DETERMINANTS OF FERTILITY BEHAVIOUR IN HIMACHAL PRADESH: A CASE STUDY OF DISTRICT BILASPUR

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Abstract: The present study has been undertaken to study the effects of different socio-economic and demographic factors on the fertility behaviour in District Bilaspur of Himachal Pradesh. A total sample comprises 150 households, out of which 75 households (sampled couples 87) were selected from rural area and 75 households (sampled couples 77) were selected from the urban area in District Bilaspur of Himachal Pradesh. Step wise forward regression analysis was applied to examine the effect of social, economic and demographic variables on total number of children ever born (TCEB) of the sampled women. In rural area the result of regression shows that total male surviving children was alone responsible for the 28 percent of variation in total no. of children ever born. Step wise regression analysis for rural area shows by including explanatory variable increases the value of R^2 i. e. age of wife at the time of marriage 21 years or more to 40 percent, age of wife at the time of marriage 18 to 20 years to 48 percent, no. of children dead to 56 percent, education of wife above senior secondary school complete to 58 percent, wife working in private sector to 60 percent, husband working in private sector to 62 percent, decision about no. of children taken by both husband and wife to 64 percent, wife working in Government sector to 66 percent and duration of effective marriage 21 years or above to 67.5 percent. In urban area the result of regression shows that total male surviving children was alone responsible for the 26 percent of variation in total no. of children ever born. Step wise regression analysis for urban area shows by including explanatory variable increases the value of R^2 i. e. duration effective marriage 21 or above to 37 percent, age of wife at the time of marriage 21 years or more to 44 percent, elders take decision about son preference to 48 percent, age of wife at the time of marriage 18 to 20 years to 50 percent, duration of effective marriage 6 to 10 years to 53 percent, duration of effective marriage 16 to 20 years to 56 percent, duration of effective marriage 11 to 15 years to 60 percent, husband working in Government sector to 63 percent and no. of children dead increase the value of R^2 to 65 percent.

Keywords: Fertility behaviour, regression analysis, total number of children ever born.

1. Introduction

At the dawn of agricultural revolution, 8000 years ago, total world population was about 2, 50,000. It took all of human history, until 1800, for the population to reach first billion. It took 130 years, until 1930, to add the second billion; it took only 30 years, until 1960, to add the third billion. The fourth billion was added between 1960 and 1975, and the fifth billion was passed in 1987. The sixth billion was reached in 1999. Rapid population growth can have serious consequences for the well being of humanity throughout the world. Population growth today is primarily the result of a rapid transition from a long historical era characterised by high birth and death rates, to one in which death rates have fallen sharply while birth rates, especially in developing countries, have not yet fallen much more than historic high level.

India is a developing country today and it is facing the population problem of a serious nature. Increasing population, for a long time, has been eating into the gains of economic growth and the consequences of this rapid growth of population are poverty and unemployment. Almost all the developing countries are experiencing demographic transition, at varying peace and levels. In a vast country like India with considerable demographic diversity and heterogeneity and varying level of social economic development among states, the levels and phases of fertility decline vary significantly from one state to another.

Rapid growth of population is one of the major problems of the developing and the least developed countries of the world. But the problem of population growth is not simply a problem of a numbers; it is problem of human welfare and of development. The unrestrained population increase is a major source of crisis facing the mankind today. It is claimed to be the principal cause of poverty, low standards of living, malnutrition and ill health. High population growth has some far-reaching consequences too. The employment problem is clearly intensified when population is growing more rapidly. Another significant consequence of population growth is, of course, the increased demand for food. The growth in country's population is more important than the growth in national income in determining the demand for food. The result of the rapid population increase is a locking in of the economy in a low-level equilibrium income. There are also serious environmental consequences of this process, in the form of land degradation, which includes nutrient exhaustion, soil erosion and deforestation.

The rate of growth of population reflects the difference in the rates of change in birth rates and death rates and migration but migration is not relevant when the world situation is considered. Therefore population growth is the function of fertility and mortality rates. Demographic studies are not merely concerned with human beings but also the social economic factors which have direct or indirect impact on the growth of population, especially fertility trends. Fertility behaviour indicates the actual reproductive performance of a woman, or a group of women. Human fertility is a complex process and is responsible for the biological maintenance of society. A multiplicity of economic, social, cultural and demographic factors is the ultimate determinant of fertility behaviour.

2. Methodology

2.1 Objective

The present study has been undertaken to study the effects of different socio-economic and demographic factors on the fertility behaviour in District Bilaspur of Himachal Pradesh.

