

Types of Infertility and Its Risk Factors among Infertile Women: A Prospective Study in Dhaka City

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Abstract

Background: Infertility is a global health issue, and it is a multidimensional problem with social, economic, and cultural influences. **Objectives:** The study aimed to determine types of infertility and their contributing factors among the respondent infertile women. **Methods:** This prospective cross-sectional study was conducted among infertile women visiting Sir Salimullah Medical College and Hospital, Dhaka. From January to December 2020, 111 infertile women were included and evaluated for infertility types and their contributing factors. Data were collected by face-to-face interviewing, and data were analyzed statistically. **Results:** Primary infertility was found among 90 (81%) and secondary infertility among 21 (18.9%). Among the direct risk factors of female infertility, ovulation failure was the majority of the cases, 74 (35.1%), and its mainly observed in primarily infertile women 58 (33.9%). These observations were statistically significant. **Conclusions:** Infertility should be treated as a public health problem, government and non-government organizations should develop a basic policy to create effective fertility centers.

Keywords

Women Infertility, Primary Infertility, Secondary Infertility, Direct Risk Factors of Infertility, Indirect Risk Factors of Infertility

1. Introduction

Infertility is a significant public health problem with genuine social outcomes. Parenthood is exceptionally wanted in every society. Most social orders far and wide are organized in a manner by which kids are required for the care and

support of more established guardians. Indeed, even in social orders with emotionally supportive social networks, children and family are relied upon to give a significant part of the consideration to the old. With the perspective on the signature appended to parenthood in social orders, childless couples experience adverse outcomes regarding their status, regard, and authority. As per World Health Organization (WHO), infertility is the failure to conceive despite two years of cohabitation and exposure to pregnancy or the inability to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse, epidemiological and clinical definition respectively [1]. It may be primary or secondary. Primary infertility refers to the infertility of a couple who have never been able to conceive, whereas secondary infertility is the failure to conceive following a previous pregnancy in the absence of contraception, breastfeeding, or postpartum amenorrhea. Primary infertility is more typical than secondary infertility in affluent nations; however, the turnaround is valid in developing nations [2]. The levels and patterns of infertility vary widely. The pattern is different in developed countries compared to those in developing regions of the world [3] and for the last decade's prevalence of infertility increasing across the globe [4]. On average, 8% to 12% of couples worldwide are infertile, and according to WHO, more than 180 million couples in developing countries suffer from infertility [5]. According to the Center for Diseases Control (CDC), 1.5 million women in the US (6%) are infertile, and 25% of infertile couples have more than one factor that contributes to their infertility [6]. Estimates suggest that the overall burden of infertility in the developing world is over three times higher than in developed countries. The World Infertility Survey revealed that in South Asian Country 4% of couples in Bangladesh are infertile, and 15% are based on women at the end of their reproductive lives at the age of 45 - 49 years. Cultural, socioeconomic, health care approaches and policies, and environmental factors play a significant role in the prevalence and etiology of infertility. The proportions of causes of infertility also have changed over time [7]. Several pathophysiological determinants of infertility include:

- Endocrine dysfunction leading to ovulatory infertility;
- Sexually transmitted diseases (STD) that cause tubal infertility;
- Congenital anomalies of the uterus and autoimmune disease impact conception and pregnancy loss.

However, among indirect causal factors of infertility—*anemia, malnutrition, poverty, lifestyle, stress, postponing parenthood, and obesity* are responsible [2]. Studies revealed that in this geographic reason, there is a causal link between infertility and reproductive health problems like STD, urinary tract infections (UTI), reproductive tract infections (RTI), unhygienic delivery, postpartum infection, and unsafe obstetric and abortion leads to sepsis and pelvic infections [2]. Despite its high prevalence and importance as a health issue, resources and attention have not been adequately focused in many countries worldwide. In addition, nearly half of the knowledge is still back yet on the cause of infertility. Further research in developed and developing countries is needed to understand

infertility's high prevalence and causes. Bangladesh is one of the rapidly growing nations; however, we are still unable to treat all the patients nationally and take part in the critical research area for this sort of illness that will enable us to the prediction of new findings and urge prediction of policies in health sectors and service provider in this country. Up to date, few single studies have been done to determine the types and causative factors behind infertility. The current study evaluates the types of women's infertility and factors contributing to its causation.

