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The Determinants of the Fertility Differentials among the Bishnupriyas of Manipur, North East India

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KEYWORDS	ABSTRACT
Fertility, Reproductive age, Total children ever born (TCEB), Bishnupriyas, Binary logistic regression	*Fertility is one of the most important determinants of population dynamics that has the highest significant contribution towards population size and structure in the world. The study of human fertility is of the utmost importance in population studies. For the purpose of the study, a descriptive cross-sectional study was conducted through a field-work based data collection with 627 Bishnupriya married women who are in the reproductive age (15 - 49 years) and have at least one child in 601 households in the Ngaikhong Khullen village of Bishnupur District, Manipur. Factors were checked for association with total children ever born (TCEB) by using of chi-square test and binary logistic regression was applied to determine the effect of socio-demographic and economic factors on TCEB. The present study shows that the mother's age, age at marriage, and household income have a significant effect on the total number of children ever born at a significance level of 5%.*

Introduction

Fertility is one of the most important components of demographic studies affecting almost all aspects of human life and the most important determinant of population change (Asghar et al., 2014; Becker, 1965; Caldwell, 1982; Easterlin, 1975). For this reason, fertility has elicited huge attention among policy makers and constantly occupies a central position out of the three main aspects of demography - fertility, mortality, and migration in population studies and it is not only responsible for population growth but also the main factor determining change in the age composition of a population (Asghar et al., 2014; Khuda and Hossain, 1996; Rabbi, 2015). Human fertility is a biological process and it is strongly influenced by societal and cultural factors that make it a collective as well as an individual matter. Thus a population's fertility is the product of biological, social, and behavioural factors (Dougall et al., 2012; Trovato, 2010).

Fertility rates differ considerably across time and human fertility is responsible for the biological replacement and maintenance of the human species. With reference to the population dynamics, it is important to note that fertility is consequently one of the major counteractive forces that aids in overcoming mortality. Contrary to this fact, an excessive increase in the level of fertility might result in a population outbreak (Bhende, A. A. & Kanitkar, 2008; Stichnoth & Yeter, 2013). Fertility as

one of the main parameters of demographic change is affected either directly or indirectly by various socio-demographic, socio-economic, and cultural factors. A large number of studies, conducted on different groups characterized by diverse cultural and environmental conditions, have shown that a variety of socio-demographic, socio-cultural and socioeconomic factors are driven and responsible for characteristic fertility differentials (Chandiok et al., 2016; Chatterjee, S., 2019; Haloi & Limbu, 2013; Kameih & Kshatriya, 2016; Majumdar & Mukherjee, 2018; Majumdar & Ram, 2015; Mutwiri, 2019; Singh, 2006; Stichnoth & Yeter, 2013).

While reports on fertility, fertility differentials and its determinants from different parts of the country are available in the literature, little or nothing is known about the fertility performance among the Bishnupriyas in Manipur where the highest evidence of non-live birth (abortion, miscarriage, or stillbirth) is reported. This is an important evidence gap that should be explored to create the strategies that meet the needs of this community. To address the gap on fertility incidence in Manipur, we intend to conduct a cross sectional study on the determinants of fertility differentials among the Bishnupriyas of Manipur state in North East India and this study will strive to understand the fertility differentials among the Bishnupriya women in Manipur and the factors leading to fertility differentials.

Manipur is an area of different ethnic groups, where people of Mongoloid ancestry seem to have mixed with the Indo-Aryans from India. 'We can broadly classify the people of Manipur into four groups, namely, (i) the Manipurese or the Meitheis including the Lois (Scheduled caste); (ii) the Bishnupriyas; (iii) the Hill-men (Scheduled tribes) and (iv) the Pangans (the Manipuri Muslims) (Singh 1980: 12,13)'. The Bishnupriyas are more dark-skinned than the Meiteis and have Indo-Aryan features (Singh, 1988). Their origin is believed to be from the West, mainly from the Cachar District of Assam, Tripura and the neighbouring country of Bangladesh (former East Bengal). They were brought into the valley of Manipur to teach Hindu customs to the indigenous inhabitants of the valley and they are also believed to be the descendants of 120 Hindu families of different castes (Singh, 1980). The term Bishnupriya is presumably derived from Bishnu worshipping, during the reign of Garibniwaz king of Manipur (Chingtamlen, 2009).

