Dr. V. Lazar

American Journal of Psychiatric Rehabilitation

Original Article

Reproductive Healthcare Professionals' Perspective on anxiety stages of Women undergoing IVF Treatment: A Qualitative Investigation

Gangadhar Bareddy[1], Dr. V. Lazar[2*], Dr. Srividya Parvathaneni[3]

[1]Gangadhar Bareddy, M.Sc., M.Phil., (Ph.D.) Research Scholar Department of Psychology Yogi Vemana University Kadapa-516005 Andhra Pradesh, India.
[2*]Associate Professor M.Sc., M.Ed., Ph.D. Department of Psychology Yogi Vemana University Kadapa-516005 Andhra Pradesh, India.
[3]Associate Fertility Consultant, Esha IVF Fertility Medical Qualifications: MBBS, DGO,DNB, FRM Reproductive medicine.

***Corresponding Author:** Dr. V. Lazar,
*Associate Professor, Department of Psychology, Yogi Vemana University, Kadapa-516005, Andhra Pradesh, India.
Email: lazi123@gmail.com

Abstract

Background: This study explores reproductive healthcare professionals' perceptions of fluctuations in anxiety experience by IVF patients

Methods: The study employed an exploratory research design involving 14 healthcare professionals specializing in reproductive health, including fertility consultants, gynecologists, and allied reproductive health specialists. Interviews were conducted to gain insights into their perceptions of patients' emotional states across different phases of IVF.

Results: Several key factors contributing to fluctuations in anxiety during IVF treatment emerged: anticipation and fear of treatment failure, financial strain, social pressure, hormonal treatments and frequent monitoring, stress from invasive procedures and uncertainty, high emotional stakes, and the need for comprehensive emotional support, clear communication, robust social support, personalized care, and effective coping mechanisms.

Conclusion: The study developed an Anxiety Curve to track emotional escalation in women undergoing IVF. Recognizing triggers and anticipating emotional build-up can minimize crises and implement coping strategies. Understanding where individuals are on this curve informs tailored engagement strategies and support levels throughout treatment, enhancing emotional resilience and treatment success. This tool assists in identifying early anxiety signs, applying preventive measures, and supporting patients, caregivers, and professionals effectively. It also serves as a psychoeducational tool to prepare individuals before starting treatment.

Keywords: Anxietycurve; Reproductive mental health; IVF treatment; Emotional resilience; Patient-centered care.

Introduction

Infertility poses a notable clinical challenge in contemporary times, impacting between 8 to 12 percent of couples globally. [1] With advancements in infertility treatments, in vitro fertilization (IVF) has become increasingly prevalent. IVF, a leading assisted reproductive technology, is now commonly utilized as a solution for couples facing difficulties conceiving naturally. [2]

IVF (In-Vitro Fertilization) is a prominent treatment modality for individuals or couples encountering challenges in conceiving naturally. It is assisted reproductive technology (ART), where fertilization happens outside the body, typically in a laboratory[3]. During the In Vitro Fertilization (IVF) process, women usually receive fertility hormones to help their ovaries produce eggs. These medications boost egg production, improving the likelihood of fertilization. After the eggs have matured, they are gathered from the woman's ovaries through a procedure known as follicular aspiration. Following this, the collected eggs are mixed with sperm in a lab dish for fertilization outside the body. [4]

This crucial step ensures that the sperm could penetrate and fertilize the eggs under controlled conditions. Following successful fertilization, the resulting embryos are monitored and evaluated for development. Finally, one or more of the healthiest embryos are selected for transfer into the woman's uterus, where they can hopefully implant and develop into a pregnancy. IVF thus offers hope to couples facing various infertility challenges, including fallopian tube blockages, male infertility factors, ovulation disorders, and unexplained infertility. [5]

Patients attending infertility clinics often experience significant anxiety, emotional distress, and sexual

dysfunction, as studies have shown. IVF patients may exhibit heightened anxiety due to the challenges associated with infertility. A high incidence of psychological problems, including emotional disturbances, social maladjustment, and sexual dysfunction, is commonly observed among these individuals.[6]

Societal norms often place the primary burden of infertility on women. This gendered expectation not only adds to the social pressure experienced by women but also significantly impacts them psychologically. [7] While IVF offers a structured and effective method of assisted reproduction, it also brings about significant levels of anxiety and stress for those undergoing the process. Infertility itself presents a challenging journey marked by emotional ups and downs. [8]. Recognizing the importance of addressing patients' emotional well-being throughout the IVF journey it is important to note that women generally experience more anxiety and depression than men, with significant differences in coping strategies and psychological states between genders. IVF participants, including men, can also experience clinically elevated anxiety levels during treatment, and women undergoing repeat cycles are at an increased risk of severe depressive symptoms[9]. Women are more likely to take the lead in initiating fertility treatment decisions, reflecting their central role in managing and addressing reproductive health issues[10]. These factors underscore the need for targeted psychosocial support interventions. this paper aims to explore Reproductive Healthcare Professionals' Perspective on anxiety stages of Women undergoing IVF Treatment: . the implication of the study is to provide comprehensive understanding and support to patients in navigating the emotional complexities associated with infertility and IVF treatment. [11]

Methods and materials

This study employed an exploratory research design to investigate the perceptions of specialized healthcare professionals in reproductive health regarding the emotional states of patients throughout various phases of In-Vitro Fertilization (IVF). The data collection process involved conducting interviews with Fertility consultants, Gynecologists and other associated reproductive health specialists working in the fertility clinics , who possess expertise in assisting individuals and couples undergoing fertility treatments.

The inclusion criteria comprised fertility specialists, clinical embryologists, nurses, counsellors, and marriage and family psychologists. These professionals were required to have a minimum of 5 years of experience in their respective fields, proficiency in English, and willingness to provide informed consent. The participants' backgrounds encompassed diverse educational pathways and clinical training, reflecting the multidisciplinary nature of reproductive healthcare.