2. Materials and Methods

A prospective cross-sectional study was conducted in Dhaka city from January 2020 to December 2020 in the gynecological outpatient department of Sir Sali-mullah Medical College and Hospital, where women comes for seeking infertility treatment. The study included women of reproductive age (18 to 45 years) who come to infertility clinics willing to consent and excluded women of reproductive age (45 years). A total of 111 consecutive cases of infertile women were included in the study, where patients were ready to be included, and data collections were fulfilled. Data were collected regarding infertility types, contributing factors, and respondents' sociodemographic variables. Variables of the study were chosen from similar kinds of local studies [2] and finalized after pretesting in another infertility clinic in Dhaka city. In this study, we define primary infertile women as those who have never been able to conceive, whereas secondary infertile women as those who were failed to conceive following a previous pregnancy in the absence of contraception, breastfeeding, or postpartum amenorrhoea. We collect respondents' current and previous medical records regarding determinants of risk factors to define their risk factors. Data were analyzed statistically using the Statistical Package for Social Science (SPSS) version 23 for windows software. Herein quantitative data were tested with unpaired students' t-test, and qualitative data were tested with Pearson's chi-square test and Fisher's exact test. The result was presented by frequency and cross-tabulation analysis. The Institutional Ethical Review Committee approved the study.

3. Results

During the study period, 111 consecutive infertile women were studied, where 90 (81%) were primary infertile, and 21 (18.9%) were secondary infertile (**Figure 1**). Regarding sociodemographic factors, mean age \pm standard deviation, residence, religion, education, occupation, and monthly income were analyzed between primary and secondary infertile women. The mean age \pm standard deviation of infertile women of primary and secondary infertility was 27.8 ± 3.8 and 34.6 ± 6.1 , respectively, and the p-value (0.001). The educational level and family's monthly income between primary and secondary infertile women were statistically significant (p-value-0.008, 0.001, respectively) (**Table 1**). However, residence, religion, and occupations were not statistically significant between infertility types. Majorities of respondents belong from urban 83 (74.5%) and Muslim

Table 1. Sociodemographic determinants between primary and secondary infertile women.

Sociodemographic determinants	Types of infertility		P-value
	Primary infertility (n = 90)	Secondary Infertility (n = 21)	
Mean age ± standard deviation	27.8 ± 3.8	34.6 ± 6.1	0.001*
Residence			
Urban	66	17	0.33
Rural	24	4	
Religion			
Islam	80	21	0.27
Hinduism	7	0	
Others	3	0	
Education			
Illiterate	11	0	
Primary level	25	2	0.008*
Secondary level	23	9	
Higher secondary level	17	2	
Graduate and above	14	8	
Occupation			
Housewife	81	17	
Service	7	2	0.433
Business	1	1	
Others	1	1	
Monthly income in Taka			
<15,000	29	0	0.001*
15,000 - 40,000	40	13	
>400,000	21	8	

*A p-value of <0.05 was considered statistically significant.

101 (91%) society, and majorities were secondary level education 32 (28.8%), Housewife 98 (88.3%) and had a monthly income of 15,000 to 400,000 Taka was 53 (47.7%) (**Figures 2(a)-(e)**). The etiological risk factors in the current study were divided into direct and indirect risk factors and compared between two types of infertility. Comparisons of risk factors between the types of infertility showed-nonsignificant results of direct risk factors ($p = 0.1$) and significant indirect risk factors (**Table 2** and **Table 3**, respectively). Among the direct etiologic