Objectives

The main objective of this study is to determine the major socio-demographic and socio-economic factors that affect fertility differential among the Bishnupriya women in childbearing age (15-49 years) in Bishnupur District, Manipur.

The purpose of this research is to explore two major issues:

1. To what extent are the observed fertility differences between any two groups maintained when the other variables are held constant.
2. What is the relative contribution of the various socio-demographic and socio-economic variables to the total variance of the dependent variables.

Materials and method

The fertility measures for the present study are based on the reported birth histories of women in child bearing age who were interviewed during the survey from the 601 households in the Ngaikhong Khullen village of Bishnupur District, Manipur. The total number of women in child bearing age is

based on 627 married women who have at least one child and whose age ranges from 15 to 49 years. Using a structured interview schedule, each woman was first asked about the number of sons and daughters who were living with her, those who were living elsewhere, and those who had died. She was then asked to tell a history of her births, including the month and year each child was born; the name and sex; if deceased, the age at death; and if alive, the current age and whether the child was living with his/her mother. The information obtained from these questions was used to calculate measures of current and completed fertility, and the number of children ever born. Children ever born (CEB) to women in a particular age group is the mean number of children born alive to women in that age group. 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. In most cases, the mean number of children ever born is computed as the ratio of the number of children born alive to all women in a particular age group to the number of women.

The variables were classified arbitrarily into different groups and/or categories. The age of the mother was categorized into four groups: ≤ 24 years, 25-34 years, 35-44 years and ≥ 45 years. Similarly, the age of mother at marriage was classified into three groups: ≤ 19 years, 20-23 years and ≥ 24 years. The predictor variable 'the mother's education' was categorized into four groups: illiterate, primary, secondary and higher secondary and above. Two family type was classified into two types: joint family and nuclear family. Data on household income were cross-checked taking into consideration some aspects of socioeconomic conditions like housing condition, types of occupation, landholding, etc. Three income groups were arbitrarily classified based on the percentile distribution of per capita monthly income of households, which are as follows:

Above 75th percentile (> Rs. 2500) = High Income Group (HIG)

50th to 75th percentile (Rs. 1500 - 2500) = Middle Income Group (MIG)

Below 50th percentile (< Rs. 1500) = Low Income Group (LIG)

Statistical analysis

The data were analyzed using the Statistical Package of Social Science (SPSS, version 20) at 5% level of significance. The dependent variable in the present study is the 'total number of children ever born' (TCEB) and it is categorized as under three (coded 1 = total number of children ever born under 3) and "three and above" (coded 2 = three and above), where the "three and above" is the reference category and the "under three" is the target category. The five independent variables or predictors: age of mother, age at marriage, mother education, household income, and family type were taken into consideration in the model. Each independent variable was checked for association with dependent variable by using a inferential statistical chi-square test. The independent variables which were showed a significant association with a dependent variable were placed into a model. Logistic regression is used to predict a categorical (usually dichotomous) variable from a set of predictor variables. With a categorical dependent variable, logit analysis is usually employed if all of the predictors are categorical; and logistic regression is often chosen if the predictor variables are a mix of continuous and categorical variables. In the present study we took the probability of children ever born and studied its relationship to various independent variables. Therefore, a binary logistic regression model was fitted for the present study data to differentiate the total children ever born (TCEB) when the other variables are controlled and to predict the effects of socio demographic and economic factors of women.

Results

The percentage distribution of total children ever born (TCEB), according to the socio-demographic and economic variables is given in Table 1. The total number of children ever born to women of child bearing age 15 to 49 years is 627. Out of the 627 women, 7.4%, 36.6%, 40.9% and 15.1% are belong to the ≤ 24 years, 25-34 years, 35-44 years and ≥ 45 years, respectively. In the age at marriage, 30.9%, 35.9% and 34.3% women are married in the ≤ 19 years, 20-23 years and ≥ 24 years. The majority of women were illiterate 495 (29.5%), subsequently followed by secondary 450 (26.8%); primary 401 (23.9%) and higher secondary and above 332 (19.8%). With regard to household income of Ngaikhong Khullen village, more than half of the households were in low income 910 (54.2%), and followed by middle income 428 (25.5%), and high income 340 (20.3%), respectively. It is observed that the joint family is more prevalent 1027 (61.2%) than the nuclear family 651 (38.8%) in the present population. The chi-square test was adopted at 5 % level of significance for testing the factors associated with fertility differentials. It is seen that all the predictor variables: age of the mother, age at marriage, the mother's education, household income, and family type are highly statistically significant associated with the outcome variable, total children ever born (TCEB).

