A STUDY ON THE KNOWLEDGE ABOUT INFERTILITY AND THE PSYCHOLOGICAL IMPACT OF ANXIETY AND DEPRESSION AMONG INFERTILITY PATIENTS AT TERTIARY CARE HOSPITAL, ERODE

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ABSTRACT

Introduction

Individuals of reproductive age around the globe face infertility, largely driven by urban development and lifestyle changes. Anxiety and depression often have a significant effect on the success rates of infertility treatments, women undergoing infertility treatments experience higher levels of pregnancy-related anxiety. While the relationship between stress and the outcomes of assisted reproductive technology is not well-defined, psychological interventions may help reduce discomfort and enhance the chances of conception, highlighting the importance of counselling in infertility treatments. There is a lack of understanding about infertility, which includes misunderstandings related to gender roles and lifestyle factors. Recognizing the gaps in knowledge concerning the causes, treatments, and lifestyle aspects of infertility among infertility patients enables more personalized education, enhanced outcomes, and informed decision-making during their reproductive journey.

Objective

This study aims to assess the knowledge of infertility and the psychological impact of anxiety and depression among infertility patients.

Methodology

A cross-sectional observational study was conducted to evaluate the knowledge of infertility as well as the psychological effects of anxiety and depression among infertility patients at tertiary care hospitals, spanning from December 2022 to August 2023. The study involved 151 participants aged between 23 and 49, with a 7% margin of error, and a sample size of 138 was calculated using RAO software. A custom-developed questionnaire was employed to gauge participants' awareness of infertility, while the Hamilton Anxiety Scale was utilized to measure anxiety levels, and the Centre for Epidemiologic Studies Depression Scale was used to assess depression in patients undergoing infertility treatments. Patients receiving unrelated therapies or those who opted out of participation were excluded from this study, which included infertility patients of both sexes.

Results and Discussion

Based on the study depression, anxiety and knowledge of infertility were 77.48%, 51.65%, and 35.09% respectively. The participants based on education and psychological conditions found that highly educated people (48.64%) had more knowledge about infertility and psychological conditions were less in educated people. **Conclusion**: This study provided how knowledge on infertility and the psychological impact related to depression and anxiety in infertile patients, raising awareness about mental health problems among infertile patients.

Keywords

Infertility, Depression, Anxiety, Assisted Reproductive Technology, Knowledge

Introduction

Couples of reproductive age experience infertility worldwide, which is fueled by urbanization and changes in lifestyle [1]. The treatment outcomes for people with infertility are typically impacted by anxiety and despair. Success rates during Assisted Reproductive Technology (ART), particularly in vitro fertilization (IVF), are lowered by stress and elevated cortisol. worry is more common in women, and lower success rates in pregnancy are associated with higher levels of pre-oocyte retrieval worry [2]. Pregnancy-specific anxiety is higher in IVF women, although it is uncertain how this may affect their long-term mental health and stress levels [3]. Anxiety and sadness are more likely to occur when there is infertility since it causes significant emotional anguish. Although the impact of stress on ART outcomes is unclear, psychological therapies have the potential to lower discomfort and increase the likelihood of conception, underscoring the significance of counseling in the treatment of infertility [4]. There is a dearth of knowledge on infertility, including misconceptions regarding gender roles and lifestyle issues. Education can reduce these gaps by emphasizing the value of campaigns and factual resources that promote prompt treatment [5]. The ramifications of infertility include emotional responses, a sense of helplessness, impacts on beliefs, identity, and self-worth, as well as implications on social interactions [6]. Because of the general lack of knowledge about infertility, there are many myths and misconceptions. One prominent method used by many to manage infertility concerns is alternative medicine [7]. Social isolation can result from infertile couples hiding their emotions, particularly from friends or parents who are expecting. Men's self-esteem may suffer and emotional anguish may increase as a result of this retreat, which can lead to psychological stress that may have an adverse effect on male fertility and semen quality [8]. By identifying knowledge gaps on causes, treatments, and lifestyle variables related to infertility, an assessment of infertility in IVF patients facilitates more individualized education, improved results, and well-informed decision-making throughout their reproductive journey. The psychological effects of anxiety and depression on infertile patients are also assessed, with an emphasis on the frequency and severity of these diseases, in order to explore the ways in which infertility influences mental health. It aims to comprehend patients' emotional struggles as well as the things that exacerbate their anxiety and despair. Healthcare professionals can enhance patient well-being by implementing more effective support systems, such as counseling and mental health therapies, by addressing these consequences. Together, these evaluations form the basis for individualized treatment plans that attend to infertility patients' emotional and reproductive health requirements.

