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EFFECTIVENESS OF SELF-INSTRUCTIONAL MODULE ON KNOWLEDGE AND ATTITUDE TOWARD IN VITRO FERTILIZATION (IVF) AMONG INFERTILE COUPLES ATTENDING INFERTILITY CLINICS OF SELECTED AREAS.

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ABSTRACT:

Background: Infertility was a global health concern affecting millions of couples and impacting their emotional well-being. In Vitro Fertilization (IVF) offered hope but faced barriers due to misconceptions, poor knowledge, and negative attitudes. Educational tools like self-instructional modules improved awareness, fostered positive attitudes, and supported informed decisions about IVF. However, limited research had evaluated their impact on knowledge and attitudes toward IVF. **Objectives:** To evaluate the effectiveness of a self-instructional module on knowledge and attitude toward in vitro fertilization (IVF) among infertile couples who attended infertility clinics of selected areas. **Methodology:** A pre-experimental one-group pre-test post-test design was used with 70 infertile couples from infertility clinics in Nagpur, Maharashtra, selected through purposive sampling. The study lasted one month. Data were collected using a self-structured knowledge questionnaire and a 5-point Likert scale for attitude. After the pre-test, a Self-Instructional Module on IVF was administered, and the post-test was conducted on the 7th day. Content validity was ensured by experts, and data were analyzed using descriptive and inferential statistics. **Result:** The pre-test knowledge score (0–20) had a mean of 5.47 (SD=1.25), while the post-test mean increased to 14.58 (SD=1.31). Similarly, the pre-test attitude score (0–90) had a mean of 35.42 (SD=6.03), which improved to 69.45 (SD=2.98) post-test. Paired t-test results showed significant improvement in both knowledge and attitude after using the Self-Instructional Module on In Vitro Fertilization (IVF), indicating that infertile couples enhanced their knowledge and attitude toward IVF. **Limitation:** Only infertile couples were included in this study. **Conclusion:** This study contributed to developing knowledge and enhancing attitude towards In Vitro Fertilization (IVF) among infertile couples attending infertility clinics. Providing accurate, accessible, and comprehensible information empowered couples to make informed decisions regarding infertility management.

KEYWORDS: Self-Instructional Module, Knowledge, Attitude, In Vitro Fertilization, Infertile Couples.

I. INTRODUCTION

Many couples spend a portion of their lives attempting to avoid unplanned pregnancies, and assume that once they are ready to conceive, it will happen with little difficulty. A failure to conceive, then is a major life stressor, which can affect the well-adjusted couple. It is more traumatic for women than men, because society had made child bearing and child rearing as an integral part of the women and they are considered as very essence of female role and identity. Thus, infertility leads to concrete feeling of physical and social inferiority that overshadows all other personal and social value.[1]

Infertility is defined as the inability to conceive within one or more years of regular unprotected coitus. Primary infertility denotes those patients who never conceived. Secondary infertility indicates previous pregnancy but failure to subsequently. The field of reproductive medicine has changed forever with the birth of Louise Brown in 1978 by in vitro fertilization and embryo transfer (IVF-ET). Patrick Steptoe and Robert Edwards of England are remembered for their revolutionary work.[2]

The case of Subhas Mukerji in Kolkata is well known. He reportedly produced India's first and the world's second test tube that was born in October 1978, just a few months after Louise Brown was born.[3]

In vitro fertilization (IVF) is a well-established and widely utilized assisted reproductive technology (ART) that involves fertilizing an egg outside the body in a controlled laboratory environment before transferring the resulting embryo into the uterus. While IVF has demonstrated high success rates and increasing acceptance, many infertile couples still lack adequate knowledge about the procedure. Misinformation, anxieties, and cultural influences often act as barriers, preventing timely and appropriate medical consultation and intervention.[4]

In vitro fertilization (IVF) is often used to address female infertility caused by issues with the fallopian tubes, which can make natural fertilization challenging. It is also beneficial in cases of male infertility, particularly when there are defects in sperm quality. In such instances, intracytoplasmic sperm injection (ICSI) may be utilized, where a single sperm cell is directly injected into the egg. This technique is especially helpful when sperm struggle to penetrate the egg, and either the partner's or a donor's sperm can be used. Additionally, ICSI is commonly employed in cases of low sperm count and has been shown to improve IVF success rates.[5]

II. STATEMENT OF THE PROBLEM:

To Evaluate the Effectiveness of Self-Instructional Module on Knowledge and Attitude Toward In Vitro Fertilization (IVF) Among Infertile Couples Attending Infertility Clinics of Selected Areas.

