

Sociodemographic Factors Affecting Primary Infertility in Bengali and Pakistani Women: A Cross-sectional Study

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Abstract:

Objectives: To identify sociodemographic factors associated with primary infertility in Bengali and Pakistani women.

Methods: Demographic and Health Survey (DHS) data for Bangladesh (2022) and Pakistan (2017–18) were used. DHS Pakistan lasted from 22/11/2017 to 30/04/2018, and DHS Bangladesh lasted from 27/06/2022 to 12/12/2022. Women 20–49 years old, married for ≥ 5 years, not using contraceptives since marriage, and never conceived during this period were included in study, and women < 20 years old, married for < 5 years, using contraceptives since marriage, and ever gave birth to a child were excluded. SPSS 22.0 was used for statistical analysis.

Results: A total of 2.9% of Bengali and 4.7% of Pakistani women had primary infertility. The Bengali women were better educated than the Pakistani women. About 40% of the women in both populations were poor. An age of ≥ 30 years at the time of survey had inverse relationship, while an age of ≥ 30 years at the time of first sexual union was directly related to primary infertility in Bangladesh and Pakistan. Urban or rural residence, wealth status, and education did not show any significant relationship with

22 primary infertility among Pakistani women; however, better education was inversely
23 related to primary infertility among Bengali women.

24 **Conclusion:** Women's present age and age at first sexual union were the only
25 significant factors affecting primary infertility in Pakistani women; however, education
26 level also affected fertility among Bengali women.

27 **Keywords:** Infertility, Pakistan, Bangladesh, women, sociodemographic factors

28 **Introduction:**

29 The term "primary infertility" is used when a woman has never conceived a child.
30 Couples and families face considerable financial, psychological, and health issues
31 during infertility treatments [1, 2]. The global prevalence of primary infertility has been
32 reported to be 10%–15% [3]. The WHO reported that one in every four couples is affected
33 by infertility in developing countries [4]. Various genetic and environmental factors have
34 been associated with infertility. Researchers must identify factors affecting fertility in
35 developing countries to counter them and decrease the financial burden on individuals
36 in these populations.

37 Bangladesh and Pakistan are overpopulated developing countries; still, they have high
38 rates of primary infertility. The present study aimed to identify and analyze the
39 sociodemographic factors associated with primary infertility among Bengali and
40 Pakistani women.

41 **Materials and Methods:**

42 The latest Demographic and Health Survey (DHS) standard data for Bangladesh (2022),
43 and Pakistan (2017–18), a cross-sectional survey, was used for this research. The DHS
44 program provided ethical approval letters from Bangladesh and Pakistan for our study.
45 The reference number for ethical approval from Bangladesh was BMRC/NREC/2019-
46 2022/156, given on June 06, 2022, and the reference number for ethical approval from
47 Pakistan was 4-87/NCB-285//17/1438, given on November 17, 2017. The fieldwork of
48 the Pakistan DHS 2017-18 lasted from 22 November 2017 to 30 April 2018, and
49 Bangladesh DHS 2022 lasted from 27 June 2022 till 12 December 2022.

50 The WHO defines infertility as the “failure of a couple to conceive after 12 months or
51 more of regular sexual unprotected intercourse”; whereas, demographers define
52 infertility as “the inability to have a live birth after five years of unprotected sexual
53 intercourse” [2]. Demographers use live birth rather than conception as the endpoint. In
54 this study, the demographic definitions of primary infertility and fertility developed by
55 Mascarenhas et al. 2012a were used to analyze global infertility in a DHS report [5].
56 According to these definitions, a woman must be married for at least five years. The
57 DHS records the data of women aged 15–49 years; thus, a woman married for five
58 years would be at least 20 years old. Consequently, we excluded the data subset 15–19
59 years of age from our data and included women aged 20–49 years [5] (Fig. 1).

60 Inclusion criteria were women from 20–49 years of age, who were married for ≥ 5
61 years, with no use of contraceptives for last 5 years, and never conceived during this
62 period (Fig. 1). Exclusion criteria were women below 20 years of age, those married for
63 less than 5 years, those using contraceptives since marriage, and those who ever gave
64 birth to a child.

