International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 20s, (2025)
https://theaspd.com/index.php/ijes

A Study to Assess the Effectiveness of Information Booklet on Knowledge and Attitude Regarding In Vitro Fertilization Among Reproductive Women in Selected Areas of Gurugram, Haryana

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Abstract

Background: *In vitro fertilization (IVF) is one of the most widely utilized assisted reproductive technologies (ART) in the world, helping millions of couples and individuals who experience infertility to realize their dreams of having children. The inability to conceive after 12 months or more of consistent, unprotected sexual activity is known as infertility, and it can affect either the male or female reproductive system.*

Method: *The pre-experimental (one group pretest - posttest) design was used in this study. The sample consisted of 60 reproductive women, who were chosen through convenience sampling technique. Data was collected by administering the self-structured questionnaire. The data was organized in master data sheet and analysis using descriptive and inferential statistics as per objective of the study, using SPSS version 20.*

Result: *The main study was finding revealed that none of participants having adequate knowledge and 25 (41.7%) had negative attitude. In posttest, majority i.e., 39 (65%) had moderate adequate knowledge and 47 (78.3%) had positive attitude. The information booklet regarding IVF was effective in improving the knowledge and attitude of the selected group of people. Hence, with an increase in knowledge, there is a gradual increase in attitude. The mean pre-test knowledge score of the women was 10.46 ± 1.55 which increased to 14.73 ± 1.62 in the post-test. Also, the mean attitude score of women improved in post-test 4.20 ± 0.776 as compared to pre-test skills score 2.78 ± 1.09. Hence it showed that effectiveness of plan teaching program regarding IVF.*

Conclusion: *After giving the plan teaching program on In Vitro Fertilization, the knowledge and attitude level of reproductive women got increased regarding In Vitro Fertilization, hence it concluded that the plan teaching program was effective in increasing the knowledge and attitude regarding In Vitro Fertilization.*

Keywords: *In Vitro Fertilization, knowledge, effectiveness, reproductive women.*

1. INTRODUCTION

In Vitro Fertilization (IVF) is one of the most widely utilized Assisted Reproductive Technologies (ART) in the world, helping millions of couples and individuals who experience infertility to realize their dreams of having children.[1] The inability to conceive after 12 months or more of consistent, unprotected sexual activity is known as infertility, and it can affect either the male or female reproductive system.[2]

IVF involves a complex process of stimulating the ovaries to produce eggs, retrieving the eggs, fertilizing them outside the body, and implanting the resulting embryos into the uterus. While IVF has evolved into a routine procedure, it remains a deeply emotional and financial decision for many individuals and couples.[3,4]

Despite the growing availability of IVF services globally, a significant gap in knowledge about IVF exists, particularly among reproductive women. According to the various research studies indicates that many women remain uninformed or misinformed about IVF, including its success rates, potential risks, and the financial and emotional burdens associated with the treatment.[5,6] This gap in understanding could potentially delay or deter women from seeking IVF as a viable solution for infertility. Consequently, there

is a critical need for effective educational resources that can improve the knowledge and attitudes of women considering or undergoing IVF.[7,8]

The Total Fertility Rate (TFR) reduced to 2.0 children per woman from 2.2 children per woman in the fourth round of the National Family Health Survey (NFHS) conducted in 2015-16, according to the fifth round of the NFHS conducted by MoHFW in 2019–21. This means that the replacement level of fertility of 2.1 children per woman has been achieved.[8]

The current study aims to explore the effectiveness of such an information booklet in improving both knowledge and attitudes regarding IVF among reproductive women.[9] By focusing on women in the reproductive age group who may be contemplating fertility treatments, this study will contribute to the ongoing discussion on how to effectively educate and inform individuals about IVF, ultimately leading to better healthcare choices and enhanced emotional preparedness.[10]

Need of the Study

This study will be conducted with reproductive women aged 20-45 years who are considering or have previously considered fertility treatments.17 Participants will be drawn from healthcare canters specializing in infertility treatments, including IVF clinics, to ensure a relevant sample of individuals. The scope of the study will be geographically limited to a specific region, with participants selected through purposive sampling to meet specific inclusion criteria.18 The information booklet used in the study will focus on educating reproductive women about the IVF process, its risks and benefits, the psychological and emotional challenges involved, and the available support systems.19 The booklet will be carefully designed to be clear, factual, and non-technical, ensuring that it is accessible and understandable to women with varying levels of education and medical knowledge.

