INDIAN JOURNAL OF POPULATION AND DEVELOPMENT
ISSN: 2583-4827; Volume 1(1), January 2021: 79-86

Risk Factors of Infertility in Bangladesh: A Poisson Regression Analysis

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Abstract

This study attempts to identify risk factors of infertility among women in Bangladesh. Based on the data available through Bangladesh Demographic and Health Survey (BDHS) 2014, the study observes that 12.7 percent married women in Bangladesh are infertile. Infertility is found to be associated with Women's age, age at marriage, education, BMI, division, religion, mass media, regular menstruation and genital diseases are found to be significant risk factors for infertility in the country.

Introduction

In the global perspective, efforts to improve community health have great success in improving maternal and child health during the past decade, partly due to the focus on reproductive health (Cousens et al, 2011). However, infertility has often been neglected in these efforts even though, it is a critical component of reproductive health (Cui, 2010). The inability to conceive affects both men and women equally across the globe. Infertility can lead to distress and depression, as well as discrimination and ostracism (Singh and Shukla, 2015).

Infertility has recently emerged as a challenge for the health sector. Accurate profile of the prevalence, distribution, and trend in infertility is important for shaping evidence-based interventions and policies to reduce the burden of this neglected disability. However, scarcity of population-based studies and inconsistent definition of infertility are the main challenges in generating global estimates of the prevalence of infertility (Gurunath et al, 2010; Ombelet et al, 2008). Infertile couples are reported to have psychological anguish, down heartedness, and low self-assurance (Chachamovich, 2010). In many cultures, social consequences of infertility compound the individual impact. Infertility has been found to be a major factor in divorce, loss of economic resources, and even annulment of rights to burial grounds (Greil, 2010). In Bangladesh, infertility as a health-related issue has been ignored in the reproductive health policy of the country (Nahar, 2012). The dominant state ideology focuses on fertility.

To the best of our knowledge, there is no national level study in Bangladesh that has estimated the prevalence of infertility in the country. The prevalence of infertility in Bangladesh is reported to be approximately 15 percent which is the highest among all south Asian countries (Kumar, 2007). There are, however, studies that have identified potential risk and causal factors of infertility in Bangladesh (Ahmad et al, 1999; Sala et al, 2018; Chowdhury et al, 2014; Momtaz et al, 2011; Nahar, 2012a). These include, among others, gynaecological problems, nutritional status as reflected through body mass index, age at marriage and poor living conditions. Other studies in South Asian countries suggest that sexually transmitted diseases (STDs), urinary tract infections (UTIs), reproductive tract infections (RTIs), unhygienic delivery, postpartum infection, unsafe obstetric practices and sepsis and pelvic infections linked to unsafe abortions are the causes of infertility (Singh and Shukla, 2015; Unisa, 2010; Jejeebhoy, 1998). Indirect causal factors of infertility include poverty, tuberculosis, under nutrition and anaemia (Ombelet et al, 2008; Ali et al, 2007; Inhorn, 2003). Poverty increases the risk of infertility in many ways. For example, scarcity of water and lack of access to nutrition and health care can make women more vulnerable to RTIs, which may cause infertility (Kumar, 2001).

In this paper, we analyse the prevalence and risk factors of infertility in Bangladesh based on the nationally representative Bangladesh Demographic and Health Survey 2014. Infertility in women is essentially a rare event and, therefore, we have applied Poisson regression model to analyse correlates and risk factors of infertility.

The paper is organised as follows. The next section describes the data source and the method used in the analysis. The study is based on a nationally representative household survey. Section three presents findings of the bivariate analysis. Section four presents findings of the Poisson regression analysis. Main findings and their policy and programme implications are discussed in the last section.

Data and Methods

The study is based on the data available from the Bangladesh Demographic and Health Survey (BDHS) 2014 (NIPORT, 2016). The BDHS was a nationally representative household survey which covered 17,863 ever-married women of reproductive age (15-49 years), out of which 8,388 currently women were not using any contraceptive method at the time of survey and were having at least one child. However, 1,064 currently women were considered infertile because they had no conception during the five years preceding the survey even though they or their husband did not use any contraceptive method during this period., Therefore, the study sample contains women whose age is more than or equal to 20 years. Both bi-variate and multi-variate analysis have been carried out to analyse the correlates and risks factors of infertility. The risk factors in this study are age, place of residence, religion, education, working status, wealth index (poor/middle/rich), age at marriage and the body-mass index (BMI) of the respondent. Along with these risk factors status of menstruation and any genital disease

have also been taken into consideration as the biological risk factors of infertility. BMI is categories into two category, BMI more than 27.5 kg/m^2 is considered as obese and rest are not obese. The Chi-square test has been used for the bivariate analysis while Poisson regression analysis has been used in the multivariate analysis to identify risk factors and covariates of infertility.

Findings

Table 1 presents estimates of the prevalence of infertility by selected socio-demographic characteristics among ever-married women. An important covariate of infertility is the age of woman. The prevalence of infertility is high among women aged 20-34 years but low among women aged 35 years and above. Among different administrative divisions of Bangladesh, the prevalence of infertility is found to be relatively the highest in Sylhet division (16.73 percent) but the lowest in Barisal division (9.43 percent) indicating strong regional patterns in the prevalence of infertility within the country. The prevalence of infertility has also been found to be associated with socio-demographic characteristics of the women. The prevalence of infertility is found to be higher in urban than in rural women; in non-Muslims compared to Muslims; in literate women compared to illiterate women; and in working women compared to non-working women.