65 The dependent variable was fertility status (i.e., primary infertility and fertile groups).
66 Independent sociodemographic variables were the age of the participants at the time of
67 the survey, the participant's age at first sexual union and marriage, the area of residence
68 (urban/rural), the household wealth status, and the women's education level. The
69 frequencies and percentages of all categorical variables were computed. A binary
70 logistic regression analysis was performed using SPSS 22.0 software.

71 Results:

72 In our study, 2.9% of Bengali women and 4.7% of Pakistani women had primary
73 infertility (Table 1). Almost all the women had their first sexual union at <30 years of age
74 (Table 1). About 55% of Pakistani women were not formally educated, while about 40%
75 of Bengali women were educated up to a secondary level (Table 1). About 40% of the
76 women in both populations had poor wealth status (Table 1). About 50% of Pakistani
77 women and 65% of Bengali women resided in rural areas (Table 1).

78 Binary logistic regression analysis found that in both populations, the age of women ≥ 30
79 years at the time of the survey was inversely associated with primary infertility (Table 2).
80 It also determined that the age of women ≥ 30 years at the time of first sexual union was
81 directly related to primary infertility in both countries (Table 2). Urban or rural residence,
82 wealth status, and the educational level of women were not significantly related to primary
83 infertility in Pakistani women; however, a higher education level was directly associated
84 with improved fertility (Table 2).

85 Discussion:

86 Our study found that the younger the present age of the participants, the higher the
87 odds of their having primary infertility. Our findings align with other studies finding that
88 younger women were more likely to have primary infertility than older women [6,
89 7]. Women older than 30 years are expected to have at least one child, as they have
90 more time to manage infertility. However, the age of marriage and first intercourse had a
91 more significant effect on primary infertility because fertility declines as age advances [7].
92 A woman's fertility peaks between the ages of 18 and 24 years; however, it
93 begins decreasing steadily at 27 years of age and declines sharply around the age of 35
94 years [3]. An age older than 30 years at first marriage (delayed marriage) reduces the
95 available time for childbearing and directly affects fertility [4, 6, 7]. Similarly, our study
96 found that an age of ≥ 30 years at the time of first sexual union was directly related to
97 primary infertility.

98 According to the literature, women with a middle school education were more than twice
99 as likely to be infertile as women with a lower level of education [4]. Changing societal
100 trends have increased the level of women's education, thus prolonging the age
101 of marriage [4, 6, 8]. Women who complete their education and focus on developing a
102 career marry late and are thus prone to primary infertility. Career interests also
103 encourage women to limit the number of children [7–10]. Nevertheless, the literature also
104 found an inverse relationship between a higher level of education and primary infertility,
105 likely due to a greater awareness of infertility treatments among highly educated women
106 [1]. Less than 15% of Pakistani women were found to have an education higher than the
107 secondary level, but the educational level of Bengali women is much higher than that of
108 Pakistani women (Table 1). Since Pakistani women are less educated than Bengali

109 women, they marry at a younger age. Although our study could not
110 establish a relationship between education level and primary infertility in the Pakistani
111 community, it identified a significant inverse relationship between primary and
112 secondary education levels and primary infertility in the Bengali population (Table 2).

113 The literature shows that women with a rich wealth status have more than twice the risk
114 of infertility than those with a poor wealth status [4]. Women with a high socioeconomic
115 status (SES) are likelier to delay childbearing than women with lower wealth status and
116 thus are more likely to become infertile. ³ The relationship between SES and infertility
117 varies among countries. ³ In the UK, women with a higher SES have higher rates of
118 fertility problems. However, a Portuguese study found no significant differences
119 among different socioeconomic groups [9]. An inverse relationship was also found
120 between SES and primary infertility, likely because of the increased access of
121 wealthy people to expensive treatments [1]. However, our study did not
122 establish a relationship between wealth status and primary infertility in either population.

123 The literature found that ² urban women were more prone to infertility than rural women,
124 likely due to lifestyle differences [1]. Rapid urbanization has increased living standards,
125 accordingly raising women's educational status. Education has increased women's
126 socioeconomic status and contributed to modified dietary habits and physical inactivity.
127 These three factors i.e., socioeconomic status, nutritional habits, and physical inactivity
128 are interrelated. Thus, primary infertility was higher among women with higher education
129 levels and higher socioeconomic status in the urban population [4, 6, 10]. Our study,
130 however, did not find a relationship between urban dwelling and primary infertility in either
131 population.