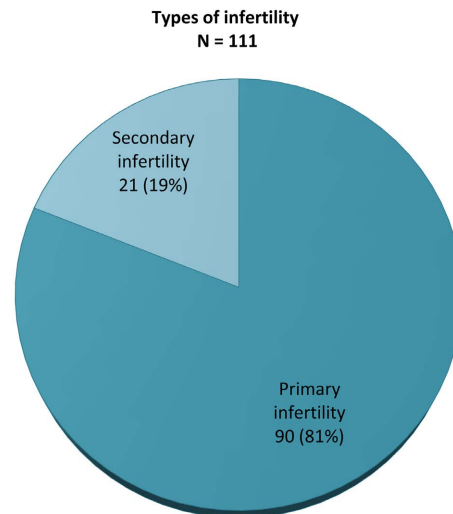


Figure 1. Types of infertility among the respondents.

Table 2. Distribution of direct risk factors between primary and secondary infertile women.

Direct risk factors Of infertility	Types of infertility		p-value
	Primary infertility (n = 90)	Secondary infertility (n = 21)	
Disease of ovary	17	6	
Ovulation failure	23	4	
Tubular disease	4	3	
Uterine disease	12	4	0.1
Pelvic Inflammatory Disease	12	0	
Unrecognized	17	4	
Multiple factors	5	0	

*A p-value of <0.05 was considered statistically significant.

Table 3. Distribution of indirect risk factors between primary and secondary infertile women.

Direct risk factors Of infertility	Types of infertility		p-value
	Primary infertility (n = 90)	Secondary infertility (n = 21)	
Overweight or obesity	14	15	
Anemia	32	0	
Diabetes Mellitus	5	4	0.001*
Unrecognized	34	0	
Multiple factors	5	2	

*A p-value of <0.05 was considered statistically significant.

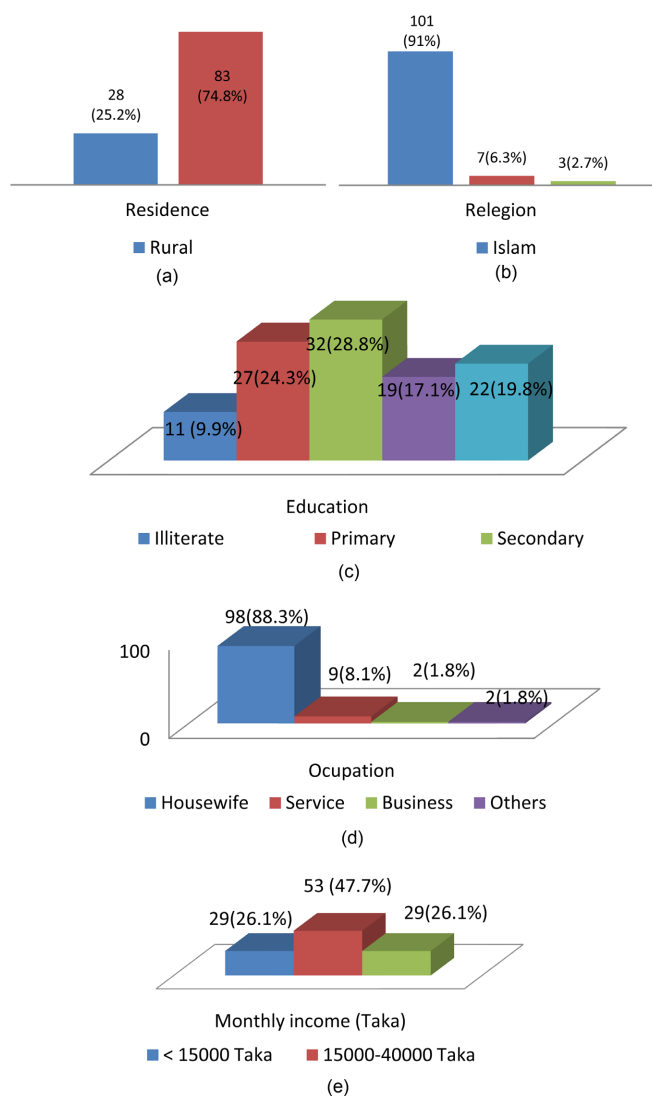


Figure 2. Sociodemographic determinant among the respondents. Distribution of residence (a), religion (b), education (c), occupation (d), monthly income (e).

