Socio-Demographic Correlates of Women's Infertility and Treatment Seeking Behavior in India

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Abstract

Background: Infertility is an emergent issue in India. Until recently, very few studies have understood the patterns and consequences of infertility in India. Family planning programs in India also viewed exclusively the patterns and determinants of overfertility rather than infertility. Furthermore, there is the lack of information about treatment seeking behavior of infertile couples. Therefore, this paper aimed to examine the extent of infertility and treatment seeking behavior among infertile women in India. An attempt was also made to evaluate the effects of socio-demographic factors on treatment seeking behavior.

Methods: The study used the data from the District Level Household and Facility Survey carried out in India during 2007-08. Several statistical techniques such as chi-square test, proportional hazard model and binary logistic regression model were used for the analysis.

Results: Approximately, 8% of currently married women suffered from infertility in India and most of them were secondary infertile (5.8%). Within India, women's infertility rate was the highest in west Bengal (13.9 percent) and the lowest in Meghalaya (2.5 percent). About 80% of infertile women sought treatment but a substantial proportion (33%) received non-allopathic and traditional treatment due to expensive modern treatment and lack of awareness.

Conclusion: In the context of policy response, it can be said that there is a need to improve the existing services and quality of care for infertile women. Treatment for infertility should be integrated into the larger reproductive health packages.

Keywords: Awareness, Determinants, Infertility, Primary infertility, Secondary infertility, Treatment seeking, Treatment.

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Introduction

Infertility is commonly defined as the inability of an individual or a couple to conceive despite two years of cohabitation and exposure to pregnancy (1). Clinically, infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (2). Infertility may be primary or secondary. Primary infertility refers to infertility of a couple who have never been able to conceive whereas secondary infertility is the failure to conceive following a previous pregnancy. Infertility among couples may occur either due to a combination of factors. The factors that may lead to infertility may be genetic, environmental, infectious or parasitic diseases (3-7). Furthermore, the incidence of infertility among couples is associated with the life style, stress, postponing parenthood and obesity (8-11). The problem of infertility may also arise as a result of high level of sexual mobility, premarital sex, extramarital sex and prostitution (8, 12).

Alhtough all around the world, 8-12 percent of couples suffer from infertility, infertility rates vary dramactically between countries and regions (1). Estimates suggest that in the developing

world, the overall burden of infertility is over three times higher than developed countries. According to the WHO study, more than 187 million ever-married women of reproductive age suffered from primary or secondary infertility in the developing world in 2002 (13). In Sub-saharan Africa, the prevalence of infertility ranged from 9 percent in Gambia to around 10 percent in Togo and Rawanda and to about 32 percent in Nigeria (14, 15). In India, the burden of primary infertility among couples ranged between 4 to 17 percent (13, 16). As per the estimates from Indian census data 2001, 1991 and 1981, researchers showed that childlessness in India has risen up. In 1981, approximately 13 percent of ever-married women of reproductive age were childless, which increased to nearly 16 percent in 2001 (17).

Infertility is an important public health issue with serious social consequences. Parenthood is highly emphasized in each and every society. Most societies around the world are structured in a way in which children are required for care and maintenance of older parents. Even in societies with social support systems, children and family are expected to provide much of the care for the elderly (13). With the view of the importance attached to parenthood in societies, childless coupels experience negative consequences in terms of their status, respect and authority. Regradless of the medical cause of infertility, couples experience a sense of failure, loss, and exclusion (13, 18). They are treated as outcast and also they lack equal opportunities in family functions and religious events. Couples themselves view infertility as a tragedy, which carries social, economic and physiological consequences. It is also not surprising that childlessness affects women to a greater degree when compared with men (19, 20).

Due to physiological, familial and community pressure in producing a biological child, most of the couples seek various traditional methods and religious practices, including visits to temples, observing tantric rites, wearing charms, participating in rituals and visiting astrologers (16, 21, 22). Studies suggest that women first seek treatment from traditional healers and afterward take help from medical science (23, 24). Few studies also identified allopathic as the first treatment sought. Couples also follow religious practices with allopathic treatment, either simultaneously or subsequently (25).

