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OVERCOMING PRACTICAL NURSING DELIVERY CHALLENGES IN ASSISTED REPRODUCTIVE TECHNOLOGIES (ART) WITHIN SELECTED IVF CENTERS IN PLATEAU STATE, NIGERIA

[1]Rifkatu Lanna, [2]Preye Jaja, [3]Chinedu. Ekwenpu, [4]Ebele Onwuagbaizu, & [6]Abdulrahman Amina*

[1,4]Department of Nursing Science, (ACE-PUTOR) University of Port Harcourt, Rivers State

[2]Department of peadriatrics, college of Health Sciences University of porthacourt.

[3]Department of obstetrics and Gynaecology. Jos University Teaching Hospital.

[6]Amity College of Nursing, Amity University Gurugram

A B S T R A C T :

Assisted Reproductive Technology (ART) refers to medical treatment used to assist people in achieving pregnancy particularly those struggling with infertility or other reproductive issues. As the prevalence of infertility continues to rise globally, the demand for ART procedures, such as in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), and gamete intrafallopian transfer (GIFT), has increased exponentially (Gameiro et al., 2015). The aim of this study was to identify the specific challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies, the underlying factors contributing to these challenges, and to also assess the impact of these challenges on patients' outcomes, healthcare quality, and nurse satisfaction and well-being within selected IVF centers in Plateau State Nigeria. This was a mixed-methods approach combining qualitative and quantitative methods conducted over a period of 6 months. The methodology used was qualitative and quantitative data and the data were subjected to a statistical tool for analysis. A closed ended questionnaire was deployed using a five-point linkert scale questionnaire. A total of 42 Nurses (respondents) were surveyed. Nurses were stratified into three groups based on the type of healthcare facility they work in (tertiary hospitals, private fertility clinics, and public health centers). From each stratum, nurses were randomly selected to ensure a representative sample from each facility type. All statistical analysis was performed using SPSS software (version 23). A P-value <0.05 was considered statistically significant. The study revealed that patients undergoing ART often experience high levels of emotional distress due to the complexities and uncertainties of the process. the study also revealed that ART procedures involve intricate protocols and techniques that require precise execution and ART treatment often involves multiple healthcare providers and complex scheduling of appointments and procedures. The study also revealed that Cultural beliefs and values can significantly influence patients' decisions and experiences with ART. The challenges faced by nurses in assisted reproductive technology settings significantly impact patient outcomes, healthcare quality, or nurse satisfaction and well-being. The need to involve critical stakeholders and professionals in the treatment of ART is significantly important to provide ongoing educational and specialized training in ART procedures, psychological and other ethical issues is necessary for the promotion of ART in Nigeria.

Keywords: Assisted Reproductive Technology, Infertility, Nurses, Healthcare Quality and Patient Outcomes.

Introduction

Assisted Reproductive Technologies (ART) represent a significant milestone in modern medicine, offering hope to millions of couples struggling with infertility worldwide (Boivin et al., 2017). As the prevalence of infertility continues to rise globally, the demand for ART procedures, such as in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), and gamete intrafallopian transfer (GIFT), has increased exponentially (Gameiro et al., 2015). However, despite the remarkable advancements in ART, the delivery of practical nursing care in this field faces numerous challenges that warrant attention and innovative solutions.

Assisted Reproductive Technologies (ART) have emerged as a beacon of hope for individuals and couples grappling with infertility, marking a profound advancement in reproductive medicine. However, the realization of this promise is often impeded by a myriad of challenges that confront nurses tasked with delivering practical care in ART settings. This study endeavors to delve into these obstacles and propose viable solutions to bolster the quality of nursing care in ART environments. One critical challenge pertains to the deficient training and education of nurses concerning ART procedures and protocols, as underscored by Craven et al. (2017). Insufficient knowledge and skills may render nurses ill-equipped to furnish comprehensive care to ART patients, thereby compromising treatment outcomes and fostering patient discontentment.

Furthermore, the escalating demand for ART services has precipitated a surge in patient volume and workload within fertility clinics, as elucidated by Dyer et al. (2016). This surge, coupled with limited nursing resources, poses a formidable barrier to delivering quality care, as nurses' grapple with the challenge of juggling multiple patients concurrently, predisposing them to potential errors and oversights. Moreover, patients undergoing ART procedures often navigate a labyrinth of emotional distress and anxiety, intricately intertwined with the complexity of infertility treatments (Dancet et al., 2012). While nurses serve as frontline caregivers, offering emotional support and counseling, they may find themselves unequipped due to inadequate resources and training in this realm.

Effective communication and collaboration among multidisciplinary teams are paramount for achieving successful ART outcomes, as emphasized by Boivin et al. (2017). However, subpar communication between nurses, physicians, and other healthcare professionals may engender misunderstandings, treatment delays, and compromised patient care. Additionally, nurses are confronted with the onerous task of navigating the ethical and legal intricacies inherent in ART procedures, as elucidated by Gleicher et al. (2018). Striking a delicate balance between adhering to regulatory frameworks and upholding patients' rights and autonomy necessitates comprehensive training and support.

In light of these formidable challenges, there exists an imperative to explore and implement strategies aimed at surmounting practical nursing delivery obstacles in ART settings. By doing so, healthcare providers can augment the caliber of care afforded to ART patients, ameliorate treatment outcomes, and optimize the overall patient experience for individuals embarking on the journey of fertility treatments.

The aim and objectives of the study is to investigate, analyze, and propose effective strategies to address the various challenges encountered by nurses in delivering care within ART settings. The specific objectives are:

- (i) Identify the specific challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies.
- (ii) Explore the underlying factors contributing to these challenges, such as organizational structures, resource limitations, and healthcare policies.
- (iii) Assess the impact of these challenges on patient outcomes, healthcare quality, and nurse satisfaction and well-being.
- (iv) Investigate existing interventions and initiatives aimed at mitigating practical nursing delivery challenges in ART settings.
- (v) Provide actionable insights and guidance for healthcare organizations, policymakers, and nursing professionals to enhance the quality of care provided to ART patients and optimize nursing practice in this specialized field.

The research is guided by the following research question and hypothesis:

1. What are the specific challenges encountered by nurses when providing care to patients undergoing assisted reproductive technologies?
2. How do organizational structures, resource limitations, and healthcare policies contribute to the challenges faced by nurses in delivering care within assisted reproductive technology settings?
3. What is the impact of the challenges faced by nurses in assisted reproductive technology settings on patient outcomes, healthcare quality, and nurse satisfaction and well-being?
4. What existing interventions and initiatives are currently in place to address practical nursing delivery challenges in assisted reproductive technology settings?
5. How can healthcare organizations, policymakers, and nursing professionals collaborate to implement actionable strategies that enhance the quality of care provided to assisted reproductive technology patients and optimize nursing practice in this specialized field?