Table1: Prevalence of infertility in ever-married reproductive age women according to some selected socio-demographic characteristics of women in Bangladesh, 2014

Socio-demographic characteristics		N	Prevalence of infertility	*p*
Age				
	20-34 years	3391	15.1	0.000
	35+ years	4997	11.05	
		Administrative Division		
	Barisal	1007	9.43	0.000
	Chittagong	1175	15.4	
	Dhaka	1396	14.18	
	Khulna	1418	13.82	
	Rajshahi	1324	10.2	
	Rangpur	1315	10.11	
	Sylhet	753	16.73	
		Place of residence		
	Urban	2930	14.58	0.002
	Rural	5458	12.34	
		Religion		
	Non-Muslim	7474	13.22	0.000
	Muslim	914	8.35	

Socio-demographic characteristics	N	Prevalence of infertility	*p*
Education			
Illiterate	2588	11.17	0.002
Literate	5800	13.43	
Working Status			
Working	5291	13.57	0.001
Not working	3097	11.17	
Wealth Index			
Poor	3002	10.39	0.000
Middle	1761	12.04	
Rich	3625	14.9	
Age at marriage			
< 18 years	7563	12.31	0.002
>= 18 years	825	16.12	
BMI			
Not obese	7823	12.39	0.002
Obese	565	16.81	
Regular Menstruation			
No	2787	17.29	0.000
Yes	5601	10.39	
Genital diseases			
No	7102	12.62	0.005
Yes	1286	13.06	
Total	8388	12.68	

Source: Authors

The prevalence of infertility has also been found to be relatively the highest among the richest women but the lowest among the poorest women. Prevalence of infertility is found to be higher in women who were married after 18 years of age compared to women who were married before 18 years of age. Obesity is found to be associated with the prevalence of infertility. The prevalence of infertility is found to be higher in obese women compared to non-obese women. Gynaecological problems have been found to be having as impact on infertility. The prevalence of infertility is found to be higher in women having irregular menstruation compared to women having regular menstruation. Similarly, the prevalence of infertility is found to be higher in women having some genital disease compared to women not having any genital disease.

Table 2 presents results of the Poisson regression analysis. The probability of being infertile is expressed in terms of incidence rate ratio (IRR). Among women aged 20-34 years, the IRR is found to be 12 percent higher than the IRR in women aged 35 years and above and the difference is found to be statistically significant. Spatial

differences in the prevalence of infertility within the country are also evident from the table. Compared to the Barisal division, the IRR is found to be statistically significantly higher in Dhaka, Chittagong, Sylhet, and Khulna Divisions but lower in Rajshahi and Rangpur divisions of the country. The analysis also confirms that the prevalence of infertility ever married reproductive age women is lower in the rural areas as compared to the urban areas of the country.

The risk of infertility has also been found to be higher in non-Muslim as compared to Muslim women. Women's education status has a statistically significant negative impact on the risk of infertility as IRR is found to be higher in literate compared to illiterate women. Similarly, working women are found to be more prone to infertility than non-working women. The risk of infertility is found to be relatively higher in middle-class women compared to rich and poor women. Women married after 18 years of age have higher risk of infertility compared to women married before 18 years of age. Similarly, obese women are at higher risk of infertility than non-obese women. Women having irregular menstruation are at about 13 percent significantly higher risk of infertility as compared to women having regular menstruation. Women suffering from genital diseases have higher risk of infertility than women not suffering from genital diseases.

Table 2: Results of the Poisson regression analysis of infertility on selected characteristics of the respondents

Socio-demographic covariates	Incidence rate ratio (IRR)	*p*	95% confidence interval	
			Lower	Upper
Age				
35^{+} years®				
20-34 years	1.118	0.000	1.093	1.162
Division				
Barisal®				
Chittagong	1.139	0.005	1.122	1.161
Dhaka	1.093	0.015	1.072	1.125
Khulna	1.044	0.018	1.026	1.082
Rajshahi	0.971	0.011	0.956	0.991
Rangpur	0.951	0.000	0.927	0.976
Sylhet	1.213	0.000	1.196	1.251
Place of residence				
Rural®				
Urban	1.217	0.000	1.191	1.239
Religion				
Muslim®				
Non-Muslim	1.103	0.000	1.066	1.116
Education level				
Illiterate®				
Literate	1.174	0.000	1.151	1.217

Socio-demographic covariates	Incidence rate ratio (IRR)	*p*	95% confidence interval	
			Lower	Upper
Working Status				
No®				
Yes	1.193	0.000	1.094	1.213
Wealth Index				
Poor®				
Middle	1.112	0.052	0.999	1.026
Rich	1.171	0.000	1.154	1.185
Age at marriage				
< 18 years®				
>= 18 years	1.426	0.000	1.411	1.411
BMI				
Not Obese®				
Obese	1.139	0.000	1.118	1.159
Regular menstruation				
Yes				
No®	1.135	0.000	1.106	1.171
Genital diseases				
No®				
Yes	1.117	0.005	1.109	1.139

®Reference category.
Source: Authors

Conclusions

Infertility remains a major public health challenge in Bangladesh. The present analysis shows that factors such as age of the woman and her age at marriage, region, education, religion, BMI, regularity of menstruation, and genital diseases are important causative factors of infertility in Bangladesh. Infertility varies widely across different regions of Bangladesh. Reasons for regional variation in the prevalence of infertility are not known at present. There is a need to explore the regional context of infertility in the country. At the same time, the public health care delivery system of the country should take into consideration the local level factors while addressing the challenge of infertility in the country which is quite high.

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