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Predictors of Adherence to Infertility Treatment among Women in Eastern Uttar Pradesh

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ABSTRACT

Background: Infertility is a significant public health concern, impacting millions of couples globally. Adherence to treatment plays a vital role in the successful management of infertility; however, many women encounter barriers that impede their ability to follow prescribed treatments. This study seeks to explore the factors influencing treatment adherence among infertile women in Eastern Uttar Pradesh.

Methods: A hospital-based study was conducted at the Department of Obstetrics & Gynaecology, Sir Sunderlal Hospital, Banaras Hindu University, from January 2024 to October 2024. A total of 106 infertile women were surveyed using a structured interview schedule. Data on socio-demographic characteristics, treatment adherence, and barriers were collected. Chi-square tests and logistic regression analyses were used to examine associations between treatment adherence and independent variables.

Results: The majority of respondents (40.6%) were aged 25-29 years, and 60.4% resided in rural areas. Socioeconomic status, duration of marriage, husband's education, and type of infertility were significantly associated with adherence. Women from the highest socioeconomic class were 15.6 times more likely to adhere (OR: 15.60, 95% CI: 1.72-140.82, $p = 0.014$). Women married for ≤5 years had higher adherence (OR: 6.45, 95% CI: 1.96-21.21, $p = 0.00$). Education also played a role; women with graduate-level education (OR: 2.81, 95% CI: 1.08-7.33, $p = 0.03$) and those whose husbands had higher education (OR: 5.84, 95% CI: 2.17-15.71, $p = 0.00$) were more likely to adhere.

Conclusion: Socioeconomic status, education, and marriage duration significantly influence adherence to infertility treatment. Strengthening financial support, improving healthcare access, and increasing awareness through education and counseling can enhance adherence. A multidimensional approach integrating financial, educational, and psychosocial support is essential to improving reproductive health outcomes.

Keywords: Infertility, Treatment Adherence, Socioeconomic Status, Education, Eastern Uttar Pradesh, Logistic Regression

INTRODUCTION

Infertility has become a growing global concern in recent years, causing significant distress for many individuals. Estimates indicate that approximately one in seven couples in the Western world and one in four couples in developing countries face infertility among women of reproductive age

[1]. Female infertility is defined as the inability to conceive after 12 months or more of unprotected sexual intercourse [2]. It is classified into two types: primary and secondary. Primary infertility refers to the inability to conceive despite one year of unprotected intercourse with no prior pregnancies, while secondary infertility occurs when a woman is unable to conceive again after a previous pregnancy. Globally, infertility affects approximately 186 million people [3]. Treatment adherence refers to the extent to which patients follow provider recommendations about day-to-day treatment with respect to the timing, dosage, and frequency. It may be defined as "the extent to which a patient acts in accordance with the prescribed interval, and dose of a dosing regimen [6]. Logistical barriers were the most commonly reported challenges affecting infertility treatment adherence. These included costs related to treatment, travel, as well as time constraints, distance to healthcare facilities, and overcrowding at treatment centres [4]. Economic constraints and limited access to healthcare facilities restrict the use of modern infertility treatments [5]. Treatment adherence plays a crucial role in determining the success of infertility interventions. Many factors contribute to women's non-adherence to infertility treatment, which can negatively impact treatment outcomes. Therefore, this study aims to identify the factors associated with adherence to infertility treatment.

MATERIAL AND METHODS

The study area is Department of Obstetrics & Gynaecology, Sir Sunderlal Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh. Which provides the health and treatment services to the population of eastern UP, western Bihar, MP, Jharkhand. This is a hospital-based study and it was conducted from January 2024 to October 2024, all cases fulfilling the definition of infertile women, fulfilling the inclusion and exclusion criteria and also given the written consent. Thus, this study is based on 106 infertile women.

Inclusion criteria:

(i) Married women within the age group (18–45 years)
(ii) Women who will provide written consent
(iii) Taking infertility treatment for at least one month

Exclusion criteria:

(i) Those with clinical diagnosis of infertility due to male causes.