Infertility is an emergent issue in India. Untill recently, not much attention has been given on this issue and very few studies have understood the level, trends, and consequences of infertility in India. Family planning programs in India also viewed exclusively the patterns and determinants of overfertility rather than infertility. Furthermore, there is a lack of information about modern treatment facility regarding infertility among currently married infertile couples. An understanding of the levels of infertility among couples is crucial in order to improve the clinical management of infertility and maintain policies for the betterment of society. Therefore, this paper aimed to fill the knowledge gap in treatment of infertility and treatment seeking behavior among currently married women in India. An attempt has also been made to access net effects of socioeconomic and demographic factors on infertility and the treatment seeking behavior.

Methods

The study used the data from the third round of District Level Household and Facility Survey (DLHS-3) carried out in India during 2007-08 (26). The DLHS-3 is one of the largest ever demographic and health surveys carried out in all the states and union territories of India with a sample size of 720,320 households. The survey was funded by different national and international organizations such as Ministry of Health and Family Welfare (MoHFW), United Nations Population Fund (UNFPA) and United Nations Children's Fund (UNICEF) and International Institute for Population Sciences (IIPS), Mumbai was the nodal agency for the development of survey design, instruments, data entry and tabulation software, training and supervision of the field work. In total, 643,944 ever married women aged 15-49 years and 166,260 unmarried women aged 15-24 years were successfully interviewed. The principal objective of the survey was to provide district level estimates on reproductive and child health (RCH), family planning, immunization and other reproductive health indicators. The survey also includes the information related to accessibility of health facilities; assess the effectiveness of Accredited Social Health Activist (ASHA) and Janani Suraksha Yojna (JSY) in promoting RCH care.

The data regarding infertility and childlessness was also collected in the survey from married women of 15-49 years for the first time ever. Married women were asked direct questions regarding infertility and treatment seeking behavior. In order

to get a clear picture regarding the type of infertility *i.e.* primary and secondary infertility, women were asked about the reasons and timing since the time they faced problems in conceiving. Regarding treatment seeking behavior, women were enquired about the type of treatment sought and the result of the treatment.

Fundamental problem of infertility studies lies in the conceptualization and definition of infertility. There have been variations observed in the definitions adopted by medical scientists, social scientists, and other researchers. The variation occurs largely (a) in the reference period used to establish the infertility and (b) in the categorization of women who have experienced pregnancy but not a live birth. Inability to conceive within two years of exposure to pregnancy is the epidemiological definition of infertility recommended by the World Health Organization. Clinical studies often use a one-year period of exposure. One community based study in Egypt considered one year of unsuccessful efforts to conceive as the criterion for infertility. But in demographic studies, it is common to use a period of five years as a exposure time (13). In this study, primary infertility is defined in women of age 15-49 years who have been married for last five years and had regular sexual intercourse without contraceptives and did not conceive at all, though they have the desire for a child. Secondary infertility is defined in currently married women for more than five years who are not able to conceive in the last five years but who have had at least a pregnancy in their reproductive life.

The present study also considered a number of potential socio-demographic covariates in the analysis to understand the differentials and determinants of infertility and treatment seeking behavior. The variables used were age of the respondents (<25 years, 25-35 years, >35 years), age at marriage (<18 years, 18-30 years, >30 years), children ever born (no children, one, two, three or more than three), religion (Hindu, Muslims and others), caste (scheduled castes, scheduled tribes, other backward classes and others), place of residence (rural, urban), years of schooling (no schooling, <10 years and >=10 years of schooling), work status (working, not working). Economic status of the households was also included in the analysis and measured as wealth index. Wealth index is a composite measure of a household's cumulative living standard. As this survey does not collect the direct information on

income and expenditure of households, wealth index was calculated using a set of the proxy indicators, such as household ownership of selected assets, housing conditions, consumer durables, water and sanitation facilities. Wealth index score of the household was computed using Principal Component Analysis (PCA), then households were categorized into five quintiles. In this study, first two quintiles of households were categorized as "poor", third quintile of households categorized as "middle" and last two quintiles of households were categorized as "rich". It is recommended that using the wealth index as a proxy of income is particularly valuable when there is a lack of reliable data on income and expenditure because it represents long-term economic status and also is much easier to implement.

In this study, bi-variate and multi-variate statistical techniques were applied to understand the extent of infertility and treatment seeking behavior among women from different socioeconomic backgrounds in India. Cross tabulations were used to understand the prevalence of infertility and treatment seeking behavior. To understand the socio-demographic association with primary infertility, Cox proportional hazard model was applied at the national level.