2.2 Sampling design

In order to achieve the objectives of the present study, the primary data has been collected from Himachal Pradesh. A systematic, multi-stage stratified random sampling design has been adopted to collect data. In sampling procedure block, panchayat, village, town, ward and household are the different stages of random sampling. For this purpose, one district i.e. Bilaspur out of twelve districts in Himachal Pradesh have been selected following simple random sampling, while arranging them in ascending order on the basis of their respective population. A total sample comprises 150 households, out of which 75 households (sampled couples 87) were selected from rural area and 75 households (sampled couples 77) were selected from the urban area in District Bilaspur of Himachal Pradesh.

3. Determinants of fertility behaviour in Himachal Pradesh

Step wise forward regression analysis was applied to examine the effect of social, economic and demographic variables on total number of children ever born (TCEB) of the sampled women. Age at the time of marriage, duration of marriage, current age of wife, education of husband and wife, occupation of husband and wife, income, male children surviving, type of family, son preference, land, religion and caste have been taken for the purpose of analysis. Age at the time of marriage of woman was classified into three categories age less than 18 years (reference category), 18-20 years and 21 years or more. Duration of effective marriage was classified into five categories up to five years (reference category), 6-10 years, 11-15 years, 16-20 years and 21 years or above. Education of husbands and wife has been classified into four categories, namely illiterate (reference category), education below middle or up to middle school complete, education above middle school to senior secondary school complete and education above senior secondary complete. Occupation of husbands has been classified in to five categories, namely agriculture (reference category), wage work, Government service, private service and business. Occupation of wives has been classified in to five categories, namely agriculture & housewife (reference category), wage work, Government service, private service and business. Decision taken about total no. of children has been classified in to five categories namely, wife (reference category), husband, husband and wife, elders and all family members collectively. Decision about son a preference has been classified in to five categories namely, wife (reference category), husband, husband and wife, elders and all family members collectively.

TCEB = f (MORT, W AGE MAR, DUR MAR, W EDU, H EDU, W OCP, H OCP, NO DEC, SON PRF, TMS)

Explanation of variables included in the regression model:

TCEB = Total number of children ever born

MORT = Number of children dead

W AGE MAR 1 = Age of wife at the time of marriage 18-20 years

W AGE MAR 2 = Age of wife at the time of marriage 21 years or more

DUR MAR 1 = Duration of effective marriage 6-10 years

DUR MAR 2 = Duration of effective marriage 11-15 years

DUR MAR 3 = Duration of effective marriage 16-20 years

DUR MAR 4 = Duration of effective marriage 21 years or above

W EDU 1 = Education of wife below middle or up to middle school complete

W EDU 2 = Education of wife above middle school to senior secondary school complete

W EDU 3 = Education of husband above senior secondary school complete

W OCP 1= Occupation of wife wage work

W OCP 2= Occupation of wife Government service

W OCP 3= Occupation of wife private service

W OCP 4= Occupation of wife business

H OCP 1 = Occupation of husband wage work

H OCP 2 = Occupation of husband Government service

H OCP 3 = Occupation of husband private service

H OCP 4 = Occupation of husband business

NO DEC H = Decision about no. of children taken by husband

NO DEC HW = Decision about no. of children taken by husband and wife

NO DEC E = Decision about no. of children taken by elders

NO DEC A = Decision about no. of children taken by all family members

SON PRF H = Husband takes decision about son preference

SON PRF HW = Husband and wife takes decision about son preference

SON PRF E = Elders takes decision about son preference

SON PRF A = All family members takes decision about son preference

TMS = Total male surviving children

The reference categories for different variables are age less than 18 years for the age at the time of marriage of women, age up to five years for duration of effective marriage, illiterate for education of wives, agriculture for the husband's occupation, agriculture & housewife for the wives occupation, wife takes decision for son preference and wife takes decision about no. of children. Other independent variables considered for mathematical model have been income, religion, education of husband, cast, type of family, land but these variables did not reveal any significant effect on dependent variable.

The R^2 is called coefficient of multiple regressions and it shows the percentage of the total variation of the dependent variable (TCEB) that is explained by the explanatory variables (i. e. social, economic and demographic variables in our analysis).