The research hypothesis is:

- H1: There is no significant difference in the challenges faced by nurses when providing care to patients undergoing assisted reproductive technologies.
- H2: Organizational structures, resource limitations, and healthcare policies do not significantly contribute to the challenges faced by nurses in delivering care within assisted reproductive technology settings.
- H3: The challenges faced by nurses in assisted reproductive technology settings do not significantly impact patient outcomes, healthcare quality, or nurse satisfaction and well-being.
- H4: There are no existing interventions or initiatives in place to address practical nursing delivery challenges in assisted reproductive technology settings.
- H5: Healthcare organizations, policymakers, and nursing professionals cannot collaboratively implement actionable strategies that enhance the quality of care provided to assisted reproductive technology patients and optimize nursing practice in this specialized field.

This paper is organized into five sections. Following this introduction, a review of the relevant literature ois presented. The methodology used to collect and analyze the data is then described. The results of the study are presented, followed by a discussion of the findings. Finally, the conclusion and recommendations are presented

LITERATURE REVIEW

The birth of Louise Brown in 1978 marked a groundbreaking milestone in the history of reproductive medicine, heralding the era of Assisted Reproductive Technologies (ART). Since then, ART has evolved significantly, reshaping the landscape of infertility treatment worldwide. ART procedures, such as in vitro fertilization (IVF), intracytoplasmic sperm injection (ICSI), and gamete intrafallopian transfer (GIFT), offer viable options for individuals and couples facing infertility challenges.

Studies have demonstrated the efficacy and success rates of ART in achieving pregnancy among various patient populations. For instance, a meta-analysis by Bhattacharya et al. (2013) reported that IVF treatment resulted in higher pregnancy rates compared to expectant management or no treatment for couples with unexplained infertility. Similarly, a study by Sunkara et al. (2011) highlighted the role of ART in overcoming age-related fertility decline, with IVF significantly improving pregnancy rates among women aged 40 and above.

Furthermore, advancements in ART techniques, such as preimplantation genetic testing (PGT) and embryo cryopreservation, have expanded the scope of infertility treatment, offered personalized solutions and enhanced success rates. Despite its remarkable progress, ART continues to face challenges, including cost barriers, ethical considerations, and treatment complications. However, ongoing research and innovation in the field hold promise for

further improving the accessibility, affordability, and outcomes of ART, reaffirming its pivotal role in helping individuals achieve their dream of parenthood.

The surge in Assisted Reproductive Technologies (ART) can be attributed to a convergence of societal, cultural, and technological factors. Delayed childbearing due to career pursuits has become increasingly common, with many individuals and couples opting to start families later in life. This trend is corroborated by studies such as that of Bunting and Boivin (2010), which found that women in developed countries are delaying childbirth to pursue educational and professional opportunities, leading to a higher demand for fertility treatments.

Moreover, societal shifts towards greater acceptance of non-traditional family structures, including same-sex couples and single parents by choice, have expanded the pool of individuals seeking ART services. Research by Blake et al. (2010) highlights the growing diversity of individuals accessing fertility treatments, reflecting changing societal norms and attitudes towards family formation.

Additionally, advancements in medical technology have played a pivotal role in enhancing the effectiveness and accessibility of ART. Innovations such as improved laboratory techniques, ovarian stimulation protocols, and embryo selection methods have significantly boosted success rates and expanded the range of individuals who can benefit from fertility treatments.

Also, the World Health Organization (2012) report estimates that infertility affects 10-15% of couples globally, underscoring the profound impact of infertility on individuals and societies worldwide. Given the prevalence of infertility and the increasing demand for ART, its role in addressing this widespread issue cannot be overstated. ART not only offers hope to millions of couples struggling with infertility but also serves as a catalyst for reshaping societal perceptions of family formation and reproductive health. (Inhorn & Patrizio, 2015).

The integration of Assisted Reproductive Technologies (ART) into clinical practice has brought forth a myriad of challenges spanning ethical, legal, financial, and clinical domains. Ethical dilemmas arise concerning issues such as embryo disposition, genetic testing, and the commodification of human gametes and embryos. Research by Dondorp et al. (2011) discusses the ethical complexities surrounding the selection and transfer of embryos with desirable genetic traits, raising concerns about eugenics and social inequality.

Legally, ART practices vary widely across jurisdictions, leading to discrepancies in regulations regarding gamete donation, surrogacy, and parental rights. A study by Pennings et al. (2014) highlights the legal challenges faced by cross-border reproductive care patients, including uncertainty regarding the recognition of parentage and citizenship of ART-conceived children.

Financial barriers present significant hurdles for individuals seeking ART services, with high costs often limiting access to treatment. Research by Gurtin et al. (2020) underscores the financial burden experienced by patients undergoing fertility treatment, with disparities in access to ART services exacerbating socioeconomic inequalities.

Clinically, ART procedures carry inherent risks, including ovarian hyper-stimulation syndrome (OHSS), multiple gestations, and treatment complications. A systematic review by Maheshwari et al. (2015) discusses the clinical challenges associated with OHSS management, emphasizing the importance of early detection and preventive measures to minimize adverse outcomes.

Overall, navigating the complex landscape of ART requires comprehensive support and expertise to address the myriad ethical, legal, financial, and clinical challenges inherent in delivering practical nursing care in this specialized field. Efforts to mitigate these challenges through interdisciplinary collaboration, evidence-based practice, and policy reforms are essential to ensure equitable access to ART services and optimize patient outcome.

MATERIAL AND METHOD

3.0 Research Design

For the study on "Overcoming Practical Nursing Delivery Challenges in Assisted Reproductive Technologies (ART) in Jos North LGA, Plateau State," the most appropriate study design was a mixed-methods approach combining qualitative and quantitative methods. This approach allowed for a comprehensive exploration of nursing delivery challenges in ART within the specific context of Jos North LGA, Plateau State.

3.1 Qualitative Component

A qualitative component involved in-depth interviews or focus group discussions with nurses working in selected IVF centers ART settings in Plateau state. Qualitative methods enabled the researcher to explore nurses' experiences, perspectives, and insights regarding practical delivery challenges in ART. Through open-ended questioning, the researcher uncovered nuanced details about the specific challenges' nurses face, as well as the strategies they employ to overcome them. Qualitative data provided rich descriptions and contextual understanding, shedding light on the unique factors influencing nursing delivery in ART within the local context.

Quantitative Component

A quantitative component involved surveying a larger sample of nurses working in selected IVF ART centres in Plateau state, Nigeria. The survey included standardized measures to assess various aspects of nursing delivery challenges, such as workload, resource availability, organizational support, and patient outcomes. Quantitative data allowed for the systematic analysis of the prevalence and magnitude of nursing delivery challenges in ART, as well as the identification of factors associated with these challenges. Statistical analysis would provide quantitative insights into the extent and impact of practical delivery challenges, informing evidence-based interventions and policy recommendations.

