. The Government of Nepal has given local level offices, Village Development Committees/municipalities full authorization to register all vital events, including annual births. To date, vital events are still undercounted. The fertility level obtained from the vital registration system is far below the true fertility level. Crude birth rates and fertility levels are estimated in the country based on information collected by censuses and surveys. According to population census of Nepal 2011, the population of far western region of Nepal was 2,552,517 of which 1,217,887 were males and 1,334,630 females. The increase in the population during the last decade (2001-2011) is recorded at 361187 with an annual average growth rate of 1.53%. The population has increased by 16.48% in the past decade, with an average annual growth rate of 1.53%, which is lower than the 2.26% growth rate recorded in the 2001 census (CBS, 2011).

Traditionally, Nepalese society has favored high fertility. Children are considered a symbol of both social and economic well-being. This is evident from a popular saying that says, "May your progeny fill the hills and mountains." Marriage is early and universal, and it is viewed as a disgrace for a couple, particularly for the wife, not to have children. High fertility is desired because by producing children, preferably sons, a woman raises her status in the family [CBS,2003]. Other reasons for high fertility include early and universal marriage as well as desire for sons, for both religious (to perform religious rituals) and economic (immediate economic gains and old age security) reasons [Karki].

The Population dynamics of Nepal shows a high proportion of the population at the bottom of the population pyramid which tapers off upward from 1961 to 1981. A low concentration of the population has been noted in1991, 2001 and 2011 at the bottom of the population pyramid. This is particularly due to considerable fall in fertility since 1991. Fertility in Nepal is high and has remained so over the last several decades, although the fertility rate has declined over the last few decades. Fertility levels persisted at a high level of 6.3 children per woman up to 1981. A decline in fertility levels has been noted only in 1991. Since then it has started to decline by 0.5 children per woman per decade, except during the period 2001 to 2006, when it dropped from 4.1 children per woman in 2001 to 3.1 children per woman in 2006, a drop of one child per woman during a five year period. Griffith Feeny, states that the rate of decline by0.77 children per woman per decade is a plausible rate of decline in developing countries. From this point of view the drop in fertility levels during 2001 to 2006 is high. The Demographic and health survey of 2001 reveals a replacement of fertility levels in urban areas, however census data indicated that replacement of fertility was not attained in urban areas until 2011[CBS,2014].

Fertility is the reproductive performance of an individual or population, measured as the number of viable offspring produced over a period and it is generally expressed as the number of live births per year per thousand of the population [Jones S, 1995]. Fertility is directly influenced by a set of social and biological factors. Socio-economic and cultural factors plays an important role in influencing the fertility of a population. Various socio-economic and cultural factors that affect fertility are marriage system, age at marriage, caste, education, occupation, income, family structure, value of children, place of residence, religion etc. That is why there is a strong need for research into the influence of the socio-cultural environment and its specific characteristics, and not only because of the mid and long-term socio-economic implications, but the immediate ones the reproductive patterns have on the biology and health of both women and their children.

Current literature clearly demonstrates that various social, economic and demographic factors are correlated with fertility rates. Akmam (2002) has provided a fairly comprehensive list of determinants of fertility in developing countries.

MATERIALS AND METHODS

This study is primarily based on the primary data. The primary data were collected from the field survey which was inducted field observation and individual interviews to the selected respondents with the help of structured questionnaires. A pre–tested questionnaire was prepared in English (explain to women in Nepali or Local language) to obtain the information about them. Some of the questions are like; present age of women, age at marriage, education, employment, income of the family, autonomy in decision making etc. In this study the eligible respondents were 15-49 years of age of ever married women. The study area for the proposed study is Kanchanpur district of far-western development region of Nepal. The district comprises of 19 VDCs (village development committee) and one municipality (at the time of survey) and in total there are 190 wards in Kanchanpur. From each ward five households are selected at random. Finally one woman is taken from each household. In this way 950 women are selected for this study. All ever married women aged 15-49 years were asked about the age when they got married and their fertility history. In particular, information was collected on the number of live births, the date of each birth, the sex of each child, whether the child was alive at the time of the survey and, if not, the duration the child was alive for. The minimum number of children born to each ever-married woman was 0 (3.9%), while the maximum was 9 (0.1%). The average number of children born to each ever-married woman was 2.63. The mean age at marriage was 17.81 years. The lowest age at marriage was 10 years and the highest age at marriage was 28 years.

