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COST INCURRED AND SOURCE OF FINANCE FOR THE TREATMENT OF INFERTILITY

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Abstract

The cost of illness is dependent on many variables. These include the type of disease, the number and severity of complications as well as the demographic characteristics of the study population. In a heterogeneous society like India, with great disparity in earning, access to medical care, as well as, differing quality of care, it is very crucial that all factors are taken into account to get the correct picture. The lack of medical records makes it even more difficult to carry out such studies (Kapur, A., 2001). Direct economic costs of disease are those generated by the resources used in treating or coping with a disease, including expenditure for medical care and the treatment of the illness (hospital care, physician services, nursing home care, drugs and other medical needs). These direct costs are often easily measured by surveys and studies. Recently, researchers have also advocated the inclusion of direct non-medical costs, including the transportation costs of patients and costs of care-giving by family members (Sam K. G. et al., 2009).

Keywords: *medical care, physician services, nursing home care, male child, Assisted Reproductive Technologies, menstrual problems*

Introduction

In India, it is promoted that the women's worth depends on their child producing capacity especially male child. They reinforce the belief that a woman's role is to mother and that a woman's life is incomplete without bearing and mothering children. There are social reasons for why most couples want children and there is great pressure on the infertile woman to do something about it. The solution offered by today's society to deal with the 'problem' of infertility is the use of advanced medical technology. But medicine is increasingly becoming privatized, market-driven and high-tech. In the urban areas, there is no dearth of gynaecologists and infertility specialists offering high technology options. These services are available in the form of simple to complicated Assisted Reproductive Technologies (ART) depending on need and the ability to pay. They have physical, psychological, social, ethical and legal consequences. As, for most childless couples, Assisted Reproductive Technology appears as a boon, but the social costs of being infertile in such a society are high. The focus for the woman is not so much the experience of motherhood but the functional obligation of bearing a child.

There are no State supported services for infertility prevention and treatment. There is a focus on other reproductive health issues like anaemia, menstrual problems, safe deliveries, HIV prevention especially on safe motherhood, contraception and others. In India, the average cost of one cycle is between Rs.30000-Rs.50000 depending on the couple and the kind of clinic. Most couples undergo 3 to 4 cycles at least. The technology is obviously affordable only for a few. It is not offered in government hospitals, though some public-sector companies have begun reimbursing some percentage of the costs. Infertile patients incur a substantial amount of out-of-pocket expenses for physician services, medications, laboratory tests, and other services that require shared payments. Infertile patient are likely to incur not only higher total medical expenditures but also higher out-of-pocket expenses (Shodh Ganga, 2012).

Table 1 Costs of Female Infertility

Source: Anil Kapur (2007)

Direct Costs	Indirect Costs	Intangible Costs
Consultation Investigations Treatment Drugs Monitoring Visits Hospitalization Costs of treating Complications	Woman days lost Low productivity Disability payment Social security Depression	Pain and discomfort stress Anxiety Loss of enjoyment Insecurity Inconvenience Lower quality of life

Relationship between Selected Socio-economic Characteristics and total expenditure for Treatment of Infertility

An examination of the differential amount spent by the sample respondents for their infertility treatment across their selected background characteristics is appropriate here so as to understand which sub-groups of the sample respondents were able to spend more or less for treatment of infertility. Data is analysed accordingly with the help of mean amount spent across the different categories of the characteristics under consideration with one-way Analysis of Variance (F-test), and results are presented in Table 2.

Table 2 Mean Total Expenditure for Treatment of Infertility across their Selected Background Characteristics

Background Characteristics of Respondents	Categories of the Variables	N	Mean (in Rs.)	SD (in Rs.)	F-Ratio	p-value
Age (in Years)	25 and below	103	**88206**	90379	***16.946***	***0.001***
	26 – 30	179	**129569**	118252		
	31 – 35	104	**164988**	130702		
	36 and above	103	**205549**	156292		
Social Background	SC/ST	40	**95490**	87391	***4.826***	***0.001***
	MBC	78	**135026**	126533		
	BC	315	**144184**	125434		
	FC	56	**103521**	173650		
Educational Status	Primary@	60	**153440**	28165	0.706	.549
	Secondary	180	**144265**	135954		
	Higher secondary	63	**160378**	154393		