132 The education rate of women is low in Pakistan, with about 50% of women not having a
133 formal education. Pakistani customs, traditions, and society deprive women of a basic
134 education [11]. Urbanization is increasing in Pakistan, and improving women's SES.
135 However, the improvement in women's education has led to delayed marriages and
136 primary infertility. Urbanization could also have impacted lifestyles, leading to polycystic
137 ovarian syndrome, a significant cause of primary infertility in women [12]. In contrast to
138 Pakistani women, most Bengali women have attained a primary education or higher.
139 Bangladesh has undergone considerable changes due to urbanization, including a
140 sharp increase in the number of girls attending primary and high school [13]. Infertility in
141 Bangladesh was found to be impacted by women's education, improved economic status,
142 social media access, and urbanization.

143 The study's key findings were that a woman's age, age of first sexual union, and
144 education were significant factors affecting primary infertility in Bangladesh but that
145 education did not affect it in Pakistan.

146 Reproductive health policy has focused on the problem of overpopulation in South Asian
147 developing countries [14], but no epidemiological studies have assessed infertility in
148 these populations. Infertility issue causes considerable financial, psychological, and
149 health issues for couples and families during treatments. This burden becomes even
150 heavier for individuals from low-income countries.

151 The study's main strength was its collection of data from a reliable source. A limitation of
152 the study was that the information collected could be biased because its focus was not
153 on infertility but on fertility and family planning. A second limitation is that because

infertility in developing countries is an infrequently discussed topic due to the shame attached to it, it has not been explored in these communities.

Conclusion:

The study concluded that a woman's age, age at first sexual union, and education were significant factors affecting primary infertility in Bangladesh, but education did not affect it in Pakistan. Information about infertility and its causes must be disseminated to the public via the mass media so that misconceptions of infertility can be corrected, and timely treatment can be undertaken.

Conflict of interest: None

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Table 1: Frequencies and percentages of variables in the study:					
Variable:	Categories:	Pakistan: (n=11742)		Bangladesh: (n=16254)	
		Frequency:	(%) Percent:	Frequency:	(%) Percent:
Fertility:	Primary infertility	550	4.7	466	2.9
	Fertile group	11192	95.3	15788	97.1
Age (years) at survey:	<30 years	3065	26.1	4845	29.8
	30-39 years	5303	45.2	6665	41.0
	≥40 years	3374	28.7	4744	29.2
Age at first union:	<30 years	11577	98.6	16187	99.6
	30-39 years	163	1.4	65	0.4
	≥40 years	2	0	2	0
Educational level:	No education	6398	54.5	2618	16.1
	Primary	1651	14.1	4728	29.1
	Secondary	2259	19.2	6949	42.8
	Higher	1434	12.2	1959	12.1
Wealth status:	Poor	4943	42.1	6168	37.9
	Middle	2306	19.6	3196	19.7
	Rich	4493	38.3	6890	42.4
Residence:	Urban	5664	48.2	5710	35.1
	Rural	6078	51.8	10544	64.9

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Table 2: Binary regression analysis of sociodemographic variables affecting primary infertility			
Independent variables:	Categories:	Pakistan: AOR*: (95% CI†)	Bangladesh: AOR: (95% CI)
Age at survey (years)	<30 years	Reference	Reference
	30-39 years	1.571‡ (CI: 1.292-1.910)	1.523‡ (CI: 1.237-1.875)
	≥40 years	2.229‡ (CI: 1.745-2.847)	3.022‡ (CI: 2.259-4.043)
Age at first union(years)	<30 years	Reference	Reference
	30-39 years	0.252‡ (CI: 0.154-0.413)	0.077‡ (CI: 0.041-0.145)
	≥40 years	NS§	0.014** (CI: 0.001-0.236)
Residence	Urban	Reference	Reference
	Rural	NS	NS
Wealth	Poor	Reference	Reference
	Middle	NS	NS
	Rich	NS	NS
Education	No education	Reference	Reference
	Primary	NS	1.608** (CI: 1.179-2.193)
	Secondary	NS	1.465†† (CI: 1.087-1.975)
	Higher	NS	NS
*Adjusted Odds Ratio, †Confidence interval, ‡p<0.001, §Not significant, **p<0.005, ††p<0.05			

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