risk factors, ovulation failure 27 (24.3%), ovarian disease 23 (20.7%), and unknown 21 (18.9%) were contributing to maximum women. However, among the indirect risk factors, overweight 29 (26.1%), anemia 32 (28.8%), and unknown 32 (30.6%) were contributing to majorities of women (**Figure 3**).

4. Discussion

In this study, 90 (81%) women were primary infertile, and 21 (18.9%) were secondary infertile. A study in the southern part of India showed 82.48% were primarily and 17.52% secondarily infertility [7]. This result corresponds with the current study. However, many risk factors may be directly or indirectly involved in infertility. Comparison of those contributing risk factors between infertility types was statistically significant in indirectly involved factors and not significant in the case of directly involved factors. The current study demonstrated

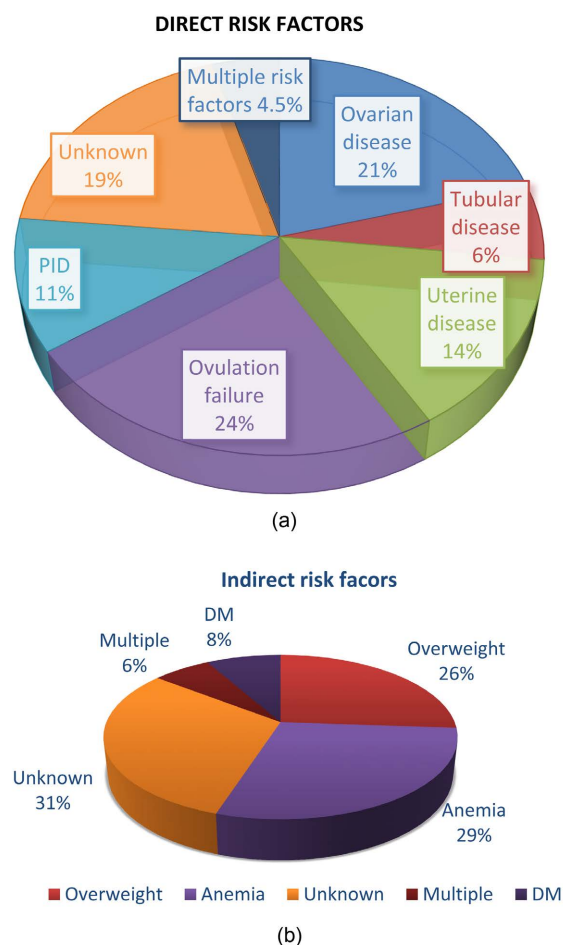


Figure 3. Showing etiological risk factors of infertile women. Distribution of direct risk factors (a), indirect risk factors (b).

ovulation failure as the most common direct factor for infertility in women 24%, followed by ovarian disease 21%, and undetectable in 19% of cases. Ovulation failure is also a common factor in Kuwait 25% and Iran 28.8% [8] [9]. A survey of infertility in the Royan Institute by Kamali and colleagues also showed that the most common cause of female infertility was ovarian factors 20.36% [10]. Sultana and colleagues also reported similar findings in one local study, where they recorded women with ovulation failure 60%, polycystic ovarian disease (PCOD) 32%, bilateral tubal occlusion 8%, and pelvic adhesions 24% [11]. Again, regarding uterine factors (e.g., endometriosis), few local studies finding was as nearly as the current study finding; [3] [12] however, it was much lower in Mongolia 4.2% [13]. Nutrition and lifestyle factors influencing fertility include anemia, weight problems, and smoking. The American Society for Reproductive Medicine notifies that 12% of infertility cases result from weighing either too much or too little [14]. Obesity is associated with ovulatory and menstrual dysfunction, infertility, increased risk of miscarriage, and decreased effectiveness of ART (Assisted Reproductive Technology). In the current study, majorities of the women had overweight or obese (26%), followed by anemic (29%) and unknown