	Degree and above	153	**135307**	117209		
Type of Family	Nuclear Family	416	**138972**	128536	***5.814***	***0.05***
	Joint Family	73	**175288**	140878		
Background Characteristics of Respondents	**Categories of the Variables**	**N**	**Mean (in Rs.)**	**SD (in Rs.)**	**F-Ratio**	**p-value**
Family Size	3 and below	391	**141038**	130169	***7.121***	***0.001***
	4 – 5	50	**111754**	98433		
	6 and above	48	**205727**	150545		
Ever Employed	Not Employed	87	**155382**	142619	***4.932***	***0.05***
	Employed	202	**128781**	110715		
Duration of Marriage (in Years)	4 and below	210	**113878**	109550	***21.649***	***0.001***
	5 – 8	118	**126484**	112644		
	9 and above	161	**197323**	151862		
Migration Status	Not Migrated	456	**139618**	126722	***9.231***	***0.001***
	Migrated	33	**210375**	145140		
Type of Resident	Rented House	335	**129876**	119676	***13.408***	***0.001***
	Own House	154	**175974**	148178		
Source of Income	Wages / Salary	460	**139567**	128201	***10.748***	***0.001***
	Business	29	**220950**	151502		
Family Monthly Income (in Rs.)	15000 and below	141	**118892**	98890	***3.9666***	***0.01***
	15001 – 30000	152	**138844**	129656		
	30001 – 45000	147	**169460**	152958		
	45001 and above	49	**159790**	132568		
Family Monthly Expenditure (in Rs.)	8000 and below	177	**123199**	123812	***6.279***	***0.001***
	7001 – 12000	188	**142182**	125782		
	12001 and above	124	**176484**	142659		
Total Value of Assets (in Rs.)	No Assets	29	**102217**	92207	***4.498***	***0.001***
	150000 & below	144	**123899**	124856		
	150001 – 300000	144	**137270**	114569		
	300001 – 400000	92	**163777**	150116		
	450001 & above	82	**187105**	145498		
Total		**489**	**144393**	**130943**		

Note: @ = 6 Respondents who are Illiterates added in this category

Information given in panel 1 of Table 2, revealed that the average total cost for infertility treatment was somewhat lower among those respondents who belonged to the age group of 25 years and below (Rs. 88,206/-), which had consistently increased with an increase in their age and reached to a higher level of Rs. 2,05,549/- when respondents' age increased to 36 years and above. The ANOVA–test results between the mean total cost for infertility treatment and age categories of the respondents turned out as highly significant ($p<0.001$). With regard to the social background and mean cost of infertility treatment (panel 2 of Table 2), it was found that the respondents who belonged to the Backward Communities had spent fairly higher amount for treatment (Rs. 1,44,184/-) closely followed by those who belonged to the Most Backward communities (Rs. 1,35,026/-), whereas such cost was relatively lower in the case of those respondents who were from Scheduled Castes and Forward

Communities (Rs. 95,590/- and Rs. 1,03,521/-, respectively). Further, the ANOVA-test results in this regard also turned out as highly significant ($p<0.001$).

Educational status of the respondents supposed to play a vital role in deciding the amount to be spent for infertility treatment. When the data of present study was examined (panel 3 of Table 2), one can see that the respondents who studied up to higher secondary level of education had spent higher amount for the infertility treatment (Rs.1,60,378), followed by the respondents who have completed primary level of education (Rs.1,53,440), whereas such cost spent by the respondents with degree and above level of education was relatively lower (Rs.1,35,307/-) than the infertile patients with secondary level of school education (Rs.1,44,265). Thus, it is found that there was no consistent pattern of incurring cost for infertility treatment across their levels of educational status and thereby, one may conclude that the sample women had spent on infertility treatment regardless of their educational status. Such pattern gives the impression that becoming mother is more important to the women in Indian context, irrespective of their level of education. This has been further supported by the fact that the differentials in the cost of infertility treatment and education status of the respondents were not significant as per the ANOVA test results.