Study Area: Plateau State Metropolis

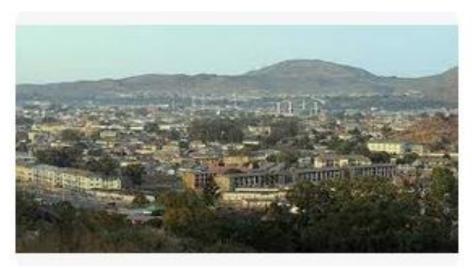**3.2.1   Geographical and Demographic Overview**

Fig. 1 Aerial View of Jos Metropolis

Jos metropolis comprises of Jos North, Jos south and part of Jos east Local Government Areas (LGA), which forms part of the 17 LGAs in Plateau State, Nigeria. Situated in the central region of Nigeria, the selected IVF centers are within the Jos metropolitan area, known for its relatively cooler climate compared to other parts of Nigeria due to its elevation on the Jos Plateau. The area covers an urban and semi-urban landscape with diverse populations and a mixture of ethnic, cultural, and religious backgrounds.

3.3.2   Healthcare Infrastructure

Jos metropolis is a hub for medical services in Plateau State, featuring several healthcare facilities, including tertiary hospitals, private clinics, and specialized centers for reproductive health. The area hosts the Jos University Teaching Hospital (JUTH), which is a prominent healthcare institution, providing a range of medical services, including Assisted Reproductive Technologies (ART). Additionally, there are private fertility clinics and reproductive health centers that cater to the needs of individuals and couples seeking fertility treatments, which includes Fertile ground Hospital, Alps Fertility Hospital, Kauna Specialist Hospital and Zenith Life Hospital all located on the Plateau.

3.4 Study Population

The primary study population for examining practical nursing delivery challenges in ART in Jos the selected IVF centers included nurses from tertiary hospitals like Jos University Teaching Hospital (JUTH), Fertile ground Hospital, Alps Fertility Hospital, Kauna Specialist Hospital and Zenith Life Hospital. These nurses represented a diverse demographic, encompassing varying ages and genders, predominantly female but including male nurses to ensure a comprehensive understanding of the workforce. Their educational backgrounds ranged from diploma holders to those with advanced degrees and specialized training in ART, with a focus on how continuous professional development impacts their ability to manage ART-related challenges. Additionally, the study included nurses with varying years of experience to understand the correlation between experience levels and their capacity to overcome delivery challenges.

3.5 Inclusion criteria

Nurses: Must be currently employed in ART-related roles within the selected IVF centers in Jos metropolis, with at least six months of experience.

3.6 Exclusion criteria

Nurses: Those that are not directly involved in ART services or with less than six months of experience.

Sampling Techniques

1. Stratified Random Sampling: Nurses were stratified into three groups based on the type of healthcare facility they work in (tertiary hospitals, private fertility clinics, and public health centers).
2. Random Sampling within Strata: From each stratum, nurses were randomly selected to ensure a representative sample from each facility type. This technique helped in achieving a balanced representation of nurses from various ART settings and ensured that different perspectives and experiences are captured.

3.8 Sample Size Determination:

The sample size was determined based on the total number of nurses available in each stratum, aiming for a sample that adequately represented the population while considering logistical constraints. 60 nurses were included to ensure sufficient data for meaningful analysis.

3.9 Method of Data Collection Methods

For the study a mixed-methods approach involving both qualitative and quantitative data collection methods are appropriate. This approach provided a comprehensive understanding of the challenges faced by nurses in ART settings and the strategies to overcome these challenges.

3.10 Data Collection

1. Structured Surveys and Questionnaires
To collect standardized information from a large number of participants (nurses) regarding their experiences, challenges, and perceptions related to ART services. The surveys included closed-ended questions with Likert scales, multiple-choice questions, and dichotomous (yes/no) questions. This design facilitated statistical analysis and comparisons across different groups.Surveys were administered in-person at healthcare facilities or electronically via email or online survey platforms, depending on the participants' convenience and accessibility.

2. Standardized Assessment Tools
Tools such as the Nursing Work Index (NWI) or the Maslach Burnout Inventory (MBI) were used to measure nurses' workload, job satisfaction, and burnout levels.

3. Qualitative Data Collection
To gain deeper insights into the personal experiences, challenges, and coping strategies of nurses involved in ART. Selected nurses were invited for one-on-one interviews. Semi-structured interview guides with open-ended questions were used to facilitate a detailed exploration of the participants' perspectives. Interviews were conducted in a private setting within the healthcare facilities to ensure confidentiality and comfort. They were audio-recorded with the participants' consent and later transcribed for analysis.

4.   Focus Group Discussions (FGDs)
To explore shared experiences and collective insights from nurses working in different ART settings. Groups of 6-8 nurses from various facilities. A moderator guided the discussion using a semi-structured guide to ensure all relevant topics were covered while allowing for spontaneous discussion. FGDs were conducted in neutral, convenient locations for the participants and were recorded and transcribed for thematic analysis. The mixed-methods approach to data collection, combining quantitative surveys and qualitative interviews, FGDs, and observations, provided a comprehensive understanding of nursing delivery challenges in ART settings in Jos North LGA. This approach ensured robust data collection, capturing both the breadth and depth of the issues, thereby informing effective strategies to overcome these challenges and improve ART services.

3.11   Data Analysis Techniques

For the study a combination of quantitative and qualitative data analysis techniques was employed. This mixed-methods approach allowed for a comprehensive understanding of the data collected from various sources.

3.11.1   Quantitative Data Analysis
Descriptive Statistics: To summarize and describe the basic features of the data.
Techniques**:** Frequency Distributions is to show the number of occurrences of each response.
Measures of Central Tendency: Mean, median, and mode to describe the average responses.
Measures of Dispersion: Standard deviation and range to show the variability of the responses.
Inferential Statistics: To make inferences about the population based on the sample data.
Techniques: Chi-Square Tests to examine the relationships between categorical variables, such as the association between facility type and reported challenges.

3.2 T-Tests/ANOVA: To compare means between groups (e.g., comparing job satisfaction scores between different types of facilities).

3.11.2   Qualitative Data Analysis
Thematic Analysis: To identify, analyze, and report patterns (themes) within qualitative data.
Techniques: Coding the transcripts from interviews, focus groups, and observational notes were coded line by line to identify significant segments of text.
Theme Development: Codes were grouped into broader themes that capture the essence of the data.

3.12   Hypothesis Testing: Construct validity was further assessed by testing hypotheses derived from existing theories and empirical studies. For example, the relationship between nurses' workload and burnout levels was examined to see if it aligned with theoretical expectations.

3.13   Ethical Considerations

Informed Consent: All participants received detailed information about the study's purpose, procedures, potential risks, and benefits. Written informed consent was obtained before participation.

Confidentiality: Data were anonymized to protect participants' identities. Access to data was restricted to the research team, and secure storage methods were used.

Ethical Approval: The study obtained ethical approval from relevant institutional review boards (IRBs) and complied with ethical guidelines for research involving human subjects.

1. RESULTS AND DISCUSSION

4.1 Introduction

This chapter describes the analysis of data followed by the discussion of the research findings. The findings relate to the research objectives that guided the study were analyzed. Frequency tables and percentages were generated. Inferential statistics were also computed for test of significance. A p-value < 0.05 was considered statistically significance. A total of 42 respondents were recruited for this study and all participated, giving a response rate of 100%.