Methods

A study on the knowledge about infertility and the psychological impact of anxiety and depression among infertility patients at tertiary care hospital, Erode. The ethics committees of the hospital and college approved the study. The nine-month observational cross-sectional study was carried out at a tertiary care hospital in Erode between December 2022 and August 2023. A 7% margin of error and a sample size of 138 were determined using RAO software. Nevertheless, 151 samples were

gathered in order to adjust for such problems and produce reliable, representative findings. The hospital was where the data was collected. Patients undergoing therapies unrelated to infertility or unwilling to participate were excluded from the study, which included IVF patients of both genders who were hospitalized and aged 23 to 49.

Study Procedure

The study employed established measures for depression and anxiety plus a self-made questionnaire to assess participants understanding of infertility. Using particular inclusion and exclusion criteria, a sample of 151 participants was gathered. After requesting sociodemographic data includes name, age, gender, marital status, and educational attainment, the questionnaire included nine questions about infertility knowledge. Knowledge was categorized as "good" (score ≥13) or "poor" (score <13), with the following scoring options: Maybe (1), Yes (2), Don't Know (0), and No (0). A total score range of 0-56 was used to quantify anxiety using the Hamilton Anxiety Scale, which consists of 14 questions with scores ranging from 0 (not present) to 4 (severe). Scores <17 indicate mild severity, 18-24 mild to moderate, and 25-35 moderate to severe. With a total score ranging from 0 to 60, depression was measured using the Centre for Epidemiologic Studies Depression Scale, which consists of 20 questions with scores ranging from 0 to 3. Higher scores indicate more severe symptoms.

Participants and Data Collections

Patient or caregiver informed consent was acquired for the study, which was carried out at a tertiary care hospital. In-person, the patients received the surveys.

Statistical Procedure

The statistical method used here is the Chi Square test. By applying statistical procedure, the association between knowledge about infertility, anxiety, and depression was evaluated and analyzed. The data collected were tabulated, analyzed, and interpreted using standard statistical tools, the statistical procedure was undertaken with the help of the statistical package JASP version 18.0. The p-value less than or equal to 0.05 was fixed as the level of significance.

Results

The understanding of infertility and its psychological effects, with a particular focus on depression and anxiety, are evaluated among infertility patients at a tertiary care hospital in Erode. The main goals are to examine the patients' comprehension of infertility, assess their depression and anxiety levels, and investigate the relationship between their knowledge and psychological consequences. By looking at these variables, this section provides clarification on the connection between patients' mental health and their awareness of infertility, improving our comprehension of how knowledge may affect infertility patients' emotional reactions.

Table 1: Presents the socio-demographic details of the study participants, which include variables such as gender, age, marital status, education level, and types of infertility.

SOCIO DEMOGRAPHIC FACTORS		FREQUENCY	PERCENTAGE
Gender	Male	38	25.16%
	Female	113	74.83%
Age	23-33 years	101	66.88%
	34-43 years	46	30.46%
	44 & above	4	2.64%
Educational Status	Below SSLC	36	23.84%
	SSLC	37	24.50%
	HSC	28	18.54%
	Degree	50	33.11%
Types of Infertility	Primary Infertility	36	23.84%
	Secondary Infertility	37	24.50%

The sociodemographic details of the research participants are summarized in this table. The sample comprises 151 people in total, with a gender distribution of 74.83% female (n=113) and 25.16% male (n=38). The ages of the participants are divided into three groups: 2.64% are aged 44 or more, 30.46% are aged 34–43, and 66.88% are aged 23–33. The educational backgrounds of the participants are diverse. About 23.84% of people have less than an SSLC (Secondary School Leaving Certificate), 24.50% have finished SSLC, 18.54% have an HSC (Higher Secondary Certificate), and 33.11% have a high school diploma. In terms of the different forms of infertility, 23.84% of participants are primary infertile, and 24.50% are secondary. Through the provision of a participant profile, these sociodemographic insights aid in placing the study findings in perspective.