Information presented in panel 4 of the Table 2, showed that respondents belonged to Nuclear families had spent relatively lesser amount for infertility treatment (Rs.1,38,972/-) than those who belonged to Joint families (Rs.1,75,288/-). Further, one can also note these differentials cost for treatment of infertility across their type of family were statistically found to be moderately significant ($p<0.05$). Another family background factor, family size also appeared to be influencing the sum of cost to be spent for infertility treatment. For instance, from panel 5 of Table 2, it may be deduced that respondents who belonged to families that had 4–5 members had spent fairly lower amount of money for their infertility treatment (Rs.1,11,754/-) as compared to those who belonged to families that had 3 or less family members (Rs.1,41,038/-); however, it is conspicuous to note that such amount was strikingly higher (Rs.2,05,727) among those who belonged to large family size (6 and above members). The ANOVA test results between family size and the average cost incurred for infertility treatment were also emerged as highly significant ($p<0.001$). All these figures give the impression joint family as well as large size families might have motivated / persuaded the women (respondents) who were part of these to take treatment and get pregnant to beget the children even by spending large amounts.

Employment status (occupation/work status) of the respondents (women) also appeared to be influencing the cost incurred for their infertility treatment. From panel 6 of Table 2, it can be seen that respondents who were not employed had spent more amount of money for infertility treatment (Rs.1,55,382) as compared to their counterparts who were ever worked (Rs.1,28,781). The AVOVA test results too turned out as moderately significant ($p<0.05$) in this regard. However, the point to be borne in

mind here is that those women never worked had spent more money for infertility treatment than those who were ever worked and thus, this finding leads to the conclusion that employment of women had no role to play in spending more or less amount of money for infertility treatment so as to beget children.

Duration of marriage is another crucial factor in deciding the cost for infertility treatment. Generally, one can expect that as duration of marriage increases, the women would become more stress and tense, if they won't get pregnant that result into live births. In Indian context, such women would be more criticised and ill-treated both at the family level as well as community / society level. In view of this, women who have longer durations of marriage are likely to spent more amount of money for their infertility treatment. Data provided in panel 7 of Table 2, highlighted that the average cost of infertility treatment had shown an increasing trend with an increase in the duration of marriage of the respondents. For instance, it can be seen that the cost incurred for infertility treatment was fairly less among those whose duration of marriage was 4 years and less (Rs. 1,13,878/-), whereas such cost had increased to a moderate and then to a higher level (Rs.1,26,484/- and Rs.1,97,323/-, respectively), when their duration of had increased to 5–8 and then to 9 years and above, respectively. The AVOVA test results in this regard also turned out to be highly significant ($p<0.001$) and thus, supported the expected contention. Migration status of the respondents also noted to be playing some role in influencing the amount to be spent for infertility treatment. Data provided in panel 8 of Table 2, revealed that the average expenditure incurred on infertility treatment is comparatively much higher among those who were migrated to Coimbatore urban area (Rs. 2,10,375/-) as against to the non-migrants (who born and living in Coimbatore city itself; Rs. 1,39,818/-). Moreover, the ANOVA results also supported the differential cost on infertility treatment across their migration status to a highly significant extent ($p<0.001$).

Generally, economic status and related factors will have great bearing on the cost of infertility treatment in terms of affordability. Type of resident treated here as one of the economic factors had exhibited highly significant ($p<0.001$) effect on the cost of infertility treatment. Information given in panel 9 of Table 2, highlighted that respondents who were residing in own house spent fairly higher amount for the treatment of infertility (Rs.1,75,974/-) as compared to those who were dwelling in rented / leased houses (Rs,. 1,29,876/-). Source of income, another indicator of economic status, also appeared to be exercising large differentials in the cost of infertility treatment. For instance, from panel 10 of Table 1, one can observe that respondents whose source of income was 'own business' had spent fairly higher amount on infertility treatment (Rs. 2,20,950/-) than those who were earning income from the sources like 'wages / salary' (Rs.1,39,567/-). The ANOVA test results also turned out as statistically highly significant ($p<0.001$). These findings give an impression that those who live in own

house and also earning from own business will be better off in their economic status and thereby, able to spend higher money for treatment of infertility.

