Effect of New Modality Application during Episiotomy Repair on Pain, Anxiety, and Satisfaction among Primiparous Women

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Abstract

Background: There are now new technologies and non-pharmacological ways to ease pain, especially during the healing process after an episiotomy. Virtual reality is a new way to treat pain during normal childbirth, and it is becoming more popular. **The aim** of the current study was to evaluate the effect of a new modality application during episiotomy repair on pain, anxiety, and satisfaction among primiparous women. To accomplish the goal of the current study, a quasi-experimental research **design** was used. **Setting**: The study was carried out in the Menoufia University Hospital delivery and labor unit. **A purposive sample** of 100 primiparous women who were in labor was divided into the study and control groups (50 for each). To collect data, **four tools** were used: a structured interviewing questionnaire schedule, a visual analog scale, a Spielberger state-trait anxiety questionnaire, and a mother satisfaction tool. **Results:** The study group mean age was 28.86± 5.96 years old, whereas the control group was 28.52± 6.21 years old. The study group's mean episiotomy repair duration score was 9.72 ± 3.15 min, whereas the control group was 15.10 ± 4.25 min. Also, the study group's mean pain intensity score was lower than the control group's mean score (4.66 ±1. 61vs. 6.82± 1.00, respectively). Also, there were statistically significant differences between the two groups in terms of the length of the repair, the severity of the pain, and the degree of anxiety. Also, most of the study sample were satisfied with virtual reality applications. **Conclusion:** Virtual reality is an effective technique for reducing pain and anxiety level. Also, it is a more efficacious distraction tool for participants during episiotomy repair. **Recommendation**: Utilization of Virtual reality as an effective complementary non-pharmacological and safe distraction method to lessen pain during episiotomy repair in maternity hospitals.

Key words: Anxiety Level, Episiotomy Repair, Maternal Satisfaction, New Modality, and Pain Intensity.

Introduction

Episiotomy is a surgical procedure that widens the vaginal opening just before the fetus is born to reduce the risk of severe perineal tears, shorten delivery, and prevent damage to the pelvic floor (Ba czek et al., 2022; and He et al., 2020). It was first introduced in the 1950s. Yet recent research indicates typical episiotomy techniques do not prevent these issues. It is no longer advised to do that. Nevertheless, there are situations when this surgical incision (episiotomy) may be necessary, including in cases of fetal distress, shoulder dystocia,

instrumental delivery, and occiput-posterior position (Gebuza, 2018). Episiotomy techniques have been found to have a danger for the mother as well; these treatments can cause pain and discomfort in the early postpartum period, the incision can become infected, and the wound scar can result in long-term dyspareunia (Berkowitz and Foust-Wright 2023).

The mediolateral type of episiotomy is the most common and well-known type (Nygaard, 2020). This is because it protects the obstetric anal sphincter (OASI) from being damaged. A midline episiotomy has been praised because it causes less pain and bleeding, is easier to fix, and speeds up recovery. However, it also has a higher chance of causing OASI (Zaami, 2019). Additional episiotomy types described in the literature include lateral episiotomies, which have been disapproved of, and J-shaped incision episiotomies, which are infrequently performed (Pebalo and Ayikoru, 2022).

A common surgical procedure called an episiotomy can make women anxious and have negative side effects like discomfort. The usage of sleep-inducing drugs and tranquilizers to lower anxiety in this treatment, as well as nerve blockers with sedative effects like lidocaine, may cause negative effects. Due to their deterministic nature and lack of side effects, non-medical approaches, such as "virtual reality application, diversion, music therapy, and prayer," as well as medical procedures used during episiotomy healing, are becoming more popular today (Kirca, 2022).

Ryding et al. (2017) found that low levels of stress boost the rate of natural childbirth after reviewing the deliveries of 205 women. Toohey (2019) also found that a previous difficult delivery is one of the things that can make fear and anxiety worse, and that this anxiety is a factor in 10-15% of cases of postpartum depression. In addition, stress can make giving birth difficult (Hernandez-Martinez et al., 2018). Moreover, Wiktor et al. (2019) advised postpartum evaluation, particularly for first-time mothers and women over 20 years of age.

Virtual reality glasses are safe, affordable, and effective as a non-pharmacological anxiolytic agent; It affects anxiety and pain perception, leading to lower doses of regular sedative medications. It is important for the nurse to have knowledge about these alternative methods (virtual reality application, distraction, music therapy, acupressure, and prayer) to reduce the pain and anxiety that occurs during episiotomy repair (Kirca, 2022).