Further, binary logistic regression model was also used to understand the adjusted effects of socio-demographic predictors on treatment seeking behavior among infertile currently married women. To see the level of significance, p-values were presented in both the models. All analyses were performed using STATA version 12.0 (27).

Results

Table 1 presents the percentage of currently married women aged 15-49 years who ever faced infertility problem by demographic and socioeconomic characteristics. Results show that about 8 percent of currently married women in India ever experienced infertility during their reproductive life period. Among them, majority (6 percent) suffered from secondary infertility which means that they faced problems in conceiving following a previous pregnancy, while the remaining 2 percent experienced primary infertility. It should also be noted that infertility rate among women increased with the age of women. Results indicate that primary infertility was higher (3 percent) among younger women (<25 years) and lower among older women (>35 years) whereas reverse is true in case of secondary infertility *i.e.* higher
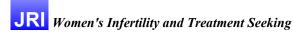
Table 1. Percentage of currently married women who had infertility problems by demographic and socioeconomic characteristics in India, DLHS, 2007-08

Demographic and Socioeconomic characteristics	% of women reported who had infertility problems			All currently married women
	Women faced with infertility problems	Primary infertility	Secondary infertility	
Age				
<25 years	7.21	2.8	4.41	141057
25-35 years	8.60	2.0	6.6	261860
>35 years	8.73	1.3	7.43	201887
Children born				
No children born	25.34	25.34	--	61869
One	11.25	--	11.24	87389
Two	6.18	--	6.18	145334
Three	5.49	--	5.49	123324
More than three	4.81	--	4.81	186718
Religion				
Hindu	8.53	2.0	6.53	468366
Muslim	8.33	1.7	6.63	70016
Others	6.89	1.7	5.19	66422
Caste				
Schedule Caste	8.98	1.9	7.08	105900
Schedule tribe	6.80	2.3	4.5	103835
Other Backward Caste	8.74	2.1	6.64	235739
Others	8.22	1.5	6.72	159330
Residence				
Rural	8.44	2.1	6.34	473768
Urban	8.07	1.7	6.37	131036
Years of schooling				
No schooling	9.12	2.3	6.82	278532
<10 years	8.01	1.8	6.21	264811
>=10 years	6.67	1.5	5.17	61461
Working status				
Working	8.92	2.1	6.82	263246
Not Working	7.91	1.9	6.01	340766
Age at marriage				
Below 18 years	8.80	2.0	6.8	402565
19 to 30 years	7.33	1.8	5.53	200099
>30 years	19.66	6.4	13.26	2138
Wealth quintiles				
Poor	9.11	2.6	6.51	214385
Middle	8.22	1.9	6.32	124035
Rich	7.87	1.6	6.27	266271
India	8.33	1.9	6.43	604804

among older women and lower among younger women.

Approximately, 25 percent of currently married women who had never given a birth reported the problems of infertility. The rate of infertility was found higher among women belonging to Hindu religion, scheduled castes and those residing in rural areas. Similar pattern was observed for primary and secondary infertility among women in the country. Higher level of infertility was estimated among women who had never attended school (9 percent), whereas it was lower for women with more than 10 years of schooling (7 percent). It was concluded that uneducated or less

Table 2. State wise percentage distribution of women who had problem in getting pregnant, DLHS, 2007-08

