

Causes of Infertility among the Couples Who are Attending the Infertility OPD of BSMMU

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Abstract

Introduction: Infertility may be defined as inability to conceive within one year of unprotected regular coitus. Approximately 85 – 90% of healthy young couples conceive within 1 year, most within 6 months¹. Infertility therefore affects approximately 10 – 15% of couples and represents an important part of clinical practice². A general classification of causes of infertility are male 35 – 40%, female 40 – 50% (tubal 25%, ovulatory 20% and cervical 1 – 2%), sexual 10% and unknown 10%³. More than one factor per couple accounts for the total percentage appearing to exceed 100%. **Objective:** To assess the determinants of infertility among the infertile couples both male and female attending the outpatient department of infertility unit of the department of obstetrics and gynaecology of Bangabandhu Sheikh Mujib Medical University, Shahbagh, Dhaka. **Materials & Methods:** This prospective observational study was conducted in the Infertility unit, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, during the period from 01.07.2018 to 31.12.2021. Five hundred infertile couples were recruited from the out-patient department of infertility unit who came to take treatment for their infertility problem. Data were collected from the couples by data collection sheet and the data were plotted in the tables. The data were analyzed by SPSS program, version 28. **Results:** The socio-demographic characteristics of the study subjects (n = 500). Husbands age group was 22 -55 in years, Mean \pm SD (34.0 \pm 5.9). Age of the female partners was 18 – 44 years, mean \pm SD (27.1 \pm 5.2). Majority of the female study subjects had secondary level of education (49.4%), where as in male study subjects secondary level of education was 30.4%, followed by graduates (29.6%). Occupation of female partners was mostly housewife = 395 (79.0%), occupation of male partners was mostly service = 356 (71.2%). Regarding religion, Muslims were 476 (95.2%), others were 24 (4.8%). Majority of them hailed from rural area (62%). According to BMI, majority of female were overweight (56%). Among the respondents, majority of them had primary infertility (59.8%) and the rest (40.2%) had secondary infertility. Regarding hormonal status of infertile women, most of them (94%) had serum FSH below normal (< 3U/L), serum LH below normal (< 2U/L) in 96% patients, Serum TSH above normal (>4.5 mU/L) in 49.0% patients, serum FT4 above normal (>21 pml/L) in (60.8%) patients, serum Prolactin level above normal (>630 mU/L) in 27.8) patients. Diabetes: In male = 28 (5.6%). Mumps: In male = 7 (1.4%). Chicken pox: In male = 18 (3.6%). Hypertension: In male = 10 (2.0%). Orchitis: In male = 6 (1.2%). Personal history of husband: Smoking = 129 (25.8%). In male patients, Testosterone level normal (10 – 30 nmol/L) in 133 (26.6%) patients and above normal (>30 nmol/L) in 367 (73.4%) patients. The semen analyses of the husbands of the infertile female patients shows, quality of semen poor (<4%) in 305 (61%) patients. Regarding semen quality, oligospermia (<15 million/ml) was in 480 (96%) patients and azospermia (0% count) in 20 (4%) patients. In case of motility of sperms, rapid linear below normal (<50%) was in 90 (18%). In case of slow linear (SL), below normal (<15%) in 324 (64.8%) patients. In case of morphology of sperms, below normal (<14million/ml) in 25 (5%) patients. Regarding structural abnormalities of female organs bicornuate uterus was found in 15.2% patients, abnormal uterine cavity in 11.4% patients. In 13.0% patients' abnormal right ostium were found and in 12.6% patients' abnormal left ostium were found. Intrauterine adhesion was found in 35.2% patients and submucous fibroid in 17.6% patients. Abnormal right fallopian tube was found in 33.2% patients and abnormal left fallopian tube was found in 34.2% patients. Dye test in 42.4% patients were negative that means the tubes were blocked. **Conclusion:** This study shows that a significant percentage of both male and female are suffering from infertility. The major causes of male infertility are partly hormonal, structural abnormalities of male genitalia, infection of genital tract, and partly psychological. Causes of female infertility are mostly hormonal, structural abnormalities of the uterus, fallopian tubes, infection of the genital tract and partly psychological.

Keywords: Female Infertility, Male Infertility, Hormonal, Structural abnormality, Semen abnormality.