Delshad et al. (2018) report that effective management of pain among women during labor is associated with better pregnancy outcomes and increased women's satisfaction.. Various pharmacological and non-pharmacological techniques are used to reduce pain during episiotomy repair (Hajesmaeel-Gohari, et al., 2021). Pharmacological treatments such as opioids are the cornerstone of pain management in inpatient settings. However, while opioids are active and useful in reducing pain, they are also connected with side effects such as; sedation, dizziness, nausea, and constipation. Although non-pharmacologic therapies may contribute to the effectiveness of a

comprehensive pain controlling strategy and serve as alternatives to conventional opioid therapies.

Currently, Women are becoming more interested in non-drug treatments because, it is non-invasive nature and lack of worse side effects. In clinics, virtual reality (VR) technology is used to relieve pain without surgery or drugs with no drug addiction and minimal side effects (Morris, Louw, & Crous, 2019). In recent year, virtual reality has become an innovative technology that is used to reduce pain and anxiety during painful treatments (Thompson, et al., 2019).

Virtual reality (VR) is a high-tech system that lets people enter a "virtual world." This system is "state-of-the-art." It is a new way to treat pain without drugs. It is a computer simulation of a 3D environment that the user can explore and interact with (Delshad et al., 2018). In addition, it is considered one of the technologies that a person in the virtual environment feels is in the real world. This technology allows the user to interact with a computer that simulates reality and pain is condensed by diverting the patient's attention from the real world. It is as if the person becomes an active contributor through the visual, auditory, and other senses (Schiza, Matsangidou, Neokleous, and Pattichis 2019). In the last ten years, it has been used in a wider range of clinical settings. It is now used to treat pain and anxiety during painful medical procedures like wound care, repairing an episiotomy, chemotherapy, dental procedures, and routine medical procedures. Initially, VR technology was only acknowledged for its entertainment value (Indovina et al., 2018).

It is an interactive computer-made simulation model that makes people feel like they are in the real world. These days, breaking a smartphone screen into two sections makes 3D virtual reality practical (for right and left eye images). Using a smart device with a headset to make a three-dimensional image that looks real. Because there is a big psychological part to how we feel pain, non-drug painkillers like hypnosis, mental imagery, watching videos, biofeedback, having more control, parental involvement and hypnosis can be effective (Kim et al., 2016).

In the delivery room, Nurses play an important role to provide the childbearing female with clear, balanced, and concise information concerning effective drug-based and non-drug-based ways to ease pain and calm anxiety during episiotomy repair. Nurses should be alert of the latest scientific studies on methods to relieve pain and reduce anxiety, to ensure unbiased and correct information about active pain relief procedures is accessible to females, to aid women decide what level of pain is acceptable to them, and to allow them to choose a method of pain relief**.** The use of VR for maternity and obstetric purposes has been gaining attention in reducing the intensity of pain and the level of anxiety (Thompson, et al., 2019).

Further research on the significance of VR analgesia during episiotomy repair is warranted. In Egypt, there are studies that handle pain during labor, and pain during the postpartum period but unfortunately, no study addresses

the consequence of VR during episiotomy repair. Therefore, there is a need to investigate the efficacy and acceptableness of other pain relief modalities for the repair of perineal injuries after childbirth. So, this study aimed to evaluate the effect of applying a new modality during episiotomy repair on pain intensity, anxiety level, and maternal satisfaction among primiparous women.

Significance of the study:

Pharmacological ways of pain relief are linked to adverse effects on the mother and the newborn, such as sedation, dizziness, and constipation. These effects also increase hospital stays, increase medical costs, and reduce women's satisfaction. Whereas, non-pharmacological methods may be contributed to the effectiveness of the pain controlling strategy (Karamchandani et al., 2019). Virtual reality has become a new way to treat pain that does not involve drugs and is easy to use. According to Delshad et al. (2018), VR is a non-invasive method and computer-generated simulation of a three-dimensional environment that the user can explore and interact with.