States	All currently married women	Women having problem n (%)	Percent distribution of women who have problems in getting pregnant [*]					
			For first conception	After a live/ still birth	After induced abortion	After spontan-eous abortion	After pelvic surgery	Others
Jammu and Kashmir	14671	1264 (8.54)	78.93	8.55	0.76	5.72	0.90	5.15
Himachal Pradesh	9622	468 (4.93)	74.15	8.48	--	6.84	1.37	9.17
Punjab	19953	1787 (8.86)	79.11	11.93	1.25	7.02	0.18	0.51
Uttarakhand	12107	615 (5.03)	71.40	10.14	1.06	6.57	1.84	8.99
Haryana	20394	2298 (11.40)	76.15	12.43	1.46	8.71	0.38	0.87
Rajasthan	38796	1899 (4.87)	72.85	14.52	1.18	5.64	0.30	5.52
Uttar Pradesh	82802	8394 (10.14)	79.17	13.01	1.23	5.46	0.29	0.84
Bihar	44339	5544 (12.27)	84.97	8.35	0.62	3.71	0.18	2.16
Sikkim	4176	317 (7.58)	73.89	19.23	1.21	4.66	--	1.01
Arunachal Pradesh	13866	410 (2.97)	67.92	12.83	0.98	5.16	7.95	5.16
Manipur	8753	630 (7.27)	47.00	34.38	1.75	12.53	1.01	3.32
Mizoram	6845	335 (5.01)	48.01	26.56	0.28	7.53	3.69	13.92
Tripura	3921	253 (6.47)	65.61	15.12	1.46	6.34	1.46	10.00
Meghalaya	6170	136 (2.50)	58.67	22.22	3.11	3.11	3.11	9.78
Assam	28584	1328 (4.97)	58.65	17.72	1.72	8.42	3.12	10.37
West Bengal	20542	2902 (13.87)	82.70	9.47	0.71	4.61	0.12	2.38
Jharkhand	25773	2417 (9.15)	72.06	13.86	0.49	8.22	0.95	4.43
Orissa	26365	2009 (7.50)	81.18	9.78	1.15	5.42	0.09	2.37
Chhattisgarh	16918	1931 (11.30)	79.65	13.22	0.49	4.87	0.18	1.57
Madhya Pradesh	44189	3100 (7.15)	72.60	12.45	0.92	5.73	1.24	7.06
Gujarat	22985	1485 (6.47)	65.41	10.85	2.79	7.66	2.51	10.78
Maharashtra	32587	2630 (8.09)	75.18	8.51	1.25	7.83	0.76	6.47
Andhra Pradesh	19831	2173 (10.68)	74.05	11.02	1.27	10.00	0.82	2.84
Karnataka	25199	1918 (7.60)	77.43	12.33	0.78	7.97	0.08	1.40
Goa	1356	184 (13.16)	87.35	3.10	2.39	5.97	0.48	0.72
Kerala	11672	1244 (10.84)	82.54	8.90	1.33	6.58	0.39	0.26
Tamil Nadu	24585	1634 (6.74)	75.61	7.79	0.92	11.73	0.35	3.60
India	604804	50806 (8.33)	76.16	11.74	1.11	6.71	0.73	3.54

*Among women who have reported any infertility problems, No case found in the empty cells

educated women are not aware of their reproductive health consequences as they are getting into marriage and reproduction at early ages that may increase the possibility of secondary infertility. Further, infertility rate was higher among women who were engaged in employment sector (9 percent).

Women marrying after 30 years of age had the highest rate of infertility (19.7 percent). Nearly 6 percent of women who married after 30 years of age also reported to have primary infertility and 13 percent of them had secondary infertility. It can be reasoned that women who married after 30 years of age already crossed the peak reproductive period *i.e*. 22-29 years and after this age, women's reproductive capacity or fecundability decreases and hence they had difficulties in getting pregnant. However, it also depended on age and bio-

logical capability of their husband at the time of marriage.

Table 2 depicts the state level prevalence of infertility among currently married women in India. Results show that women's infertility was observed to be high in West Bengal (13.9 percent) followed by Goa (13.1 percent), Bihar (12.3 percent), Haryana (11.4 percent), Chhattisgarh (11.3 percent) and low in Meghalaya (2.5 percent) followed by Arunachal Pradesh (3 percent), Himachal Pradesh (5 percent) and Assam (5 percent).

Causes of incidence of infertility among women are also presented in table 2. 76 percent of currently married women who ever experienced infertility reported that they faced the problem at their first conception. Approximately, 12 percent of them faced the problem after a live or still birth and 7 percent after spontaneous abortion. The

Table 3. Treatment seeking behavior among infertile women by demographic and socioeconomic characteristics in India, DLHS, 2007-08