Table 3.1 Regression coefficient for rural sampled couple calculated by applying step-wise forward method

Variable	Coefficient	Standard error	Significance	R^2
Step 1				.28
Constant	1.385	.157	.000	
TMS	.534	.117	.000	
Step 2				.40
Constant	1.838	.175	.000	
TMS	.388	.115	.000	
W AGE MAR 2	-.388	.191	.000	
Step 3				.48
Constant	2.390	.219	.000	
TMS	.330	.119	.000	
W AGE MAR 2	-.627	.222	.000	
W AGE MAR 1	-.370	.193	.000	
Step 4				.56
Constant	2.390	.202	.000	
TMS	.335	.100	.000	
W AGE MAR 2	-.602	.205	.000	
W AGE MAR 1	-.432	.181	.000	
MORT	.295	.266	.000	
Step 5				.58
Constant	2.389	.200	.000	
TMS	.304	.100	.000	
W AGE MAR 2	-.545	.209	.000	
W AGE MAR 1	-.430	.177	.000	
MORT	.291	.261	.000	
W EDU 3	-.162	.253	.045	
Step 6				.60

Constant	2.431	.196	.000	
TMS	.282	.098	.000	
W AGE MAR 2	-.581	.207	.000	
W AGE MAR 1	-.431	.173	.000	
MORT	.288	.254	.000	
W EDU 3	-.239	.269	.006	
W OCP 3	.182	.368	.024	
Step 7				.62
Constant	2.360	.193	.000	
TMS	.275	.096	.000	
W AGE MAR 2	-.587	.202	.000	
W AGE MAR 1	-.413	.169	.000	
MORT	.288	.248	.000	
W EDU 3	-.274	.267	.002	
W OCP 3	.199	.360	.012	
H OCP 3	.156	.166	.027	
Step 8				.64
Constant	2.659	.231	.000	
TMS	.314	.096	.000	
W AGE MAR 2	-.587	.197	.000	
W AGE MAR 1	-.374	.168	.000	
MORT	.223	.263	.003	
W EDU 3	-.282	.260	.001	
W OCP 3	.226	.355	.004	
H OCP 3	.160	.162	.020	
NO DEC HW	-.168	.197	.027	
Step 9				.66
Constant	2.750	.227	.000	
TMS	.291	.094	.000	
W AGE MAR 2	-.628	.194	.000	
W AGE MAR 1	-.381	.164	.000	
MORT	.217	.256	.003	
W EDU 3	-.349	.269	.000	
W OCP 3	.277	.359	.001	
H OCP 3	.172	.158	.011	
NO DEC HW	-.193	.193	.010	
W OCP 2	.167	.326	.020	
Step 10				.68
Constant	2.649	.226	.000	
TMS	.249	.095	.001	
W AGE MAR 2	-.556	.202	.000	
W AGE MAR 1	-.311	.172	.001	
MORT	.196	.252	.007	
W EDU 3	-.357	.262	.000	
W OCP 3	.283	.351	.000	

H OCP 3	.158	.155	.016	
NO DEC HW	-.197	.189	.007	
W OCP 2	.175	.318	.013	
DUR MAR 4	.164	.196	.030	

Regression in table 3.1 is for rural sample. Total numbers of observations for rural area sampled couples were 87 and dependent variable is total children ever born (TCEB). In rural area the result of regression shows that total male surviving children was alone responsible for the 28 percent of variation in total no. of children ever born. The second step includes age of wife at the time of marriage 21 years or more with respect to reference category wife age less than 18 year increases the value or R^2 to 40 percent. The third step includes age of wife at the time of marriage 18 to 20 years with respect to reference category wife age less that 18 year increase the value of R^2 to 48 percent. The forth step includes no. of children dead increases the value of R^2 to 56 percent. The fifth step includes education of wife above senior secondary school complete with respect to reference category illiterate increases the value of R^2 to 58 percent. The sixth step includes wife working in private sector with respect to reference category housewife or engaged in agriculture sector increases the value of R^2 to 60 percent. The seventh step includes husband working in private sector with respect to reference category husband engaged in agriculture sector increases the value of R^2 to 62 percent. The eighth step includes decision about no. of children taken by both husband and wife with respect to reference category decision about no. of children taken by wife increases the value of R^2 to 64 percent. The ninth step includes wife working in Government sector with respect to reference category housewife or engaged in agriculture sector increases the value or R^2 to 66 percent. The tenth step includes duration of effective marriage 21 years or above with respect to reference category duration of effective marriage up to 5 years increases the value or R^2 to 67.5 percent.

Second regression table 3.2 is for urban area. Total numbers of observation for urban area sampled couples were 77 and dependent variable is total children ever born (TCEB). In urban area the result of regression shows that total male surviving children was alone responsible for the 26 percent of variation in total no. of children ever born. The second step includes duration effective marriage 21 or above with respect to reference category duration of effective marriage up to 5 years increases the value of R^2 to 37 percent. The third step includes age of wife at the time of marriage 21 years or more with respect to reference category wife age less than 18 year increases the value of R^2 to 44 percent. The forth step includes elders take decision about son preference with respect to wife takes decision about son preference increases the value of R^2 to 48 percent. The firth step includes age of wife at the time of marriage 18 to 20 years with respect to reference category age of wife at the time of marriage less than 18 years increases the value of R^2 to 50 percent. The sixth step includes