Demographic characteristics of respondents

Out of the 42 participants, overwhelming majority were females. Male to female ratio was 0.05 to ratio 1 (0.05:1).

Higher percentage of the participants were between 36-45 years (35.7%) while only few were below 25 (7.1%) and above 55 (4.8%) respectively.

On educational qualification of the participants, more than half (52.4%) had Bachelor's degree.

It was further discovered that majority of the participants, representing 32(76.2%) had full time employment while 2(4.8%) of the participants were unemployed.

Finding on post nursing school experience revealed that 28(66.7%) had more than 10 years' experience in nursing.

It was also discovered that overwhelming majority of the participants had ever worked in a healthcare setting that offers ART services. Study further opined that out of the 42 participants, 4(9.5%) were client coordinators while 4.8% were counselors and 40.5% were Fertility Nurses. Other included Head Nurse, IVF clinic manager, IVF coordinator (2.4%) respectively.

Table 1: Demographic characteristics of respondents

Demographic variables	Frequency (f)	Percent (%)
Gender		
Female	40	95.2
Male	2	4.8
Total	42	100.0
Age (years)		
< 25	3	7.1
25-35	12	28.6
36-45	15	35.7
46-55	10	23.8
56 and above	2	4.8
Total	42	100.0
Educational level completed		
Bachelor's degree	22	52.4
High School Diploma/GED	5	11.9
HND	1	2.4
Master's degree	12	28.6
Phd Nursing in view	1	2.4
RM	1	2.4
Total	42	100.0

Employment status

Current employment status		
Full-time employed	32	76.2
Part-time employed	4	9.5

Self employed	1	2.4
Student	3	7.1
Unemployed	2	4.8
Total	42	100.0
Years of experience in Nursing		
1-5 years	6	14.3
6-10 years	8	19.0
More than 10 years	28	66.7
Total	42	100.0
Ever worked in a healthcare setting that offers ART services		
Yes	40	95.2
No	2	4.8
Total	42	100.0
If yes, specify your role/job description		
Client coordinator	4	9.5
Counselor	2	4.8
Fertility Nurse	17	40.5
Head Nurse	1	2.4
IVF clinic manager	1	2.4
IVF coordinator	1	2.4
IVF Nurse	3	7.1
Nurse manager/ Sonographer	1	2.4
Nursing officer	10	23.8
Not applicable	2	4.8
Total	42	100.0

Specific challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies.

The study revealed that 34 participants representing 81.0% strongly agree while 6(14.3%) agreed that Patients undergoing ART often experience high levels of emotional distress due to those complexities and uncertainties of the process.
In addition, 32(76.2%) strongly agree that ART procedures involve intricate protocols and techniques that require precise execution. Furthermore, 33(78.6%) strongly agreed that Patients undergoing ART require extensive education about the procedures, medications, and potential outcomes.
The study also indicated that that 54.8% and 35.7% affirmed that ART treatment often involves multiple healthcare providers and complex scheduling of appointments and procedures.
It was also observed that 78.6% and 16.7% affirmed that ART raises various ethical and legal issues, such as the use of donor gametes, embryo disposition, and the rights of surrogate mothers. Also, 31(73.8%) participants strongly agree while 9(21.4%) agree that Cultural beliefs and values can significantly influence patients' decisions and experiences with ART.
It was also discovered that 34(81.0%) participants affirmed ART treatments can be costly, and financial constraints may limit patients' access to care. In addition, the study revealed that 24(57.1%) participants strongly agreed while 15(35.7%) agreed that providing care to patients undergoing ART can be emotionally and physically demanding, leading to burnout among nurses.

Table 2a: Specific challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies

Response	Frequency (f)	Percent (%)
Patients undergoing ART often experience high levels of emotional distress due to the complexities and uncertainties of the process		
Strongly agree	34	81.0

Agree	6	14.3
Undecided	1	2.4
Disagree	1	2.4
Total	42	100.0

ART procedures involve intricate protocols and techniques that require precise execution

Strongly agree	32	76.2
Agree	8	19.0
Undecided	1	2.4
Disagree	1	2.4
Total	42	100.0

Patients undergoing ART require extensive education about the procedures, medications, and potential outcomes

Strongly agree	33	78.6
Agree	7	16.7
Undecided	1	2.4
Disagree	1	2.4
Total	42	100.0

ART treatment often involves multiple healthcare providers and complex scheduling of appointments and procedures

Strongly agree	23	54.8
Agree	15	35.7
Undecided	2	4.8
Disagree	2	4.8
Total	42	100.0

Table 2b: Specific challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies

Response	Frequency (f)	Percentage (%)
ART raises various ethical and legal issues, such as the use of donor gametes, embryo disposition, and the rights of surrogate mothers.		
Strongly agree	33	78.6
Agree	7	16.7
Undecided	2	4.8
Total	**42**	**100.0**
Cultural beliefs and values can significantly influence patients' decisions and experiences with ART.		
Strongly agree	31	73.8
Agree	9	21.4
Undecided	2	4.8
Total	**42**	**100.0**
ART treatments can be costly, and financial constraints may limit patients' access to care.		
Strongly agree	34	81.0

Agree	7	16.7
Undecided	1	2.4
Total	**42**	**100.0**

Providing care to patients undergoing ART can be emotionally and physically demanding, leading to burnout among nurses.		
Strongly agree	24	57.1
Agree	15	35.7
Undecided	2	4.8
Strongly disagree	1	2.4
Total	**42**	**100.0**

Hypothesis 1:

There is no significant difference in the challenges faced by nurses when providing care to patients undergoing assisted reproductive technologies.
Table 3 below revealed that calculated chi-square statistic was 381.866 and a p-value 0.000. Since the p-value was less than 0.05, the null hypothesis was rejected. It therefore revealed that there is a significant difference in the challenges faced by nurses when providing care to patients undergoing assisted reproductive technologies.

Table 3: Test Statistics

Variables	**Test Statistics**		
	Chi-Square	df	p-value
Patients undergoing ART often experience high levels of emotional distress due to the complexities and uncertainties of the process	71.714	3	0.000
ART procedures involve intricate protocols and techniques that require precise execution	61.81	3	0.000
Patients undergoing ART require extensive education about the procedures, medications, and potential outcomes	66.571	3	0.000
ART treatment often involves multiple healthcare providers and complex scheduling of appointments and procedures	30.571	3	0.000
ART raises various ethical and legal issues, such as the use of donor gametes, embryo disposition, and the rights of surrogate mothers.	39.571	2	0.000
Cultural beliefs and values can significantly influence patients' decisions and experiences with ART.	32.714	2	0.000
ART treatments can be costly, and financial constraints may limit patients' access to care.	44.143	2	0.000
Providing care to patients undergoing ART can be emotionally and physically demanding, leading to burnout among nurses.	34.762	3	0.000
	381.856	**21**	**0.000**

The underlying factors contributing to the challenges, providing care to patients undergoing assisted reproductive technologies

The study opined that 18(42.9%) of the participants strongly agree and exactly half (50.0%) agreed that the organizational structure of healthcare institutions can impact the delivery of care for patients undergoing ART.