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Introduction:

Infertility may be defined as inability to conceive within one year of unprotected regular coitus. Approximately 85 – 90% of healthy young couples conceive within 1 year, most within 6 months¹. Infertility therefore affects approximately 10 – 15% of couples and represents an important part of clinical practice². A general classification of causes of infertility are male 35 – 40%, female 40 – 50% (tubal 25%, ovulatory 20% and cervical 1 – 2%), sexual 10% and unknown 10%³. More than one factor per couple accounts for the total percentage appearing to exceed 100%. Increased public awareness of the natural age – related decline in fertility and the increasing risk of chromosomally abnormal offspring with advancing maternal age, at a time when large numbers of women have deferred childbearing to pursue to carriers, has led to a new sense of urgency among the many couples who now seek to initiate and complete their families over a relatively short period of time before age 40³. Infertility affects approximately 15% of couples. Roughly 40% of cases involve a male contribution or factor, 40% involve a female factor, and the remainder involves both sexes⁴. According to the American Society for Reproductive Medicine, infertility affects about 6.1 million people in the United States, equivalent to 10% of the reproductive age population. Female infertility accounts for one-third of infertility cases, male infertility another third, combined male and female infertility for another 15% and the remainder of cases is ‘unexplained’⁵. A Robertsonian translocation in either partner may cause recurrent abortions or complete infertility. “Secondary infertility” is difficulty conceiving after already having conceived and carried a normal pregnancy. Apart from various medical conditions (e.g. hormonal), this may come as a result of age and stress felt to provide a sibling their first child. There are various treatment options of the infertile couples. Among them, counseling of the infertile couples is one of the main and most effective methods of treatment. In this research it will prove that counseling is one of the most effective methods of treatment of infertile couples.

Materials and Methods:

This prospective observational study was conducted in the Infertility unit, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, during the period from 01.07.2018 to 31.12.2021. Ethical clearance was got from Bangladesh Medical Research Council (BMRC) Dhaka, Bangladesh. Bangabandhu Sheikh Mujib Medical University (BSMMU) is a tertiary hospital, where patients of infertility come from different parts of the country. Here, diagnosis of infertility is done by most modern investigation techniques and most modern treatment and management is given for the infertile couples. 500 infertile couples who are sexually active were recruited from the out-patient department of infertility unit who came for diagnosis and take treatment for their infertility problem either primary or secondary. Inclusion criteria of male partners were from 22 years to 55 years sexually active one. Inclusion criteria of female partners were 18

years to 44 years who were menstruating. Exclusion criteria for male were sexually inactive, that means impotent. Exclusion criteria for female were post menopausal whether naturally or surgically. All the study subjects were informed about the study and they were confirmed about the privacy and they gave their consent about the study. After collecting the data, it was analyzed by appropriate statistical methods using Statistical package for Social Sciences (SPSS) software programme.

Results:

Table I shows the socio-demographic characteristics of the study subjects (n = 500). Age of the female patients was 18 – 44 years, Mean ± SD (27.1 ± 5.2). Husbands age group was 22 -55in years, Mean ± SD (34.0 ± 5.9). Educational level of female partners was, no education = 8 (1.6%), primary = 49 (9.8%), secondary = 247 (49.4%), graduate = 87 (17.4%), postgraduate = 54 (10.8%), Others = 55 (11.0%). Educational level of male partners was, no education = 5 (1.0%), primary = 27 (5.4%), secondary = 152 (30.4%), graduate = 148 (29.6%), postgraduate = 74 (14.8%), Others = 94 (18.8%). Occupation of female partners was, housewife = 395 (79.0%), service = 103 (20.6%), business = 2 (0.4%). Occupation of male partners was, unemployed = 6 (1.2%), service = 356 (71.2%), business = 138 (27.6%). Regarding religion, Muslims were 476 (95.2%), others were 24 (4.8%). Monthly income of the infertile couple were in taka, < 10000 = 52 (10.4%), 10000 – 20000 = 188 (37.6%), 20000 – 40000 = 212 (42.4%), > 40000 = 48 (9.6%). Area of residence: urban 176 (35.2%), rural = 310 (62.0%), slum = 14 (2.8%). BMI (kg/m²) of the female partners were, underweight (< 18.0) = 4 (0.8%), normal weight (18-24.99) = 127 (25.4%), overweight (25 – 29.99) 281 (56.2%), obese (>30.0) = 88 (17.6%).