2. MATERIAL AND METHODS

Study Objectives

1. To assess the knowledge regarding IVF among reproductive women in selected areas of Gurugram.
2. To assess the attitude regarding IVF among reproductive women in selected areas of Gurugram.
3. To assess the effectiveness of information booklet among reproductive women in selected areas of Gurugram.
4. To find out the association between knowledge and attitude among reproductive women with selected demographic variable in selected areas of Gurugram.

Study Design: The research strategy for this study will be pre-experimental research with a one-group pre-test and post-test.

Setting: Selected areas of Gurugram

Sample: Reproductive women

Sampling technique: Convenience sampling technique

Description of the Tools:

- **Section A:** Demographic Variables

It deals with demographic data. Which contain of 6 items to collect the data age, qualification, no. of pregnancy, occupation, socioeconomic status and previous knowledge regarding IVF.

- **Section B**: Structured Knowledge Questionnaire regarding IVF

It deals with Structured Knowledge Questionnaire regarding IVF. The structure knowledge questionnaires contain of 20 questions of multiple choice.

- **Section C:** Five-point Likert's Attitude Scale regarding IVF.

Data Collection Duration:

The study was conducted in the month of 5 January, 2025 to 12 January, 2025 after the approval of institutional committee of SGT University. An information Booklet on IVF was given to the participants with proper guidelines and explanation. After 7 days, the same instrument was used to conduct a follow-up test

Data analysis

Analysis and interpretation of data was done according to the objectives using descriptive and inferential statistics. The level of significance chosen was at $p \leq 0.05$.

3. RESULTS

Analysis of data is presented in following section:

Section A: Description of the demographic data.

Table : 1 According to age (N=60)

Age in years	**Frequency**	**Percentage**
a. 21-23	20	33.3%
b. 24-28	30	50.0%
c. 29 and above	10	16.7%
Total	60	100%

The table presents the distribution of participants by age group. The largest group, 24-28 years, comprises 50% (30 participants), followed by 21-23 years with 33.3% (20 participants), and 29 and above with 16.7% (10 participants).

Table 2 – Distribution of respondents according to type of pregnancy (N=60)

Type of pregnancy	Frequency	Percentage
a. Primi	24	40%
b. Multi	36	60%
Total	60	100%

The table shows the distribution of participants based on the type of pregnancy. The majority, 60% (36 participants), have multi pregnancies, while 40% (24 participants) are primi.

Table 3- Distribution of respondents according to Education (N= 60)

Education	Frequency	Percentage
a. Primary Education	14	23.3%
b. Secondary Education	32	53.4%
c. Gradution	14	23.3%
d. Uneducated	0	0%
Total	60	100%

The table illustrates the educational qualifications of the participants. A majority, 53.4% (32 participants), hold a secondary education. Both primary education and diploma qualifications are held by an equal number of participants, each representing 23.3% (14 participants). The distribution shows that most individuals in this sample have completed their secondary studies, while the remaining have either a diploma or a primary qualification.

Table 4-Distribution of respondents according to Socio-Economic status (N=60)

Socio- Economic status	Frequency	Percentage
a. Upper middle class	10	16.7 %
b. Below- lower	9	15%
c. Upper class	18	30%
d. Lower class	23	38.3%
Total	60	100%

The table presents the socio-economic status of the participants. The largest group, 38.3% (23 participants), belongs to the lower class, followed by 30% (18 participants) from the upper class. The

upper middle class represents 16.7% (10 participants), and 15% (9 participants) fall into the below-lower category. This distribution shows that most participants are either from the upper or lower socio-economic classes, while fewer belong to the upper middle or below- lower classes.

Table 5-Distribution of respondents according to Have you Attended any Education Session on IVF (N=60)

Have you Attended any education session on IVF	Frequency	Percentage
a. Yes	33	55%
b. No	27	45%
Total	60	100%

The table shows the responses of participants regarding their attendance at education sessions on IVF. A majority, 55% (33 participants), have attended such sessions, while 45% (27 participants) have not. This indicates that more than half of the sample has received information or education on IVF, suggesting a moderate level of awareness in the group.