It is not necessary to restrict the use of VR-based pain control to women giving birth. Techniques that work with laboring women are therefore likely to work with other unpleasant procedures (e.g., during labor, during medical procedures that require the woman to remain conscious or for which repeated sedation is undesirable, and for any chronic pain). In fact, a recent case study revealed that VR seems to work well for toothaches (Hajesmaeel-Gohari et al., 2021). To date, there is currently insufficient evidence in the literature to guide clinical practice on the appropriate management of pain in women during episiotomy repair. This study will increase the knowledge base on the benefits of the non-invasive modality in relation to the application of VR for pain relief among mothers undergoing episiotomy repair and also, the results of this study will have a clinical impact to improve the quality of care. In addition, the results of this study will boost policy makers in experimental setting to incorporate both pharmacological and non-pharmacological approaches especially VR interventions that are non-invasive, safe, cost-effective, and easy-to-implement among women undergoing episiotomy repair.

The aim of the Study:

The aim of the current study is to evaluate the effect of new modality application during episiotomy repair on pain, anxiety, and satisfaction among primiparous women.

Operational definition

- **New modality:** In the current study, a new way to fix an episiotomy is suggested: using a VR device with a virtual reality app. It is a method that lets people go into a 3-D environment that has been simulated on a computer.
- **An episiotomy Repair :** means undertaken in three steps: repair of the vaginal mucosa, repair of the muscle layer and repair of the skin layer.

Research Hypotheses:

To accomplish the purpose of the present study the following research hypotheses were formed:

H1. Laboring women who apply virtual reality technique, will experience less pain intensity during episiotomy repair than women who receive routine hospital care.

H2. Laboring women who apply virtual reality technique, will experience less anxiety level during episiotomy repair than women who receive routine hospital care.

H3. Laboring women who apply virtual reality technique, will experience higher satisfaction level than women who receive routine hospital care.

Research Design:

To accomplish the current study's aim, a quasi-experimental research design (equivalent pre-posttest groups) was used. The most common type of quasi-experimental design is the comparable pre-posttest design, which involves an intervention and two groups of women (the study group and the control group) who are watched before and after the intervention is put into place (Polit & Beck, 2020).

Research Settings:

The current study was carried out in the obstetrics and gynecology department's delivery and labor unit at Menoufia University Hospital. It was affiliated with Menoufia University Hospital. The first unit is the Obstetrics and Gynecology Department, placed on the third floor and has 48 beds, including (2) normal labor rooms, (1) observation room with 5 beds, and (4) operating rooms. The flow rate of primiparous postpartum women is approximately 400 per year.

Sampling:

A purposive sample of 100 primiparous women in the delivery room were randomly assigned into two groups (50 in study group and 50 in control group).

Inclusion criteria: primiparous women with singleton fetus, gestational age (>37 up to 40 weeks of gestation), low risk of pregnancy without obstetric complications (hemorrhage, non-reassuring FHR) during labor, spontaneous vaginal delivery associated with episiotomy incision, no history of mental illness, addiction, motion sickness, and headache.

Exclusion criteria: women who have a high-risk pregnancy or abnormal fetal condition, Apgar-score <7 in 1 minute and 5 minutes of birth, neonate anomaly.

Sample size:

A total of (100) laboring woman selected according to the following statistical formula

n = Z2p (1-p)/d2,

Where z = level of confidence according to the standard normal distribution (for a level of confidence of 95%, z = 1.96). p = estimated proportion of the population that presents the characteristic (when unknown we use p = 0.5), d = (d is considered 0.05).

Tools: Four tools were used for data collection.

1) A structured interviewing questionnaire schedule

The researchers developed it in order to gather data based on a literature review. There are two sections to it. Data on demographic factors such as the mother's age, education level, occupation, place of residence, height, and weight were included in the first

portion to compute body mass index (BMI). In the second section, the obstetrical profile was presented, such as the gestational age at delivery, the type of episiotomy, its duration, and its recovery time.

2) Visual Analogue Scale (VAS)

It is adopted by Wewers and Lowe (1990) to measure the intensity of labor pain. It is made up of a blank line, on which adjectives are based that describe how bad the suffering is.Anchoring descriptors (10) often use "no pain" (zero score) and "severe pain" (worst pain), which is the highest score. The woman is asked to place a mark on the line that best indicates the pain she is suffering. This scale measures sensory and functional dimensions. It takes 2 to 5 minutes to finish this tool. It was separated into three main sections: the first, which measures mild pain and is graded from 0-3.5 cm; the second, which measures moderate pain and is graded from 4-7.5 cm; and the third, which measures severe pain and is graded from 8–10 cm.