The study also shows that 33(78.6%) participants strongly agree that Resource constraints, such as limited staffing, inadequate facilities, and insufficient funding, can pose significant challenges for nurses providing care to patients undergoing ART.

In addition, 16(38.1%) strongly agree while 18(42.9%) agreed that Healthcare policies and regulations related to ART can influence nurses' ability to provide comprehensive and patient-centered care ART.

The study also revealed that 27(64.3%) strongly agree while 16(38.1%) agree that Nurses may face challenges in advocating for patients' rights and preferences within the healthcare system, particularly regarding ethical and legal issues related to ART.

The study also revealed that 19(45.2%) participants strongly agree while 16(38.1%) agreed that Nurses may face challenges in advocating for patients' rights and preferences within the healthcare system, particularly regarding ethical and legal issues related to ART.

Table 3: The underlying factors contributing to the challenges, providing care to patients undergoing assisted reproductive technologies

Responses	Frequency (f)	Percent (%)
The organizational structure of healthcare institutions can impact the delivery of care for patients undergoing ART		
Strongly agree	18	42.9
Agree	21	50.0
Undecided	3	7.1
Total	42	100.0
Resource constraints, such as limited staffing, inadequate facilities, and insufficient funding, can pose significant challenges for nurses providing care to patients undergoing ART.		
Strongly agree	33	78.6
Agree	7	16.7
Undecided	2	4.8
Total	42	100.0
Healthcare policies and regulations related to ART can influence nurses' ability to provide comprehensive and patient-centered care ART.		
Strongly agree	16	38.1
Agree	18	42.9
Undecided	4	9.5
Disagree	3	7.1
Strongly disagree	1	2.4
Total	42	100.0
The level of education and training provided to nurses in reproductive healthcare can impact their competency and confidence in delivering care to patients undergoing ART.		
Strongly agree	27	64.3
Agree	13	31.0
Undecided	2	4.8
Total	42	100.0
Nurses may face challenges in advocating for patients' rights and preferences within the healthcare system, particularly regarding ethical and legal issues related to ART.		
Strongly agree	19	45.2
Agree	16	38.1
Undecided	4	9.5
Disagree	3	7.1
Total	42	100.0

Hypothesis 2:

The challenges faced by nurses in assisted reproductive technology settings do not significantly impact patient outcomes, healthcare quality, or nurse satisfaction and well-being.

The table below revealed that the calculated chi-square (124.57, p-value = 0.0016). Since the p-value was less than 0.05, the null hypothesis was rejected. Hence, it implies that the challenges faced by nurses in assisted reproductive technology settings significantly impact patient outcomes, healthcare quality, or nurse satisfaction and well-being.

Test statistics

Responses	Test Statistics		
	Chi-Square	df	p-value
The organizational structure of healthcare institutions can impact the delivery of care for patients undergoing ART	13.286	2	0.001
Resource constraints, such as limited staffing, inadequate facilities, and insufficient funding, can pose significant challenges for nurses providing care to patients undergoing ART.	39.571	2	0.000
Healthcare policies and regulations related to ART can influence nurses' ability to provide comprehensive and patient-centered care ART.	30.143	4	0.000
The level of education and training provided to nurses in reproductive healthcare can impact their competency and confidence in delivering care to patients undergoing ART.	22.429	2	0.000
Nurses may face challenges in advocating for patients' rights and preferences within the healthcare system, particularly regarding ethical and legal issues related to ART.	19.143	3	0.000
	124.57	13	0.0016

Impacts of the challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies

The study revealed that higher proportion of the respondents (59.5%) strongly agree while 15(35.7%) agree that fragmented care, resource limitations, and organizational barriers can result in delays in treatment initiation or completion, which may negatively impact patients' chances of successful conception.

In addition, 32(76.2%) strongly agree and 9(21.4%) agreed that inadequate emotional support and communication gaps can exacerbate patients' stress and anxiety levels, potentially affecting their psychological well-being and treatment adherence.

The study further revealed that majority of the participants strongly agree (64.3%) while 14(33.3%) agreed that Inadequate staffing, training, or resources may increase the risk of treatment complications or errors, leading to adverse outcomes for patients undergoing ART procedures.

Other findings on impact of challenges faced by nurses in providing care to patients undergoing assisted reproduction technologies are as showed in the table below.

Table 4: Impacts of the challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies

Responses	Frequency (%)	Percent (%)
Fragmented care, resource limitations, and organizational barriers can result in delays in treatment initiation or completion, which may negatively impact patients' chances of successful conception.		
Strongly agree	25	59.5
Agree	15	35.7
Undecided	2	4.8
Total	42	100.0

Inadequate emotional support and communication gaps can exacerbate patients' stress and anxiety levels, potentially affecting their psychological well-being and treatment adherence.

Strongly agree	32	76.2
Agree	9	21.4
Undecided	1	2.4
Total	42	100.0

Inadequate staffing, training, or resources may increase the risk of treatment complications or errors, leading to adverse outcomes for patients undergoing ART procedures.

Strongly agree	27	64.3
Agree	14	33.3
Undecided	1	2.4
Total	42	100.0

Fragmented care and communication barriers between different healthcare providers and departments can compromise the continuity and comprehensiveness of care for patients undergoing ART.

Strongly agree	19	45.2
Agree	19	45.2
Undecided	4	9.5
Total	42	100.0

Resource limitations, such as inadequate staffing or equipment, may impact the safety and quality of ART procedures, increasing the risk of adverse events or treatment failures.

Strongly agree	27	64.3
Agree	14	33.3
Undecided	1	2.4
Total	42	100.0

Job Burnout: High levels of emotional and psychological demands associated with caring for patients undergoing ART, coupled with resource constraints and organizational challenges, can contribute to nurse burnout and job dissatisfaction.

Strongly agree	24	57.1
Agree	11	26.2
Undecided	7	16.7
Total	42	100.0

Moral Distress: Ethical dilemmas and conflicting priorities in ART care, such as navigating patient autonomy, financial constraints, and regulatory requirements, can lead to moral distress among nurses, impacting their job satisfaction and well-being.

Strongly agree	14	33.3
Agree	17	40.5
Undecided	9	21.4
Disagree	2	4.8
Total	42	100.0

Hypothesis 3

Test of significant revealed that the null hypothesis was rejected since the p-value was less than 0.05 (chi-square value was 138.572, p-value was 0.0148). Implies that Impacts of the challenges faced by nurses in providing care to patients undergoing assisted reproductive technologies has significant impact on the practice (p<0.05).