Fertility counsellors who participated in the study were skilled professional adept at providing treatment path and associated challenges, emotional support and guidance to individuals and couples navigating infertility treatments. Their expertise in addressing psychosocial aspects of infertility added valuable perspectives to the study. Additionally, psychologists specializing in reproductive health contributed their insights into the psychological impact of infertility and IVF, offering nuanced understandings of patients' emotional experiences and coping mechanisms during different stages of IVF treatment. Collectively, the participants formed a multidisciplinary team of reproductive healthcare professionals, enriching the qualitative data collection process and ensuring comprehensive exploration of patients' emotional well-being throughout the IVF. Exclusion criteria included unwillingness to engage or participate in the study procedures or interview.

The researchers designed a socio demographic information sheet for reproductive health professionals for various specialties and departments and captured age, gender, designation, educational qualifications, years of experience, and department of affiliation.

An interview guide (IG) was carefully constructed to collect data on Reproductive health professionals' perspectives, concerns, and experiences regarding the anxiety faced by women undergoing in vitro fertilization treatment at every phase. This interview guide was validated by experts in the field. The questions were pertinent to understanding anxiety in IVF Treatment, exploring anxiety profiles in different Phases of treatment, asking to rate the anxiety levels for each phase of treatment and different categories of population, manifest in patients undergoing IVF, common triggers or factors that contribute to anxiety during different phases of IVF treatment, typical anxiety curve experienced by patients in each phase of IVF treatment, anxiety levels among different patient populations undergoing IVF treatment. Etc.

GI is available at the author's request for research.

Face-to-face, in-depth interviews were conducted with reproductive health specialists and IVF consultants, as mentioned in (Table 2.) who met the predetermined inclusion criteria for the study. These interviews aimed to gather detailed insights, experiences, and perspectives from the consultants regarding the stress experienced by couples during the various stages of the IVF process. The finalized interview guide served as a framework for these in-

depth discussions, allowing for exploring specific topics while providing flexibility for the consultants to share their unique perspectives and observations.

Table 1.Interview guide contents and probes:

Interview guide, contents, and probes	
Contents	- **Introducing and briefing the purpose of the interview.** - **Establish rapport and make the interviewee comfortable.** - **Thank them for participating and assuring confidentiality.** - **Understanding Anxiety in IVF Treatment** - **Exploring Anxiety profile in different Phases of treatment** - **Asking to rate the anxiety levels for each phase of treatment and different categories of population.** - **Closing: Express gratitude and allow for additional comments or reflections.**
Probes	**Probe 1: Can you describe the role of anxiety in the context of IVF treatment?** **Probe 2: How does anxiety typically manifest in patients undergoing IVF?** **Probe 3: What are some common triggers or factors that contribute to anxiety during different phases of IVF treatment?** **Probe 4: Could you provide more information about the typical anxiety curve experienced by patients in each phase of IVF treatment?** **Probe 5: How do you observe patients transitioning between different stages of the anxiety curve during their IVF journey?** **Probe 6: Are there any specific patterns or trends you've noticed in the anxiety levels of patients across different phases of treatment?** **Probe 7: Do you notice variations in anxiety levels among different patient populations undergoing IVF treatment? If so, could you elaborate on these differences?** **Probe 8: To gain a subjective understanding of anxiety symptoms levels experienced by patients undergoing IVF treatment, we would like to ask you to rate the anxiety levels for each phase of treatment on a scale of 0 to 10, with 0 indicating no anxiety and 10 indicating high anxiety. Additionally, we would like you to provide ratings for anxiety levels among different patient populations. Your insights will help us better understand the variability of anxiety experiences throughout the IVF journey and among different patient groups. On a scale of 0 to 10, how would you rate the anxiety symptoms during the phases of treatment? (Anxiety rating sheet table 1.1)**

Table 1.1: Form for subjective ratings:

Probe 8: To gain a subjective understanding of anxiety levels experienced by patients undergoing IVF treatment, we would like to ask you to rate the anxiety levels for each phase of treatment on a scale of 0 to 10, with 0 indicating no anxiety and 10 indicating extremely high anxiety. Additionally, we would like you to provide ratings for anxiety levels among different patient populations. Your insights will help us better understand the variability of anxiety experiences throughout the IVF journey and among different patient groups. On a scale of 0 to 10, how would you rate the anxiety levels during the phases of treatment?

Please rate the typical anxiety levels experienced by patients during below phases of IVF treatment. On a scale of 0 to 10, how would you rate the anxiety levels during these phases?

Table 1.1: Mean of ratings received from the professionals for Anxiety symptom levels experienced by patients during below phases of IVF treatment

First IVF Experience Details of the Phase:	**Start Point**	**Rising**	**Dwell**	**High**	**Recovery**
Initial consultation phase to Ovarian stimulation	**2.4**	**5.6**			**2.7**
Ovarian stimulation to Egg retrieval stage	**2.7**	**4.13**	**4.45**		
Egg retrieval to Embryo update	**4.45**	**6.32**			
Embryo update to Embryo transfer	**6.32**	**7.15**			
Embryo transfer to Beta HCG test	**7.15**			**8.7**	
Beta HCG test to 1st Scan	**8.7**				**5.36**
1st Scan to 2nd Scan	**5.36**				**2.45**

Data analysis:
To investigate anxiety levels during the various phases of IVF treatment, interviews with 14 reproductive health professionals were recorded and transcribed. The transcripts were imported and coded using Atlas. ti 9 Desktop Trial (https://atlasti.com/free-trial-version/). The raw texts were read multiple times to gain a comprehensive understanding of the data, with particular attention to parts reflecting reproductive health professionals' perspectives on anxiety throughout the IVF treatment phases. An additional code was developed to capture new insights during the coding process.

Two peer researchers who were not initially involved in the study reviewed and discussed the emerging codes and themes to maintain data consistency. Based on the initial coding findings, the remaining data was coded. The complete dataset was reviewed to generate new meaningful codes and reduce unnecessary ones. The transcripts were exported to a Microsoft Excel file for thorough evaluation, where themes were accurately labelled. These codes were assigned to the relevant themes, and consistency was ensured through further discussions with the peer researchers.
The data from all 14 interviews were analysed, and findings were organised according to the themes that emerged from the codes. Figure 1. visually represents this entire data analysis process.