Data collection:

This study employed a structured interview schedule to collect data on the socio-demographic characteristics of infertile women and their adherence to infertility treatment. The schedule included variables such as age, state of residence, current place of residence, religion, caste, education level, and socioeconomic status (SES). The economic status of participants was determined using the B.G. Prasad Classification scale.

In this study, treatment adherence is defined as the extent to which women consistently follow their prescribed infertility treatment. It is assessed through a binary response (Yes/No) to the question: "Do you always follow your infertility treatment?" A "Yes" response indicates consistent adherence to the prescribed regimen, while a "No" response signifies non-adherence or irregular adherence.

STATISTICAL ANALYSIS

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 28.0. Descriptive statistics, including frequencies and percentages, were used to summarize the background characteristics and treatment adherence of infertile women. The chi-square test was employed to examine the association between treatment adherence and socio-demographic variables. Additionally, binary and multiple logistic regression analyses

were performed to identify factors influencing treatment adherence.

RESULTS

Table 1 shows that the majority of respondents (40.6%) were in the 25-29 years age group, followed by 30-34 years (22.6%), indicating that most participants were in their prime reproductive years. A larger proportion of respondents (60.4%) resided in rural areas compared to urban areas (39.6%), reflecting a higher prevalence of infertility cases or healthcare-seeking behavior in rural settings. Geographically, most participants (67.9%) were from Uttar Pradesh, while the remaining (32.1%) were from Bihar and Jharkhand. Socioeconomic status was assessed using a standard BG prasad classification, with the largest proportion of respondents (40.6%) belonging to Class II, followed by Class III (25.5%) and Class IV & V (20.8%), while only a small percentage (13.2%) belonged to the highest economic class (Class I). Religion-wise, the study population was predominantly Hindu (90.6%), with Muslims accounting for 9.4%. Regarding caste distribution, a significant proportion belonged to the Other Backward Classes (OBC) (40.6%), followed by Scheduled Caste/Scheduled Tribe (SC/ST) (25.5%) and General category (13.2%). More than half of the respondents (55.7%) married for five years or less, 28.3% married for 6-10 years, and 16% married for 11 years or more. Education levels varied among respondents, with 38.7% having completed graduation or higher education, 31.1% studying up to higher secondary, and 30.2% only up to high school. A similar pattern was observed in their husbands' education levels, where half (50%) had completed graduation or above, while 27.4% and 22.6% had education up to high school and higher secondary, respectively. Infertility type was also assessed, revealing that 52.8% of women suffered from primary infertility, while 47.2% had secondary infertility.

Table 2 presents the association between various independent variables and treatment adherence among women undergoing infertility treatment. It categorizes treatment adherence into two groups: "Yes" (adherent) and "No" (non-adherent) and reports the frequency and percentage of participants in each category for different demographic, socioeconomic, and clinical characteristics. Socioeconomic status ($p = 0.016$) significantly influences treatment adherence, with higher adherence in Class I (92.9%). Duration of marriage ($p = 0.001$) shows a strong association, with adherence decreasing as marriage duration increases. Husband's education ($p = 0.000$) is significantly associated with adherence, where women whose husbands have a graduate and above education show higher adherence (75.5%). Type of infertility ($p = 0.037$) is significantly associated, with secondary infertility patients showing higher adherence (54%) than primary infertility patients (33.9%).

Table 3 presents the odds ratios (OR) with 95% confidence intervals (C.I.) and corresponding p-values from binary logistic regression analyses. Women from the highest socioeconomic class (Class I) were 15.6 times more likely to adhere to treatment compared to those in the lowest class (Class IV & V) (OR: 15.60, 95% CI: 1.72-140.82, p=0.014). Similarly, women who had been married for five years or less were 6.45 times more likely to follow treatment recommendations (OR: 6.45, 95% CI: 1.96-21.21, p=0.00). Education level played a crucial role in adherence. Women with graduate or higher education had significantly greater odds of adherence (OR: 2.81, 95% CI: 1.08-7.33, p=0.03) than those with only high school education. Similarly, husbands' education was strongly associated with adherence. Women whose husbands had graduation or higher education were nearly six times more likely (OR: 5.84, 95% CI: 2.17-15.71, p=0.00) to adhere to treatment compared to those whose husbands had only high school education. Regarding infertility type, women experiencing secondary infertility were 2.28 times more likely (OR: 2.28, 95% CI: 1.04-5.00, p=0.03) to adhere to treatment compared to those

with primary infertility.