Demographic and so cioeconomic characteristics	Treatment/ Advice Received		Women by type of treatment			Women who had infertility problem
	Percent	Numbers	Allopathic	Non-allopathic *	Others	
Age						
<25 years	74.98	7648	49.80	23.51	1.59	10306
25-35 years	83.04	18709	52.37	28.79	1.75	22718
>35 years	80.53	14165	46.99	31.72	1.72	17782
Children born						
No children born	78.91	12049	49.51	27.89	1.39	15531
One	82.62	8193	53.83	27.09	1.60	10002
Two	83.68	7728	55.81	26.22	1.53	9273
Three	80.60	5539	48.24	30.33	1.87	6911
More than three	77.78	7000	41.25	33.99	2.46	9075
Religion						
Hindu	79.79	31862	49.11	29.11	1.46	40323
Muslim	85.00	4987	51.97	29.36	3.58	5923
Others	81.36	3673	54.55	25.39	1.32	4560
Castes						
Schedule Caste	77.90	7447	45.96	30.16	1.67	9636
Schedule Tribe	68.88	4835	31.66	35.56	1.52	7094
Other Backward castes	82.08	17007	52.65	27.76	1.56	20858
Others	85.70	11233	57.35	26.22	2.05	13218
Residence						
Rural	78.34	31612	44.53	31.82	1.88	40370
Urban	85.61	8910	62.19	21.99	1.31	10436
Years of schooling						
No schooling	76.37	19386	39.28	35.05	1.90	25537
<10 years	83.20	17504	56.37	25.16	1.60	21175
>= 10 years	89.22	3632	73.16	14.73	1.21	4094
Working status						
Working	76.92	18102	43.06	31.94	1.82	23696
Not Working	83.46	22365	55.39	26.35	1.61	27042
Age at marriage						
Below 18 years	79.26	28116	45.75	31.64	1.77	35730
19 to 30 years	83.57	12089	58.84	23.02	1.58	14662
>30 years	76.35	316	61.71	13.16	1.33	413
Wealth quintiles						
Poor	73.44	14458	34.67	36.65	2.00	19688
Middle	78.50	8033	46.06	30.53	1.82	10221
Rich	86.64	18020	62.76	22.34	1.45	20884
India	80.57	40522	49.95	28.81	1.71	50806

*Non-Allopathic treatment includes Ayush, Traditional and Religious treatment

study also showed the state level variations in causes of infertility among women. More than 80 percent of infertile women in West Bengal, Bihar, Goa, and Kerala reported they faced problems at the time of first conception. Infertility among women caused after a live or still birth was found to be high in Manipur (34 percent) and Mizoram (27 percent). On the other hand, infertility among women caused after spontaneous abortion was found highest in Manipur (13 percent) followed by Tamil Nadu (12 percent).

Table 3 represents the treatment seeking behavior among infertile women in India by demographic and socioeconomic characteristics. Results indicate that about 80 percent of infertile women received treatment services in the country. However, nearly half of them received allopathic treatment. Treatment received by infertile women

was found to be higher among women aged more than 35 years, belonging to the religion other than Hindu or Muslims, residing in urban area, having more than 10 years of schooling and belonged to rich wealth quintiles. By caste status, more infertile women from castes other than scheduled castes or scheduled tribes went for treatment.

Variation was also noticed in types of treatment received by infertile women. About half of the infertile women (50 percent) preferred allopathic treatment. More women who attained more than 10 years of schooling (73 percent) opted allopathic treatment compared to those who never attended school or received less education. Similarly, uptake of allopathic treatment was higher among women residing in urban areas (62 percent). On the other hand, non-allopathic treatment was popular among scheduled tribes (35 percent), poor wealth quintiles (37 percent) of infertile women.

Hazard risk of primary infertility among women in India: In table 4, results of Cox regression model has been depicted for India to understand the hazards of facing infertility problem by different socioeconomic characteristics. Findings show that hazards of primary infertility decrease with the age of women. For example, risk of primary infertility was higher among women aged less than 25 years compared to older women. High risk of primary infertility was estimated among Hindu women in comparison to those from Muslim and other religions. Hazard risks of primary infertility were 19 percent and 6 percent higher for women who belonged to other backward classes (OBCs) and scheduled tribes, respectively compared to scheduled castes women. Women education was found to be significantly associated with the hazard risks of primary infertility. Women with less than 10 years of schooling were 41 percent and women with more than 10 years of schooling were 70 percent less likely to be primary infertile than women with no schooling. Non-working women showed 11 percent lower risks of primary infertility compared to working women. Women belonging to rich wealth quintiles showed 43 percent lower risks of primary infertility compared to women from poor wealth quintiles. Hazard risks of primary infertility was 30 percent and 8 percent higher among women residing in the central and the eastern regions of India compared to women form northern India. On the other hand, south Indian women showed 4 percent lower risk of pri-

Table 4. Results from Proportional Hazard Model for incidence of primary infertility among currently married women in India, DLHS, 2007-08