Table 6-Distribution of respondents according to Mother's Occupation (N=60)

Education	Frequency	Percentage
a. Private Sector	14	23.3%
b. Govt. Sector	32	53.4%
c. Others	14	23.3%
Total	60	100%

This table shows the distribution of respondents based on their mother's occupation. Out of 60 respondents, 23.3% have mothers in the private sector, 53.4% in the government sector, and 23.3% in other occupations. The total percentage adds up to 100%.

Section- B Pre-test Knowledge and Attitude regarding IVF among women's.

Table 7: Pre-test Knowledge & Attitude regarding IVF among women's. (N=60)

Pre test score	No of items	Max score	Mean score	Mean%	SD
Overall knowledge score	20	20	10.46	52.3%	1.55
Likert scale regarding IVF	10	10	5.54	55.6%	1.09

This table presents the results of pre-test scores for two measures: overall knowledge and self-structured attitude toward IVF. The overall knowledge score is based on 20 items, with a maximum score of 20, where the mean score is 10.46, reflecting a mean percentage of 52.3% and a standard deviation (SD) of 1.55. For the self-structured attitude checklist, which consists of 10 items and a maximum score of 10, the mean score is 5.54, corresponding to a mean percentage of 55.6% and an SD of 1.09. These scores highlight the participants' average knowledge and attitudes toward IVF before the intervention.

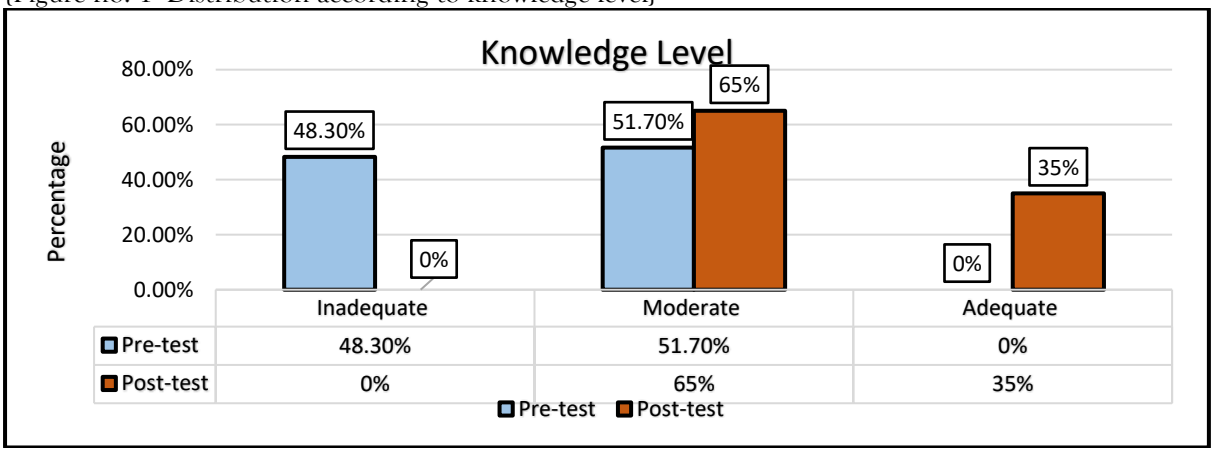
Section- C Post-test Knowledge and Attitude regarding IVF among mothers

Table 8: Post-test Knowledge attitude regarding IVF among mothers. (N=60)

Post-test Score	**No of items**	**Max. Score**	**Mean score**	**Mean %**	**SD**
Over all Knowledge score	**20**	**20**	**14.73**	**73.65%**	**1.62**
Likert Scale Regarding IVF	**5**	**10**	**4.20**	**84%**	**0.776**

