



## Feto-maternal outcome program in infertile women undergoing IUI and IVF in Srikakulam

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### Abstract

This study examines the effectiveness of a Feto-Maternal Outcome Program specifically designed for infertile women undergoing Intrauterine Insemination (IUI) and *In Vitro* Fertilization (IVF). Employing a quasi-experimental design, the research involved a sample of 30 infertile women recruited from selected IVF clinics in Srikakulam. The primary objective was to evaluate the program's impact on maternal and fetal outcomes through a structured methodology. Data collection was conducted via interviews and physical assessments, aimed at gaining a comprehensive understanding of the various feto-maternal outcomes linked to the reproductive technologies of IUI and IVF. The program incorporated educational sessions, psychological support, and health monitoring to bolster the well-being of participants throughout their fertility treatments. To measure effectiveness, a pre-test and post-test approach was implemented, allowing for the identification of significant changes in both maternal and fetal well-being post-intervention. Results indicated notable improvements in several key indicators, including maternal health status, prenatal care engagement, and overall satisfaction with the fertility treatment process. Additionally, positive trends were observed in fetal outcomes, suggesting a beneficial impact of the program on the health trajectory of pregnancies achieved through assisted reproductive technology. These findings underscore the importance of integrated educational and health programs tailored for infertile women, emphasizing the need for comprehensive support during assisted reproductive processes. The study concludes that such programs can significantly enhance feto-maternal outcomes, presenting a case for broader implementation in clinical settings. Continued research is encouraged to further explore the long-term benefits of such interventions and refine methodologies for supporting women experiencing infertility challenges. Overall, the study offers valuable insights into how structured support systems can improve the experiences and health outcomes of individuals undergoing IUI and IVF treatments.

**Keywords:** Feto-maternal outcome, IUI, IVF, infertile women, health education, program effectiveness

### Introduction

Feto-maternal health outcomes were widely recognized as critical components in the context of assisted reproductive technologies, particularly for women who underwent Intrauterine Insemination (IUI) and *In Vitro* Fertilization (IVF). Infertility affected approximately 15% of couples of reproductive age, posing significant emotional and psychological challenges alongside physical health concerns (Mascarenhas *et al.*, 2012) [9]. The journey through infertility treatment was often perceived as a tumultuous experience, marked by emotional distress, financial strain, and societal pressures, which necessitated a holistic approach to care that addressed both the psychological and physiological aspects of health (Domar *et al.*, 2000) [2]. Women who sought IUI and IVF frequently reported elevated levels of anxiety and depression. Research indicated that these psychological stresses could adversely impact feto-maternal health outcomes, leading to complications during pregnancy and challenges in maintaining emotional well-being (Lange *et al.*, 2020) [8]. It became increasingly evident that psychological distress could contribute to negative health outcomes for both mother and fetus, thereby complicating the already intricate process of assisted reproduction (Schmidt *et al.*, 2018) [12]. As a result, there was a pressing need for comprehensive interventions that focused not only on the medical aspects of fertility treatment but also on the emotional and psychological well-being of patients. At that time, many IVF clinics in India, including those located in Srikakulam, did not implement comprehensive educational programs designed to inform and support patients throughout their

fertility journeys. Existing practices often lacked the integration of educational initiatives that could significantly enhance patient understanding of the IUI and IVF processes (Singh & Kaur, 2019) [13]. Educational interventions were acknowledged in the literature as vital tools that could promote better patient engagement and greater adherence to treatment protocols (Brennan *et al.*, 2018) [1]. However, empirical evidence regarding the specific benefits of educational programs tailored for women undergoing IUI and IVF was relatively limited. The Feto-Maternal Outcome Program aimed to serve as a systematic approach to educating infertile women about treatment options, psychological coping mechanisms, and the impact of lifestyle choices on reproductive health. Educational initiatives were believed to empower patients, fostering a sense of autonomy in their care and contributing to improved feto-maternal outcomes (Lea *et al.*, 2016). A key observation in the literature was that informed patients tended to be more engaged in their care, which could lead to better overall treatment adherence and enhanced clinical outcomes (Domar *et al.*, 2000) [2].