Age-composition of the respondents

The current age of the respondents is one of the most important variables in demographic analysis (Shryock and Siegel, 1976). Vital events such as fertility, mortality, marriage and divorce are a function on age. Most countries in the world have set minimum age at which individuals can enter into marriage. The age structure plays a significant role in demography whether it influences the values, roles, social mores, responsibilities, social relation and fundamental social hierarchy. In the study from the 950 sampled respondents, their ages were broadly grouped as 15-19, 20-24, 25-29, 30-34, 35-39, 40-44 and 45-49 years of age. The following table reveals that 26.6 percent respondents were found in age group 25-29 years, where as 19.2 percent respondents were in age group 30-34 years followed by age group 35-39 years (18.6%). Only 15 respondents were in age group 15-19 (1.6 %) while 9.3% of the respondents were in the highest age group 44-49 and the mean age of the respondents was recorded to be 32.52 years.

Table1: Distribution of the respondents by broad age-group

Age group	Frequency	Percentage
15-19	15	1.6
20-24	124	13.1
25-29	253	26.6
30-34	182	19.2
35-39	177	18.6
40-44	111	11.7
45-49	88	9.3
Total	950	100

Source: Field Survey, 2015

Place of residence and fertility

Current place of residence of the respondents in urban or rural areas was used. Andorka (1978), Li and Wang (1994) and Findley (2005) characterized the relationship between fertility behavior and place of residence as having a direct linkage. There is a fairly consistent correlation between urban or rural trait of the place of residence and fertility. The place of residence has a property of natural or manmade environment. On the other hand, the trait in rural area is determined by families living in relatively small apartment houses. Andorka (1978) argue that this ecological characteristic of urban-rural differential is also connected with the different monetary costs and efforts necessary for raising and educating children that are much greater in urban than in the rural areas. The following table shows the distribution of respondents on the basis of average number of children and their place of residence.

Table2: Distribution of respondents according to No. of CEB and place of residence

Place of residence	No. of respondents	No. of CEB	Average No. of CEB
Rural	813	2238	2.75
Urban	137	258	1.88
Total	950	2496	2.63

Source: Field Survey, 2015

Above table reveals that women residing in rural areas have a higher fertility rate than that of the women residing in urban areas of far western Nepal.

Age at marriage and fertility

In most Asian countries, including Nepal, marriage marks the beginning of socially-sanctioned exposure to pregnancy and sets the course of subsequent childbearing. Thus, age of a woman at marriage is one of the most important proximate determinants of the aggregate level of fertility. There is inverse relationship

between age at marriage and fertility. Many studies at national and international level have shown that fertility is affected by a number of socioeconomic, cultural, and biological factors. Of particular importance is age at marriage. Unlike in western countries where marriage is not a pre-condition to childbearing, in most Asian countries, childbearing prior to marriage is not socially acceptable and is quite uncommon. Postponement of marriage contributes significantly to a reduction in fertility level by shortening the total reproductive span of women. This, in turn, reduces the number of children a woman is likely to have and has a negative impact on the population growth rate of a country. Thus, age at marriage has been proved that as one of the most important responsible factors that determines the level of fertility.