Table 3.2 Regression coefficient for urban sampled couple calculated by applying step-wise forward method

Variable	Coefficient	Standard error	Significance	R^2
Step 1				.26
Constant	1.316	.157	.000	
TMS	.518	.117	.000	
Step 2				.37
Constant	1.306	.175	.000	
TMS	.380	.115	.000	
DUR MAR 4	.373	.191	.000	
Step 3				.44
Constant	1.774	.219	.000	
TMS	.272	.119	.007	
DUR MAR 4	.329	.222	.001	
W AGE MAR 2	-.303	.193	.002	
Step 4				.48
Constant	1.708	.202	.000	
TMS	.274	.100	.005	
DUR MAR 4	.349	.205	.000	
W AGE MAR 2	-.274	.181	.004	
SON PRF E	.209	.266	.014	
Step 5				.50
Constant	2.244	.200	.000	
TMS	.253	.100	.008	
DUR MAR 4	.318	.209	.001	
W AGE MAR 2	-.524	.177	.001	
SON PRF E	.220	.261	.008	
W AGE MAR 1	-.296	.253	.032	
Step 6				.53
Constant	2.221	.196	.000	
TMS	.233	.098	.013	
DUR MAR 4	.368	.207	.000	
W AGE MAR 2	-.566	.173	.000	
SON PRF E	.234	.254	.004	
W AGE MAR 1	-.331	.269	.015	
DUR MAR 1	.172	.368	.042	
Step 7				.56
Constant	1.978	.193	.000	
TMS	.205	.096	.023	
DUR MAR 4	.494	.202	.000	
W AGE MAR 2	-.513	.169	.000	
SON PRF E	.203	.248	.011	
W AGE MAR 1	-.355	.267	.007	
DUR MAR 1	.269	.360	.003	

DUR MAR 3	.251	.166	.010	
Step 8				.60
Constant	1.567	.231	.327	
TMS	.154	.096	.130	
DUR MAR 4	.682	.197	.274	
W AGE MAR 2	-.421	.168	.276	
SON PRF E	.206	.263	.663	
W AGE MAR 1	-.330	.260	.252	
DUR MAR 1	.411	.355	.238	
DUR MAR 3	.418	.162	.262	
DUR MAR 2	.268	.197	.282	
Step 9				.63
Constant	1.487	.227	.317	
TMS	.172	.094	.126	
DUR MAR 4	.708	.194	.266	
W AGE MAR 2	-.292	.164	.286	
SON PRF E	.242	.256	.651	
W AGE MAR 1	-.294	.269	.244	
DUR MAR 1	.448	.359	.232	
DUR MAR 3	.447	.158	.254	
DUR MAR 2	.323	.193	.279	
H OCP 2	-.201	.326	.163	
Step 10				.65
Constant	1.519	.226	.310	
TMS	.161	.095	.123	
DUR MAR 4	.706	.202	.259	
W AGE MAR 2	-.283	.172	.279	
SON PRF E	.252	.252	.637	
W AGE MAR 1	-.332	.262	.242	
DUR MAR 1	.468	.351	.228	
DUR MAR 3	.469	.155	.249	
DUR MAR 2	.311	.189	.273	
H OCP 2	-.243	.318	.165	
MORT	.153	.196	.471	

duration of effective marriage 6 to 10 years with respect to reference category duration of effective marriage up to 5 years increases the value of R^2 to 53 percent. The seventh step includes duration of effective marriage 16 to 20 years with respect to reference category duration of effective marriage up to 5 years increases the value of R^2 to 56 percent. The eighth step includes duration of effective marriage 11 to 15 years with respect to reference category duration of effective marriage up to 5 years increases the value of R^2 to 60 percent. The ninth step includes husband working in Government sector with respect to

reference category husband engaged in agriculture sector increases the value of R^2 to 63 percent. The tenth step includes no. of children dead increase the value of R^2 to 65 percent.

Comparison of rural urban fertility behaviour by applying step wise regression coefficient shows that in rural area the value of R^2 is 67.5 percent and in urban area the value of R^2 is 65 percent.

4. Policy Implications

Present study shows that literacy rate and work participation rates for women are far below those for men. It is important that women are made aware of their social, economic, health and cultural rights in order for human resources development to take place. Evidence shows that when women's status is improved or enhanced there is a reduction in fertility, maternal and infant mortality, and female infanticide. It is concluded that the key to the control of population pressure is therefore a woman. The results suggest, among others, that advancement in female education increases age at marriage and lead to fertility decreases. It is recommended that the level of women's education be raised so that they may play a more active and effective role in family planning. Excess female child mortality will decline with the widespread availability of family planning and health services, and through women's development and income generation programme.

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