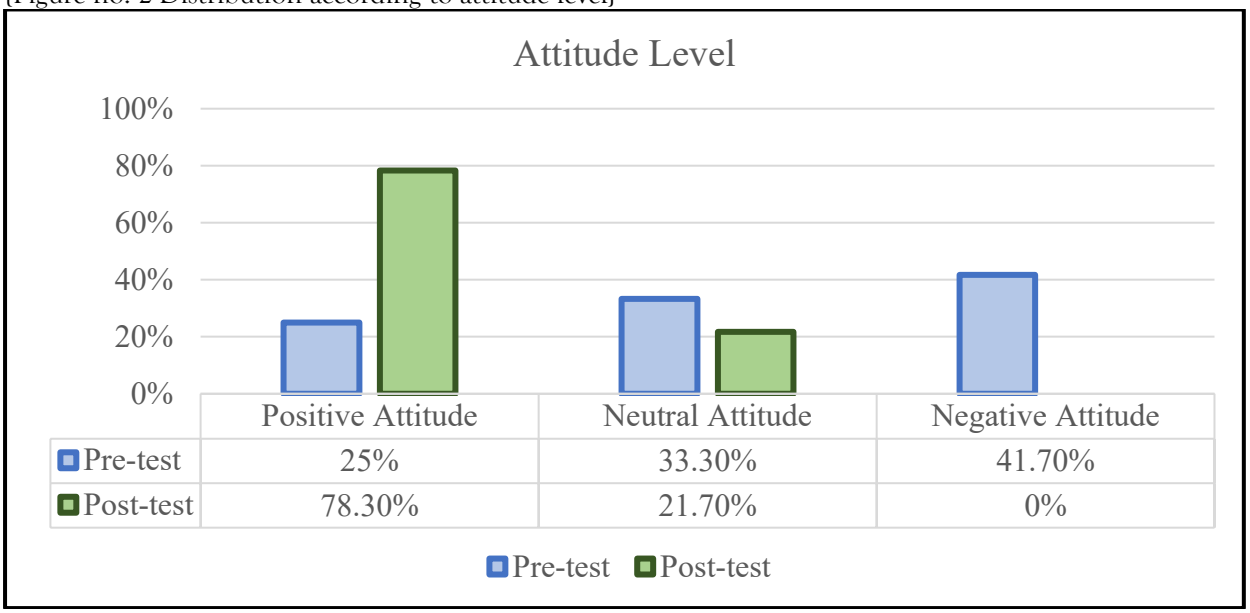
The table presents the results of post-test scores for two measures: overall knowledge and self-structured attitude toward IVF. The overall knowledge score, based on 20 items with a maximum score of 20, has a mean score of 14.73, translating to a mean percentage of 73.65%, with a standard deviation (SD) of 1.62. For the self-structured attitude checklist, which consists of 5 items with a maximum score of 10, the mean score is 4.20, resulting in a mean percentage of 84% and an SD of 0.776. These results indicate an improvement in both knowledge and attitudes toward IVF after the intervention.

{Figure no. 1 -Distribution according to knowledge level}



It shows the distribution of participants' knowledge levels in the pre-test and post-test. In the pre-test, 48.3% (29 participants) scored in the "inadequate" range (0-10), while 51.7% (31 participants) scored in the "moderate" range (11-15). No participants scored in the "adequate" range (15-20) in the pre-test. However, in the post-test, the results show improvement: 65% (39 participants) scored in the moderate range, and 35% (21 participants) achieved an adequate score. Notably, no participants scored in the inadequate range post-test, indicating a significant enhancement in knowledge following the intervention.