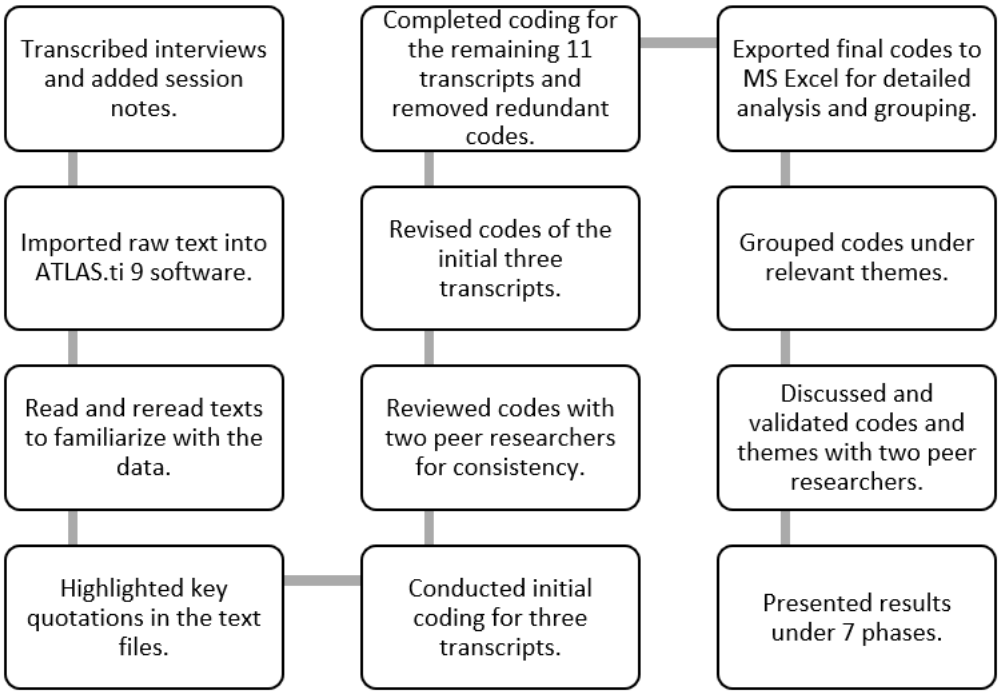


Figure 01: Steps of qualitative data analysis

This study is the initial phase of an ongoing Ph.D. research project entitled "The Effectiveness of a Comprehensive Mind-Body Intervention Integrating Various Techniques in Reducing Psychological Distress and Enhancing Fertility Outcomes among In Vitro Fertilization (IVF) Patients." Ethical clearance was obtained from the Institutional Ethics Committee (IEC) (No. 01/IEC/VL/YVU/PSY. /2023-24 dt. 20/11/2023). Participants received detailed information about the research and its procedures before giving their written informed consent.

Results:
The sociodemographic profiles of the Reproductive Health Professionals experts engaged in the study are delineated in Table 2.

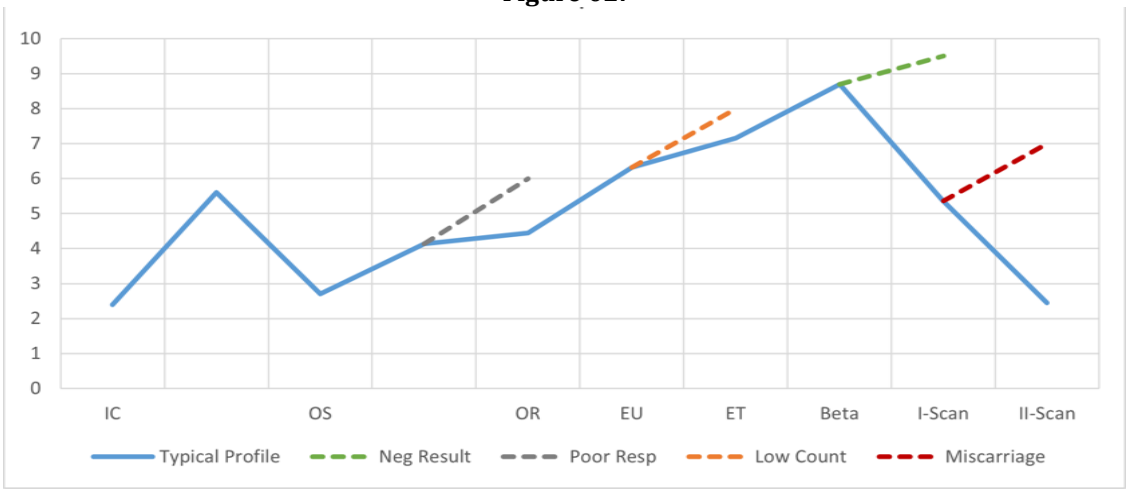
Table 2. Socio-demographic details of Reproductive Health Professionals

S.no	Designation	Age	Gender	Education qualification	Years of experience	Department
1	Fertility Specialist	50	F	M.S in Obstetrics & Gynecology, Fellowship in Reproductive Medicine (FRM)	20	Fertility Services
2	Fertility Specialist	44	F	MD (Gynecology & Obstetrics) & Fellowship in IVF & Reproductive Medicine	14	Fertility Services
3	Associate Fertility consultant	35	F	Diploma in Gynecology and Obstetrics (DGO), Fellowship in Infertility.	7	Fertility Services
4	Associate Fertility consultant	34	F	Diploma in Gynecology and Obstetrics (DGO), Fellowship in Infertility.	8	Fertility Services
5	Fertility Specialist	46	F	M.S in Obstetrics & Gynecology, Fellowship in Reproductive Medicine (FRM)	12	Fertility Services
6	Associate Fertility consultant	40	F	Diploma in Gynecology and Obstetrics (DGO).	11	Fertility Services
7	Associate Fertility consultant	42	F	Diploma in Gynecology and Obstetrics (DGO)., Fellowship in Reproductive Medicine (FRM)	14	Fertility Services
8	Clinical Embryologist	37	F	Master's degree in clinical embryology	7	Fertility Services
9	Registered Fertility nurse	31	F	Bachelor of Nursing (Basic)	7	Fertility Services
10	Registered Fertility nurse	29	F	Bachelor of Nursing (Post Basic)	6	Fertility Services
11	Fertility Counselor	37	F	PhD in Psychology	5	Fertility Services
12	Fertility Counselor	33	F	Masters in Psychology	6	Fertility Services
13	Clinical Psychologist	52	M	M.Phil. (CP), Ph.D. Psychology	19	Clinical Psychology
14	Psychologist-Marriage & Family	61	M	M.Phil. Rehabilitation Psychology	11	Psychological Services

M.Phil., Master of Philosophy; MD, Doctor of Medicine; PhD, doctor of philosophy;

Causes, contributing factors and professional insights on fluctuations in anxiety experienced by Women undergoing during different phases of IVF treatment

Figure 02:



1) Initial consultation (IC) phase of ovarian stimulation (OS)

Experts have observed that the primary trigger for rising anxiety (fig2) is the disclosure of the diagnosis regarding fertility issues. Initially, there is shock and denial upon receiving disappointing news, which leads to a flood of thoughts and questions such as questioning the choice of IVF clinic, doubting the doctor's credibility, and feeling confused about making key decisions. Additionally, pressure from family members adds to the stress.