3) Spielberger state-trait questionnaire for anxiety

It includes 20 items, and they are all rated between 1 and 4. The total anxiety score varied from 20 to 80; a score between 20 and 40 suggests mild anxiety, a score between 41 and 60 shows moderate anxiety, and a score between 61 and 80 indicates severe anxiety. With a correlation coefficient of 0.85-0.91, this instrument is frequently used in clinical studies to assess "state-trait anxiety." Before, during, and following the intervention, anxiety levels were measured (Spielberger et al., 1970).

4) Maternal satisfaction tool

It was created by the researcher after reviewing the relevant literature using Likert scale. It is divided into two parts. The ***First part*** included data on women's preference to use a virtual reality application in the future; Consists of 4 items and a 2 points scale ranging from 1- 4. ***Scoring system***: Score (4) most certain; certain (3) and (2) denote quite certain and score (1) denote not certain. The ***Second part*** includes data on women's satisfaction with the application of the virtual reality device. ***Scoring system***: It consists of 4 items and a 2-point scale ranging from 1 to 4. Score (4) highly satisfactory; Satisfied (3) and (2) denote satisfaction to some extent and score (1) denote dissatisfaction.

Validity and reliability :

Before making any changes, three experts in maternal health nursing looked at the accuracy, usefulness, and clarity of the tools. The Cronbach's alpha test was used to check the tools' reliability, and the scores of 0.89, 0.85, and 0.86 for tools 1, 3, and 4—which measure the tools' relevance, comprehensiveness, and clarity—were reliable. Split-half approaches were used to evaluate the tools' dependability (r = 0.88). This approach was used to assess the tool's homogeneity.

Pilot Study

To assess the ease of use and clarity of the tools, it was conducted on 10% of the study sample, who were arbitrarily chosen and excluded from the main study population. It also

assisted in estimating how long it would take to fill the tools. Simple adjustments were made, such as rephrasing the questions and removing some questions, in response to the findings of the pilot study.

Ethical considerations:

Researchers talk to women at birth who meet the criteria for the study and explain what the study is about to get their permission to take part in the study. This is done after receiving formal approval from the Research Ethics Committee of the Faculty of Nursing at Menoufia University (Code of Ethics, 859). then get their signed consent. Data encryption also ensures secrecy and anonymity. The women were also given the assurance that their participation in the study was voluntary and that they had the freedom to leave at any moment without having an adverse impact on the medical care they would get.

Procedure:

The director of the Menoufia University Hospital granted official authorization. The researchers collected data four days a week: on Sunday and Monday for the study group and Tuesday and Wednesday for the control group. Data collection take eight months from Jan 2022 to August 2022. Collection of data conducted in three consecutive phases.

Interviewing and assessment phase:

An interview was conducted to collect data related to the demographic and obstetrical profile, which took around 10 minutes to be completed at the first stage of labor. Informed written consent was obtained from each primiparous woman in the "study group" after a full explanation of the VR application.

Implementation phase:

- The selected women were randomly assigned into two groups "study group and control group" (50 women in each group). The first group was the "control group" that received the standard local anesthesia. The second group was the 'study group' that received a virtual reality application in addition to standard local anesthesia. The research assistant who was an obstetrician and had more than twenty years of experience in the field, was trained by the researcher in the application of the virtual reality device and in the research methodology. Also women in the study group were trained on VR application.
- Women in the study group received VR added with local anesthesia (video glasses and local infiltration 5 ml of lidocaine hydrochloride 2% solution according to hospital policy). During the episiotomy suturing, women applied an immersive and interactive VR system that was worn on the head and included a hand control and noise-reducing headphones. The VR simulation was an ocean scene with marine mammals or something, with the calls of marine mammals alongside the sounds of underwater breathing. A stream of relaxing music was also included from a nighttime sleep program. Women could control the direction of their view by moving their head and could simulate taking underwater pictures using hand control. The

technique of the episiotomy repair was the same in all women and was done by the same expert obstetrician using a 2-0 chromic suture.

- Women in the control group received standard local anesthesia (local infiltration 5 ml of lidocaine hydrochloride 2% solution) according to hospital policy. They did not use VR application or other non-pharmacological coping methods and received routine hospital care. The length and depth of the episiotomy incision were similar in both groups and were determined by the obstetrician.

Evaluation phase:

In both groups, pain intensity was measured on the basis of a visual analogue scale (0-10) and anxiety level was measured using state-trait anxiety questionnaire before, during, and one hour after episiotomy repair. Moreover, the suturing time for episiotomy repair was also recorded. In addition, women's satisfaction and preference for future VR application were recorded using a maternal satisfaction tool.