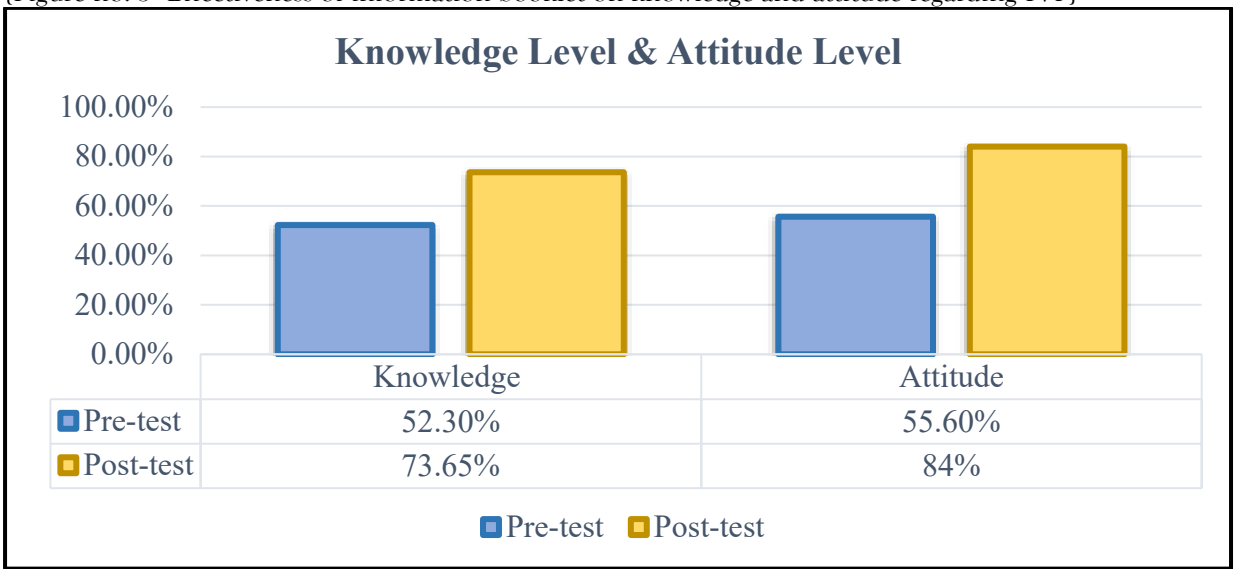
{Figure no. 2-Distribution according to attitude level}



The Figure illustrates the distribution of participants' attitude levels toward IVF in both the pre-test and post-test. In the pre-test, 41.7% (25 participants) had a negative attitude (score less than 5), while 33.3% (20 participants) had a neutral attitude (score between 5 and 7), and 25%(15 participants) had a positive attitude (score between 8 and 10). In the post-test, attitudes improved significantly, with 78.3% (47 participants) exhibiting a positive attitude, and only 21.7% (13 participants) showing a neutral attitude.

No participants had a negative attitude post-test, indicating a clear shift toward a more positive outlook on IVF.

Section D: Effectiveness of information booklet on the Knowledge and Attitude of IVF among mothers
{Figure no. 3- Effectiveness of information booklet on knowledge and attitude regarding IVF}



The effectiveness of an information booklet on mothers' attitudes and understanding of IVF is assessed in the table. The pre-test mean score for knowledge was 10.46 (52.3%), however the standard deviation (SD) was 1.55. With a t-value of 4.27 and a p-value of 0.05*, the post-test mean score rose to 14.73 (73.65%) with an SD of 1.62, indicating a substantial improvement. This implies that the booklet had a statistically significant effect on knowledge. The pre-test mean score for attitude was 2.78 (55.2%), with a standard deviation of 1.09. A significant positive change in attitude was shown by the post-test mean score, which indicate to 4.20 (84%), with an SD of 0.776, a significant t-value of 8.76, and a p-value of 0.05*.

SECTION E Findings on the association between posttest knowledge level with the selected demographic variables

TABLE 9: Chi- square computed to establish the association between post-test level of knowledge and their demographic characteristics (N=60)

Demographic Variable	N	Mean	SD	Calculated value (X^2)	df	P-Value
Age in year a) 21-23 years b) 24-28 years c) 29 & above	 20 30 10	 15.100 14.700 14.100	 1.61 1.55 1.79	X^2 =1.288^{NS}	2	0.284
Qualification a) Primary Education b) Secondary Education c) Graduation	 12 32 16	 14.142 15.156 14.357	 1.46 1.43 1.98	X^2 =2.506^{NS}	2	0.091
No. Of pregnancy a) Primi b) Multi	 24 36	 15.208 14.416	 1.58 1.59	X^2 3.568^{NS}	1	0.064
Occupation a) Private Sector b) Govt. Sector	 14 32	 14.142 15.156	 1.46 1.43	X^2 =2.506^{NS}	2	0.091

c) Others	14	14.357	1.98			
Socio- economic status a) Upper middle class b) Below lower class c) Upper class d) Lower class	 10 9 18 23	 14.200 14.555 14.666 15.087	 1.39 1.01 1.70 1.87	X^2 =0.759^{NS}	3	0.522
Previous knowledge regarding IVF a) Yes b) No	 33 27	 14.484 15.037	 1.54 1.69	X^2 =1.737^{NS}	1	0.193