Family income is another indicator that indicates the overall economic status of the family and thereby, may exhibit positive association with the cost of infertility treatment. While examining the data from the present study (panel 11 of Table 2), it can be sees that the average cost incurred for infertility treatment noted to be relatively low among those who belonged to the lower family income bracket of Rs. 15,000/- and below (Rs. 1, 18,892/-), which had increased consistently to Rs. 1,38,844/- and then to Rs. 1,69,460/, respectively when their family incomes had increase to Rs 15,001 – Rs, 30,000/- and then to Rs 30,001-45,000/-.; however, such case had slightly lowered to a level of Rs. 1,59,790/- in spite an increase in the respondent' family income per month to Rs. 45001 and above. The ANOVA test results also supported these differentials in cost incurred for infertility treatment across their family income brackets to a higher extent ($p<0.01$). Likewise, the family monthly expenditure, another indicator of economic status, had showed a positive association with the cost of infertility treatment.

For instance, from panel 12 of Table 2, it is pertinent to note that average cost of infertility treatment was somewhat lower (Rs. 1,23,199/-) among those whose family monthly expenditure was relatively less (Rs. 8,000/- and below), which had increased to Rs. 1,42,182/- and then to Rs. 1,76,488/- in correspondence to an increase in the family monthly expenditures to Rs. 8001–12000/- and Rs. 12,001/- and above. The ANOVA test result in this regard also emerged as highly significant ($p<0.001$). Yet another precise and reliable indicator of economic status, total value of assets, had also showed a highly significant ($p<0.001$) positive association with the cost incurred on infertility treatment. For instance, the data from this study (panel 13 of Table 2) revealed that the average sum of money spent for infertility treatment was much lower among those who had no assets at all (Rs. 1,02,217/-), which had consistently increased with an increase in the total value of assets increased and reached strikingly to a higher level of Rs. 1,87,105/- among those who had a total assets value of Rs. 4,50,001/- and above. Thus, it can be deduced that the respondents who had higher total value of assets had the affordability to spent large sums of money for infertility treatment.

In sum, the cross-tabular analysis between the selected background characteristics of the respondents and their average cost of infertility treatment with one-way ANOVA highlighted that out of the 13 factors under consideration 12 factors, except educational status of the respondents, had exhibited significant associations (at different levels) with the average cost spent for infertility treatment. Among these both direct and indirect economic status indicators – family monthly income family monthly expenditure and total value of assets possessed as well as ever employed, source of income, type of resident and ever employed – had played a vital role in making a decision to spend large sums of money for infertility treatment. On the other hand, the

average amount of money spent for infertility treatment also found to be much higher among those who belonged to higher adult ages and durations of marriage, belonged to better social standing (caste) as well as among those who were part of large size families and joint families, and also among migrants than their respective counterparts.

Multiple Linear Regression Analysis on Total Cost Incurred for Treatment of Infertility

For identifying the factors that determine the total cost incurred for treatment of Infertility the multiple linear regression analysis is carried out and the results are presented in table 1.

Table 3 Results of Multiple Linear Regression Analysis on Total Cost Incurred for Treatment of Infertility

Explanatory Variables	Standardized Coefficient (ß)	t-value	p-value
Age (in Years)	0.096	1.716	0.087
Household Size (Members)	0.102	2.471	**0.01**
Family Monthly Expenditure (in Rs.)	0.037	0.848	0.397
Total Value of Assets (in Rs.)	0.104	2.325	**0.05**
Duration of Marriage (in Years)	0.280	5.019	**0.001**
Social Background (Ref. *SC/ST & MBC*) Backward & Forward Castes	0.088	2.154	**0.05**
Educational Status (Ref. *Up to Secondary School)* Higher Secondary and above	0.030	0.709	0.479
Migration Status (Ref. *Not Migrated*) Migrated	0.152	3.719	**0.001**
Source of Income (Ref. *Wages / Salary*) Business	0.096	2.236	**0.05**
R^2 (in per cent)	**22.3**		
Total Sample	**489**		

Determinants of Total Cost Incurred for Infertility Treatment

In the preceding section, gross differentials in the (average) total cost incurred for infertility treatment are examined through cross-tabular analysis with one-way ANOVA. These simple tabulations provide us a general understanding of the nature of relationship between the independent variables (background characteristics of respondents) and dependent variable (total cost incurred for infertility) on one to one basis and therefore, these are less conclusive. But in general phenomena, at a point of time, any dependent variable would not only be influenced by not only one independent variable but also by several other such variables. Under these circumstances, multivariate analysis allows us a more accurate assessment of each of the explanatory variable by taking into account the potential confounding effects of other variables used in the model. Such an analysis would help us to know the crucial determinants of the dependent variable under consideration, which would be very useful

to suggest policy implications and programmes for availing infertility services and treatment by women.