Table 4 presents the results of a stepwise logistic regression analysis, identifying significant risk factors associated with the outcome variable. The analysis was conducted in a stepwise manner, where variables were included sequentially based on their significance, and the model's explanatory power (R^2) was assessed at each step. In the first step, the education level of the husband was identified as a significant predictor. Women whose husbands had completed graduate and above education were 5.84 times more likely to exhibit the outcome variable compared to those whose husbands had an education level of up to high school (reference category) (OR = 5.84, 95% CI: 2.17–15.71, p = 0.000). In the second step, duration of marriage was added as another significant predictor. Women who had been married for ≤ 5 years were 4.43 times more likely to exhibit the outcome compared to those married for ≥ 11 years (reference category) (OR = 4.43, 95% CI: 1.24–15.76, p = 0.021). The education level of the husband remained significant in this step as well. Graduate and above education remained a strong predictor (OR = 5.45, 95% CI: 1.87–15.91, p = 0.002).

Table 1: Background characteristics of the respondents

Variables	Frequency	Percentage
Age group		
20-24	23	21.7
25-29	43	40.6
30-34	24	22.6
35-39	16	15.1
Residence		
Rural	64	60.4
Urban	42	39.6
State		
Uttar Pradesh	72	67.9
Bihar & Jharkhand	34	32.1
SES		
Class I	14	13.2
Class II	43	40.6
Class III	27	25.5
Class IV and Class V	22	20.8
Religion		
Hindu	96	90.6
Muslim	10	9.4
Caste		
General	30	13.2
OBC	60	40.6
SC/ST	16	25.5
Duration of Marriage (Years)		
≤ 5	59	55.7
6-10	30	28.3
≥11	17	16
Education Level of respondent		
Up to High School	32	30.2
Up to Higher Secondary	33	31.1
Graduate and above	41	38.7
Education Level of respondent’s husband		
Up to High School	29	27.4
Up to Higher Secondary	24	22.6
Graduate and above	53	50
Type of Infertility		
Primary	56	52.8
Secondary	50	47.2

Table 2: Association of treatment adherence with independent variables

Independent Variables	**Treatment Adherence**		**p value**
	Yes	**No**	
Age group	Number (%)	Number (%)	
20-24	14(60.9)	9(39.1)	
25-29	27(62.8)	16(37.2)	0.351
30-34	13(54.2)	11(45.8)	
35-39	6(37.5)	10(62.5)	
Residence			
Rural	39(60.9)	25(39.1)	0.266
Urban	21(50)	21(50)	
State			
Uttar Pradesh	37(51.4)	35(48.6)	
Bihar & Jharkhand	23(67.6)	11(32.4)	0.115
Socioeconomic Status			
Class I	13(92.9)	1(7.1)	0.016
Class II	25(58.1)	18(41.9)	
Class III	12(44.4)	15(55.6)	
Class IV and Class V	10(45.5)	12(54.5)	
Religion			
Hindu	55(57.3)	41(42.7)	0.658
Muslim	5(50)	5(50)	
Caste			
General	19(63.3)	11(36.7)	0.223
OBC	35(58.3)	25(41.7)	
SC/ST	6(37.5)	10(62.5)	
Duration of Marriage (Years)			
≤ 5	43(72.9)	16(27.1)	0.001
6-10	12(40)	18(60)	
≥11	5(29.4)	12(70.6)	
Education Level of respondent			
Up to High School	13(40.6)	19(59.4)	
Up to Higher Secondary	20(60.6)	13(39.4)	0.083
Graduate and above	27(65.9)	14(34.1)	
Education Level of respondent's husband			
Up to High School	10(34.5)	19(65.5)	0.000
Up to Higher Secondary	10(41.7)	14(58.3)	
Graduate and above	40(75.5)	13(24.5)	
Type of Infertility			
Primary	19(33.9)	37(66.1)	0.037
Secondary	27(54)	23(46)	