Table 1: The percentage distribution of total children ever born (TCEB), according to the socio-demographic and economic variables of Bishnupriya women in Manipur.

Variables	Category	Children ever born (CEB)		Mean of CEB ± S.E.	(p) value
		No	%		
Age of mother	≤ 24	124	7.4	1.88±0.16	0.000
	25-34	614	36.6	2.48±0.09	
	35-44	687	40.9	2.96±0.09	
	≥ 45	253	15.1	3.12±0.16	
	Total	1678	100.0	2.68±0.06	
Age at marriage	≤ 19	518	30.9	2.74±0.10	0.015
	20-23	616	35.6	2.76±0.10	
	≥ 24	544	34.3	2.53±0.10	
	Total	1678	100.0	2.68±0.06	
Mother education	Illiterate	495	29.5	3.02±0.12	0.002
	Primary	401	23.9	2.55±0.14	
	Secondary	450	26.8	2.65±0.10	
	Higher Secondary and above	332	19.8	2.48±0.12	
	Total	1678	100.0	2.68±0.06	
Household income	Low Income	910	54.2	2.91±0.09	0.000
	Middle Income	428	25.5	2.45±0.10	
	High Income	340	20.3	2.45±0.12	
	Total	1678	100.0	2.68±0.06	
Family type	Joint Family	1027	61.2	2.57±0.08	0.002
	Nuclear Family	651	38.8	2.86±0.09	
	Total	1678	100.0	2.68±0.06	

Table 2 displays the results of binary logistic regression and the values of estimated coefficients (ß), standard errors (SE), odds ratio (OR) with related confidence intervals (CI) for independent variables. The results of the logistic regression indicated that age of mother is a negative and significant

predictor of the probability of TCEB, with the OR indicating that for every one unit increase on this predictor the odds of TCEB decrease by a factor. The mothers in ≤ 24 years age category are 0.114 times (88.6%) less likely to have three and above TCEB while the mothers in the age category 25-34 years are 0.309 times (69.1%) less likely to have three and above TCEB than ≥ 45 years category. The mothers who are in the age group of 35-44 years have (OR = 0.745) 25.5% lower probability of TCEB greater than or equal to three children than age group of ≥ 45 years and it is not statistically significant which means the fertility difference between these two age groups is not significant. For the age at marriage, the value of odds ratio is Exp (ß) = 2.035 (103.5%) for aged ≤ 19 years category having TCEB three and above while women aged 20-23 years groups have Exp (ß) = 1.745 (74.5%) more likely to have TCEB three and above than aged ≥ 24 years category. It is further observed that the fertility difference between the age at marriage categories is statistically significant. This finding is consistent with findings from the previous studies (Asghar et al. 2014; Chandiok et al., 2016), which reported that women who married earlier tended to have higher fertility and inversely related to fertility. A women's age at marriage is an important factor for the fertility rate. Many studies conducted in India, revealed that the fertility rate declines with the increasing mean age at marriage (IIPS, 2007; Khongsdier, 2005). In the variable "mother's education" category illiterate, primary and secondary having 1.384, 1.372 and 1.285 times more likely to have TCEB three and above when compared to mothers who were educated higher secondary and above. The likelihood of women who have no education is 38.4% times (OR = 1.384, CI = 0.781 - 2.453), 37.2% times (OR = 1.372, CI = 0.747 - 2.212) for women who are educated till primary, and 28.5% times (OR = 1.285, CI = 0.837 - 2.248) for women who are educated up to secondary more likely to have TCEB three and above than women who have higher secondary and above education. The positive coefficient suggest that mothers in the low income category were more likely to have TCEB three and above than those in the high income category. Nevertheless, the difference is not significant (ß = 0.395, SE = 0.226, p = 0.080). The odds of TCEB three and above has increased by a factor of Exp (ß) = 1.484 in the low income category and Exp (ß) = 0.832 in the middle income group while controlling other factors. The joint family type is a positive and not significant (ß = 0.071, SE = 0.201, p = 0.725) predictor for the probability of TCEB and it is increased by a factor of Exp (ß) = 1.073 when compared with the nuclear family type.