indirect risk factors (31%). These findings correspond with a study conducted by Strobelt and colleagues [15]. However, in China, it has been reported that the most frequent women's infertility was among underweight women [16]. In the present study, 8% of females suffered from Diabetes Mellitus (DM). This result is almost closer to the findings of a local study [17]. In the present study, regarding sociodemographic factors of respondents in comparison between infertility types, educational level of women and their monthly family income were found significant. The mean age \pm SD of respondents in the current study was 27.8 ± 3.8 in primary infertile women and 34.6 ± 6.1 in secondary infertile women. The study finding is similar to studies conducted in a selective infertility clinic in Bangladesh by Hossain and colleagues and Chowdhury and colleagues (32.38 ± 4.884 y, and 30.36 ± 5.752 years, respectively) [2] [17]. The reduction in fertility is most significant in women in their late 30 s and early 40 s, similar to this study [18]. In this study, 74.3% of couples were from urban areas and 25.2% from rural areas. Urban residents are at a greater chance of infertility than rural residents. Furthermore, it is because of the high reservoir of infection and a greater chance of having sex with infected persons [19]. In this study, 91% of respondents were followers of Islam, and 6.3% were Hinduism. This result corresponds with a local study conducted by Chowdhury and colleagues [2]. Present data showed that a relatively high number of females were the secondary and above level of education and went with the findings of local studies [17]. Regarding the employment factor on the frequency of infertility cases distribution in the current study, it has been documented that the most prevalence was among housewives, 88.3%. These results agree with a study that reported in Iran [20]. In the current study, the monthly family income of 26.1% couples < 15,000 Taka, 47.7% of couples \rightarrow 15,000 to 400,000 Taka, and 26.1% couples \geq 40,000 Taka. Identical findings were found in local studies [2] [17].

5. Conclusion

Childbearing and family are considered a right of every human being. Infertility is a global health problem that requires appropriate diagnosis and determinants. Various anatomical, socio-economic, biological, and lifestyle-related factors influence infertility. Moreover, the consequence of infertility on women's lives in our society seems substantial; they had a greater vulnerability to emotional and physical violence, and higher rates of marital disruption were observed among infertile women. Therefore, infertility cannot be treated as an individual problem; it has a wide range of social and health repercussions, and it should be considered an essential public health issue with broader social implications. A thorough but time-efficient investigation is required for the infertile couples at different national health care levels and should include every infertile couple under infertility management scheme by governments and Nongovernment organizations (NGOs). However, no stone is left unturned to make the mother fertile and return the smile on the face of the family.

Limitation of the Study

The present study evaluated the infertile women of single centers in Dhaka city and was conducted on a small population for a limited period, and the study was performed during the Coronavirus disease (COVID-19) pandemic. The study was cross-sectional in design; the clinical endpoints were not followed. There might be the presence of subjective recall bias.

Recommendation of the Study

- The Studies with large samples, longer duration, and multicenter are recommended to assess the accurate picture of infertility among infertile women in Bangladesh and other developing countries.
- Aging, delaying childbirth, professional stress, nutrition, and poor reproductive hygiene may cumulatively affect infertility risk factors. Thus, infertility can be managed to some extent by evading late marriage, having a baby at the right time, having a healthy life, good and healthy food, good reproductive hygiene, medication, stress-free life, and regular exercise.
- Awareness programs should be arranged among the affected or population at risk of infertility to report early to fertility experts.
- Infertility should treat as a public health issue and government and non-government organizations (NGOs) should develop a basic policy to create effective fertility centers for the detection, prevention, and management of infertility.

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Authors' Contributions

The first author conceived, designed this study, collected data from Hospital, prepared and analyzed the data, and wrote this manuscript. All authors interpreted and approved the final version.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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