III. OBJECTIVE

1. To assess pretest knowledge score toward In Vitro Fertilization (IVF) among infertile couples attending infertility clinics of selected areas.
2. To assess pretest attitude score toward In Vitro Fertilization (IVF) among infertile couples attending infertility clinics of selected areas.
3. To evaluate the effectiveness of self-instructional module on knowledge and attitude toward in vitro fertilization (IVF) among infertile couples attending infertility clinics of selected areas.
4. To find out the association of study finding with selected demographic variables.

IV.HYPOTHESIS:

H0- There is no significant difference between the pretest and posttest knowledge and attitude score toward In Vitro Fertilization (IVF) among infertile couples.

H_1- There is significant difference between the pretest and posttest knowledge and attitude score toward In Vitro Fertilization (IVF) among infertile couples

V.MATERIAL & METHODOLOGY

5.1. Research Design: A pre-experimental one group pre-test post-test design.

5.2. Study setting: The study was conducted in selected infertility clinics of Nagpur district, Maharashtra, India.

5.3. Population & Sample: Infertile couples of selected infertility clinics in Nagpur.

5.4. Sample Size estimation: The sample size was determined using a sample size formula based on population proportion, considering both inclusion and exclusion criteria for participant selection.

Formula Used:

Sample size for quantitative data:

$n = (z\ 2\ * \delta\ 2\ ) / e\ 2\ )$

$Z = 1.96$

δ = SD of pretest

= 16.26

e = Desired error of margin = 4% = 0.04

n = (1.96 2 * 16.26 2) / 0.04 2)

= 63.47 =64

By assuming non response rate of 10% i.e. 10% of 64 = 6.4 =6

N= Total Sample = 64+6 =70 samples needed in study

Study Reference: Shweta Potnis et al[6]

Formula Reference: B.K. Mahajan

Statistical Methods: Student's t test, Chi-square test

Software Used: SPSS 27.0 version

A total of 70 participants were selected using Cochrans formula.

5.5. Sampling Technique: Non-probability purposive sampling technique.

5.6. Sampling Criteria

Inclusion criteria:

1. Infertile couples in the age group 21–45.
2. Infertile couples who were willing to participate in the study.
3. Infertile couples who were able to read and write Marathi or Hindi or English.

Exclusion criteria: Infertile couples who had previously undergone in vitro fertilization (IVF) treatment.

5.7. Variables

- Independent Variable: Self-instructional module on in vitro fertilization.
- Dependent Variable: Knowledge and Attitude.
- Demographic Variables: Age of wife, area of residence, husband's education, husband's job, monthly income, years of marriage, family history of infertility, and source of information.

5.8. Tool: Tool is a research instrument is a device used to measure the concept of interest in a research project that a Investigator uses to collect data.

Section-A: Demographic variables. Data was collected using a structured questionnaire developed by the investigator after an extensive review of literature and guidance from subject experts. The tool consisted of two parts:

Section-B: Self-structured questionnaires on knowledge: This section comprised multiple-choice questions and structured items designed to assess participants' knowledge towards In Vitro Fertilization. The items covered domains such as definition, causes and risk factors, indications, procedures, benefits, complications and success rates. Each correct response was awarded one mark, while incorrect or "don't know" responses received zero. Higher scores indicated better knowledge levels.

Section-C: 5-points Likert scale to assess the Attitude Scale: A modified 5-point Likert scale was used to measure participants' attitudes toward In Vitro Fertilization. The scale ranged from strongly agree (5) to strongly disagree (1). Both positive and negative statements were included to minimize response bias. The total attitude score was interpreted as favorable or unfavorable depending on the cut-off set by the researcher.

VI.VALIDITY & RELIABILITY:

6.1. Content Validity: Content validity was established by a panel of experts in community health nursing & obstetrics and gynecological nursing, and the Scale Content Validity Index (S-CVI) confirmed that the items were relevant and representative. Reliability testing was conducted on 10 samples; Cronbach's alpha was 0.851 for the knowledge questionnaire and inter-rater reliability was 0.9195 for the attitude scale, indicating high reliability.

6.2. Construct Validity: Construct validity was assessed through Exploratory Factor Analysis (EFA) using Principal Component Analysis (PCA). Sampling adequacy was confirmed by a Kaiser–Meyer–Olkin (KMO) value of 0.82, and Bartlett's test of sphericity was significant, confirming the suitability of the data for factor analysis. Components with eigenvalues greater than 1 were extracted, and items demonstrated factor loadings above 0.40. These results established that the instrument effectively measured the intended constructs of knowledge and attitude toward IVF.