Test statistics

Variables	Test Statistics		
	Chi-Square	df	p-value
Fragmented care, resource limitations, and organizational barriers can result in delays in treatment initiation or completion, which may negatively impact patients' chances of successful conception.	19	2	0.000
Inadequate emotional support and communication gaps can exacerbate patients' stress and anxiety levels, potentially affecting their psychological well-being and treatment adherence.	37	2	0.000
Inadequate staffing, training, or resources may increase the risk of treatment complications or errors, leading to adverse outcomes for patients undergoing ART procedures.	24.143	2	0.000
Fragmented care and communication barriers between different healthcare providers and departments can compromise the continuity and comprehensiveness of care for patients undergoing ART.	10.714	2	0.005
Resource limitations, such as inadequate staffing or equipment, may impact the safety and quality of ART procedures, increasing the risk of adverse events or treatment failures.	24.143	2	0.000
Job Burnout: High levels of emotional and psychological demands associated with caring for patients undergoing ART, coupled with resource constraints and organizational challenges, can contribute to nurse burnout and job dissatisfaction.	11.286	2	0.004
Moral Distress: Ethical dilemmas and conflicting priorities in ART care, such as navigating patient autonomy, financial constraints, and regulatory requirements, can lead to moral distress among nurses, impacting their job satisfaction and well-being.	12.286	3	0.006
	138.572	15	0.014809

The existing interventions and initiatives aimed at mitigating practical nursing delivery challenges in ART settings

The study revealed that 69.0% of the participants strongly agree that establishing interdisciplinary teams comprising nurses, reproductive endocrinologists, embryologists, psychologists, and other specialists promotes collaboration and communication, ensuring comprehensive care for patients undergoing ART.

Furthermore, 64.3% strongly agree while 26.2% agreed that Providing comprehensive education and support programs for patients undergoing ART helps to address their informational needs, alleviate anxiety, and enhance treatment adherence.

In addition, 26(61.9%) strongly agree while 13(31.0%) agree that Developing and implementing standardized protocols and guidelines for ART procedures streamlines care delivery, reduces variability, and ensures adherence to evidence-based practices. It was further revealed that 27(64.3%) participants strongly agree while 11(26.2%) agreed that Offering simulation-based training and skills development programs for nurses enhances their competency and confidence in performing ART procedures and managing potential complications.

The study also indicated that 20(47.6%) respondents strongly agreed while 17(40.5%) agreed that Implementing quality improvement initiatives, such as audit and feedback processes, performance monitoring, and benchmarking against established standards, helps to identify areas for improvement and optimize care delivery in ART settings. It was further revealed that 20(47.6%) respondents strongly agreed that Technology Integration and Tele-health: Leveraging technology, such as electronic health records (EHRs), Tele-health platforms, and mobile applications, facilitates communication, coordination, and remote monitoring of patients undergoing ART.

In addition, it was discovered that 28(66.7%) strongly agreed while 10(23.8%) agreed that Healthcare institutions can implement workplace support and well-being programs to address nurse burnout, promote job satisfaction, and enhance retention in ART settings.

Table 5: Investigate existing interventions and initiatives aimed at mitigating practical nursing delivery challenges in ART settings

Responses	Frequency	Percent
Establishing interdisciplinary teams comprising nurses, reproductive endocrinologists, embryologists, psychologists, and other specialists promotes collaboration and communication, ensuring comprehensive care for patients undergoing ART.		
Strongly agree	29	69.0
Agree	9	21.4
Undecided	4	9.5
Total	42	100.0
Providing comprehensive education and support programs for patients undergoing ART helps to address their informational needs, alleviate anxiety, and enhance treatment adherence.		
Strongly agree	27	64.3
Agree	11	26.2
Undecided	4	9.5
Total	42	100.0
Developing and implementing standardized protocols and guidelines for ART procedures streamlines care delivery, reduces variability, and ensures adherence to evidence-based practices.		
Strongly agree	26	61.9
Agree	13	31.0
Undecided	3	7.1
Total	42	100.0
Offering simulation-based training and skills development programs for nurses enhances their competency and confidence in performing ART procedures and managing potential complications.		
Strongly agree	27	64.3
Agree	11	26.2
Undecided	4	9.5
Total	42	100.0
Implementing quality improvement initiatives, such as audit and feedback processes, performance monitoring, and benchmarking against established standards, helps to identify areas for improvement and optimize care delivery in ART settings.		
Strongly agree	20	47.6
Agree	17	40.5
Undecided	5	11.9
Total	42	100.0
Technology Integration and Tele-health: Leveraging technology, such as electronic health records (EHRs), Tele-health platforms, and mobile applications, facilitates communication, coordination, and remote monitoring of patients undergoing ART.		
Strongly agree	20	47.6
Agree	14	33.3

Undecided	7	16.7
Disagree	1	2.4
Total	42	100.0

Healthcare institutions can implement workplace support and well-being programs to address nurse burnout, promote job satisfaction, and enhance retention in ART settings.

Strongly agree	28	66.7
Agree	10	23.8
Undecided	4	9.5
Total	42	100.0

Hypothesis 4:

There are no existing interventions or initiatives in place to address practical nursing delivery challenges in assisted reproductive technology settings. Since p-value was less than 0.05, (p=0.012) as shown in the table below, the null hypothesis was rejected. Hence it implies that existing interventions or initiatives in place to address practical nursing delivery challenges in assisted reproductive technology settings has significant impact on the practice.

Test statistics

Test Statistics	Chi-Square	Df	p-vale
	25.000	2	0.000
Establishing interdisciplinary teams comprising nurses, reproductive endocrinologists, embryologists, psychologists, and other specialists promotes collaboration and communication, ensuring comprehensive care for patients undergoing ART.	19.857	2	0.000
Providing comprehensive education and support programs for patients undergoing ART helps to address their informational needs, alleviate anxiety, and enhance treatment adherence.	19.000	2	0.000
Developing and implementing standardized protocols and guidelines for ART procedures streamlines care delivery, reduces variability, and ensures adherence to evidence-based practices.	19.857	2	0.000
Offering simulation-based training and skills development programs for nurses enhances their competency and confidence in performing ART procedures and managing potential complications.	9.000	2	0.011
Implementing quality improvement initiatives, such as audit and feedback processes, performance monitoring, and benchmarking against established standards, helps to identify areas for improvement and optimize care delivery in ART settings.	19.524	3	0.000
Technology Integration and Tele-health: Leveraging technology, such as electronic health records (EHRs), Tele-health platforms, and mobile applications, facilitates communication, coordination, and remote monitoring of patients undergoing ART.	22.286	2	0.000
Healthcare institutions can implement workplace support and well-being programs to address nurse burnout, promote job satisfaction, and enhance retention in ART settings.	134.524	15.000	0.012

Actionable insights and guidance for healthcare organizations, policymakers, and nursing professionals to enhance the quality of care provided to ART patients and optimize nursing practice in this specialized field.

The study revealed that 31(73.8%) of the participants strongly agree while 6(14.3%) agreed that Allocating sufficient resources, including staffing, equipment, and facilities, to support ART services and ensure optimal care delivery.

Similarly, 69.0% strongly agreed while 9(24.4%) agreed that Fostering a collaborative environment that encourages communication and teamwork among healthcare providers involved in ART care, including nurses, reproductive endocrinologists, embryologists, psychologists, and other specialists.