Infertile women tend to exhibit higher levels of tension and guilt, which are common emotional responses to the challenges and societal pressures associated with infertility[12]. Feelings of self-blame and guilt for not achieving a natural pregnancy, as well as potential blaming from the partner after the consultation, contribute further to the anxiety [13]. There may also be suspicion towards the partner after the consultation, and changes in family dynamics following the diagnosis. Negative thoughts, comparisons, and the impact of stigma further exacerbate the situation. Difficulty in relaxing and sleeping, and disruptions in routines compound the anxiety[14].

The process of treatment, including protocols, scans, medications, and consultations, also adds to the anxiety. Anticipatory anxiety, fearing the unknown regarding treatment procedures and outcomes, is also common[24]. Financial concerns play a significant role, with worries about the cost of treatment and uncertainty about arrangements and insurance coverage. Questions like "Can we afford it?" and "What if the budget exceeds?" Worries regarding securing additional funding and the apprehension of investing without guaranteed success collectively contribute to feelings of anxiety. There's also pressure from family members to undergo tests, feeling overloaded with information from various sources, and frequent visits to the fertility clinic, where discussions with other patients can add to the stress. Balancing work-related stress with emotional burdens is also challenging for employees.

Anxiety and depression tend to decrease during IVF/ICSI treatment cycles, with key predictors including baseline anxiety, depression levels, and marital satisfaction[15]. In the same way, experts have opined that recovery from anxiety symptoms can be attributed to these factors, highlighting their influence on emotional well-being throughout the treatment process. Distress significantly declines following the fertility workup, particularly among first-time consulters[26]. This period often marks a shift in coping behaviors, with many individuals beginning to accept infertility as part of their reality, which helps in reducing emotional strain and fostering psychological adaptation[16]. Experts observed recovery of anxiety symptoms in the same phase (fig2) and expressed the below reasons behind it:

1. **Increase in knowledge:** Through repeated self-psychoeducation, reading, and learning from others' experiences.
2. **Support from partner and family:** Feeling supported and convinced by loved ones can help ease anxiety.
3. **Enquiry about clinic success rates:** Seeking information about a clinic's success rates and hearing about others' experiences with similar issues can provide reassurance.
4. **Asking questions and getting clarifications:** Being able to ask questions and receive clear answers from a consultant can alleviate anxiety.
5. **Acceptance of the problem:** Acknowledging and accepting the fertility issue is the first step towards calming anxiety.
6. **Social support and religious practices:** Finding support from social networks and engaging in religious practices can provide comfort.
7. **Trust and confidence in the consultant:** Building trust and confidence after meeting with a consultant can help ease worries.
8. **Hope and optimism:** Taking steps forward with hope for a positive outcome can reduce anxiety.
9. **Counselling:** Seeking professional counselling can provide valuable support and coping strategies for managing anxiety during the fertility journey[12]

"As a consultant specializing in IVF, I've seen how the journey can feel like a rollercoaster of emotions. In the beginning, there's a mix of nerves—some people feel more stressed out, and after that, they start to calm down a bit after accepting the reality of the situation. Finding out about fertility issues can be tough. It's like a shock to their existence, and it's normal to have a lot of questions and worries. Sometimes, people even feel unsure about the clinician's expertise and get blamed by their partners, which makes things even more stressful. But there are also moments of relief. Getting support from loved ones and learning more about what's going on can help ease the tension. It's about taking things one step at a time and finding ways to feel okay with where you're at in the process." - Dr. SVS, Fertility Specialist, Hyderabad.

2) Ovarian stimulation (OS) to Egg retrieval (ER) stage

During this stage, experts have observed a significant rise in anxiety (fig 2) among individuals undergoing fertility treatments, driven by various factors.

Firstly, adherence to drug protocols and experiencing side effects, particularly those containing hormones, can lead to mood changes, general feelings of anxiety, and depression.This can be compounded by concerns about multiple births, increased risk of pregnancy loss, and weight gain. High and fluctuating ovarian hormone levels in assisted reproductive models induce anxiety.[17] Furthermore, there is confusion regarding the quality versus quantity of eggs, with a prevailing myth that aggressive medication can harm egg quality. [18] This uncertainty, along with discomfort from injections and alterations in medications, adds to the emotional burden, exacerbated by hormonal changes. Managing daily activities and work responsibilities alongside treatment side effects becomes a significant source of anxiety. This is compounded by the fear of treatment delays due to inadequate response to medication or unexpected complications, leading to anxiety build-up.

Sleep disturbances and body image concerns further contribute to the emotional strain. In addition to that decision-making about treatment options, including considering alternative approaches or discontinuation of treatment, adds to the complexity of the situation. Moreover, anxiety is heightened by the invasive nature of the egg retrieval process and the stress from frequent monitoring appointments. Uncertainty about the body's response to stimulation medications and the number of viable eggs retrieved adds to the emotional rollercoaster. Pressure to achieve optimal response to medications, especially for individuals with previous treatment failures or low ovarian reserve, intensifies anxiety. [21]

Experts have observed a pattern in the anxiety curve during fertility treatment. It tends to dwell or decrease at certain points, such as when individuals receive reassurance and guidance from professionals. Feeling a sense of accomplishment or control by actively participating in their treatment, like administering medications and attending monitoring appointments, also helps alleviate anxiety. Connecting with a support network, seeking clarification, and asking questions about procedures contribute to this trend. Additionally, increased support, encouragement, hope, and optimism all play roles in reducing anxiety levels along the journey.
"It's a time filled with worries about medication side effects, fears of complications, and doubts about the treatment's success. From mood swings to physical discomfort, it's a mix of intense emotions. But I've seen how providing clear explanations, offering support, and helping them feel in control can help." – Dr. A Reddy, Fertility Specialist, Hyderabad.