Table I: Socio-demographic characteristics of the study subjects (n=500)

Socio-demographic characteristics	No of patients	Percentage (%)
18-20	32	6.4
21-25	198	39.6
26-30	152	30.4
31-35	83	16.6
36-40	31	6.2
41-45	4	.8
Mean±SD (range: min-max)	27.1±5.2 (18 – 44 years)	
Range		
Husband's age group (in years)		
21-25	14	2.8
26-30	166	33.2
31-35	160	32.0
36-40	103	20.6
41-45	42	8.4
46-50	10	2.0
51-55	5	1.0
Mean±SD (range: min-max)	34.0±5.9 (22 – 55) years	
Range		
Educational level of female partner		
Not education	8	1.6
primary	49	9.8
Secondary	247	49.4
Graduate	87	17.4
Postgraduate	54	10.8
Other	55	11.0

Educational level of male partner		
Not education	5	1.0
primary	27	5.4
Sacondary	152	30.4
Graduate	148	29.6
Postgraduate	74	14.8
Other	94	18.8
Occupation of female partner		
Housewife	395	79.0
Service	103	20.6
Business	2	.4
Occupation of male partner		
Unemployed	6	1.2
Service	356	71.2
Business	138	27.6
Religion		
Islam	476	95.2
Other	24	4.8
Monthly family income of infertile couple		
<10000	52	10.4
10000-20000	188	37.6
20000-40000	212	42.4
>40000	48	9.6
Area of residence		
Urban	176	35.2
Rural	310	62.0
Slum	14	2.8
BMI(kg/m²)		
Underweight (<18.0)	4	.8
Normal weight (18-24.99)	127	25.4
Overweight (25-29.99)	281	56.2
Obese (>30.0)	88	17.6

Table II shows the type of infertility of the study subjects (n = 500):

Primary infertility = 299 (59.8%), secondary infertility = 201 (40.2%).

Table-II: Type of infertility of the study subjects (n=500)

Type of infertility	No of patients	Percentage (%)
Primary	299	59.8
Secondary	201	40.2
Total	500	100.0

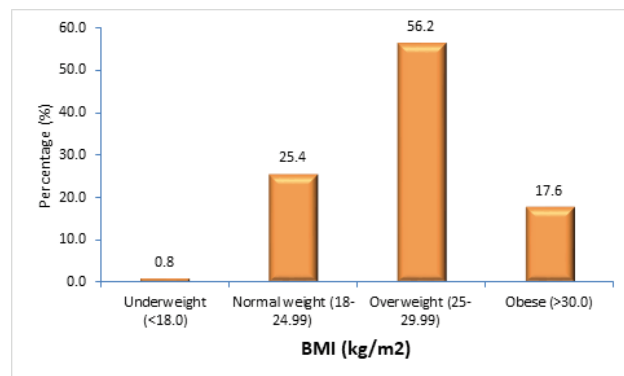


Figure-1: Bar diagram showing the BMI of the study female patients (n=500)

Figure 1 shows the BMI of the female patients. Underweight (<18) is 0.8%, normal weight (18-24.99) is 25.4% , overweight (25-29.99) is 56.2% and obese (>30.0) is 17.6%.

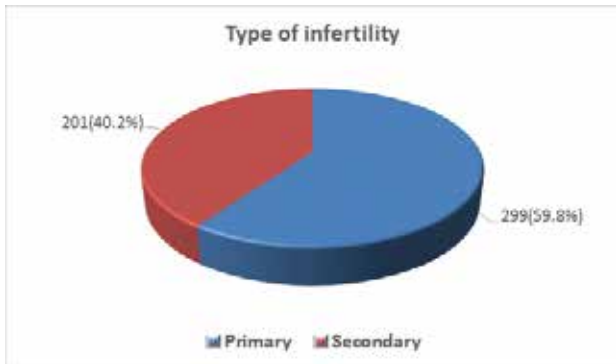


Figure-2: Pie diagram showing the type of infertility (n=500)

Figure 2 shows the type of infertility. Primary infertility is 299 and Secondary is 201.