Other actions as affirmed by the respondents in guidance for health organization to enhance the quality of care provided to ART patients include developing a clear Regulations and Policies: Establish clear regulations and policies governing ART services to ensure patient safety, ethical practice, and equitable access to care, while also addressing emerging issues and advancements in reproductive technology include.

Exactly half (50.0%) of the respondents strongly agree while 11(26.2%) agreed that Enhance Insurance Coverage and Reimbursement: Advocate for comprehensive insurance coverage and reimbursement policies for ART services to reduce financial barriers and improve access to care for patients.

Furthermore, 20(47.6%) participants strongly agreed while 17(40.5%) agreed that Support Research and Innovation that is Allocating funding and support research initiatives aimed at advancing the field of reproductive healthcare, improving ART outcomes, and addressing emerging challenges and opportunities.

It was further revealed that 59.5% respondents strongly agree while 12(28.6%) agree that Promoting ethical practice standards and patient rights in ART care through regulatory frameworks, guidelines, and public education campaigns, emphasizing informed consent, autonomy, and privacy protections.

Similarly, 26(61.9%) of the respondents strongly agree while 13(31.0%) agreed that Seeking out of opportunities for specialized education, training, and certification in reproductive healthcare and ART will enhance professional competency and career advancement. Other means included Advocating for patient-centered care approaches that prioritize patients' emotional well-being, autonomy, and preferences throughout the ART treatment process, actively participate in interdisciplinary collaborations and communication channels to facilitate coordinated care delivery and optimize patient outcomes in ART settings; Advocating for health equity and cultural competence in ART care by addressing disparities in access to care, understanding patients' diverse cultural backgrounds and values, and providing culturally sensitive support and education and Prioritization self-care and well-being by seeking support, managing stress, and maintaining a healthy work-life balance to prevent burnout and sustain professional fulfillment in the demanding field of reproductive healthcare.

Table 6a: Actionable insights and guidance for healthcare organizations, policymakers, and nursing professionals to enhance the quality of care provided to ART patients and optimize nursing practice in this specialized field.

Variables	Frequency (%)	Percent (%)
Allocate sufficient resources, including staffing, equipment, and facilities, to support ART services and ensure optimal care delivery.		
Strongly agree	31	73.8
Agree	6	14.3
Undecided	5	11.9
Total	42	100.0
Foster a collaborative environment that encourages communication and teamwork among healthcare providers involved in ART care, including nurses, reproductive endocrinologists, embryologists, psychologists, and other specialists.		
Strongly agree	29	69.0
Agree	9	21.4
Undecided	3	7.1
Disagree	1	2.4
Total	42	100.0
Offer specialized education and training programs for nurses working in reproductive healthcare to enhance their knowledge, skills, and competency in ART procedures and patient care.		
Strongly agree	33	78.6
Agree	6	14.3
Undecided	3	7.1
Total	42	100.0

Develop Clear Regulations and Policies: Establish clear regulations and policies governing ART services to ensure patient safety, ethical practice, and equitable access to care, while also addressing emerging issues and advancements in reproductive technology

Strongly agree	23	54.8
Agree	15	35.7
Undecided	4	9.5
Total	42	100.0

Enhance Insurance Coverage and Reimbursement: Advocate for comprehensive insurance coverage and reimbursement policies for ART services to reduce financial barriers and improve access to care for patients.

Strongly agree	21	50.0
Agree	11	26.2
Undecided	8	19.0
Disagree	1	2.4
Strongly disagree	1	2.4
Total	42	100.0

Support Research and Innovation: Allocate funding and support research initiatives aimed at advancing the field of reproductive healthcare, improving ART outcomes, and addressing emerging challenges and opportunities.

Strongly agree	20	47.6
Agree	17	40.5
Undecided	5	11.9
Total	42	100.0

Table 6b: Actionable insights and guidance for healthcare organizations, policymakers, and nursing professionals to enhance the quality of care provided to ART patients and optimize nursing practice in this specialized field.

Responses	Frequency (f)	Percent (%)
Promote ethical practice standards and patient rights in ART care through regulatory frameworks, guidelines, and public education campaigns, emphasizing informed consent, autonomy, and privacy protections.		
Strongly agree	25	59.5
Agree	12	28.6
Undecided	5	11.9
Total	42	100.0
Seek out opportunities for specialized education, training, and certification in reproductive healthcare and ART to enhance professional competency and career advancement.		
Strongly agree	26	61.9
Agree	13	31.0
Undecided	3	7.1
Total	42	100.0
Advocate for patient-centered care approaches that prioritize patients' emotional well-being, autonomy, and preferences throughout the ART treatment process.		
Strongly agree	23	54.8

Agree	15	35.7
Undecided	4	9.5
Total	42	100.0

Actively participate in interdisciplinary collaborations and communication channels to facilitate coordinated care delivery and optimize patient outcomes in ART settings.

Strongly agree	16	38.1
Agree	17	40.5
Undecided	7	16.7
Disagree	2	4.8
Total	42	100.0

Advocate for health equity and cultural competence in ART care by addressing disparities in access to care, understanding patients' diverse cultural backgrounds and values, and providing culturally sensitive support and education.

Strongly agree	17	40.5
Agree	17	40.5
Undecided	8	19.0
Total	42	100.0

Prioritize self-care and well-being by seeking support, managing stress, and maintaining a healthy work-life balance to prevent burnout and sustain professional fulfillment in the demanding field of reproductive healthcare.

Strongly agree	22	52.4
Agree	16	38.1
Undecided	3	7.1
Strongly disagree	1	2.4
Total	42	100.0

Hypothesis 5

Ho: Healthcare organizations, policymakers, and nursing professionals cannot collaboratively implement actionable strategies that enhance the quality of care provided to assisted reproductive technology patients and optimize nursing practice in this specialized field.

Since the p-value (0.162) was greater than 0.05, we failed to reject the null hypothesis. This implies that Healthcare organizations, policymakers, and nursing professionals did not collaboratively implement actionable strategies that enhance the quality of care provided to assisted reproductive technology patients and optimize nursing practice in this specialized field.

Test statistics

Variables	Test Statistics		
	Chi-Square	df	Asymp. Sig.
	31.000	2	0.000
Allocate sufficient resources, including staffing, equipment, and facilities, to support ART services and ensure optimal care delivery.			
	46.762	3	0.000
Foster a collaborative environment that encourages communication and teamwork among healthcare providers involved in ART care, including nurses, reproductive endocrinologists, embryologists, psychologists, and other specialists.			

	39.000	2	0.000

Offer specialized education and training programs for nurses working in reproductive healthcare to enhance their knowledge, skills, and competency in ART procedures and patient care.

	13.000	2	0.002

Develop Clear Regulations and Policies: Establish clear regulations and policies governing ART services to ensure patient safety, ethical practice, and equitable access to care, while also addressing emerging issues and advancements in reproductive techno

	32.762	4	0.000

Enhance Insurance Coverage and Reimbursement: Advocate for comprehensive insurance coverage and reimbursement policies for ART services to reduce financial barriers and improve access to care for patients.