NS=Non-Significant * Significance at p≤0.05 level of significance

Data in table 9 evaluates the association between post-test knowledge and demographic characteristics of experimental group by chi square test. Chi square value of age in year, qualification, no. Of pregnancy, occupation, socio-economic status, previous knowledge regarding IVF as calculated value (X^2=1.288^{NS}), (X^2=2.506^{NS}), (X^2=3.568^{NS}), (X^2=2.506^{NS}) (X^2=0.759^{NS}), (X^2=1.737^{NS}) respectively. There is no association between post-test knowledge and demographic variables.

SECTION F To find association between post-test attitude score of IVF and demographical variables of mothers

Table 10: Chi- square computed to establish the association between post-test and their demographic characteristics of experimental (N=60)

Demographic Variable	**N**	**Mean**	**SD**	**Calculated F value (X^2)**	**df**	**P-Value**
Age in year a) 21-23 years b) 24-28 years c) 29 & above	 20 30 10	 4.150 4.233 4.200	 0.81 0.77 0.78	X^2 =0.067^{NS}	2	0.935
Qualification a) Primary Education b) Secondary Education c) Graduation	 12 32 16	 4.285 4.218 4.071	 0.726 0.792 0.828	X^2 =0.279^{NS}	2	0.757
No. Of pregnancy a) Primi b) Multi	 24 36	 4.125 4.250	 0.89 0.69	X^2 =0.369NS	1	0.546
Mothers Occupation a) Private Sector b) Govt. Sector c) Others	 14 32 14	 4.285 4.218 4.071	 0.726 0.792 0.828	X^2 =0.279^{NS}	2	0.757
Socio economic status a) Upper middle class b) Below lower class c) Upper class d) Lower class	 10 9 18 23	 4.300 4.222 4.166 4.173	 0.823 0.833 0.716 0.857	X^2 =0.074^{NS}	3	0.974
Previous knowledge regarding IVF a) Yes	 33	 4.212	 0.739	X^2	1	0.895

b) No	27	4.185	0.833	$=0.018^{NS}$		

NS=Non-Significant * Significance at p≤0.05 level of significance

Data in table 10 evaluates the association between post-test attitude and demographic characteristics of experimental group by chi square test. Chi square value of age in year, qualification, no. of pregnancy, occupation, socio-economic status, previous knowledge regarding IVF as calculated value ($X^2=0.067^{NS}$), ($X^2=0.279^{NS}$), ($X^2=0.369^{NS}$), ($X^2=0.279^{NS}$), ($X^2=0.074^{NS}$), ($X^2=0.018^{NS}$) respectively. There is no association between post-test attitude and demographic variables.

4. DISCUSSION

In the present study, the investigator aimed to A study to assess the effectiveness of information booklet on knowledge and attitude regarding In Vitro Fertilization among reproductive women in selected areas of Gurugram, Haryana.

Discussion is done under the following categories:

The objective was to assess the knowledge regarding IVF among reproductive women.

The study findings were explained in the context of hypothesis, objectives and a contrast with results from previous studies was also done. Findings related to pre-test and post-test. In the pre-test, 48.3% (29 participants) scored in the "inadequate" range (0-10), while 51.7% (31 participants) scored in the "moderate" range (11-15). No participants scored in the "adequate" range (15-20) in the pre-test. However, in the post-test, the results show improvement: 65% (39 participants) scored in the moderate range, and 35% (21 participants) achieved an adequate score. Also, the mean post-test scores the knowledge of 14.73 overcoming the pre-test scores the knowledge 10.46.Hence it showed, the effectiveness of planned teaching programme regarding IVF among reproductive women.