Limitation of the study:

There were no any limitation during application of VR glassess during episiotomy repair.

Statistical analysis:

The data were coded and put into a table using a personal computer and the statistical program "statistical package for social science (SPSS) version 23."Research hypotheses were addressed through inferential statistics. In this study, the chi-square test and student's t-test were employed as inferential statistics to compare the means of two separate groups and two qualitative variables, respectively. At a p-value of 0.05, the findings were deemed statistically significant.

Results

Table 1 shows that in both the study and control groups, more than half of the sample was between the ages of 20 and 30 years, with a mean age of 28.86 years in the study group and 28.52 years in the control group, respectively, and living in a rural area (62% & 52%) respectively. One-third of the women in the study and control groups had completed their secondary education, and around two-thirds of the women in both groups worked (74% and 62%, respectively). Also, upon recruitment, half of the study and control samples had normal Body Mass Index.

According to **Table 2**, the gestational age of the sample at delivery was (38.10 ±0.41 wks.) in the study group as compared to (39.20± 1.10 wks.) in the control group. The majority of women in the study and control group had mid-lateral episiotomy (86% & 88%) respectively. Moreover, the duration of episiotomy repair in the study group was (9.72 ± 3.15 min.) as compared to (15.10 ± 4.25 min.) in the control group with the statistically significant difference among both groups at ($p \leq 0.05$).

According to **Table 3,**the mean score of episiotomy pain in the study group was (8.28 ±1.06) as compared to (8.32± 1.05) in the control group before repairing of the episiotomy, while the mean pain score during episiotomy repair in the study group was (4.66 ±1. 61) as compared to (6.82± 1.00) in the control group. On the other hand, the mean pain score at one hour after the

episiotomy repair in the study group was (3.00 ±1.32) as compared to (5.40± 0.98) in the control group with statistically significant differences among the both group at ($p \leq 0.05$).

Figure (1) shows the pain score during the episiotomy repair, it was found that, 48% of women in the study group had mild pain intensity as compared to 14% in the control group. While, 42% of women in the study group had moderate pain intensity as compared to 72% in the control group. On the other hand, 10 % of women in the study group had severe pain intensity as compared to 14% in the control group with statistically significant differences between the both groups at $p \leq 0.05$.

Figure (2)illustrates the pain score after the episiotomy repair by one hour, it was found that 58% of women in the study group had mild pain intensity as compared to 20% in the control group. While 34% of women in the study group had moderate pain intensity as compared to 68% in the control group. On the other hand, 8% of women in the study group as compared to12 % of women in the control group had severe pain with statistically significant differences between both groups at $p \leq 0.05$.

Table (4) shows that before the episiotomy was repaired, the mean anxiety scores in the study and control groups were (60.94±10.92) and (60.48±7.36), respectively, with no statistically significant difference between the groups. Additionally, the mean anxiety score one hour after episiotomy repair in the study group was (22.98±4.84) compared to (32.50±4.63) in the control group, with statistically significant differences between both groups ($p \leq 0.05$). The mean anxiety score during episiotomy repair in the study group was (40.76±8.29) as compared to (48.12±12.76) in the control group.

Figure (3) shows the women's level of satisfaction with the application of virtual reality during the episiotomy repair, it was found that 42% of the study sample was very satisfied, 36% was satisfied, while 10% was fairly satisfied and 12% of the women was unsatisfied with VR application.

Figure (4) shows the percentage of women's preference to use a virtual reality application in the future among the study group, as 42% of the women was most certain, 18% was certain, while 24% of them was quite certain, and 16% was not certain to use a virtual reality application in the future.

Table (1) The demographic characteristics of the studied samples (N=100)

Characteristics	Control group (N=50)		Study group (N= 50)		Test
	No.	%	No.	%	
Age:					
20-30 years	27	54%	29	58%	X=1.38
31-40 years	18	36%	19	38%	P=0.50
≥ 40 years	5	10%	2	4%	
Age (Mean ± SD) years	28.52± 6.21		28.86± 5.96		T=-0.27, P=0.94
Residence					
Urban	24	48%	19	38%	X=1.02
Rural	26	52%	31	62%	P=0.31
Educational Level:					
Cannot read & write	5	10%	5	10%	
Read & write	7	14%	5	10%	X=0.90
Primary School	10	20%	12	24%	P=0.97
Preparatory School	8	16%	6	12%	
Secondary School	12	24%	13	26%	
University School	8	16%	9	18%	
Occupation					
Housewife	19	38%	13	26%	X=1.65
Working	31	62%	37	74%	P=0.19
BMI (kg/m2)					
Underweight	3	6%	9	18%	X=4.80
Normal	24	48%	22	44%	P=0.18
Overweight	15	30%	9	18%	
Obese	8	16%	10	20%	
Mean BMI	24.20 ±3.98		23.88 ± 4.71		=0.36, p=0.71