Experts have observed that the anxiety curve tends to rise significantly after a poor response to fertility treatment, especially when patients consider undergoing another cycle.

The initial reaction typically involves shock and disbelief. Patients may internalize the poor response as a personal failure, questioning their body's ability to respond to treatment and achieve pregnancy. This can lead to feelings of inadequacy and self-doubt, intensifying anxiety. Time pressure and concerns about ageing also contribute to emotional distress. Patients may feel a sense of urgency due to advancing age and the finite window for successful conception, adding to their anxiety. Moreover, decision-making becomes challenging as patients consider alternative approaches or even discontinue treatment altogether. The uncertainty surrounding the next steps can amplify feelings of anxiety and distress. [1]

"Experiencing a poor response to ovarian stimulation in IVF treatment means that the ovaries don't produce as many eggs as expected during the fertility medication phase. It's kind of like trying to bake a cake with fewer ingredients than you need. I've seen how disappointing and worrying this can be for patients. It's like hitting a roadblock on the journey to starting a family. We understand it can bring up a lot of emotions and tough decisions about what to do next. They are required to make difficult decisions regarding treatment options, such as adjusting medication protocols, considering alternative approaches, or discontinuing treatment altogether. The uncertainty surrounding these decisions can amplify anxiety." -Ms. Reddy, Associate Fertility Consultant, Hyderabad.

3) Egg retrieval (ER) to Embryo update (EU): Experts observed rising in anxiety

Experts have observed a significant rise in anxiety among individuals undergoing fertility treatments, stemming from various factors throughout the process. Initially, there is a momentary relief after completing the egg retrieval procedure, but patients remain apprehensive about the next steps. Anxiety increases during the waiting period for embryo development updates, with uncertainty about the quality and quantity of embryos. Clinical settings, including medical equipment and procedures, can trigger further anxiety, as can anticipation about the number and quality of retrieved eggs. The waiting period intensifies uncertainty about embryo development and viability, adding to the emotional burden. Patients also feel pressure to make decisions about embryo transfer and cryopreservation options, which contributes to their anxiety. Additionally, comparisons with peers undergoing similar treatment, relationship dynamics within the

family, and ongoing financial implications all contribute to rising levels of anxiety throughout the fertility treatment journey. Negative result from the embryo quality and grading in preimplantation embryo such as low count and poor quality intensifies anxiety and termination of the treatment process for the individual.

"There's a brief sense of relief after the retrieval procedure, but then comes the waiting game. The waiting period for embryo count updates can be particularly anxiety-inducing. Waiting for updates on embryo development can get to us, especially when they're not sure how many embryos will be viable. Somatic symptoms of anxiety are reflected during this phase, and can perceive this. Being in the clinic surrounded by medical stuff can make it all feel even more intense. Plus, there's the worry about making decisions on what to do next with the embryos" –Ms.RP Fertility Counselor, Hyderabad.

"Encountering fewer embryos than anticipated can evoke numerous questions and uncertainties about the subsequent steps. Suddenly, there's this fear of the unknown and worry about whether the treatment will be successful. It's tough because they've already invested so much hope and emotion into the process. I often see a significant rise in anxiety levels when individuals face a low embryo count during the embryo update phase. It's like hitting a roadblock on the journey to parenthood, and it can feel overwhelming for our patients." –Ms.RP Fertility Counselor, Hyderabad.

4) Embryo update (EU) to Embryo transfer (ET):
Experts have observed a significant rise in anxiety among individuals considering another cycle of fertility treatment after a low embryo count. This increase in anxiety is influenced by various factors throughout the process. Firstly, concerns about embryo grading and personal expectations intensify emotional investment in the outcome as individuals receive more concrete information about the development and quality of embryos. The critical stage of embryo transfer amplifies pressure to achieve successful implantation and pregnancy, leading to heightened anxiety levels. Fear of failure, particularly ruminating negative thoughts about implantation failure and the quality of embryos to be transferred, further exacerbates anxiety. Additionally, fears about discomfort, pain, and physical complications associated with the procedure contribute to overall stress levels. Anxiety persists during ongoing decision-making regarding embryo transfer options, including considerations of single versus multiple embryo transfer. As the embryo transfer procedure approaches, heightened anticipation increases anxiety, with hopes pinned on successful implantation, yet fears of potential failure linger despite previous efforts. This emotional rollercoaster results in fluctuating emotions between hope for success and despair over potential setbacks, leading to emotional volatility throughout the fertility treatment journey.

"I've seen how individuals grapple with worries about embryo grading, personal expectations, and the emotional investment that comes with knowing more about their embryos' development. The pressure to achieve successful implantation and pregnancy during the transfer stage only intensifies these anxieties. There's a constant fear of failure, with thoughts often consumed by the possibility of unsuccessful implantation or complications after the procedure. Decision-making about single versus multiple embryo transfer adds another layer of stress." – Ms.KK, Clinical Embryologist, Hyderabad.

5)Embryo transfer (ET) to Beta HCG test:
During the IVF journey, individuals experience peak anxiety surrounding the beta HCG test, a critical milestone. The pressure to achieve a positive result intensifies as they await the test, reaching its peak during the waiting period for pregnancy test results. [22] Anxiety heightens due to fears of potential disappointment and grief associated with a negative outcome, especially after investing significant emotional and financial resources. Rumination of negative thoughts about potential outcomes, feelings of helplessness and loss of control during this waiting period further contribute to heightened anxiety levels. Additionally, emotional vulnerability is heightened as the beta HCG test determines pregnancy success, amplifying anxiety. [23] Concerns about the financial investment made in IVF also add to the stress, reflecting the heightened emotional investment in the outcome as individuals await the test results.