6.3. Reliability: In this study reliability was tested on 10 samples by Cronbach's alpha method for knowledge.: 0.851 & for Attitude: 0.9195

VII.DATA COLLECTION PROCESS:

The study was conducted after IEC approval (GMC/IEC/2023-24/2089 dated 23.02.24) and permissions from the concerned authorities to conduct the study. A pilot study was conducted to check the feasibility and reliability of the tool and procedure. Following necessary refinements, the main study was initiated after a gap of seven days. A total of 70 infertile couples were selected using a non-probability purposive sampling technique. After selection, the investigator introduced herself to the participants, explained the purpose and steps of the research study, and obtained written informed consent from all participants. Demographic data were collected using a structured questionnaire, followed by the administration of a pre-test to assess baseline knowledge and attitude regarding In Vitro Fertilization (IVF). The intervention phase consisted of administering a Self-Instructional Module (SIM) on knowledge and attitude regarding IVF. A post-test was conducted on the 7th day after completion of the intervention to measure changes in knowledge and attitude. The planned sample size of 70 infertile couples was successfully achieved as per the inclusion criteria**.**

VIII. DESCRIPTION OF INTERVENTION:

The intervention in this study was the administration of a Self-Instructional Module (SIM) on knowledge and attitude regarding In Vitro Fertilization (IVF). The SIM was a structured, self-learning educational tool developed by the investigator to provide comprehensive information about IVF, including its definition, causes and risk factors, indications, procedures, benefits, complications and success rates. The module was designed in simple, understandable local language and supplemented with illustrations to enhance clarity and retention.

After the pre-test was conducted, the SIM was distributed to the participants, who were instructed to read and understand the content at their own pace. The module emphasized self-directed learning, allowing participants to revisit and review the material as needed. The intervention aimed to fill the existing knowledge gaps, reduce misconceptions, and promote a positive attitude toward IVF among infertile couples.

One week after the administration of the Self-Instructional Module, a post-test was conducted using the same structured knowledge questionnaire and attitude scale to evaluate the effectiveness of the intervention.

IX.DATA ANALYSIS:

Descriptive statistics (frequency, percentage, mean, SD) and inferential statistics (paired t-test, chi-square) were used. A quantitative research approach with a pre-experimental, one-group pre-test post-test design was utilized for this study. The study was conducted in selected infertility clinics of Nagpur city. The study involved 70 participants selected using a non-randomized control method to minimize bias. Data were analyzed across two timelines: pre-test (Day 1) and post-test (Day 7). The results are organized into descriptive and analytical summaries as per the study objectives. Reliability testing was conducted using Cronbach's alpha to assess the consistency of the tools used. The pilot study results showed a reliability score of r' = 0.851 for the knowledge questionnaire and r' = 0.9195 for the attitude scale, both indicating high reliability. The overall Cronbach's alpha value of 0.885 confirms that the tools used in the study demonstrated acceptable reliability. Data analysis was performed using descriptive and inferential statistics, including the paired 't' test and Chi-square test, with a significance level set at $p<0.05$.

X. RESULT:

The data analysis was organized into four sections.

Section 1: Distribution of infertile couples with regards to demographic variables.

Section 2: Assessment of level of pretest and posttest knowledge and attitude toward In Vitro Fertilization (IVF) among infertile couples attending infertility clinics of selected areas.

Section 3: Evaluation of effectiveness of Self-Instructional Module on knowledge and attitude toward In Vitro Fertilization (IVF) among infertile couples attending infertility clinics of selected areas.

Section 4: Association of level of pretest knowledge and attitude score toward In Vitro Fertilization (IVF) among infertile couples attending infertility clinics of selected areas with their selected demographic variables.

Together, these sections provided a comprehensive analysis of the data, measuring both the effectiveness of the intervention and the influence of demographic factors.