Table 3: Results from Binary logistic Regression Analysis

Variables	**OR (95% C.I.)**	**p value**	**R Square (%)**
SES			
Class I	15.60(1.72-140.82)	0.014	14.4
Class II	1.66(0.59-4.69)	0.333	
Class III	0.96(0.31-2.97)	0.944	
Class IV and Class V(Ref.)			
Duration of Marriage (Years)			
≤ 5	6.45(1.96-21.21)	0.002	17.9
6-10	1.60(0.44-5.71)	0.469	
≥11(Reference)			
Education Level of respondent			
Up to High School (Ref)			
Up to Higher Secondary	2.24(0.83-6.06)	0.110	6.1
Graduate and above	2.81(1.08-7.33)	0.034	
Education Level of respondent's husband			

Up to High School			
Up to Higher Secondary	1.35(0.44-4.14)	0.592	18.9
Graduate and above	5.84(2.17-15.71)	0.000	
Type of Infertility			
Primary (Ref)			
Secondary	2.28 (1.04-5)	0.039	5.4

Table 4: Results from Stepwise Logistic Regression Analysis

Steps	Significant risk factors	OR (95% CI)	p value	R Square (%)
Step 1st	Education Level of respondent's husband			
	Up to High School (Ref)			18.9
	Up to Higher Secondary	1.35(0.44-4.14)	0.592	
	Graduate and above	5.84(2.17-15.71)	0.000	
Step 2nd	Duration of Marriage (Years)			30.1
	≤ 5	4.43(1.24-15.76)	0.021	
	6-10	1.06(0.26-4.22)	0.933	
	≥11(Reference)			
	Education Level of respondent's husband			
	Up to High School (Ref)			
	Up to Higher Secondary	1.55(0.46-5.19)	0.473	
	Graduate and above	5.45(1.87-15.91)	0.002	

DISCUSSION

The present study explored the factors influencing infertility treatment adherence among women. The findings indicate that socioeconomic status, duration of marriage, education level of both the respondent and her husband, and type of infertility play crucial roles in determining adherence to treatment. One of the key findings was the significant association between socioeconomic status (SES) and adherence. Women from the highest SES class were more likely to follow treatment recommendations than those from lower SES groups. This could be attributed to better financial resources, improved healthcare access, and greater awareness regarding infertility treatments [7]. The duration of marriage was another significant factor. Women who had been married for ≤5 years showed higher adherence compared to those married for ≥11 years. This could be due to the societal pressure on newly married couples to conceive, making them more committed to seeking and following treatment. In contrast, women married for a longer duration might experience treatment fatigue or psychological distress due to repeated failures, leading to lower adherence [8]. Education level played a crucial role in adherence. Women with graduate or higher education were significantly more likely to adhere to treatment compared to those with lower educational attainment. This aligns with existing research indicating that education improves health literacy, awareness, and the ability to make informed decisions regarding treatment [9]. Furthermore, husbands' education was also a strong predictor of adherence. Women whose husbands had graduate-level education were nearly six times more likely to adhere to treatment. This underscores the importance of spousal support and shared decision-making in infertility management. Couples with higher educational levels may have better communication and a stronger commitment to the treatment process [9].

Limitations

Despite offering valuable insights, this study has certain limitations. The relatively small sample size may restrict the generalizability of the findings. Additionally, since treatment adherence was self-reported, there is a possibility of recall bias or social desirability bias. Future research involving larger and more diverse populations, along with longitudinal study designs, could provide a more comprehensive understanding of the long-term factors influencing infertility treatment adherence.

CONCLUSION

Higher education, husband's higher education level, better socioeconomic status, and shorter marriage duration were associated with better treatment adherence. Strengthening health education, financial support, and accessible healthcare policies is essential to enhancing treatment adherence and improving reproductive health outcomes.

Declaration by Authors

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