Table III shows the medical history of the couple (n = 500). Diabetes: In female = 18 (3.6%), in male = 28 (5.6%). Mumps: In female = 1 (0.2%), in male = 7 (1.4%). Chicken pox: In female = 35 (7.0%), in male = 18 (3.6%). Hypertension: In female = 12 (2.4%), in male = 10 (2.0%). Chemotherapy: In female = 0 (0.0%), in male = 1 (0.2%). Tuberculosis: In female = 2 (0.4%), in male = 3 (0.6%). Hypothyroidism: In female = 38 (7.6%), in male = 3 (0.6%). Allergy: In female = 5 (1.0%), in male = 1 (0.2%). Radiation: In female = 0 (0.0%), in male = 1 (0.2%). Orchitis: In female = 0 (0.0%), in male = 6 (1.2%).

Table-III: Medical history of the couple (n=500)

Medical history of couple	Female partner No. (%)	Male partner No. (%)
Diabetes	18 (3.6%)	28 (5.6%)
Mumps	1 (0.2%)	7 (1.4%)
Chicken pox	35 (7.0%)	18 (3.6%)
Hypertension	12 (2.4%)	10 (2.0%)
Chemotherapy	0 (0.0%)	1 (0.2%)
Tuberculosis	2 (0.4%)	3 (0.6%)
Hypothyroidism	38 (7.6%)	3 (0.6%)
Allergy	5 (1.0%)	1 (0.2%)
Radiation	0 (0.0%)	1 (0.2%)
Orchitis	0 (0.0%)	6 (1.2%)

Table IV shows personal history and family history of the couple (n = 500). Personal history of husband: Smoking = 129 (25.8%), alcohol = 3 (0.6%), others (nil) = 368 (73.6%). Disease of family: Hypothyroidism = 9 (1.8%), diabetes = 38 (7.6%), tuberculosis = 4 (0.8%), history of subfertility = 14 (2.8%), hypertension = 5 (1.0%), hypothyroidism with diabetes = 3 (0.6%), hypertension with diabetes = 4 (0.8%).

Table-IV: Personal history and family history of the couple (n=500)

Personal history of husband	No of patients	Percentage (%)
Smoking	129	25.8
Alcohol	3	0.6
Others	368	73.6

Family history	No.	%
Hypothyroidism	9	1.8
Diabetes	38	7.6
Tuberculosis	4	0.8
History of subfertility	14	2.8
HTN	5	1.0
Hypothyroidism+DM	3	0.6
DM+HTN	4	0.8

Table V shows the drug history of the couple (n 500). Antihypertensive: In female partner = 12 (2.4%), in male partner = 16 (3.2%). Antidiabetic: In female partner = 20 (4.0%), in male partner = 21 (4.2%). Anti TB: In female partner = 5 (1.0%), in male partner = 5 (1.0%). Thyroid drug: In female partner = 34 (6.8%), in male partner = 2 (0.4%).

Table-V: Drug history of the couple (n=500)

Drug history of couple	Female partner No. (%)	Male partner No. (%)
Anti-hypertensive	12 (2.4%)	16 (3.2%)
Anti diabetic	20 (4.0%)	21 (4.2%)
Anti TB	5 (1.0%)	5 (1.0%)
Thyroid drug	34 (6.8%)	2 (0.4%)

Table VI shows hormonal status of infertile women (N=500). Serum FSH below normal (< 3U/L) in 470 (94%) patients, normal (3 – 10 U/L) in 17 (5.4%) patients and above normal (>10 U/L) in 3 (0.6%) patients. Serum LH below normal (< 2U/L) in 480 (96%) patients, normal (2 – 9 U/L) in 17 (3.4%) patients and above normal (>9.0 U/L) in 3 (0.6%) patients. Serum TSH normal (0.2 – 4.5 mU/L) in 255 (51.0%) patients and above normal (>4.5 mU/L) in 245 (49.0%) patients. Serum FT4 normal (9 – 21 pmol/L) in 196 (39.2%) patients and above normal (>21 pmol/L) in 304 (60.8%) patients. Serum Prolactin level normal (25 – 630 mU/L) in 361 (72.2%) patients and above normal (>630 mU/L) in 139 (27.8%) patients. In male patients, Testosterone level normal (10 – 30 nmol/L) in 133 (26.6%) patients and above normal (>30 nmol/L) in 367 (73.4%) patients.