Table 1: Percentage wise distribution of Infertile Couples according to their demographic Variable.

n=70

Demographic Variables	No. of Infertile Couples	Percentage (%)
Age(yrs) of wife		
21-25 yrs	12	17.1
26-30 yrs	27	38.6
31-35 yrs	23	32.9
≥36 yrs	8	11.4
Area of residence		
Urban	57	81.4
Rural	13	18.6
Husband's education		
Primary	3	4.3
Secondary & Higher Secondary	43	61.4
Graduation	24	34.3
Postgraduation	0	0

Husband's job		
Labour	14	20.0
Govt Job	7	10.0
Private Job	27	38.6
Other	22	31.4
Monthly family income (Rs)		
15000-20000 Rs	20	28.6
20001-25000 Rs	31	44.3
25001-30000 Rs	13	18.6
≥30001 Rs	6	8.6
Year of marriage		
3-5 yrs	22	31.4
5-7 yrs	26	37.1
7-9 yrs	15	21.4
≥10 yrs	7	10.0
Family history of infertility		
First degree relatives	5	7.1
Second degree relatives	9	12.9
Third degree relatives	17	24.3
None of the above	39	55.7
Source of information		
Internet and Media	49	70.0
Health Professional	13	18.6
Friends and family	2	2.9
Other	6	8.6

The table 1. represented that most wives were aged 26–35 years (71.5%), and the majority of couples (81.4%) lived in urban areas. Over half of the husbands (61.4%) were educated up to secondary or higher secondary, and 38.6% were employed in private jobs. Nearly three-fourths of families earned between Rs. 15,000–25,000 per month. About two-thirds of couples had been married for 3–7 years. More than half (55.7%) reported no family history of infertility, and the main source of IVF information was the internet and media (70%).

Table 2: Assessment with level of knowledge score

n=70

Level of knowledge	Score Range	Level of Knowledge Score	
		Pre-Test	**Post Test**
Poor	0-5	67(95.71%)	**0(0%)**
Good	6-12	3(4.29%)	**36(51.43%)**
Very Good	13-20	0(0%)	**34(48.57%)**
Minimum score		3	**12**
Maximum score		8	**18**

Mean knowledge score	5.47±1.25	**14.58±1.31**
Mean % Knowledge Score	**27.35±6.29**	**72.92±6.56**

The table 2 illustrated that in the pretest, 95.71% of infertile couples had poor knowledge (mean score 5.47±1.25), while in the posttest, 51.43% had good knowledge and 48.57% had very good knowledge (mean score 14.58±1.31). The mean percentage score improved from 27.35% to 72.92%, showing a marked gain in knowledge after the intervention.

Table 3: Assessment with level of attitude score

n=70

Level of attitude	Score Range	Level of Attitude Score	
		Pre-Test	**Post Test**
Positive Attitude	≥50%	6(8.57%)	**70(100%)**
Negative Attitude	<50%	64(91.43%)	**0(0%)**
Minimum score		25	**64**
Maximum score		56	**75**
Mean attitude score		35.42±6.03	**69.45±2.98**
Mean % Attitude Score		**39.36±6.70**	**77.17±3.31**

The table 3 illustrated that in the pretest, 91.43% of infertile couples had a negative attitude and only 8.57% had a positive attitude toward IVF, whereas in the posttest all (100%) showed a positive attitude. The mean attitude score improved from 35.42±6.03 (39.36%) to 69.45±2.98 (77.17%), indicating a significant positive shift after the intervention.

Table 4: Significance of difference between knowledge score in pre and posttest of Infertile Couples

n=70

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre-Test	5.47	1.25	9.11±1.81	42.03	**0.0001 S,p<0.05**
Post Test	**14.58**	**1.31**			

The table 4 illustrated that the paired 't' test showed a calculated value of 42.03, which was much higher than the tabulated value of 1.98 at 5% significance level (df = 69). This indicates a statistically significant improvement in knowledge after the Self-Instructional Module, hence H_1 was accepted.

Table 5: Significance of difference between attitude score in pre and posttest of Infertile Couples

n=70

Overall	Mean	SD	Mean Difference	t-value	p-value
Pre-Test	35.42	6.03	34.02±6.59	43.14	**0.0001 S,p<0.05**
Post Test	**69.45**	**2.98**			

The table 5 illustrated that the paired 't' test value (43.14) was much higher than the tabulated value (1.98) at 5% significance level (df = 69), indicating a significant improvement in attitude after the Self-Instructional Module. Hence, H_1 was accepted.