Table 2: Knowledge about infertility in infertility patients

S. No	Statement	Response	Frequency	Percentage
1.	Infertility should be treated	Yes	85	56.29%
		No	9	5.96%
		May be	41	27.15%
		Don't Know	16	10.59%
2.	Infertility is a serious medical condition	Yes	42	27.81%
		No	36	23.84%
		May be	47	31.12%
		Don't Know	26	17.21%
3.	An ovulation is the release of an egg from, the ovary	Yes	77	50.99%
		No	16	10.59%
		May be	39	25.82%
		Don't Know	19	12.58%
4.		Yes	78	51.65%

	The egg that a woman releases from her ovary lives for 12-24 hours if it is not fertilized	No	9	5.96%
		May be	28	18.54%
		Don't Know	36	23.84%
5.	Normal menstrual cycle length ranges between 21-35 days	Yes	77	50.99%
		No	11	7.28%
		May be	42	27.81%
		Don't Know	21	13.90%
6.	Ovulation always occur on the 14th day of each menstrual cycle	Yes	81	53.64%
		No	13	8.60%
		May be	27	17.88%
		Don't Know	30	19.86%
7.	The age between 20-30 is easier to get pregnant	Yes	63	41.72%
		No	5	3.31%
		May be	56	37.08%
		Don't Know	27	17.88%
8.	Infertility risk factors are: stress, smoking, alcohol consumption, over 35 years.	Yes	47	31.12%
		No	5	3.31%
		May be	64	42.38%
		Don't Know	35	23.17%
9.	After 1 year of unprotected sex without becoming pregnant, the couples need to consult the fertility specialist	Yes	53	35.09%
		No	3	1.98%
		May be	41	27.15%
		Don't Know	54	35.76%

This dataset identifies significant knowledge gaps by examining infertile patients' awareness of risk factors, reproductive health, and infertility therapy. While 27.15% are unsure, 56.29% think infertility should be addressed. Infertility is not considered a serious medical problem by 27.81% of people, and many are unaware (17.21%) or unsure (31.12%). There is some basic information of menstrual cycles and ovulation (50.99%), yet there are also some misconceptions, such as the idea that ovulation usually happens on the fourteenth day (53.64%). Only 31.12% of respondents are aware of risk factors including age and stress, and 23.17% are unsure. There is also a low awareness of the impact of age on fertility (41.72%). In addition, 35.76% are nervous and just 35.09% are aware that they should see a specialist after a year of unprotected sexual activity. These observations emphasize how important it is to provide patients with thorough infertility knowledge.

Table 3: Level Of Knowledge About Infertility

Category	**Gender**		**Frequency**	**Percentage**
	Male	**Female**		
Good	13	40	53	35.09%
Poor	25	73	98	64.90%

This data classifies the knowledge levels of infertility patients as "Good" or "Poor," with a gender-specific division. 13 men and 40 women made up the 35.09% of respondents (53 people) who demonstrated "Good" knowledge. On the other hand, 64.90% (98 people), comprising 25 men and 73 women, showed "Poor" knowledge. Given that the majority of patients now exhibit a lack of understanding, this distribution suggests that both genders need more education regarding infertility.

Table 4: Associations Between Knowledge About Infertility and Selected Sociodemographic Profile

Demographic Variables		**Frequency**	**Good (Frequency/ percentage)**		**Poor (Frequency/ percentage)**		**Chi Square**	**P Value**
			F	**%**	**F**	**%**		
Education	Below SSLC	36	4	11.11%	32	88.88%	13.000	0.005 Significant
	SSLC	37	18	38%	19	62%		
	HSC	28	12	42.85%	16	57.14%		
	Degree	50	19	48.64%	31	51.35%		

The table illustrates the connection between infertility knowledge and educational attainment. Only 11.11% of those with schooling below SSLC showed strong knowledge, while 88.88% showed inadequate knowledge, indicating a significant knowledge gap. 38% of the SSLC group demonstrated a better understand, indicating a more balanced distribution of knowledge. Knowledge levels increased among degree holders (48.64%) and in the HSC group (42.85%), indicating a correlation between higher education and more knowledge. A significant correlation is shown by a chi-square test ($p = 0.005$), highlighting the significance of educational programs to increase awareness of infertility.

