

# **On Population Dynamics: The Impact of Education on Human Fertility in an Urban Population**

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## **ABSTRACT**

Fertility is considered a positive factor for growth of human population and it is affected by a number of socio-economic and biological variables. In this paper, an attempt has been made to study the relationship between education level of husband and wife and fertility (number of live births per woman) from the data obtained in fertility survey of randomly selected 300 households of an urban area. To find out the relationship between education (an independent variable) and fertility (dependent variable),  $\chi^2$  (Chi-square) test-a statistical test was used. It was found that chi-square value is highly significant at level .01 which confirms that education level affects the fertility in human population.

**Keywords:** Human population, fertility, education level, chi-square test.

## **INTRODUCTION**

Population is the problem of our-age. A rapid growing population in the world and especially in developing countries is the most fundamental obstacle to economic progress. Among developing countries, India is the second most populous country in the world with a sixth of the world population According to an official estimates, India's population stood as 1.38 billion<sup>[1]</sup>.

It overtakes China to become world's most populous country<sup>[2]</sup>. The persisting high level of fertility rates despite considerable decline in mortality rate is considered as the main factor for high population growth. In population dynamics, fertility is a complex phenomenon and is affected by a number of socio-economic and biological factors<sup>[3]</sup>.

Time to time, studies are done for obtaining current information on fertility measures and fertility differentials for an urban population<sup>[4], [5], [6]</sup>. Considering the relationship between education and fertility, Donald R. Holsinger and John D. Kasarda pointed out that education may influence fertility directly by altering the attitudes of individuals and indirectly by affecting the factor like age at marriage<sup>[7]</sup>. Many researchers have found the inverse relationship between education of wife and husband and the fertility<sup>[8], [9]</sup>.

In a population study of State Kerala (India), it was found that higher female education level directly impacts the Total Fertility Rate (TFR) and was found a chief factor behind the significant reduction in the fertility rate in Kerala.

In the present study, choosing randomly 300 households of an urban area (City Azamgarh in Uttar Pradesh, India), the effect of education level of husband and wife on fertility rate was studied by data obtained in fertility survey of sample households.

## **METHODOLOGY**

To achieve our aim, the data on educational qualification and the number of live births of a woman were collected from 283 currently married woman aged 15-44 (reproductive age group) of 300 sample households of an urban area (Azamgarh city) situated in eastern part of State Uttar Pradesh of India with the help of an interview schedule (called here fertility survey) during previous year January 2025 - December 2025.

Also the data on educational qualification of husbands of the interviewed women were collected. For the purpose, only those women were interviewed who has at least one living child at the time of survey. From the data obtained on fertility survey according to selected variables (educational level of husband and wife), Chi-square ( $\chi^2$ ) test was used to find out the association between educational level and fertility.

## **OBSERVATION AND RESULTS**

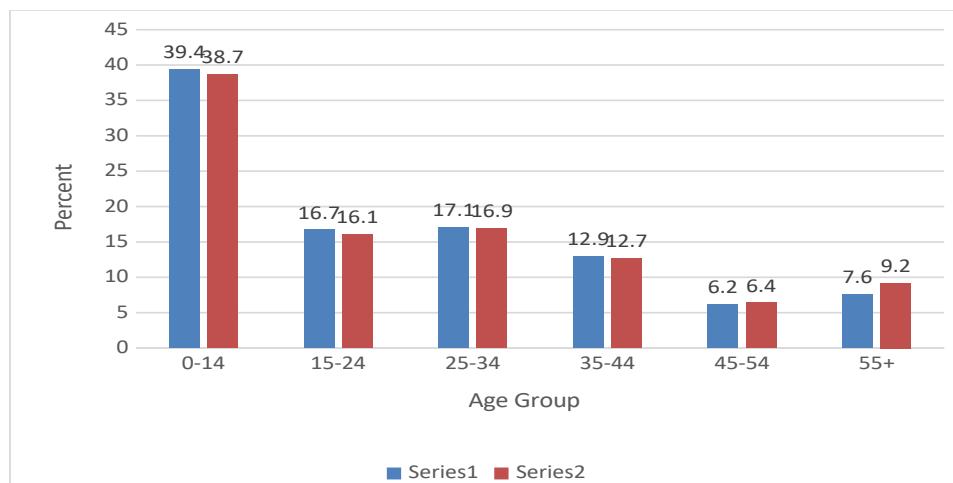
### **(1) Age and Sex Distribution of Sample population**