Research substantiated the beneficial effects of psychological support and educational interventions on the feto-maternal health of women undergoing assisted reproductive treatments. For instance, studies highlighted that counseling services contributed significantly to reducing anxiety and improving satisfaction levels among patients receiving fertility treatments (Hughes *et al.*, 2002) [5]. Moreover, educational materials informed patients about procedures and potential outcomes, demystifying complex medical terminologies and processes (Latthe *et al.*, 2006). In

a study conducted by Gana *et al.* (2011) [4], it was discovered that provision of educational support resulted in participants feeling more knowledgeable and confident in their treatment decisions, which positively influenced their psychological well-being. Furthermore, the exploration of nutrition and lifestyle factors underscored their importance, as they were believed to play a significant role in the success of fertility treatments. The Feto-Maternal Outcome Program sought to provide guidance on nutrition and lifestyle modifications conducive to achieving positive pregnancy outcomes. Evidence indicated that sustained lifestyle changes, such as proper diet and regular exercise, could enhance fertility rates and overall health during pregnancy (Tay *et al.*, 2021) [15]. Previous studies emphasized that the integration of lifestyle education and psychosocial support could contribute to enhanced feto-maternal outcomes. For example, a systematic review by Suh *et al.* (2018) [14] found that programs focusing on nutrition, physical activity, and psychological well-being yielded favorable health outcomes during assisted fertility interventions. The incorporation of integrative approaches that factored in mental health, lifestyle modifications, and medical care aimed to provide a comprehensive framework for improving reproductive health. Despite the emotional and psychological strains that accompanied infertility, there was a growing appreciation for the need to implement programs targeting the enhancement of feto-maternal health outcomes among women receiving assisted reproductive technologies. Numerous studies indicated that integrating educational support with psychosocial interventions resulted in improved health outcomes and patient satisfaction (Evers *et al.*, 2001) [3]. Targeting educational initiatives toward issues unique to fertility treatments would better address the specific needs of women struggling with infertility and ultimately lead to improved interactions with healthcare providers and outcomes of fertility treatments (Thompson *et al.*, 2015) [16]. To ensure the maximum effectiveness of such programs, it was crucial that they were based on comprehensive research and tailored to meet the specific requirements of the target population. An extensive evaluation of the existing literature and current IVF practices would inform the development and implementation of the Feto-Maternal Outcome Program, ensuring relevance and impact. Ultimately, the proposed research intended to scrutinize the efficacy of the Feto-Maternal Outcome Program among women undergoing IUI and IVF at selected IVF clinics in Srikakulam, thereby providing insightful contributions to the field of integrated care models in reproductive health. By enhancing our understanding of the role that educational and support initiatives could play in improving maternal and fetal health outcomes, this study aimed to identify potential avenues for fostering more effective fertility experiences throughout the entire assisted reproductive process. Infertility represented a significant public health concern with various emotional and psychological challenges faced by couples undergoing assisted reproductive technologies. The ongoing lack of comprehensive educational programs within many IVF clinics highlighted a pertinent gap that required immediate attention. The Feto-Maternal Outcome Program aimed to bridge this gap by presenting an integrated approach that combined education, emotional support, and lifestyle guidance with the goal of optimizing health outcomes for women undergoing IUI and IVF. This research aspired to

evaluate the effectiveness of this program, offering valuable insights into how educational and psychosocial support could transform patient care within the context of assisted reproductive technology.

## Methods

The present study utilized a quasi-experimental time-series design to evaluate the effectiveness of the Feto-Maternal Outcome Program aimed at improving feto-maternal health outcomes among infertile women undergoing Intrauterine Insemination (IUI) and *In Vitro* Fertilization (IVF) in selected clinics located in Srikakulam, Andhra Pradesh. This design was chosen to provide insights into changes over multiple time points, allowing for the observation of trends and improvements attributed to the intervention.

**Study Design:** The quasi-experimental design was appropriate for this study as it permitted the assessment of outcome changes before and after the implementation of an intervention without random assignment to control and experimental groups. Instead, the focus was on collecting longitudinal data from the same set of participants at multiple intervals. This method enabled researchers to closely observe the impact of the Feto-Maternal Outcome Program while minimizing confounding variables that might arise from participant differences in a purely experimental design. The study comprised several assessment phases, referred to as O1 to O7, which marked specific intervals for data collection: O1 was the baseline measurement, followed by assessments at 2 months (O2), 3 months (O3), 5 months (O4), 6 months (O5), and 8 months (O6), culminating in a follow-up assessment at 9 months (O7).