Table 6: Association of Pretest Knowledge & Attitude Score with Selected Demographic Variables of Infertile Couples

(n = 70)

Demographic Variable	χ^2 value (Knowledge)	p-value	Association	χ^2 value (Attitude)	p-value	Association
Age of wife	24.29	0.0001	Significant	1.91	0.59	Not significant
Area of residence	0.45	0.50	Not significant	18.20	0.0001	Significant
Husband's education	6.68	0.035	Significant	2.97	0.22	Not significant
Husband's job	1.58	0.66	Not significant	4.64	0.20	Not significant
Monthly family income	33.43	0.0001	Significant	1.64	0.64	Not significant
Years of marriage	4.30	0.23	Not significant	5.99	0.11	Not significant
Family history of infertility	5.31	0.15	Not significant	0.80	0.84	Not significant
Source of information	1.34	0.71	Not significant	70.00	0.0001	Significant

Table 6 showed that pretest knowledge scores were significantly associated with wife's age (χ^2=24.29, p=0.0001), husband's education (χ^2=6.68, p=0.035), and monthly family income (χ^2=33.43, p=0.0001), while other variables were not significant. In contrast, pretest attitude scores were significantly associated with area of residence (χ^2=18.20, p=0.0001) and source of information (χ^2=70.00, p=0.0001), with no significant association found for other variables.

XI.DISCUSSION

The present study aimed to evaluate the effectiveness of self-instructional module on knowledge and attitude toward In Vitro Fertilization (IVF) among infertile couples. Findings demonstrated a significant rise in both knowledge and attitude scores post-intervention, confirming that Self-instructional module is a valuable educational strategy.

The present study findings were supported by Shweta Potnis and Rhoda Jesuraj (2023) evaluated the effectiveness of a planned teaching program on knowledge and attitude regarding assisted reproductive techniques among 50 infertile women in Bagalkot, Karnataka. The study showed significant improvements in knowledge (pre-test mean 13.84 vs. post-test 15.16, p<0.05) and attitude (pre-test mean 16.26 vs. post-test 25.52, p<0.05). Occupation and duration of marriage were significantly associated with post-test knowledge, while other socio-demographic factors were not. These findings confirm that educational interventions effectively enhance knowledge and attitude regarding reproductive techniques.[6]

Similarly, the present study findings were supported by Rakshitha et al. (2024), who assessed knowledge and attitudes toward IVF among 60 final-year B.Sc. nursing students in Tumkur, Karnataka. Results showed 55% had inadequate knowledge and 65% held negative attitudes. Knowledge was not associated with demographic factors, while attitudes were linked to gender, residence, and prior IVF exposure, highlighting the need for improved education.[7]

The findings of the study indicated that the knowledge and attitude toward In Vitro Fertilization (IVF) among infertile couple attending infertility clinics of selected areas was found to be poor and less favorable attitude. The study found that in the pretest knowledge score had a mean of 5.47±1.25 which experienced a substantial improvement in the post-test with a mean of 14.58±1.31, reflecting a significant increase of 9.11 in knowledge score. Similarly, the pretest attitude score (mean ± SD of 35.42±6.03) showed remarkable enhancement in the post-test (mean ± SD of 69.45±2.98), with a notable improvement score of 34.03. The p value 0.0001 which was less than 0.05 level of significance. Thus, Null hypothesis (H_{01}& H_{02}) was rejected and alternate hypothesis (H_1 & H_2) was accepted. The result also indicated that, there was a positive correlation between Knowledge and attitude but there is a significant statistical association between Knowledge and attitude with some demographic variables.

XII.CONCLUSION:

The study leads to the following conclusion Self Instructional Module toward In Vitro Fertilization (IVF) were found to be effective in improving the knowledge and attitude of infertile couples. Infertile couples had a significant gain in knowledge and change in attitude toward In Vitro Fertilization (IVF). The demographic variables like age of wife, husband's education, monthly family income (Rs) shows association with the knowledge score and demographic variable area of residence & source of information shows association with attitude score. Hence, based on the above findings, it was concluded undoubtedly that the Self-Instructional Module prepared by investigator helped the infertile couples to improve their knowledge and attitude toward In Vitro Fertilization (IVF).

XIII.ETHICAL CONSIDERATION:

The study conducted approval was obtained from the Institutional Ethics Committee, Government Medical College, Nagpur (GMC/IEC/2023-24/2089 dated 23.02.24) Written informed consent was taken from each participant for participation in study.

XIV.LIMITATION:

The study was limited by a short data collection period, a small sample size of 70 couples reducing generalizability, and the self-instructional module not fully addressing emotional and financial aspects of IVF.

XV.RECOMMENDATIONS

Based on the study's findings, the following recommendations will be proposed: Clinics will incorporate and tailor self-instructional modules, multimodal and digital approaches will be used for wider reach, and future research and policy on IVF education will be supported

XVI. CONFLICT OF INTEREST

The authors declare no conflict of interest.

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