The 300 sample households had a population of 1727 of which 893 were males and 834 were females. Sex ratio of population was found 934 female per 1000 male. The age and sex distribution of sample population is shown in table-1 and figure-1 (Series-1 [Male], Series-2 [Female]). Table-1 indicated that survey population is young and about 39 percent of the population is below 15 years of age. The high bars in the beginning (Figure-1) in the graph indicates the character of high fertility. This is a characteristics of population of India<sup>[10]</sup>.

**Table-1**  
**Sample population by age and sex**

Age group (years)	Male	Female
0 - 14	352 (39.4)*	323 (38.7)*
15 - 24	149 (16.7)	134 (16.1)
25 - 34	153 (17.1)	141 (16.9)
35 - 44	116 (12.9)	106 (12.7)
45 - 54	55 (6.2)	53 (6.4)
55 +	68 (7.6)	77 (9.2)
<b>Total</b>	<b>893</b>	<b>834</b>

*\*Figures in brackets denote percent*



**Figure- : Age-sex percent distribution of sample population**

**(2) Age Specific General Fertility Rate (ASGFR):**

In the sample population, total 381 women were found in reproductive age group 15-44 years and 283 were found currently married. Total number of live births to 283 women was found 919 and average number of birth per woman was 3.24. During one year Jan. 2025 to Dec. 2025, total number of live births was obtained 64 in which 33 were male child and 31 female child giving sex ratio at birth 94 female child per 100 male child. Table-2 represents the Age Specific General Fertility Rate (ASGFR). The table reveals that ASGFR was highest 303 for age-group 25-29. After age 35 years of women it was found to drop sharply. The curve of ASGFR is found 'late peak type' (Figure-2). ASGFR is found to increase with age from 36 at age 15 and reaches a peak 303 in age group 25-29 and there after it declines. This type of increasing and decreasing rate of ASGFR is seen in many of the developing countries such as India, Pakistan and Bangla Desh<sup>[11]</sup>. General fertility Rate (GFR) was found 167.9 Total fertility rate (TFR) was found 4.7 and Maternal Fertility Rate (MFR) was found 226.

**Table-2**

**ASGFR**

Age Group	No. of Females	No. of live births during one year	General fertility per 1000
15 - 19	56	02	36
20 - 24	55	11	200
25 - 29	76	23	303
30-34	77	19	247
35- 39	49	06	122
40 - 44	68	03	44
<b>Total</b>	<b>381</b>	<b>64</b>	

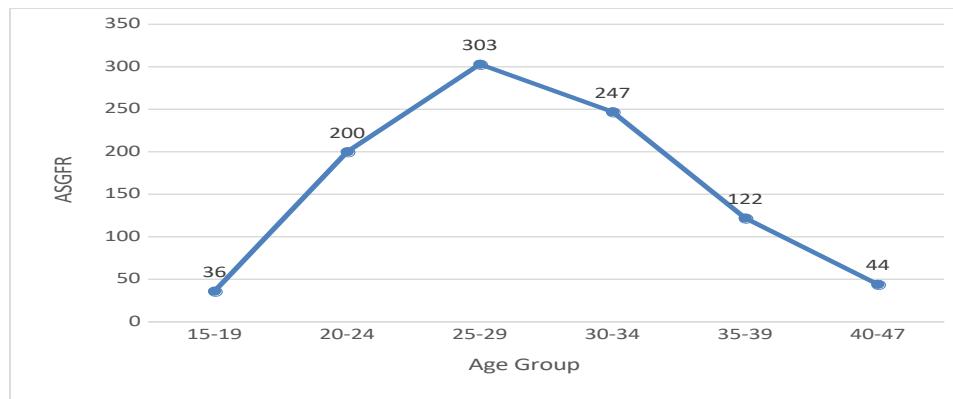


Fig.-2: ASGFR curve

**(3) Education level and Fertility:**

Table-3

**Percent distribution of married women by education level of husbands and fertility**

Education level of husbands	Fertility			No. of women	Average fertility
	1-2	3-4	5+		
Illiterate	07.21	75.25	17.50	97	4.0
Upto Primary	30.76	42.31	26.92	26	3.73
Upto Intermediate	39.71	21.98	38.29	141	2.79
Graduate and above	57.89	42.10	00	19	2.11
<b>Total</b>				<b>283</b>	