Table3: Average Number of Children According to Age at Marriage of the respondents

Age at marriage	No. of women	No. of CEB	Average no. of CEB
Below15	90	374	4.16
15-19	606	1699	2.80
20-24	237	403	1.70
25 and above	17	20	1.17
Total	950	2496	2.63

Source: Field Survey, 2015

Table4: Chi-Square Test

	Value	df	Sig.(two sided)
Pearson Chi-Square	294.4[a]	27	0.000
N of Valid Cases	950		

a. 19 cells (47.5%) have expected count less than 5. The minimum expected count is .02.

The chi-square test shows that age at marriage of women has a significant effect on fertility. Table 3 shows the average number of children in different age groups according to their age at marriage. The women who got married before the age of 15 have 4.16 average children per woman. In the age group 15-19 and 20-24 women have 2.8 and 1.7 average children respectively while the women who got married at the age of 25 or above have only 1.17 children per woman in the study area. From these results it is clear that age at marriage, indeed, had a significant effect on fertility of women. An increase in age at marriage significantly reduces total fertility of a woman.

Female education and age at marriage

The higher the educational level of woman, the stronger is the effect of education on age at marriage. Education tends to increase the age at first marriage, thereby decreasing the number of years that can be devoted to child bearing. This relationship between women's education and age at marriage has been found in almost all fertility studies. The following table shows the distribution of respondents on the basis of level of education and their age at marriage.

Table5: Distribution of respondent according to education and their age at marriage

Education of women	Age at marriage				Total
	Below 15	15-19	20-24	25 and above	
Illiterate	74	246	37	0	357
Primary	14	102	23	0	139
Lower secondary	2	118	42	1	163
SLC(secondary)	0	92	56	4	152
Intermediate	0	30	48	3	81
Graduation	0	12	24	5	41
PG and above	0	6	7	4	17

Total	90	606	237	17	950

Source: Field Survey, 2015

Table6: Chi-Square Test

	Value	df	Sig.(two sided)
Pearson Chi-Square	295.3[a]	18	0.000
N of Valid Cases	950		

a. 9 cells (32.1%) have expected count less than 5. The minimum expected count is .03.

The chi-square test shows that education of women has a significant effect on their age at marriage. There is positive correlation between women`s educational level and their age at marriage. This means that education is an important factor that increases their age at marriage which most probably reduces the total fertility of women.

Education and Fertility

Education is one of the most determinant factors on fertility. The negative relationship between women's education and fertility has also been established from the NFHS, 1991 survey. There is close relationship between education and fertility. Fertility is highly affected by education. Educational attainment also reflects the socio-economic status of people. Education and women's participation in decision making is better educative women than uneducated women. So we can say that higher the educational attainment lower the fertility, lower the educational status higher the fertility. The following table reveals that the women with no education have the highest average number of children born. As the level education increasing, the average number of children born is decreasing and the women with highest level of education have the lowest average number of children in the study area.

Table7: Distribution of respondents according to educational level and number of children

Education of respondent	Frequency	Number of CEB	Average number of CEB
Illiterate	357	1245	3.49
Primary	139	398	2.86
Lower secondary	163	350	2.15
SLC	152	293	1.92
Intermediate	81	136	1.68
Graduation	41	55	1.34
PG and above	17	19	1.12
Total	950	2496	2.63

Source: Field Survey, 2015

Caste and Fertility

In this study the respondents were divided into four major ethnic groups–"Dalit" (SC), "Tharu", "General" and "Others". The following table shows the distribution of respondents according to different caste groups and average number of children in the study area. The table reveals that women from dalit caste group have the highest average number of children, 3.17 children per woman followed by tharu women 2.78 children per woman. The women from general caste group have the lowest average number of children, 2.07 children per woman while the women from other caste group have 2.49 children per woman.

Table8: Distribution of respondents according to caste and No. of CEB

Caste of respondent	Frequency	Number of children	Average number of children
Dalit (SC)	237	752	3.17
Tharu	244	678	2.78
General	242	501	2.07

Others	227	565	2.49
Total	950	2496	2.63

Source: Field Survey, 2015

Table9: Chi-Square Test

	Value	df	Sig.(two sided)
Pearson Chi-Square	99.385[a]	27	0.000
N of Valid Cases	950		

a. 12 cells (30%) have expected count less than 5. The minimum expected count is .24.