Table 5: Gender Wise Anxiety and Depression

Gender	**Frequency/ Percentage**	**Anxiety(Frequency/ Percentage)**			**Depression (Frequency/ Percentage)**			
		<17	**18-24**	**Above 25**	**0-15**	**16-30**	**31-45**	**46-60**
Male	38 25.16%	17 44.7%	8 21.05%	13 34.21%	3 7.89%	18 47.36%	17 44.7%	0
Female	113 74.83%	56 49.5%	19 16.81%	38 33.6%	31 27.4%	42 37.1%	40 35.39%	0

The 18–24 age group has the highest anxiety levels among males (n=38), with 44.7% expressing moderate anxiety (scores between 16–30). The percentage of men over 25 who exhibit substantial anxiety is just 7.89%. This tendency is reflected in depression levels, with 47.36% of younger boys reporting minor depression (scores between 0-15). On the other hand, anxiety and depression rates are higher among females (n=113). 49.5% of people in the 18–24 age range report having mild anxiety, whereas 33.6% of those in the 31–45 age range report having moderate anxiety. In addition, 35.39% of women in all age groups have some level of depression symptoms. According to this investigation, younger people of both sexes who exhibit higher levels of anxiety and despair require focused mental health treatment**.**

Table 6: Associations Between Educational Status and Anxiety

Educational Status	**F**	**P**	**Anxiety Score (Frequency/ Percentage)**			**Chi - Square**	**P - Value**
			< 17	**18-24**	**>25**		
Below SSLC	36	23.84%	2 5.5%	5 13.88%	29 80.55%	106.685	< 0.001 Significant
SSLC	37	24.50%	4 10.81%	14 37.83%	19 51.35%		
HSC	28	18.54%	22 78.57%	4 10.81%	2 25.5%		
Degree	50	33.11%	45 90%	4 10.81%	1 2%		

The table examines the connection between anxiety ratings and educational attainment. Of those with lower SSLC (n=36), 80.55% had severe anxiety (scores >25) and just 5.5% had minor anxiety (scores <17). 10.81% scored below 17 and 51.35% scored above 25 for SSLC holders (n=37). Of those in the HSC category (n=28), only 10.81% expressed modest anxiety, while 78.57% experienced severe anxiety. 90% of degree holders (n=50) received scores over 25, and only 2% received scores below 17. The p-value of less than 0.001 and the chi-square statistic of 106.685 indicate a significant relationship between anxiety levels and educational status, indicating that anxiety is positively correlated with lower educational achievement and emphasizing the need for focused mental health interventions.

Table 7: Associations Between Educational Status and Depression

Educational Status	**F**	**Depression Score(Frequency/ Percentage)**				**Chi - Square**	**P - Value**
		0-15	**16-30**	**31-45**	**46-60**		
Below SSLC	36	1 2.77%	7 19.4%	28 77%	0		
SSLC	37	0	12 32.44%	25 67.56%	0	98.728	0.001 Significant

HSC	28	5 17.85%	21 75%	2 7.14%	0		
Degree	50	28	20 40%	2 4%	0		

The table indicates a significant relationship between individuals' depression levels and their educational status (Chi-square = 98.728, p = 0.001). 77% of people who were below SSLC had depression ratings between 31 and 45, whereas 67.56% of SSLC participants had lower depression scores between 31 and 45. 75 percent of HSC students scored between 31 and 45, and those with degrees had the lowest levels of depression (just 4%). This shows that lower depression levels are associated with better educational status.