Socio-demographic Characteristics	Hazard ratio	P-value*	95% CI Lower	95% CI Upper
Age				
<25 years®				
25-35 years	0.547	0.000	0.524	0.570
>35 years	0.338	0.000	0.321	0.357
Religion				
Hindu®				
Muslim	0.731	0.000	0.686	0.781
Others	0.779	0.000	0.727	0.836
Caste				
Schedule caste				
Schedule tribe	1.065	0.050	1.000	1.134
Other backward caste	1.197	0.000	1.136	1.261
Others	0.884	0.000	0.831	0.941
Residence				
Rural				
Urban	0.959	0.121	0.909	1.011
Years of schooling				
No schooling®				
<10 years	0.593	0.000	0.567	0.619
>=10 years	0.303	0.000	0.282	0.329
Working status				
Working				
Not working	0.892	0.000	0.858	0.928
Wealth quintiles				
Poor				
Middle	0.779	0.000	0.740	0.824
Rich	0.579	0.000	0.547	0.611
Region				
North				
Central	1.305	0.000	1.233	1.382
East	1.086	0.007	1.023	1.153
North east	0.43	0.000	0.396	0.467
West	0.932	0.070	0.864	1.006
South	0.964	0.272	0.902	1.029

Time variable: Age at marriage of women; ®: Reference category.
Regions are demarcated based on NFHS divisions. Northern region includes Delhi, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, and Uttaranchal. Central region includes Chhattisgarh, Madhya Pradesh, andUttar Pradesh. Eastern region includes Bihar, Jharkhand, Orissa and west Bengal. North east region includes Arunachal Pradesh, Assam, Manipur, Mizoram, Meghalaya, Nagaland, Sikkim and Tripura. Western region includes Goa, Gujarat and Maharashtra. Southern region includes AP, Karnataka, Kerala and Tamil Nadu.
*Reported p-value equals 0.000 which means that p<0.001

mary infertility than that of women residing in the northern region.

Determinants of treatment seeking behavior among infertile women in India: Table 5 depicts the results from logistic regression analysis to examine the

Table 5. Result of binary logistic model showing the likelihood of treatment seeking behavior of infertile currently married women in India, DLHS, 2007-08

Socio-demographic Characteristics	OR	P-value*	95% CI Lower	95% CI Upper
Age				
<25 years®				
25-35 years	1.644	0.000	1.545	1.750
>35 years	1.432	0.000	1.335	1.536
Children born				
No children born				
One	1.188	0.000	1.113	1.268
Two	1.188	0.000	1.106	1.275
Three	0.998	0.951	0.923	1.078
More than three	0.900	0.005	0.836	0.969
Religion				
Hindu				
Muslim	1.251	0.000	1.158	1.353
Others	1.198	0.000	1.100	1.306
Caste				
Schedule caste				
Schedule tribe	0.638	0.000	0.593	0.686
Other backward caste	1.189	0.000	1.118	1.263
Others	1.216	0.000	1.131	1.308
Residence				
Rural				
Urban	1.026	0.460	0.959	1.097
Years of schooling				
No schooling				
<10 years	1.220	0.000	1.158	1.286
>=10 years	1.600	0.000	1.426	1.795
Working Status				
Working				
Not working	1.127	0.000	1.074	1.182
Age at marriage				
Below 18 years				
19 to 30 years	0.907	0.001	0.856	0.960
>30 years	0.563	0.000	0.443	0.717
Wealth quintiles				
Poor				
Middle	1.147	0.000	1.081	1.217
Rich	1.624	0.000	1.523	1.732
Constant	3.958	0.000		
R square (Cox and Snell)		0.039		

*Reported p-value equals 0.000 which means that p<0.001
® Reference category

determinants of treatment seeking behavior among infertile currently married women. Women more than 35 years were 43 percent more likely to receive any kind of treatment services for infertility compared to women of age less than 25 years. Likelihood to receive treatment was 18 percent higher among women who had one child than those who had no children born. Women belonging to other castes were 21 percent more likely to receive any treatment than that of scheduled castes. Women who attained more than 10 years of schooling were 60 percent more likely to receive any treatment than that of women having no schooling. Women who were not engaged in employment sector were 12 percent more likely to receive

treatment than those who were employed. Women belonged to middle and rich wealth quintiles were 14 percent and 62 percent respectively more likely to receive treatment for infertility compared to women belonging to poor wealth quintiles. The likelihood of receiving treatment for infertility increased with an increase in age at marriage. For example, women with more than 30 years of age at marriage were 44 percent less likely to receive treatment compared to women marrying below 18 years of age.