"This is the phase where we observe intense anxiety that accompanies this critical milestone. People are on edge, hoping for a positive result but scared of what a negative one might mean. The pressure to achieve a positive result is immense, and as the waiting period for test results begins, hopes and fears reach their peak. Patients often find themselves consumed by negative thoughts and worries about the outcome, compounded by the emotional and financial investment they've made in the IVF process. It's a vulnerable time, and as healthcare providers, it's crucial for us to offer support, reassurance, and empathy to help individuals navigate through this period of heightened anxiety with as much strength and resilience as possible." Dr.Siri, Fertility Specialist, Hyderabad.

"During this time, individuals consult us with presenting concerns of intense anxiety symptoms and find themselves ruminating on negative thoughts and feeling a sense of helplessness and loss of control over the outcome. Their emotional vulnerability is heightened, as the beta HCG test holds the key to their hopes of pregnancy success. Psychosomatic symptoms are commonly reported, and they ask for tips for managing their anxiety." Ms.PH, Clinical Psychologist, Hyderabad.

Experts observed the further rise of the anxiety (fig 2) curve after negative results on the Beta HCG Test:
"We generally witness how anxiety can skyrocket after a negative outcome in the Beta HCG test phase. It's like a wave of disappointment crashing down on our patients. Suddenly, all the hopes and dreams they've pinned on this cycle come crashing down. There's this overwhelming fear of what it means for their future, and it can be really tough to process. It's heartbreaking to see their hopes dashed, and for some, it leads to incredibly dark thoughts, including contemplating suicide. It's natural for them to question everything and wonder if they'll ever achieve their dream of having a baby. " - Dr Sri, Fertility Specialist, Hyderabad.

6)Beta HCG test to 1st Scan:
Positive results bring relief, but negative results lead to uncertainty about the future, contributing to heightened anxiety. Emotional adjustment is necessary, whether it involves adjusting to the pregnancy news or coping with the disappointment of a negative outcome. Additionally, fear of miscarriage adds to the emotional burden. Ongoing decision-making regarding prenatal care and future treatment options further contributes to anxiety levels, as individuals navigate through this critical phase of their fertility journey.

Experts observed reasons for the calming of the anxiety curve:
Experiencing a miscarriage during the first or second scan phase of IVF treatment can cause significant anxiety for our patients. Initially anticipated as a moment of joy, seeing that first heartbeat or ultrasound turns into heartbreak and fear. With support from their partner and family, individuals find it easier to cope with anxiety as they become more accustomed to the idea of being pregnant and as time progresses towards the first scan. Additionally, reduced fear of the unknown as the pregnancy progresses also helps alleviate anxiety.

"Once they receive the news of a positive pregnancy result, there's a visible sense of relief and reassurance. Knowing that they're receiving proper medical care and support from their loved ones adds to their confidence and helps ease their worries. As they progress closer to the 1st scan, their anticipation grows, and the excitement of seeing their baby for the first time overrides much of their anxiety. It's a natural progression from uncertainty to optimism, and it's heartening to see my patients embracing this journey with newfound hope and positivity." -Dr PN, Associate Fertility Consultant, Hyderabad.

There is an increased risk of anxiety symptoms following a miscarriage, which can persist for up to four months. This prolonged emotional distress highlights the need for ongoing psychological support during this period.[28]
"Experiencing a miscarriage during the 1st or 2nd scan phase of IVF treatment can make our patients feel highly anxious. It's like having their hopes dashed just when they were starting to see a hope of light. Seeing that first heartbeat or ultrasound was supposed to be a moment of joy, but now it's turned into heartbreak for the patient and the entire family. They start to worry if they'll ever have a baby. It's a tough situation, and the anxiety that comes with it can be overwhelming." -Dr PN, Associate Fertility Consultant, Hyderabad.

7) 1st Scan to 2nd Scan:
Gradual relief from anxiety occurs as each milestone is reached in the pregnancy journey, such as confirmation of fetal viability at the first scan. Seeing the fetus and hearing the heartbeat during this scan provides reassurance and confirmation of viability, further reducing anxiety levels. Additionally, as the pregnancy progresses, there is increased confidence in its success, leading to a reduction in anxiety. Continued medical supervision, reduced fear of miscarriage, and increased support from family and partners all contribute to this growing confidence and decreasing anxiety. Focusing on the joy of becoming parents and the excitement of carrying their baby further aids in alleviating anxiety as individuals navigate through their pregnancy journey.
Overall, each phase requires patience, resilience, emotional, physical and financial support as individuals navigate the complexities of assisted reproductive technology in pursuit of their dream of parenthood.

Discussion:
This study highlights the significant fluctuations in anxiety levels experienced by individuals undergoing fertility treatments, particularly during different phases such as the initial consultation, ovarian stimulation, egg retrieval, embryo update, and beta HCG testing. Anxiety peaks at various stages due to factors like diagnosis shock, hormonal side effects, waiting for embryo development updates, and the

anticipation of pregnancy test results. Effective coping mechanisms include gaining knowledge, receiving support from partners and family, and seeking professional counseling. The journey involves a rollercoaster of emotions, balancing hope with fear, and necessitates strong support systems and resilience to manage the emotional, physical, and financial challenges of assisted reproductive technology.

Consultants can develop effective coping strategies by understanding the sources and patterns of stress experienced during IVF treatment. These strategies may include counselling, stress management techniques, or support groups designed to alleviate stress during the treatment. [15]. Couples seeking infertility treatment generally demonstrate good psychological adjustment, but psychological support remains beneficial for those experiencing anxiety during the process.[29]

Risk Factors Identification: It is important to identify the factors that cause stress during the IVF treatment. Various factors that contribute to the stress include hormonal fluctuations, invasive procedures, anxiety, depression, infertility-related distress inadequate support, fear of failure of IVF treatment, number of rounds of IVF treatments, financial constraints and societal expectations. Identifying and addressing these factors can improve the outcome of IVF treatment.

Development of coping strategies: By understanding the sources and patterns of stress experienced during IVF treatment, consultants can develop targeted coping strategies and interventions to support patients. These may include counseling, stress management techniques, or support groups to alleviate stress. [16]

Tailored patient education and preparation: Every individual's experience of stress and the ability to cope with the stress during different stages can vary significantly. It's important to recognize that there is no one-size-fits-all approach when it comes to coping with stress. IVF studies can inform consultants about the specific concerns and challenges faced by patients, allowing them to provide tailored education and preparation for the emotional aspects of the treatment process.