Table (2) The obstetrical profile of the studied samples (N=100)

Characteristics	Control group (N=50)		Study group (N= 50)		test
	No.	%	No.	%	
Gestational age at delivery (Mean ± SD) by weeks	39.20± 1.10		38.10 ±0.41		P=0.061
Type of episiotomy					
Mid-lateral	44	88%	43	86%	X=0.08
Median	6	12%	7	14%	P=0.76
Episiotomy Length (cm)	3.60 ± 0.78		3.40 ±0.63		T=1.40 P=0.16
Duration of episiotomy repair (in minutes)	15.10 ± 4.25		9.72 ± 3.15		T=7.17 P=0.001*

*Highly statistically significant differences

Table 3 Mean pain score of episiotomies among the studied samples before, during, and one hour after episiotomy repair (N = 100)

Pain scores	Control group (N=50)		Study group (N= 50)		Test	p-value
	Mean	± SD	Mean	± SD		
Before repair (0-10)	8.32	1.05	8.28	1.06	0.18	0.85
During repair (0-10)	6.82	1.00	4.66	1.61	8.04	0.001*
After repair by (one hour) (0-10)	5.40	0.98	3.00	1.32	8.02	0.001*

*Highly statistically significant differences

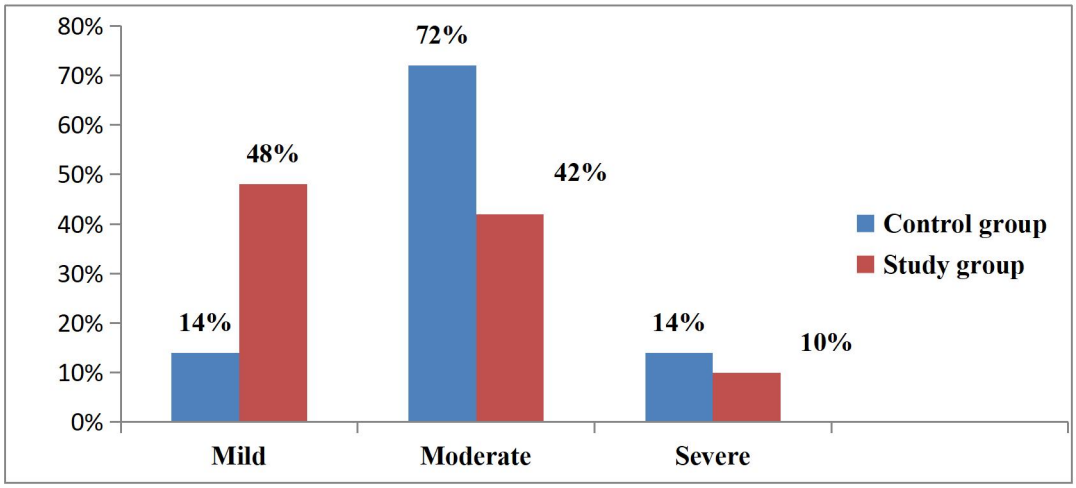

Figure (1) Severity of pain intensity during episiotomy repair among the studied samples (N=100)