In Congreve with these findings Rakshitha (2024): A cross-sectional study at Sri Siddhartha College of Nursing assessed IVF knowledge and attitudes among 60 respondents using a pretested 5-point Likert scale. Regarding IVF steps and risks, 63.3% lacked knowledge. 65% held an unfavourable attitude towards IVF. Knowledge scores ranged from 7-29 (mean 17.63, 50.38%), and attitude scores ranged from 10-19 (mean 17.5, 87.5%). Chi-square tests found no significant associations between knowledge and demographics, but significant associations were observed between attitude and gender, area of living, and previous exposure to IVF information. [12]

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The study findings were explained in the context of hypothesis, objectives and a contrast with results from previous studies was also done. Findings related pre-test and post-test. In the pre-test, 41.7% (25 participants) had a negative attitude (score less than 5), while 33.3% (20 participants) had a neutral attitude (score between 5 and 7), and 25%(15 participants) had a positive attitude (score between 8 and 10). In the post-test, attitudes improved significantly, with 78.3% (47 participants) exhibiting a positive attitude, and only 21.7% (13 participants) showing a neutral attitude. No participants had a negative attitude post-test, indicating a clear shift toward a more positive outlook on IVF.

My findings are analogous to those of a study undertaken by Chinonso Okafor, Ngozi Ume, et al. (2022) conducted a descriptive study to investigate the attitudes and knowledge of 400 women in Enugu, Nigeria, regarding IVF. Only 79% of participants had heard of IVF, and only roughly 35% truly understood the process, according to the results of the structured questionnaire and stratified random sampling techniques. Although 82% of people had a favourable opinion of IVF, approval of the procedure was mostly influenced by cultural and religious considerations. Misconceptions over IVF's efficacy and high expense were other obstacles to its utilization.[30]

The objective was to assess the effectiveness of information booklet among reproductive women.

Findings related to the effectiveness of an information booklet on mothers' attitudes and understanding of IVF is assessed. The pre-test mean score for knowledge was 10.46 (52.3%), however the standard deviation (SD) was 1.55. With a t-value of 4.27 and a p-value of 0.05*, the post-test mean score rose to 14.73 (73.65%) with an SD of 1.62, indicating a substantial improvement. This implies that the booklet had a statistically significant effect on knowledge. The pre-test mean score for attitude was 2.78 (55.2%), with a standard deviation of 1.09. A significant positive change in attitude was shown by the post-test

mean score, which indicate to 4.20 (84%), with an SD of 0.776, a significant t-value of 8.76 and a p-value of 0.05.

The information presented above was similar with the findings of an experimental study done by Sudha Lal (2022): A quasi-experimental one-group pretest-posttest design was used to assess the impact of an educational intervention on the knowledge of assisted reproductive technology (ART) among final-year nursing students. The mean knowledge score increased from 12.33 ± 4.33 in the pretest to 23.43 ± 2.59 in the posttest. A dependent t-test showed a significant improvement ($t = 25.611$, $p = 0.0001$). The result showed that there is a significant difference before and after the administration of (ART) in terms of knowledge .[14]

5. CONCLUSION

Out of 60 respondents, In the pretest, none of participants having adequate knowledge and 25 (41.7%) had negative attitude. In posttest, majority i.e, 39(65%) had moderate adequate knowledge and 47 (78.3%) had positive attitude. The information booklet regarding IVF was effective in improving the knowledge and attitude of the selected group of people. Hence, with an increase in knowledge, there is a gradual increase in attitude. Post-test attitudes and knowledge of IVF did not significantly correlate with certain demographic factors. The researcher came to the conclusion that most of the ladies knew very little about IVF, and this study demonstrated how useful the IVF information booklet was. Therefore, regular training sessions will aid in women's education and improve their attitudes on IVF.

Acknowledgement

We extend our gratitude to each and every participant who provided a sample for the research.

Auther's contribution

The study, data collection and analysis, data interpretation, paper drafting and critical revision were all equally contributed to by all authors.

Funding

External funding has not been received for this project.

Conflict of interest

The author declares that there is no conflict of interest.

Ethical approval

The study was approved by the institutional ethical committee of the SGT University.

Informed consent

Informed consent was obtained from the participants.

Data and materials availability

Upon justifiable request, the corresponding author will make all of the sets gathered during this investigation available.

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