	9.000	2	0.011

Support Research and Innovation: Allocate funding and support research initiatives aimed at advancing the field of reproductive healthcare, improving ART outcomes, and addressing emerging challenges and opportunities.

	14.714	2	0.001

Promote ethical practice standards and patient rights in ART care through regulatory frameworks, guidelines, and public education campaigns, emphasizing informed consent, autonomy, and privacy protections.

	19.000	2	0.000

Seek out opportunities for specialized education, training, and certification in reproductive healthcare and ART to enhance professional competency and career advancement.

	13.000	2	0.002

Advocate for patient-centered care approaches that prioritize patients' emotional well-being, autonomy, and preferences throughout the ART treatment process.

	17.049	3	0.001

Actively participate in interdisciplinary collaborations and communication channels to facilitate coordinated care delivery and optimize patient outcomes in ART settings.

	3.857	2	0.145

Advocate for health equity and cultural competence in ART care by addressing disparities in access to care, understanding patients' diverse cultural backgrounds and values, and providing culturally sensitive support and education.

	29.429	3	0.000

Prioritize self-care and well-being by seeking support, managing stress, and maintaining a healthy work-life balance to prevent burnout and sustain professional fulfillment in the demanding field of reproductive healthcare.

	268.573	**29**	**0.162**

4Discussion of findings

The study revealed that 34 participants representing 81.0% strongly agree while 6(14.3%) agreed that Patients undergoing ART often experience high levels of emotional distress due to those complexities and uncertainties of the process. This agrees with a study done by Another by Menezes et al. (2019) which emphasizes the role of nurses in providing emotional support and coping strategies to patients undergoing ART treatments. Psychosocial interventions, such as counseling, support groups, and stress management techniques, help patients navigate the emotional challenges of infertility and ART. By addressing patients' psychological needs, nurses contribute to improved emotional well-being and treatment adherence. Similarly, this also aligned with a study with another study carried out by Johnson et al. (2019) also highlighted the emotional burden of caring for patients experiencing infertility and the stress of managing patients' expectations and anxieties throughout the treatment process. Nurses may also grapple with ethical dilemmas, such as balancing patient autonomy with medical recommendations and navigating sensitive conversations about treatment options and outcomes.

In addition, the study also revealed that ART procedures involve intricate protocols and techniques that require precise execution. Furthermore, the study opined that Patients undergoing ART require extensive education about the procedures, medications, and potential outcomes. This is in line with a study carried out by Lee et al. (2020) which highlighted the importance of comprehensive patient education in enhancing patient satisfaction and treatment outcomes. Nursing-led educational interventions aim to empower patients with knowledge about ART procedures, medication regimens, and lifestyle factors that can impact fertility. By equipping patients with the necessary information and skills, nurses enable them to make informed decisions and actively participate in their care.

The study also indicated that that ART treatment often involves multiple healthcare providers and complex scheduling of appointments and procedures. It was also observed that ART raises various ethical and legal issues, such as the use of donor gametes, embryo disposition, and the rights of surrogate mothers. This is also in agreement with a study carried out by Smith et al. (2021) which underscores the importance of ethical considerations in healthcare practice, particularly in the context of ART where nurses play a crucial role in guiding patients through sensitive and ethically complex decisions. By conducting a scoping review, researchers can systematically identify and categorize the types of ethical dilemmas encountered by nurses in ART settings, providing an overview of the ethical landscape and its implications for nursing practice.

Also, participants strongly agreed that Cultural beliefs and values can significantly influence patients' decisions and experiences with ART. This agreed with a study conducted by Deonandan et al. (2020) emphasizes the importance of organizational culture and leadership support in fostering a conducive environment for nursing practice in ART. Nurse-led interventions are most effective when supported by institutional policies, resources, and opportunities for professional development. This is also similar with another Research by Jones et al. (2020) who highlighted the ethical complexities surrounding embryo disposition and the importance of patient-centered decision-making in navigating these discussions.

It was also discovered that 34(81.0%) participants affirmed ART treatments can be costly, and financial constraints may limit patients' access to care. In addition, the study revealed that 24(57.1%) participants strongly agreed while 15(35.7%) agreed that providing care to patients undergoing ART can be emotionally and physically demanding, leading to burnout among nurses.

Overall, the result shows that there was a significant difference in the challenges faced by nurses when providing care to patients undergoing assisted reproductive technologies ($p<0.05$). Organizational structures, resource limitations, and healthcare policies significantly contribute to the challenges faced by nurses in delivering care within assisted reproductive technology settings ($p<0.05$).

The challenges faced by nurses in assisted reproductive technology settings significantly impact patient outcomes, healthcare quality, or nurse satisfaction and well-being. There are no existing interventions or initiatives in place to address practical nursing delivery challenges in assisted reproductive technology settings. Healthcare organizations, policymakers, and nursing professionals cannot collaboratively implement actionable strategies that enhance the quality of care provided to assisted reproductive technology patients and optimize nursing practice in this specialized field.

CONCLUSION

The study was carried out to investigate, analyze, and propose effective strategies to address the various challenges encountered by nurses in delivering care within ART settings. From the study carried out, the following conclusion were drawn;

    (i)   There was a significant difference in the challenges faced by nurses when providing care to patients undergoing assisted reproductive technologies.

    (ii)   Organizational structures, resource limitations, and healthcare policies significantly contribute to the challenges faced by nurses in delivering care within assisted reproductive technology settings.

    (iii)   The challenges faced by nurses in assisted reproductive technology settings significantly impact patient outcomes, healthcare quality, or nurse satisfaction and well-being.

    (iv)   There are no existing interventions or initiatives in place to address practical nursing delivery challenges in assisted reproductive technology settings.

    (v)   Healthcare organizations, policymakers, and nursing professionals cannot collaboratively implement actionable strategies that enhance the quality of care provided to assisted reproductive technology patients and optimize nursing practice in this specialized field.

From the study carried out, the following effective strategies are recommended in order to address the various challenges encountered by nurses in delivering care within ART settings.

    1.   Providing ongoing education and specialized training in ART procedures, ethical issues, and psychological support can help nurses stay updated and confident in their roles.

    2.   Implementing support systems such as counseling services for both patients and staff can help manage the emotional and psychological aspects of ART.

    3.   Establishing and regularly updating clear ethical guidelines and providing training on these can help nurses navigate moral dilemmas with confidence.

4. Training programs focused on communication skills can help nurses effectively convey complex information and support patients through the emotional.

5. Regular meetings and collaborative sessions with other professionals involved in ART can enhance teamwork, ensure comprehensive patient care, and address any issues promptly.

6. Implementing advanced electronic health record (EHR) systems can help manage documentation efficiently and ensure compliance with regulatory requirements.

7. Addressing workload issues through adequate staffing, offering flexible schedules, and providing access to wellness programs can help mitigate burnout and improve job satisfaction. By addressing these areas, ART settings can improve the quality of care provided by nurses, enhance patient outcomes, and foster a more supportive and efficient work environment.

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