Table 8: Associations Between Knowledge on Infertility and Anxiety

Score	**N=151**	**Good Knowledge (Frequency/ Percentage)**	**Poor Knowledge (Frequency/ Percentage)**	**Chi – Square**	**P - Value**
<17	73	42 57.53%	31 42.46%	37.929	0.001 Significant
18-24	27	9 33.33%	18 66.66%		
Above 25	51	2 3.92%	49 96.07%		

The relationship between 151 participants' anxiety levels and their understanding of infertility is displayed in the table. 42.46% of the <17 group had low knowledge, compared to 57.53% who had strong knowledge. 33.33% of those with scores between 18 and 24 demonstrated good knowledge, while 66.66% demonstrated inadequate knowledge. The >24 group showed a considerable correlation between anxiety and knowledge, with only 3.92% having good knowledge and 96.07% having inadequate knowledge. This strong association is confirmed by the Chi-square test (p = 0.001), which implies that higher anxiety levels may affect knowledge of infertility.

Table 9: Associations Between Knowledge on Infertility and Depression

Depression Level	**N=151**	**Good Knowledge (Frequency/ Percentage)**	**Poor Knowledge (Frequency/ Percentage)**	**Chi - Square**	**P - Value**
0-15	34	15 (44.1%)	19 (55.8%)	7.887	0.019 Significant
16-30	60	13 (21.6%)	47 (78.3%)		
31-45	57	25 (43.85%)	32 (56.14%)		
46-60	0	0	0		

The correlation between 151 participants' knowledge of infertility and their depression levels is shown in the table. 44.1% of people with depression levels between 0 and 15 had strong knowledge, compared to 55.8% who had poor knowledge. Merely 21.6% of the 16–30 group demonstrated strong knowledge, while 78.3% demonstrated inadequate knowledge. There was a little improvement in the knowledge of the 31–45 group, with 43.85% having strong knowledge and 56.14% having poor knowledge. The 46–60 age group did not have any participants. There is a significant correlation between higher levels of depression and less awareness regarding infertility, according to the chi-square test ($p = 0.019$).

Table 10: Level Of Anxiety, Depression and Knowledge About Infertility

IVF Patients in our Study	**ANXIETY (N= 151)**	**DEPRESSION (N = 151)**	**Knowledge About Infertility (N = 151)**
N = 151	78 (51.65%)	117 (77.48%)	53 (35.09%)

In a study of 151 IVF patients, a substantial psychological burden was indicated by 51.65% reporting anxiety and 77.48% reporting depression. Significant understanding of infertility was only demonstrated by 35.09% of respondents, suggesting a knowledge gap that may affect results. In fertility treatments, this emphasizes the importance of addressing mental health and education.

Discussion

Higher educated people are more likely to comprehend and be aware of infertility, the study found, emphasizing the significance of focused educational interventions, particularly for those with less education. Higher education was associated with significantly higher knowledge of different aspects of infertility, according to a comparable cross-sectional study by **Vinita Singh et al., 2023,** which also revealed notable variations in mean knowledge scores. At the moment, the majority of patients show little comprehension, suggesting that more education about infertility needs to be focused on both sexes **Dong-Li Mei, 2021.** Male and female infertile patients frequently have unfavourable attitudes and inadequate IVF understanding. Raising awareness and improving treatment satisfaction may encourage more optimistic sentiments and improve the results of IVF treatments. Additionally, young people of both sexes who have high levels of anxiety and depression require focused mental health therapies. The psychological burden of initial infertility cases is higher than that of secondary instances, according to **Kalpana Singh et al., Feb. 2020**. This highlights the significant influence of infertility on anxiety and depression in both male and female patients. The study also raises the possibility that psychological and educational status are significantly correlated, suggesting that people with less education are more prone to struggle psychologically, highlighting the need for targeted mental health care. Infertile women with higher educational attainment had better psychosocial adjustment than those with lower educational performance, according to **Dogar, I. A., et al.** (2008), suggesting a useful psychosocial component in the research of infertility, that could inform further research.

Conclusion

In this study, we evaluated the psychological impacts of infertility and the knowledge of those who are more prone to anxiety and sadness based on their educational backgrounds. We discovered that those who had a degree scored better on knowledge tests, suggesting a clear correlation between educational attainment and mental health issues including despair and anxiety. When we examined psychological conditions according to the probability of experiencing anxiety and depression, we found that anxiety was more common in people with less than SSLC education, whereas depression was more common in people with SSLC education. According to our research, people who know less are more likely to experience psychological difficulties, especially when undergoing infertility therapy. Public awareness campaigns and infertility education seminars, particularly for recently weds, are advised as a means of alleviating this. Throughout treatment, couples pursuing infertility therapy should have their psychological well-being regularly assessed as this could lead to better patient outcomes.