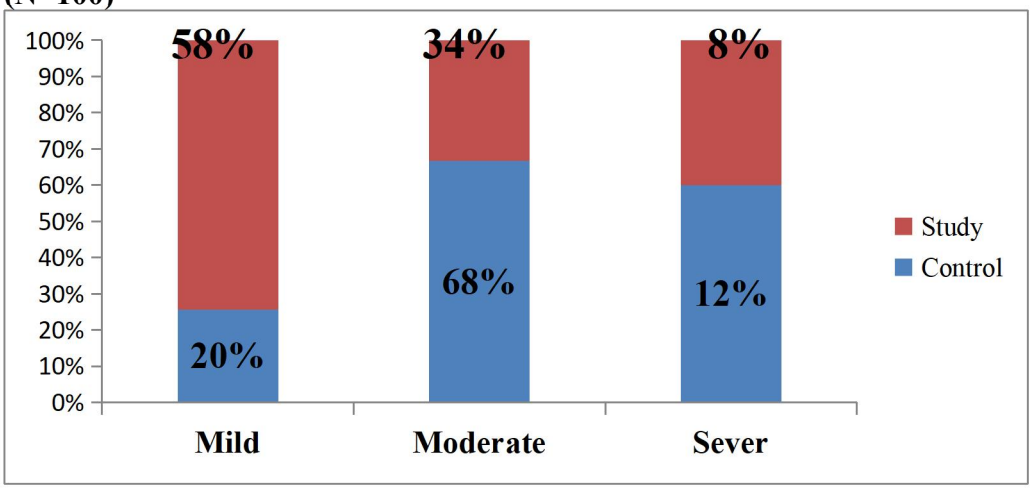

Figure (2) Severity of pain intensity after episiotomy repair by one hour among the studied samples (N=100)

Table (4) The mean anxiety score of the studied samples before, during, and one hour after episiotomy repair (N =100).

Anxiety scores	Control group (n=50)	Study group (n=50)	t-test	P-value
	M ± SD	M ± SD		
Before repair (20-80)	60.48 ± 7.36	60.94 ±10.92	-0.24	0.80
During repair (20-80)	48.12± 12.76	40.76 ±8.29	3.41	0.001*
After repair by one hour (20-80)	32.50± 4.63	22.98± 4.84	10.04	0.0001*

*Highly statistically significant differences

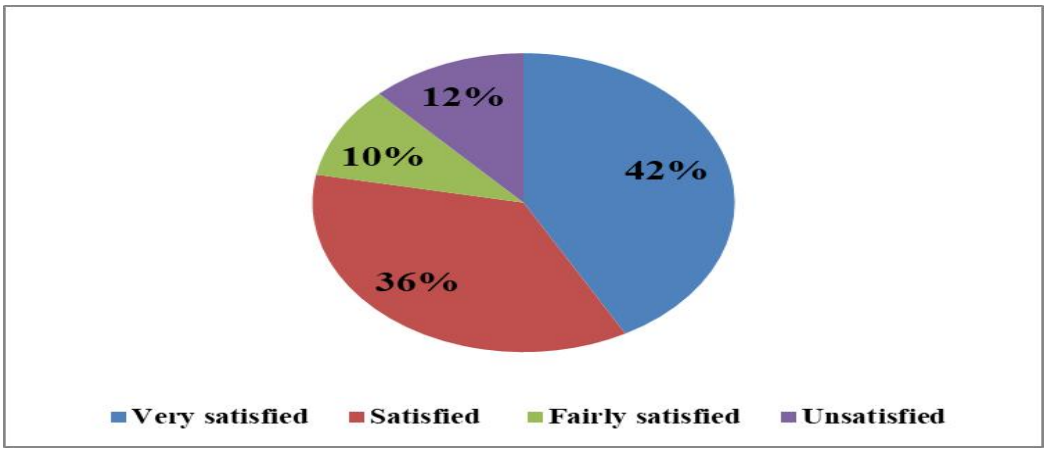

Figure (3) Distribution of women's level of satisfaction with the application of virtual reality during episiotomy repair (n=50).

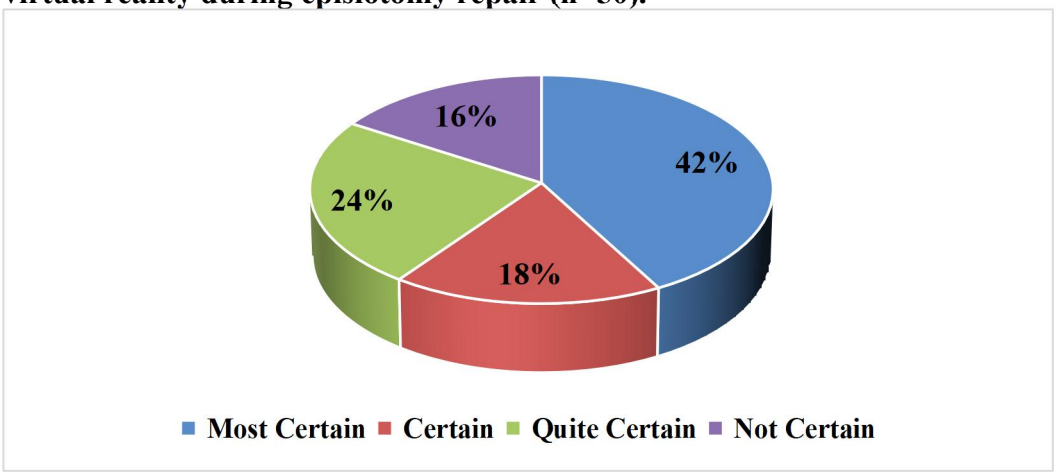

Figure (4). Distribution of women's preferences to use a virtual reality application in the future among the study group (N = 50)