Table-VI: Hormonal status of infertile women (n=500)

Hormonal status	No of patients	Percentage (%)	
FSH	Below normal (<3 U/L)	470	94.0
	Normal (3.0-10.0 U/L)	27	5.4
	Above normal (>10 U/L)	3	.6
LH	Below normal (<2 U/L)	480	96.0
	Normal (2.0-9.0 U/L)	17	3.4
	Above normal (>9.0 U/L)	3	.6
TSH	Normal (0.2-4.5 mU/L)	255	51.0
	Above normal (>4.5 mU/L)	245	49.0
FT4	Normal (9-21 pmol/L)	196	39.2
	Above normal (>21 pmol/L)	304	60.8
Prolactin	Normal (25-630 mU/L)	361	72.2
	Above normal (>630 mU/L)	139	27.8
Testosterone	Normal (10-30 nmol/L)	133	26.6
	Above normal (>30 nmol/L)	367	73.4

In table VII shows the structural abnormalities of female organs (n=500). In Hysterosalpigography (HSG), there were seen patients with abnormal uterine cavity in 2 (0.40%) patients, septed uterus in 21 (4.2%) patients, bicornuate uterus in 76 (15.2%) patients, unicornuate uterus in 5 (1.0%) patients and endometrial polyp in 8 (1.6%) patients. In Hysteroscopy, abnormal uterus was found in 6 (1.2%) patients, abnormal uterine cavity in 57 (11.4%) patients and abnormal endometrial flakes were found in 62 (12.4%) patients. In 65 (13.0%) patients abnormal right ostium were found and in 63 (12.6%) patients abnormal left ostium were found. During Hysteroscopy, there were found intrauterine adhesion in 176 (35.2%) patients, polyp in 14 (2.8%) patients and submucous fibroid in 88 (17.6%) patients. During Laparoscopy, abnormal uterus were found in 15 (3%) patients, abnormal right fallopian tube were found in 166 (33.2%) patients and abnormal left fallopian tube were found in 171 (34.2%) patients. During Laparoscopy, there also was found abnormal right fallopian tube in 185 (37.0%) patients and abnormal left fallopian tube was found in 188 (37.6%) patients. During laparoscopy, there also was found pouch of Douglas free in 315 (63%) patients. During dye test in laparoscopy, 288 (57.6%) patients were found positive and rest of the patients was negative that means the tubes were blocked.

Table-VII: Structural abnormalities of female organs (n=500)

	No of patients	Percentage (%)
HSG findings		
Abnormal uterine cavity	2	0.40
Septed	21	4.2
Bicornuate	76	15.2
Unicornuate	5	1.0
Endometrial polyp	8	1.6
Hysteroscopy		
Abnormal uterus	6	1.2
Abnormal cavity	57	11.4
Abnormal Endometrium flakes	62	12.4
Ostium		
Abnormal (Right)	65	13.0
Abnormal (Left)	63	12.6
Any pathology		
Intrauterine adhesion	176	35.2
Polyp	14	2.8
Submucous fibroid	88	17.6
Laparoscopy		
Abnormal Uterus	15	3.0
Abnormal (Right)	166	33.2
Abnormal (Left)	171	34.2
Fallopian tubes		
Abnormal (Right)	185	37.0
Abnormal (Left)	188	37.6
Ovary		
Pouch of Douglas (free)	315	63.0
Dye test (positive)	288	57.6

Table VIII shows the semen analysis of the husbands of the infertile female patients. In quality, semen type was intermediate (4-14%) in 195 (39%) patients and poor (<4%) in 305 (61%) patients. Regarding semen count, normal (15-20 million/ml) was in 96 (19.2%) patients and above normal (>20 million/ml) was in 404 (80.8%) patients. Regarding semen quality, oligospermia (<15 million/ml) was in 480 (96%) patients and azospermia (0% count) in 20 (4%) patients. In case of motility of sperms, rapid linear (RL), normal (50-60%) in 408 (81.6%) patients, above normal (>60%) was in 2 (0.4%) patients and below normal (<50%) was in 90 (18%). In case of slow linear (SL), normal (15-20%) in 125 (25%) patients, above normal (>20%) was in 51 (10.2%) patients and below normal (<15%) in 324 (64.8%) patients. Regarding non propagative (NP), normal (0-10%) in 439 (87.8%) patients and above normal (>10%) was in 61 (12.2%) patients. In case of morphology of sperms, normal (14-50 million/ml) in 72 (14.4%) patients, above normal (>50 million/ml) in 403 (80.6%) patients and below normal (<14million/ml) in 25 (5%) patients.