**Sample Selection:** The study sample consisted of 30 infertile women who attended selected IVF clinics in Srikakulam. The clinics were chosen based on their accessibility and reputation for providing reproductive health services. A random sampling technique was employed to select participants, ensuring that every eligible infertile woman had an equal chance of being included in the study. This randomization was crucial for reducing selection bias and ensuring that the results obtained could be generalized to a broader population of infertile women seeking assisted reproductive technologies. Inclusion criteria for participants encompassed women aged 20 to 40 years who had been diagnosed with infertility and were seeking treatment through IUI or IVF. Exclusion criteria included women with co-morbid medical conditions impacting fertility, those with psychological disorders requiring immediate treatment, and individuals who had previously undergone extensive fertility treatments. By applying these criteria, the researchers focused on a homogeneous group, allowing for a clearer understanding of the feto-maternal outcomes associated with the educational intervention.

**Data Collection Process:** Data was collected through structured interviews and physical assessments conducted at each assessment phase. The structured interviews were designed to gather comprehensive information on several key variables: maternal mental health, fetal health indicators, and overall satisfaction with the IVF process. Specifically, validated assessment tools and questionnaires were employed to measure these outcomes at the respective time points.

**Instruments and Measures:** The following instruments were utilized for data collection:

**Maternal Mental Health Assessment:** The General Health Questionnaire (GHQ-12) was employed to assess the emotional well-being of participants. The GHQ-12 is a widely used screening tool that evaluates psychological distress through a set of 12 items assessing aspects such as anxiety, depression, and social dysfunction. A higher score on the GHQ-12 indicates poorer mental health.

**Fetal Health Indicators:** Maternal reports concerning fetal movements, regularity of prenatal visits, and ultrasound findings were documented. These indicators provided insights into fetal development and well-being during the IVF process.

**Overall Satisfaction Questionnaire:** A self-designed questionnaire measured participants' satisfaction with the IVF process, addressing factors such as perceived quality of care, emotional support received, and the effectiveness of the information provided about the treatment process. Participants rated their satisfaction on a Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied). Prior to initiation, a pilot study was conducted among a small group of women to test the feasibility and clarity of the instruments. Feedback from pilot participants helped refine the questionnaires for clearer comprehension and relevance to the general study population.

#### **Intervention: Feto-Maternal Outcome Program**

The Feto-Maternal Outcome Program consisted of structured educational sessions and counseling designed to provide crucial information related to fertility treatments, psychological coping strategies, and lifestyle modifications that could enhance reproductive health. The program was structured around four primary themes:

**Understanding IUI and IVF:** Participants received educational materials detailing the processes involved in IUI and IVF, including success rates, potential side effects, and what to expect during treatment. Emphasis was placed on clarifying misconceptions about fertility treatments and fostering realistic expectations.

**Psychological Support and Coping Strategies:** The program included information about the psychological aspects of infertility, teaching participants coping strategies to manage stress and anxiety. Techniques introduced included mindfulness, relaxation exercises, and cognitive behavioral strategies aimed at fostering resilience during treatment.

**Nutritional Guidance:** Emphasis was placed on the importance of nutrition in achieving reproductive health. The program included guidelines on balanced diets, essential nutrients for fertility, and recommendations for lifestyle adjustments that could facilitate better reproductive outcomes.

**Open Communication:** Participants were encouraged to communicate effectively with their healthcare providers. The program fostered an environment where women could voice concerns, ask questions, and ensure they received

appropriate advice and support throughout their fertility journey.

Each session was conducted bi-monthly over the course of six months, enabling participants to absorb and implement the information gradually while allowing time for follow-up discussions and individual questions.

**Data Analysis:** Upon completion of data collection, statistical analyses were performed to evaluate the effectiveness of the Feto-Maternal Outcome Program. Descriptive statistics were utilized to summarize baseline characteristics of the study sample. The means and standard deviations were calculated for continuous variables, while frequencies and percentages were computed for categorical variables. To assess changes in maternal mental health, fetal health indicators, and satisfaction with the IVF process over time, paired t-tests were conducted comparing pre-test (O1) and post-test (O4) measurements. Moreover, repeated measures ANOVA was applied to evaluate trends in feto-maternal outcomes over multiple time points, analyzing how specific outcomes evolved throughout the intervention period from O1 to O7. Statistical significance was set at a p-value of less than 0.05 to determine if there were meaningful differences pre- and post-program intervention. Additionally, qualitative data gathered from open-ended questions in interviews were thematically analyzed to derive insights regarding participant experiences and perceptions of the program.

**Ethical Considerations:** Ethical approval for this study was obtained from the Institutional Review Board of the participating IVF clinics before the research commenced. Informed consent was acquired from all participants, ensuring that they were fully aware of the study's purpose, procedures, and potential risks involved. Participants were assured of their right to withdraw from the study at any time without penalty, maintaining their confidentiality throughout the research process.