Discussion

Infertility issues have largely been ignored in the government policy in India. The National Population Policy (2000) also very briefly mentions about the infertility issues in the context of providing information, counselling and regular supply of medication only for deprived communities like tribal, displaced and migrant populations who "may not need fertility regulation" (MoHFW, 2000). There is also limited focus on services for infertile couples in the Reproductive and Child Health Programme (RCH). Though the Tenth Five-year Plan (2002-07) has discussed on the access to essential clinical examination, investigation, management and counselling services for infertility, such services are in practice rarely available in the public sector. Recently, government of India came out with the "ART regulation bill 2010" to provide for a national framework for the accreditations, regulation and supervision of assisted reproductive technology clinics, for prevention of misuse of assisted reproductive technology, for safe and ethical practice of assisted reproductive technology services.

The findings of the study showed that approximately 8 percent of currently married women in India suffered from infertility both primary and secondary. Primary infertility rate was found higher among young women i.e. women of age less than 25 years and decreases as age of women increases. On the other hand, secondary infertility was found lower among young women and higher among older women *i.e.* women of age more than 35 years. The study found that the incidence of infertility increases with the women's age because for a pregnancy to occur, several things have to happen, such that, an egg must develop in the women's ovary. The egg has to be released each month into the fallopian tube. A men's sperm must fertilize the eggs in the fallopian tube. The fertilized eggs must be able to travel through the

fallopian tube and attach in the lining of the uterus. If any of these events do not happen or are disrupted, it will result in infertility (28). Again, quantity and quality of eggs decrease with the women's age. So women marrying above 30 years show the highest rate of infertility problems and most of them were primary infertility.

Infertility problems may be because of either male or female problems or combined. However, the most common problem of female infertility is ovulation problem; tubal blockage, age related factors, uterine problems, sexual disorder and other unknown causes. With the advancement of medical sciences, today, about 85 percent of causes of infertility can be taken care of using appropriate surgical and medical interventions such as assistant reproductive technology (ART). The rapid increase in the number of infertility clinics providing "ART" services is a good indication for the people looking for solution. Although ART offers a hope to infertile couples to bear a biological child, several issues remain to be addressed. The findings of the study also stated that though about 80 percent of infertile women sought for any treatment in India, only half of them received allopathic treatment. The remaining 50 percent of women seek non-allopathic treatment such as traditional methods, Ayush or different religious treatments. The treatment seeking behavior towards allopathic or modern treatment makes them more vulnerable to infertility. Furthermore, access to modern treatment remains beyond the reach for most of the poor and middle class women due to high expense of the services. Evidence here also showed that among poor women, 36 percent received non-allopathic treatment and 34 percent received allopathic treatment whereas among rich women, allopathic treatment was opted by 63 percent of women and only 22 percent of rich women had-non allopathic treatment. Another concern of infertility treatment in India is quality of care. Services are not regulated and quality of treatment varies with the clinics run by both qualified and unqualified practitioners. Public health care system in India largely ignored these issues. There is an urgent need to consider this emerging health issue and also the need to regulate all infertility clinics run by both qualified and unqualified practitioners to ensure the quality and affordability of the services.

Conclusion

Infertility is one of the emerging medical prob-

lems among individuals. It also has enormous social implications. Each couple has the right to have a child. In the Indian social context, children are considered as a kind of old age insurance. In the context of policy response, it can be said that there is a need to improve the exiting service and quality of care for infertile couples. Services for infertile treatment should be integrated into the larger reproductive and child health package of services. Investigations for infertility could be conducted at various levels of the health care system. Effective mechanisms need to be implemented to regulate and manage high technology treatments for infertility, which are offered mostly in the private sector, have low success rates and are expensive. Guidelines should be implemented in a manner that doctors are compelled to look critically into the issues of informed consent, screening donors, legal and ethical issues and quality of care. Policies should ensure that the rights of women as users of these technologies are not in any way compromised. The issue of exploitation of patients in low-resource settings should be addressed as well.