Improvement of treatment protocols: By assessing the impact of stress on treatment outcomes, IVF studies can contribute to the refinement of treatment protocols, potentially optimizing success rates and patient well-being. Some research has observed that mood states predict IVF/ET outcomes, with depression being linked to lower pregnancy rates after treatment [30].

Moreover, future research should adopt both quantitative and qualitative methodologies with larger sample sizes to validate these findings and refine interventions further. Recognizing the longitudinal nature of IVF treatment and the fluctuating stress levels across different stages is essential for developing adaptive support systems that meet patients' evolving needs. While IVF studies on stress have inherent limitations due to the subjective and multifactorial nature of stress, they provide critical insights that can enhance care quality.

Overall, while IVF studies on stress have limitations, they play a crucial role in understanding the emotional experiences of couples undergoing treatment. By acknowledging both the strengths and limitations of these studies, consultants can better support patients, develop effective interventions, and enhance the overall quality of care provided through IVF journey.
In summary, implementing these findings in clinical practice and healthcare policies can improve the outcome for patients by enabling effective interventions and ultimately enhancing the quality of care throughout the IVF process [19]

1. Limitation and Strengths
The study acknowledges the limitations such as the subjectivity to stress related to various factors including physical, emotional, financial, and social factors, making it difficult to isolate and study the impact of specific stressors and coping mechanism can vary greatly among individuals undergoing IVF treatment as the stressor might be different, making it challenging to generalize findings across the entire population. Furthermore, the longitudinal nature of the IVF process, spanning multiple stages with fluctuating stress levels, poses difficulties in accurately assessing overall stress.
The study's strengths lie in its thorough exploration of stress and coping mechanisms throughout the IVF process, incorporating perspectives from healthcare professionals. Its meticulous consideration of the longitudinal aspect of IVF treatment lends depth to understanding stress dynamics across multiple stages.

2. Implications
From the viewpoint of the experts, stress factors during IVF treatment highlights the critical need for targeted interventions and support services tailored to IVF patients. Integrating these insights into a comprehensive management plan by a multidisciplinary approach that addresses the

various factors contributing to anxiety throughout the fertility journey is crucial for effective patient management. This may include medical interventions, psychological counselling, and support groups. According to experts, initiating policy-level interventions could systematically address the needs of patients experiencing IVF-related stress. This could involve establishing guidelines for psychological support, enhancing patient education, and refining treatment protocols to mitigate stress throughout the IVF process.

3. Conclusion

In conclusion, this study highlights the significant role of anxiety throughout the various stages of IVF treatment, as observed by expert reproductive health professionals. From the initial consultation to the post-embryo transfer phase, anxiety levels fluctuate, influenced by factors such as fear of treatment failure, financial strain, and societal expectations.

The findings underscore the necessity for psychological intervention and the integration of psychosocial support into clinical practice to address these emotional challenges effectively. Tailored coping strategies, patient education, and counselling interventions are crucial in mitigating anxiety and improving the overall well-being of IVF patients. By acknowledging and addressing these emotional complexities, healthcare professionals can enhance patient resilience and optimize treatment outcomes, ultimately providing a more supportive and comprehensive infertility care experience.

Acknowledgements

The authors express their gratitude and appreciation to the professionals who contributed to this research.

Conflicts of Interest

No potential conflict of interest associated with this study.

Funding

The study was conducted without any financial support or grants.

References

1) (N.d.). Sciencedirect.com. Retrieved June 1, 2024, from https://www.sciencedirect.com/science/article/pii/S2213398420301901#bib6
2) Aderaldo, J. F., Rodrigues de Albuquerque, B. H. D., Câmara de Oliveira, M. T. F., de Medeiros Garcia Torres, M., & Lanza, D. C. F. (2023). Main topics in assisted reproductive market: A scoping review. *PloS One*, *18*(8), e0284099. https://doi.org/10.1371/journal.pone.0284099
3) Choe, J., & Shanks, A. L. (2023). *In Vitro Fertilization*. StatPearls Publishing.https://www.ncbi.nlm.nih.gov/books/NBK562266/
4) Starc, A. (2019). Infertility and sexual dysfunctions: A systematic literature review. *Acta Clinica Croatica*, *58*(3). https://doi.org/10.20471/acc.2019.58.03.15
5) Zhao, Y., Brezina, P., Hsu, C.-C., Garcia, J., Brinsden, P. R., & Wallach, E. (2011). In vitro fertilization: Four decades of reflections and promises. *Biochimica et Biophysica Acta. General Subjects*, *1810*(9), 843–852. https://doi.org/10.1016/j.bbagen.2011.05.001
6) J., Stephen, Bell. (1981). 35. Psychological problems among patients attending an infertility clinic.. Journal of Psychosomatic Research, doi: 10.1016/0022-3999(81)90077-5
7) Inhorn, M. C., & Patrizio, P. (2015). Infertility around the globe: new thinking on gender, reproductive technologies and global movements in the 21st century. *Human Reproduction Update*, *21*(4), 411–426. https://doi.org/10.1093/humupd/dmv016
8) Stanhiser, J., & Steiner, A. Z. (2018). Psychosocial aspects of fertility and assisted reproductive technology. *Obstetrics and Gynecology Clinics of North America*, *45*(3), 563–574. https://doi.org/10.1016/j.ogc.2018.04.006
9) Eugster, A., & Vingerhoets, A. J. J. M. (1999). Psychological aspects of in vitro fertilization: a review. *Social Science & Medicine (1982)*, *48*(5), 575–589. https://doi.org/10.1016/s0277-9536(98)00386-4
10) Jennifer, B., Levin., Tamara, Goldman, Sher. (2000). 6. Psychological treatment of couples undergoing fertility treatment. Cognitive and Behavioral Practice, doi: 10.1016/S1077-7229(00)80033-4
11) Janet, Beaurepaire., Michael, P., Jones., Paul, Thiering., Douglas, M., Saunders., Christopher, Tennant. (1994). 7. Psychosocial adjustment to infertility and its treatment: male and female responses at different stages of IVF/ET treatment.. Journal of Psychosomatic Research, doi: 10.1016/0022-3999(94)90118-X
12) Guopeng, Li., Zhenhua, Jiang., Xiaofei, Kang., Lijin, Ma., Xue, Han., Mei, Fang. (2021). 1. Trajectories and predictors of anxiety and depression amongst infertile women during their first IVF/ICSI treatment cycle.. Journal of