The result of chi-square test indicates that caste of the respondents and their fertility are highly significant which means that caste of the respondents is one of the factors that affects the fertility of women. Thus from above it can be concluded that fertility depends on the caste of household in the study area.

Multiple regression model

To show the functional relationship between one dependent and various independent variables, multiple regression model is very useful tool. In this study, the dependent and independent variables are as follows:

Dependent variable: Number of children ever born(0,1,2,3...).

Explanatory variables: Age at marriage, education of the respondent, husband`s education, occupation of the respondent, husband`s occupation, nature of family, caste of the respondent, age at first delivery, age at last delivery, use of contraceptives, place of residence.

The multiple regression model is given below

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11}$$

Where Y represents number of children which is dependent variable and X_i`s are independent variables.

Table10: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766[a]	.587	.580	.808

a. Predictors: (Constant), age at last delivery, education of the respondent, use of contraceptives, nature of family, caste of the respondent, husband`s occupation, place of residence, age at marriage, occupation of the respondent, husband`s education, age at first delivery

b. Dependent Variable: number of children ever born

Table11: ANOVA[b]

Model	Sum of Squares	df	Mean Square	F	Sig.

1	Regression	685.331	11	62.303	95.329	.000^a
	Residual	482.978	739	.654		
	Total	1168.309	750			

a. Predictors: (Constant), age at last delivery, education of the respondent, using contraceptives, nature of family, caste of the respondent, husband`s occupation, place of residence, age at marriage, occupation of the respondent, husband`s education, age at first delivery

b. Dependent Variable: number of children ever born

Normal P-P Plot of Regression Standardized Residual
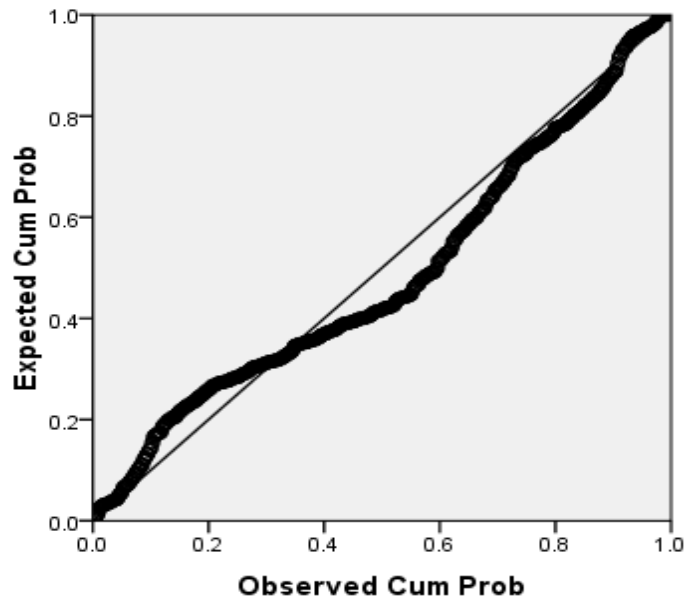
Dependent Variable: number of children everborn