$\chi^2 = 80.96$  df = 6 Highly significant at level .01

Table-4

**Percent distribution of married women by education level of women and fertility**

Education level of women	Fertility			No. of women	Average fertility
	1-2	3-4	5+		
Illiterate	09.64	62.65	27.71	83	4.02
Upto Primary	11.47	54.09	34.42	61	3.39
Upto Intermediate	42.24	28.44	29.31	116	2.99
Graduate and above	78.26	21.74	00	23	1.34
<b>Total</b>				<b>283</b>	

$\chi^2 = 70.07$  df = 6 Highly significant at level .01

From the findings of Table-3 it is evident that highest average of live birth rate (4.0) was obtained in women whose husbands were illiterate. This average was very low (2.11) in case of high education level of husbands. It is also seen that among the highly educated husbands the percentage of women who had 1-2 live births was 57.89 percent as compared to illiterate 7.21 percent. From this it is clear that women whose husbands were highly educated have lower fertility rate. In the analysis chi-square value is obtained 80.96 at six degree of freedom which is highly significant at level .01 which confirms that education level of husbands affects fertility.

From table-4, it is clear that as the education level in the female increases the average fertility declines. In highly educated female the percentage of female having 1-2 births was found very high (78.26). Chi-square value is obtained 70.07 at six degree of freedom which is highly significant at level .01. Thus a significant association between female education and fertility was obtained. Similar results were obtained in <sup>[12], [13]</sup>.

**CONCLUSION**

From the present study it was concluded that ASGFR was found highest in age group of women 25-29 and it declines after this age. A significant association was found between education of wife as well as of husband, and fertility. As the education level of wife as well as of husband increases, it was found that the fertility decreases. It was also found that high level of education in female is more effective for reducing fertility in comparison to high level of education of husband.

## **REFERENCES**

- [1]. Prensa Latina (31 December 2021) : Registrar General of India (RGI), The UN Department of Economic and Social affairs and the Adhaar data base.
- [2]. The Guardian, 24 April 2023.
- [3]. Thompson, WS. And Lewis D.T. : Population Problems, Tata Mc Graw Hill Publishing Co. Ltd., New Delhi, 1965.
- [4]. Cleland J., Bernstoin S., et.al.: Family Planning the Unfinished Agenda, The Lancet Sexual and Reproductive Health Series, October 2006.
- [5]. Yadav R.C., Tiwari A.K. and Sharma S.S.: Indirect measure of Total Fertility Rate, The Journal of Family Welfare, 55(2), 70-73, 2009.
- [6]. Brand J.E. and Devis, D. : The impact of college education on fertility : evidence for heterogenerus effects, Demography, 48, 863-887, 2011.
- [7]. Wyon, John B. and Gordon John E. : The Khann Study Population Problems in the Rural Punjab, Harward University Press, Pp. 140, 1971.
- [8]. Malgavalear, P.D. : Population and Development, Somaiya Publication Pvt. Ltd., Bombay, Pp. 18, 1982.
- [9]. The Mysour Population study : New York, United Nations, 120, 1961.
- [10]. Asha, A. Bhinde and T. Kanitkar : Principle of population studies, Himalaya Pub. House, 1978.
- [11]. Bhaskar D. Mishra : An Introduction to the study of Population, South Asian Publishers Pvt. Ltd., New Delhi, 1982.
- [12]. Rele, J.R. and Tata Kanitkar : "Fertility differentials by religion in Greater Bombay" role of explanatory variables in the economic and social support for High Fertility by Ludo, T Ryzicka Canberra, p. 371-383, 1978.
- [13]. Singh, S.: The proximate determinants of fertility, subnational variationals, Populational Studies, 34, p. 113-135, 1985.