Keeping this in mind, an attempt is made here to analyse the principal determinants of total cost incurred for infertility treatment with the help of a multivariate technique. The dependent variable, total cost incurred for infertility treatment, treated here as a continuous variable in nature (i.e., actual amount spent in Indian Rupees) and hence, multiple regression analysis is felt to be most appropriate. The independent (explanatory) variables considered for analysis are based on the theoretical importance as well as their levels of significance with the dependent variable (except the educational status). Out of the 9 variable included in the model, 5 are continuous in nature and the other 4 are dummy variable type (2 categories only – for details see Table 3). More details about the multiple regression analysis are provided in the chapter on Methodology. Results based on multivariable analysis are provided in Table 3.

Data provided in Table 3 suggest that, among the sample infertile respondents, all the nine variables included in the model together have explained about 22.3 percent variation in total cost incurred for infertility treatment. Controlling for all the variables included in the model, the total const incurred for infertility treatment of the respondents tend to increase significantly with an increase in their duration of marriage as well as with the total value of assets they possess ($p<0.001$ and $p<0.01$, respectively). These results indicate that, on the one side, the tendency to spend more and money for infertile treatment is higher as the times lapse after marriage increasing, may be because of fear of not bearing children even at higher ages, more pressure from close relatives including spouse and also fear of difficult in getting pregnant during the later years of reproductive span. On the other side, women are able to spend lot of money for infertility treatment if they have large value of assets, since they are able to bear such cost with less hassle. Likewise, the total cost for infertility treatment of the sample respondents is observed to be fairly increasing with an increase in the household size and the results are turned out as moderately significant ($p<0.05$). Increase in the family or household size is likely to exhibit here the joint family sentiment, pressure from several members of the family for begetting children and also partially explaining through their earnings.

The positive net effects of current age and family monthly expenditure on the total cost incurred for infertility treatment are also worth to note, but while the t-test results in the case of former one did not turn out significant at 5 per cent level, similar results in the case of latter one is much lower and insignificant.

Among the categorised variables, it is conspicuous to note that the net positive effect of migrant status on the total cost spent for infertility treatment is significantly high ($ß= 0.152$; $p<0.001$) and thus, indicate that migrants to the city of Coimbatore (relatively have rural background) are spending lot of money for infertility treatment as

compared those who born and brought up in Coimbatore city. Similarly, social background and source of income of the respondent also have exhibited moderately significant net effects (ß= 0.088 and 0.096; $p<0.05$ in each case, respectively) on such cost. From these results one can interpret that infertile sample respondents belonged to Backward and Forward Communities (fairly higher in the social ladder in Indian society) and whose (husband's) main source of income is business have showed higher tendency to spend more money for their treatment related to infertility as compared to their respective counterparts viz., those belonged Scheduled Castes / Tribes and Most Backward communities and whose source of income is wages / salary. Educational status per se though appears to be positively influencing the total cost incurred for infertility treatment, the t-test results did not turned out significant.

In sum, the multiple regression analysis results on the total cost incurred for infertility treatment highlight that the such cost has increased significantly (at different levels) with an increase in the sample women's duration of marriage, total value of assets possessed and household size. Though such positive net effects also noted in the case of current age and family monthly expenditure, the t-test results did not turn out as significant. It is also striking to note that the total cost incurred for the treatment of infertility is higher and significant (at different levels) among those who have migrated to Coimbatore city, belonged to Backward and Forward communities, and whose source of income is business than their respective counterparts. Education has exhibited little bit positive net effect on the total cost for treatment, but in a significant way.

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