Table12: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	3.932	.345		11.415	.000
age at marriage	-.098	.022	-.195	-4.423	.000
nature of family	-.014	.062	-.006	-.221	.825

age at first delivery	-.624	.072	-.386	-8.665	.000
using contraceptives	-.037	.039	-.023	-.947	.344
caste of the respondent	-.045	.028	-.041	-1.590	.112
place of residence	-.103	.106	-.026	-.971	.332
occupation of the respondent	.037	.034	.032	1.108	.268
education of the respondent	-.041	.035	-.047	-1.177	.240
husband`s education	-.039	.029	-.051	-1.369	.171
husband`s occupation	-.052	.022	-.064	-2.356	.019
age at last delivery	1.085	.046	.616	23.852	.000

a. Dependent Variable: number of children ever born

The fitted multiple regression model is given below

Number of CEB = 3.932-0.098(Age at marriage) - 0.014(nature of family)-0.624(age at first delivery)-0.037(using contraceptives)-0.045(caste of the respondent)-0.103(place of residence) +0.037(occupation of the respondent)-0.041(education of the respondent)-0.039(husband`s education)-0.052(husband`s occupation) +1.085(age at last delivery).

The above estimated equation is the result of the OLS regression between number of CEB and other determinants of women fertility of the sample data. The value of R square was found to be 0.587 by which 58.7% variations can be explained and the significant F statistic justified the model fit (table 11). The predictors: age of respondent at the time of marriage, age of the respondent at first delivery, use of contraceptives, caste of the respondent, place of residence, education of respondent, education of husband, husband`s occupation and nature of family were found to have a negative and significant effect on fertility whereas the occupation of the respondent and age at last delivery were positively associated with fertility (table12). Thus the results were almost consistent over the model.

Conclusion and discussion

The result from the present study support and contribute to the literature relating to socioeconomic, demographic variables and fertility. Both age at marriage and age at first delivery have a significant negative impact on fertility. This supports findings by Kamaiah et al. (1999). The relationship between the total years of education and live births is also an indicator that more educated women are going for fewer children. As supported by literature, higher education is leading to more knowledge about contraception, family planning etc. (Mason, 1986; Cochrane, 1983). Higher education is also making the women more aware of the economic and social scenario of the country and that may be leading to lesser number of children in the household.

The present study was aimed at investigating the effect of socioeconomic and demographic variables on fertility behavior of married women with living husbands of far-western region of Nepal. The present study also shows that rural women have higher fertility than urban women.

Various factors are attributed to fertility behavior of women in this region. The main influencing factors included age at marriage, education, occupation, place of residence, age at first delivery, caste of the respondent, husband`s education, husband`s occupation, age at last delivery, nature of family, use of contraceptives. Among these factors, age at first marriage, education, caste and place of residence are

important and strong predictors that affect fertility. Despite the legal restrictions against marrying at a young age, early marriage is common in the region. Therefore, programs should focus on creating awareness of the marriage law and the disadvantages of early marriage and large family size. Similarly, more emphasis needs to be place on messages conveyed via the mass media, addressing the advantages of small family size and family planning. Mass media can present a wider range of knowledge and lead to adopting contraception. Furthermore, long-running programs focusing on increasing literacy status and wealth status are essential to improve the reproductive health status of women. Similarly, the relation between fertility and child mortality experienced by mothers was found to be very strong and positive in the study. Programs that focus on reduction of infant and child mortality could also be considered, which would also help to reduce fertility. In short, it can be concluded that programs should aim to reduce fertility by focusing on all these identified predictors so that fertility can be decreased and the overall wellbeing of the family maintained and enhanced. Age at marriage indeed has a significant effect on fertility of women. An increase in age at marriage significantly reduces total fertility of women. So, women's education not only has a direct effect in fertility reduction, but also has an indirect effect through effect on age at marriage.

The major policy implication that follows immediately is that more emphasis should be made to educate girls. Increased women's education significantly increased age at marriage, which, in turn, has a strong effect on fertility. In addition, female educational attainment has a direct effect on fertility as well, although this direct effect is significant only if the woman is highly educated. Further, women's education appeared to have a strong inter-generational effect as well-age at marriage was significantly higher for women with literate parents, and it is important to note that mother's literacy has a stronger effect on age at marriage of her daughters compared to father's literacy. From the policy point of view, all other things being equal, governments should accord a significant priority to female education and, in particular, a higher priority compared to male schooling.

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