Limitations

A gender imbalance was evident in our study measuring infertility knowledge, as there were significantly more females than males. Because of this unequal distribution, it is more difficult for us to assess knowledge levels across genders. Additionally, participant discomfort made it difficult for some people to directly answer some of the items on the questionnaire we created for the study, which resulted in a reduced sample size. In addition, we encountered challenges in investigating each distinct category when comparing infertility diseases like primary and secondary infertility because of their significant and subtle variances.

Recommendations

We advise doctors and other healthcare professionals to emphasize patient comfort as a crucial consideration when advising patients receiving infertility therapy, based on the study's findings. Physicians must speak in a way that reassures patients and helps them realize that they are not burdened by their circumstances. This method can create a nurturing atmosphere that gives patients the confidence to feel appreciated and understood during their course of treatment.

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References

1. Bapayeva G, Aimagambetova G, Issanov A, Terzic S, Ukybassova T, Aldiyarova A, et al. The Effect of Stress, Anxiety and Depression on In Vitro Fertilization Outcome in Kazakhstani Public Clinical Setting: A Cross-Sectional Study. Journal of Clinical Medicine. 2021 Mar 1;10(5):937.
2. Gdańska P, Drozdowicz-Jastrzębska E, Grzechocińska B, Radziwon-Zaleska M, Węgrzyn P, Wielgoś M. Anxiety and depression in women undergoing infertility treatment. Ginekologia Polska. 2017 Feb 28;88(2):109–12.
3. Oup.com. 2024 [cited 2024 Sep 30]. Available from: https://academic.oup.com/humrep/article/33/7/1237/5001646
4. Rooney KL, Domar AD. The relationship between stress and infertility. Dialogues in clinical neuroscience [Internet]. 2018;20(1):41–7. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6016043/
5. Ahmed HM, Khan M, Yasmin F, Jawaid H, Khalid H, Shigri A, et al. Awareness Regarding Causes of Infertility Among Out-patients at a Tertiary Care Hospital in Karachi, Pakistan. Cureus. 2020 Apr 16;12(4).
6. Dunkel-Schetter C, Lobel M. Psychological Reactions to Infertility. Infertility. 1991;29–57.
7. Ali S, Sophie R, Imam AM, Khan FI, Ali SF, Shaikh A, et al. Knowledge, perceptions and myths regarding infertility among selected adult population in Pakistan: a cross-sectional study. BMC Public Health. 2011 Oct 4;11(1).
8. Simionescu G, Doroftei B, Maftei R, Obreja BE, Anton E, Grab D, et al. The complex relationship between infertility and psychological distress (Review). Experimental and Therapeutic Medicine. 2021 Feb 1;21(4).
9. Singh V, Rajpal G, Majumdar S, Mandal S, Sahu R. Awareness, knowledge, and psycho-emotional aspect of infertility among women seeking fertility assistance at a tertiary care hospital in Chhattisgarh, a cross-sectional study. Journal of Education and Health Promotion [Internet]. 2023 Jan 31; 12:3. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10079196/
10. Mei DL. Awareness and Attitudes Toward In Vitro Fertilization in Patients with Infertility: A Cross-Sectional Study. [cited 2024 Jan 16]; Available from: https://www.tmrjournals.cn/public/articlePDF/20210320/50faa918083deed743d0ddbd70041c4e.pdf
11. Singh, K., Shashi, K., Rajshee, K., Sinha, S., & Bharti, G. (2020). Assessment of depression, anxiety and stress among Indian infertile couples in a tertiary health care centre in Bihar. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 9(2), 659+. http://dx.doi.org/10.18203/2320-1770.ijrcog20200354
12. Imtiaz Ahmad Dogar, Parveen B, Sumaira Kousar, Sadia Musharraf, Masood A, Afzal S. Psychosocial Adjustment of Educated and Uneducated Infertile Females of Pakistan. Annals of Punjab Medical College [Internet]. 2014 [cited 2024 Oct 31];2(2):108–12. Available from: https://www.apmcfmu.com/index.php/apmc/article/view/612.