Table-VIII: Semen analysis of husbands (n=500)

Semen analysis (husbands)	No of patients	Percentage (%)
Semen type		
Intermediate (4-14%)	195	39.0
Poor (<4%)	305	61.0
Semen count		
Normal (15-20)	96	19.2
Above normal (>20)	404	80.8
Semen analysis		
Oligospermia (<15 million/ml)	480	96.0
Azoospermia (0%)	20	4.0
Rapid linear (RL)		
Normal (50-60)	408	81.6
Above normal (>60)	2	.4
Below normal (<50)	90	18.0
Slow liner (SL)		
Normal (15-20)	125	25.0
Above normal (>20)	51	10.2
Below normal (<15)	324	64.8
Non propagative (Np)		
Normal (0-10)	439	87.8
Above normal (>10)	61	12.2
Morphology		
Normal (14-50)	72	14.4
Above normal (>50)	403	80.6
Below normal (<14)	25	5.0

Discussion:

The present study attempted to assess the determinants of infertility among the married couples who were attending the infertility outpatient department of Bangabandhu Sheikh Mujib Medical University, shahbagh, Dhaka. Socio-demographic characteristics of the married couples attending the infertility outpatient department are one of the determinants affecting fertility. Rural residents 310 (62%)

are more sufferer of infertility than urban 176 (35.2%) ones. Mallikarjuna M. et.al also shows in their study that rural couples are more sufferers in infertility than urban⁶. BMI more than 25 are 281 (56.2%) more affect fertility in female. Giwercman A et al. has shown the results like ours⁷. Primary infertility was significantly higher 299 (59.8%) than secondary infertility 201 (40.2%). Similarly, one study by Singh K et al. in Bihar, India also shows the results like those of ours⁸. In our study, nearly 77% of infertile couples reported to hospital for treatment between 2- 10 years of marriage. Singh K et al. in Bihar, India also shows the same presentation like ours⁸. Determinants of infertility among the female partners of the couple were hormonal status like FSH below normal (<3 U/L) was in 470 (94%), LH below normal (<2 U/L) was in 480 (96%), TSH above normal (>4.5 mU/L) was in 245 (49%), serum prolactin above normal (>630 mU/L) was in 139 (27.8%) which corresponds with the results of infertile married women of India⁸ and Ethiopia⁹. Structural abnormalities of female organs which are the determinants of female infertility like HSG findings, Hysteroscopic findings, any pathology of uterus, laparoscopic findings of uterus, fallopian tubes, ovary all corresponds to the findings of Bihar, India⁸. Among the determinants of male infertility are: age, smoking, obesity, alcohol and caffeinated beverages consumption, stress, electronic devices, scrotal temperature, some drugs. Our findings of male infertility corresponds with the findings of Mahat et al.¹⁰. Besides, some structural factors of male genital tract, like varicocele, endocrine disorders, male reproductive tract infection, ejaculatory disorders, immunological factors, genetic and chromosomal defects also cause male infertility. One of the main causes of male infertility is semen quality. In our study, semen analysis shows normozoospermia and oligospermia together 96% and azoospermia 4%, motility 81.6%, which corresponds to the study of Nigeria¹¹. Bhattacharya et al. also shows the male factors of infertility which also corresponds to our study results¹². One study conducted by Farhi and Ben-Haroush et al., also shows the similar results of male infertility like ours one¹³. Seminal fluid abnormalities among male partners of infertile couples in this study correspond to the study of male partners of Owolabi et al., Ile-Ife, Nijeria¹⁴. Results of our study in socio-demographic characteristics also corresponds to the study of Nepal (Tamarkar et al 2019)¹⁵. One study in India from the demographic health survey showed the Prevalence and Potential Determinants of Primary Infertility in India also corresponds to our study (Purakayastha et al. 2021)¹⁶.

Conclusion:

The present study found a good number of infertile couples both primary and secondary who attended in the infertility outpatient department of infertility unit of Gynaecology and Obstetrics department. Among the male partners, the determinants of infertility are hormonal, structural abnormalities of male genitalia, abnormal sperm count in semen and partly psychological. Among the female partners, major determinants of infertility are partly hormonal, structural

abnormalities of uterus, fallopian tubes, infection of genital tract and partly psychological which can be overcome by counseling.

Conflict of Interest: None.

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