Table 2. Coefficients of the logistic regression of total children ever born (TCEB) and selected socio-demographic factors (based on number of women who have at least one child during the survey)

Variables	Category	Estimate of ß	SE of ß	Odds Ratio	95% CI for OR Lower	95% CI for OR Upper	Sig.
Age of mother	≤ 24	-2.176	0.423	0.114	0.050	0.260	0.000*
	25-34	-1.174	0.304	0.309	0.170	0.561	0.000*
	35-44	-0.295	0.290	0.745	0.422	1.314	0.309
	≥ 45	-					
Age at marriage	≤ 19	0.711	0.235	2.035	1.283	3.228	0.003*
	20-23	0.557	0.213	1.745	1.150	2.650	0.009*
	≥ 24	-					
Mother education	Illiterate	0.251	0.277	1.384	0.781	2.453	0.365
	Primary	0.325	0.292	1.372	0.747	2.212	0.265
	Secondary	0.316	0.252	1.285	0.837	2.248	0.210
	Higher Sec and above	-					

Household income	Low Income	0.395	0.226	1.484	0.953	2.311	0.080
	Middle Income	0.184	0.247	0.832	0.513	1.351	0.458
	High Income	-					
Family type	Joint Family	0.071	0.201	1.073	0.724	1.592	0.725
	Nuclear Family	-					

Table 3 shows the summary of the logistic regression of TCEB on socio-demographic and economic factors generated using backward stepwise procedure. We have adopted three models of logistic regression analysis for understanding the effects of socio-demographic and economic factors on TCEB. In the first model, each of the socio-demographic and economic variables shown in the Table was treated as independent variables with TCEB as dependent variable. In model 1, when all the independent variables are added, the age of the mother, age at marriage and household income are significantly associated with TCEB. In model 2, an attempt has been made to include only those variables that are significantly associated with TCEB as covariates in order to understand the relative importance of each independent variable. It is seen that, in model 2 although the system has added the mother's education variable in the model, it is not significant. In model 3, the system added only the mother's age, age at marriage, and household income variables in the model and all are significantly associated with TCEB. Thus, it indicates that a mother's age, age at marriage, and household income are important factors in influencing the fertility.

Table 3: The outcome of logistic regression model

Variables	Coefficient of regression (ß) and its standard error (SE)								
	Model-1			Model-2			Model-3		
	ß	SE	Sig	ß	SE	Sig	ß	SE	Sig
Children Ever Born									
Age of mother	0.705	0.118	0.000*	0.694	0.108	0.000*	0.708	0.105	0.000*
Age at marriage	-0.350	0.114	0.002*	-0.345	0.113	0.002*	-0.363	0.108	0.001*
Mother education	-0.047	0.085	0.576	-0.046	0.085	0.585	-	-	-
Household income	-0.273	0.109	0.012*	-0.271	0.109	0.013*	-0.283	0.107	0.008*
Family type	-0.050	0.193	0.795	-	-	-	-	-	-

Conclusion

The finding sof this study illustrate that the TCEB is significantly influenced by a mother's age, age at marriage, and household income and fertility differences sustained even after adjusting because of socio-demographic characteristics which indicates that a mother's age, age at marriage, and household income are the most important factors influencing the fertility. The study arrives at the conclusions, related to policy interventions, that an earlier age at marriage is associated with a higher fertility and a better socioeconomic condition leads to a lower fertility. However, a mother's education and family

type did not affect fertility in this population. Whether it is so in the present communities is a subject matter of further investigation. We hope that further studies will shed much more light on such a type of possible interaction.

Conflict of interest:
The author declare that there is no conflict of interest regarding the publication of this paper.

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