### **3. Result and Discussion:**

This section presents the findings from the study aimed at evaluating the effectiveness of the Feto-Maternal Outcome Program among infertile women undergoing Intrauterine Insemination (IUI) and *In Vitro* Fertilization (IVF). The study engaged a total of 30 participants who were recruited from selected IVF clinics in Srikakulam, Andhra Pradesh. The demographics of these participants, along with their pre-test and post-test scores for maternal and fetal health, were meticulously documented and analyzed. Demographic characteristics are crucial as they provide insight into the sample population and help contextualize the findings. In this study, participants displayed a range of ages, educational backgrounds, and lengths of time dealing with infertility, all of which are relevant factors influencing treatment outcomes. The age distribution of participants was indicative of typical reproductive age norms, with the majority falling between 31 and 40 years old, a demographic often associated with increased rates of infertility due to age-related factors. This finding corroborates existing literature that highlights the significance of age in fertility and assisted reproductive technology (Schmidt *et al.*, 2018) <sup>[12]</sup>. Additionally, a substantial portion of the participants possessed higher educational qualifications, which reflects an increasing trend

of educated women pursuing fertility treatments as they become more informed about reproductive health issues (Singh & Kaur, 2019) [13]. Moreover, understanding the duration of infertility experienced by participants provided further insight into their unique challenges and emotional burdens. Those with longer durations of infertility, particularly those who had experienced it for more than two years, may have faced exacerbating psychological distress, as prolonged infertility is well-established as a significant source of anxiety and depression (Evers *et al.*, 2001) [3]. The effectiveness of the Feto-Maternal Outcome Program was assessed through structured pre-test and post-test evaluations. These assessments were focused on maternal mental health, fetal health indicators, and overall satisfaction with the IVF process. By leveraging validated instruments for the measurement of psychological and health-related outcomes, the study aimed to yield reliable results that could inform future interventions.

The results from these evaluations, detailed in the following tables, reflect the changes in outcomes linked to the Feto-Maternal Outcome Program over various time points throughout the intervention. The analysis was conducted using paired statistical tests to determine the significance of changes observed before and after implementation of the program.

**Table 1:** Demographic Characteristics of Participants

Demographic Variable	Frequency (n = 30)	Percentage (%)
Age (Years)		
- 20-30	8	26.7
- 31-40	15	50.0
- 41 and above	7	23.3
Education Level		
- High School	5	16.7
- Graduate	15	50.0
- Post Graduate	10	33.3
Duration of Infertility (Years)		
- < 2	10	33.3
- 2-5	12	40.0
- > 5	8	26.7

The demographic data indicates that the participants were predominantly aged between 31 and 40 years, with this group constituting 50% of the total sample. This age range is consistent with existing literature that highlights a greater likelihood of infertility-related consultations among women in this age bracket due to increased reproductive challenges (Schmidt *et al.*, 2018) [12]. Additionally, a substantial proportion of the participants had attained higher education levels, with 50% being graduates and 33.3% holding postgraduate degrees. This aligns with findings from other studies that suggest educated women are more likely to seek fertility treatments as they are generally more aware of their reproductive health (Singh & Kaur, 2019) [13]. In terms of duration of infertility, the results revealed that 40% of the participants had been experiencing infertility for 2-5 years, while 33.3% had been facing infertility for less than 2 years. This distribution indicates a significant number of participants who had been navigating their infertility for several years, a factor known to influence psychological distress (Evers *et al.*, 2001) [3].

**Table 2:** Pre-Test and Post-Test Scores for Maternal and Fetal Health

Measure	Pre-Test Mean (SD)	Post-Test Mean (SD)	p-value
Maternal Mental Health	21.5 (4.2)	28.5 (3.8)	<0.001
Fetal Health Indicators	60.2 (10.1)	75.3 (8.4)	<0.001
Overall Satisfaction	3.2 (1.1)	4.6 (0.9)	<0.001

The data in Table 2 illustrates significant improvements in maternal mental health, fetal health indicators, and overall satisfaction with IVF treatments post-intervention. The mean score for maternal mental health before the program was 21.5 (SD = 4.2), which rose to 28.5 (SD = 3.8) following the intervention, demonstrating a statistically significant improvement (p < 0.001). This underscores the effectiveness of the Feto-Maternal Outcome Program in targeting psychological well-being, as improved mental health is crucial in fertility care (Lange *et al.*, 2020) [8]. Fetal health indicators also showed significant enhancements, with pre-test scores averaging 60.2 (SD = 10.1) and post-test scores averaging 75.3 (SD = 8.4). This increase indicates the potential positive impact of reduced maternal stress levels on fetal outcomes, as research has indicated that maternal mental well-being can significantly influence fetal health (Tay *et al.*, 2021) [15]. Participants' overall satisfaction with the IVF process improved from a mean score of 3.2 (SD = 1.1) pre-intervention to 4.6 (SD = 0.9) post-intervention, highlighting the program's role in enhancing the quality of care experienced by patients. The significant increases in satisfaction indicate a positive response to the educational resources provided, which is crucial in fostering better patient experiences and adherence to treatment plans (Brennan & Thomas, 2018) [11].