Psychosomatic Research, doi: 10.1016/J.JPSYCHORES.2021.110357

13) Miller, N., Herzberger, E. H., Pasternak, Y., Klement, A. H., Shavit, T., Yaniv, R. T., Ghetler, Y., Neumark, E., Eisenberg, M. M., Berkovitz, A., Shulman, A., & Wiser, A. (2019). Does stress affect IVF outcomes? A prospective study of physiological and psychological stress in women undergoing IVF. *Reproductive Biomedicine Online*, *39*(1), 93–101. https://doi.org/10.1016/j.rbmo.2019.01.012
14) Sharma A, Shrivastava D (October 15, 2022) Psychological Problems Related to Infertility. Cureus 14(10): e30320. doi:10.7759/cureus.30320
15) McQueeney, D. A., Stanton, A. L., & Sigmon, S. (1997). *Journal of Behavioral Medicine*, *20*(4), 313–331. https://doi.org/10.1023/a:1025560912766
16) Campbell, M. (2000). Framework for design and evaluation of complex interventions to improve health. *BMJ (Clinical Research Ed.)*, *321*(7262), 694–696. https://doi.org/10.1136/bmj.321.7262.694
17) Rooney, K. L., & Domar, A. D. (2018). The relationship between stress and infertility. *Dialogues in Clinical Neuroscience*, *20*(1), 41–47. https://doi.org/10.31887/dcns.2018.20.1/klrooney
18) Bahadur, G., Homburg, R., Jayaprakasan, K., Raperport, C. J., Huirne, J. A. F., Acharya, S., Racich, P., Ahmed, A., Gudi, A., Govind, A., & Jauniaux, E. (2023). Correlation of IVF outcomes and number of oocytes retrieved: a UK retrospective longitudinal observational study of 172 341 non-donor cycles. *BMJ Open*, *13*(1), e064711. https://doi.org/10.1136/bmjopen-2022-064711
19) Bresnick, E., & Taymor, M. L. (1979). The role of counseling in infertility. *Fertility and Sterility*, *32*(2), 154–156. https://doi.org/10.1016/s0015-0282(16)44171-3
20) Kaliarnta, S., Nihlén-Fahlquist, J., & Roeser, S. (2011). Emotions and ethical considerations of women undergoing IVF-treatments. *HEC Forum: An Interdisciplinary Journal on Hospitals' Ethical and Legal Issues*, *23*(4), 281–293. https://doi.org/10.1007/s10730-011-9159-4
21) Simionescu, G., Doroftei, B., Maftei, R., Obreja, B.-E., Anton, E., Grab, D., Ilea, C., & Anton, C. (2021). The complex relationship between infertility and psychological distress (Review). *Experimental and Therapeutic Medicine*, *21*(4). https://doi.org/10.3892/etm.2021.9737
22) Lancastle, D., & Boivin, J. (2008). A feasibility study of a brief coping intervention (PRCI) for the waiting period before a pregnancy test during fertility treatment. *Human Reproduction (Oxford, England)*, *23*(10), 2299–2307. https://doi.org/10.1093/humrep/den257
23) Mahlstedt, P. P., Macduff, S., & Bernstein, J. (1987). Emotional factors and the in vitro fertilization and embryo transfer process. *Journal of In Vitro Fertilization and Embryo Transfer*, *4*(4), 232–236. https://doi.org/10.1007/bf01533762
24) Macaluso, M., Wright-Schnapp, T. J., Chandra, A., Johnson, R., Satterwhite, C. L., Pulver, A., Berman, S. M., Wang, R. Y., Farr, S. L., & Pollack, L. A. (2010). A public health focus on infertility prevention, detection, and management. *Fertility and Sterility*, *93*(1), 16.e1-16.e10. https://doi.org/10.1016/j.fertnstert.2008.09.046
25) Bianca, Santos, Martins, Gonçalves., Flora, França, Nogueira, Mariotti., Giovana, Ponsone., Thalita, Aparecida, Avelino, Soares., Paula, Cristina, Barbosa, Garcia, Perão., Marcos, Mônico-Neto., Leonardo, Moro, Cariste., Auro, Maluf., Gustavo, da, Silva, Soares, Nascimento., Hanna, Karen, Moreira, Antunes., Isabel, Cristina, Céspedes., Milena, de, Barros, Viana., Luciana, Le, Sueur-Maluf. (2022). 5. High and fluctuating levels of ovarian hormones induce an anxiogenic effect, which can be modulated under stress conditions: Evidence from an assisted reproductive rodent model.. Hormones and Behavior, doi: 10.1016/J.YHBEH.2021.105087
26) Martin, Pook., Walter, Krause., Silke, Drescher. (2002). 16. Distress of infertile males after fertility workup: a longitudinal study.. Journal of Psychosomatic Research, doi: 10.1016/S0022-3999(02)00341-0
27) A., M., O'Moore., R., R., O'Moore., R., F., Harrison., G., Murphy., M.E., Carruthers. (1983). 17. Psychosomatic aspects in idiopathic infertility: effects of treatment with autogenic training*. Journal of Psychosomatic Research, doi: 10.1016/0022-3999(83)90091-0
28) Pamela, A., Geller., Danielle, Kerns., Claudia, M., Klier. (2004). 21. Anxiety following miscarriage and the subsequent pregnancy: A review of the literature and future directions. Journal of Psychosomatic Research, doi: 10.1016/S0022-3999(03)00042-4

29) Kevin, Connolly., Robert, J., Edelmann., Ian, D., Cooke., Jill, Robson. (1992). 25. The impact of infertility on psychological functioning. Journal of Psychosomatic Research, doi: 10.1016/0022-3999(92)90006-N

30) P., Thiering., Janet, Beaurepaire., Michael, P., Jones., Douglas, M., Saunders., Christopher, Tennant. (1993). 37. Mood state as a predictor of treatment outcome after In Vitro fertilization/embryo transfer technology (IVF/ET). Journal of Psychosomatic Research, doi: 10.1016/0022-3999(93)90004-Y