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. No specific funding was received for this study

References

1. World Health Organization (WHO). Infertility: A Tabulation of Available Data on Prevalence of Primary and Secondary Infertility. WHO/MCH/91.9. Geneva: World Health Organization; 1999.
2. Zegers-Hochschild F, Adamson GD, de Mouzon J, Ishihara O, Mansour R, Nygren K, et al. International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) revised glossary of ART terminology, 2009. Fertil Steril. 2009;92(5):1520-4.
3. Larsen U. Childlessness, subfertility, and infertility in Tanzania. Stud Fam Plann. 1996;27(1):18-28.
4. World Health Organization. Infections, pregnancies, and infertility: perspectives on prevention. World Health Organization. Fertil Steril. 1987;47(6):964-8.
5. Parikh FR, Nadkarni SG, Kamat SA, Naik N, Soonawala SB, Parikh RM, et al. Genital tuberculosis--a major pelvic factor causing infertility in Indian women. Fertil Steril. 1997;67(3):497-500.
6. Yeboah ED, Wadhwani JM, Wilson JB. Etiological factors of male infertility in Africa. Int J Fertil. 1992;37(5):300-7.

7. Philippov OS, Radionchenko AA, Bolotova VP, Voronovskaya NI, Potemkina TV. Estimation of the prevalence and causes of infertility in western Siberia. Bull World Health Organ. 1998;76(2):183-7.

8. Sharon NC, Linda HB. Infertility counselling: A comprehensive handbook for clinicians. 2nd ed. USA: Cambridge University Press; 2006. 635 p.

9. Homan GF, Davies M, Norman R. The impact of lifestyle factors on reproductive performance in the general population and those undergoing infertility treatment: a review. Hum Reprod Update. 2007;13(3):209-23.

10. Yilmaz N, Kilic S, Kanat-Pektas M, Gulerman C, Mollamahmutoglu L. The relationship between obesity and fecundity. J Womens Health (Larchmt). 2009;18(5):633-6.

11. Schmidt L, Sobotka T, Bentzen JG, Nyboe Andersen A. Demographic and medical consequences of the postponement of parenthood. Hum Reprod Update. 2012;18(1):29-43.

12. Ganguly S, Unisa S. Trends of infertility and childlessness in India: findings from NFHS data. Facts Views Vis Obgyn. 2010;2(2):131-8.

13. Rutstein SO, Iqbal HS. Infecundity, Infertility, and Childlessness in Developing Countries. Calverton, Maryland, USA: ORC Macro and the World Health Organization; 2004 Sept. 74 p. DHS Comparative Reports No.: 9.

14. Larsen U. Primary and secondary infertility in sub-Saharan Africa. Int J Epidemiol. 2000;29(2):285-91.

15. Ombelet W, Cooke I, Dyer S, Serour G, Devroey P. Infertility and the provision of infertility medical services in developing countries. Hum Reprod Update. 2008;14(6):605-21.

16. Unisa S. Childlessness in andhra Pradesh, India: Treatment-seeking and consequences. Reprod Health Matters. 1999;7(13):54-64.

17. Ram U. Childlessness and its consequences in India: Levels, patterns and Differentials. Final Report. International Institute for Population Sciences, Mumbai, India; 2006 Sept. 308 p.

18. Greil AL. Infertility and psychological distress: a critical review of the literature. Soc Sci Med. 1997;45(11):1679-704.

19. Bharadwaj A. Culture, infertility and gender–vignettes from South Asia and North Africa. Sex Health Exch. 2002;2:14-5.

20. Phipps S. Men and women react differently to infertility. South Africa Today. 1993;122(2581):14-7.

21. Desai S, Hazra M. Understanding the emotions of infertile couples. J Obstet Gynaecol India. 1992;42:498-503.

22. Patel T. Fertility behaviour: population and society in a Rajasthan village. 1st ed. New Delhi: Oxford University Press; 1994. 77 p.

23. Dhaliwal LK, Khera KR, Dhall GI. Evaluation and two-year follow-up of 455 infertile couples–pregnancy rate and outcome. Int J Fertil. 1991;36(4):222-6.

24. Kakar DN. Traditional healers in North India: a study. Nurs J India. 1983;74(3):61-3.

25. Mulgaonkar VB. A research and an intervention programme on women's reproductive health in slums of Mumbai. 1st ed. Mumbai: Sujeevan Trust; 2001. 144 p.

26. International Institute for Population Sciences (IIPS), 2010. District Level Household and Facility Survey (DLHS-3), 2007-08, India. Mumbai: IIPS.

27. Statacrop. Stata Statistical Software: Release 10. College Station, TX: StataCrop LP; 2007.

28. Hormones and You: Patient Information Page [Internet]. The Hormone Foundation; 1998. Infertility and Women; 2005 April [cited 2011 Dec 21]. Available from: http://press.endocrine.org/doi/abs/10.1210/jcem.90.4.9997