The results obtained from this study provide compelling evidence for the effectiveness of the Feto-Maternal Outcome Program in improving both maternal mental health and fetal health indicators among infertile women undergoing assisted reproductive technologies. The significant improvements observed post-intervention highlight the critical importance of implementing comprehensive educational and emotional support programs within fertility clinics. The enhancement in maternal mental health demonstrated through an increase in GHQ-12 scores aligns with existing literature that emphasizes the importance of addressing psychological factors during fertility treatments (Schmidt *et al.*, 2018) [12]. The role of mental health in reproductive success cannot be understated, as psychological distress can lead to poor treatment adherence and can influence reproductive outcomes negatively (Domar *et al.*, 2000) [2]. Although literature in this field has focused primarily on psychosocial support rather than structured educational interventions, the current findings contribute to an emerging body of evidence advocating for integrated approaches in fertility care. Furthermore, the notable increase in fetal health indicators suggests that addressing maternal mental well-being may also create a healthier gestational environment for the developing fetus. Research has indicated that maternal anxiety and stress during pregnancy can have deleterious effects on fetal development and outcomes (Thompson *et al.*, 2015) [16]. It is essential to prioritize interventions that target mental health to improve the overall well-being of

both mothers and their children. Satisfaction with the IVF process also significantly improved, indicating that the Feto-Maternal Outcome Program increased participant awareness and understanding of the procedural intricacies associated with assisted reproduction. The combination of education, counseling, and support offered within the program provided women with valuable tools to navigate their infertility journey more effectively. As noted by Wilson *et al.* (2013), informed patients tend to have higher satisfaction levels and are more engaged in their treatment process. While the findings of this study support the effectiveness of the Feto-Maternal Outcome Program, they also highlight the need for future research to explore long-term impacts and potential variations in outcomes based on sociodemographic factors. Addressing diverse populations within fertility care settings allows for tailored interventions that meet the unique needs of individual patients (Latthe *et al.*, 2006). Moreover, it is worth noting that while the positive outcomes observed in this study contribute to the literature on feto-maternal health, additional investigations are warranted to validate these findings and assess the program's sustainability over time. Longitudinal studies would be particularly valuable in understanding the lasting effects of educational interventions on mental health, satisfaction and overall reproductive success.

### Conclusion

The Feto-Maternal Outcome Program significantly improved maternal mental health, fetal health indicators, and overall satisfaction among infertile women undergoing Intrauterine Insemination (IUI) and *In Vitro* Fertilization (IVF). These findings underscore the critical need for integrating comprehensive educational resources and emotional support into fertility care practices. By enhancing patient knowledge and well-being, healthcare providers can create a supportive environment conducive to improved reproductive outcomes and enrich the quality of care administered to women facing infertility challenges. The marked improvement in maternal mental health aligns with existing literature emphasizing the link between psychological well-being and reproductive success. By addressing both the physiological and emotional aspects of infertility, the program enables women to navigate their fertility journeys more effectively. Additionally, the enhancement in fetal health indicators highlights the importance of maternal mental health in promoting optimal fetal development, reinforcing the necessity for holistic approaches in reproductive healthcare. Overall satisfaction scores increased significantly among participants, positively correlating with treatment engagement and adherence. This underscores the value of patient-centered care, where informed participants tend to exhibit higher satisfaction levels. Looking ahead, future studies should delve deeper into the multifaceted aspects of reproductive health intervention programs, exploring their long-term impacts and adaptability to diverse populations. Investigating how sociodemographic factors influence experiences and outcomes will be vital for tailoring interventions to meet the unique needs of various groups. The successful implementation of the Feto-Maternal Outcome Program presents a promising model for enhancing education and support in fertility care. By prioritizing these elements, healthcare practitioners can revolutionize practices within the field of assisted reproductive technologies, ultimately fostering healthier and more fulfilling reproductive experiences for women confronting infertility challenges.

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