Discussion:

VR is a technology that lets women use their sight, hearing, touch, and smell to interact with a computer-simulated world. Recently, there has been a lot of interest in using virtual reality in practical settings, such as pain management. Thus, the aim of the current study is to evaluate the effect of new modality application on pain intensity, anxiety level and maternal satisfaction during episiotomy repair among primiparous women. Results of the current study are discussed within the following frame of references; the demographic characteristics, the obstetrics profile of the studied samples, the mean pain scores, and the mean anxiety scores of the studied samples. Also, mothers' level of satisfaction with the use of visual reality applications.

1) Demographic characteristics of the study sample

According to the study's findings, the mean age of the participants in the study group was twenty-eight years old, and more than half of them were between the ages of twenty and thirty years. Among them, two thirds were employed. Almost one-third of the study group had completed high school. The correlation between these results and the randomized controlled experiment performed by Jahani Shoorab et al. (2015) to examine the impact of virtual reality use on pain in primiparous women undergoing episiotomy repair was confirmed. According to the researcher, the study sample's mean age was twenty-four years old, and around half of the participants had completed at least their secondary education. Concerning their occupation, its finding was contradicted with our study finding, where the majority of women were housewives. This controversy might be due to type of the sample, different demographic characteristics as occupation and different culture of the study sample.

2) The obstetrics profiles

Regarding the time needed to repair an episiotomy took nine minutes in the study group as opposed to fifteen minutes in the control group. This finding was in line with Jahani Shoorab et al. (2015), who discovered women using a VR distraction stated significantly shorter episiotomy repair times than women in group not using VR. This agreement emphasized by the literature, that the usage of virtual reality may decrease the duration of episiotomy repair.

3) The mean pain scores during the episiotomy repair

The current study showed that there was a decrease in the scores of pain during the repair of episiotomy and after repair by (one hour) in the study group with high statistically significant differences between the study and control groups at ($P = 0.001$). This finding was matched with the data reported in a study by Mohamed et al., (2022), who study the impact of applying virtual reality on pain and anxiety among primiparous women with (surgical incision in the vaginal opining)an episiotomy, and the study highlighted that there was a decrease in pain scores after an episiotomy (immediately after application and an hour later) with a highly statistically significant difference between the study and control groups at ($P <0.001$). Additionally, this finding was

supported by a study by Jahani Shoorab, et al., (2015), who reported that there is a decrease in pain scores at different stages of episiotomy repair. This might be due to the positive effects of virtual reality applications because the pain is reduced by diverting women's attention from the real world.

Moreover, Goodier, (2020), discovered that there was a decrease in the levels of pain in the study group than in the control group and there was an average decrease in pain level at the end of VR application. Furthermore, Wong, Spiegel, and Gregory, (2020) found that there was a significant decrease in pain scores in the control and study groups. Also a study was conducted by Karaman, Erol, Yılmaz and Dikmen (2019) to investigate the effect of applying virtual reality on experimental pain intensity in health. The researcher mentioned that the mean pain score for individuals was 2.62±1.82 and 5.75±1.65 in the experimental group and control group respectively with statistically significant differences between the two groups at ($p < 0.001$). This agreement might be due to that the use of virtual reality technology allows the user to interact with a computer, that simulates the reality and the pain is reduced through diverting patient's attention from the real world.

Regarding to the severity of pain intensity after repair by one hour, findings of the present study showed that there was 12 % of the control group had severe pain intensity as compared to 68% & 32% in the study group had mild and moderate pain respectively with statistical significant differences between both groups at $p < 0.05$. This finding is contradicting with Mohamed, (2022), who assured that (33%) of women in the study group had severe pain after episiotomy compared to (70%) in the control group one hour after VR application. This controversy might be due to type of the sample, different demographic characteristics, the fact that pain is subjective phenomenon and both of psychological and emotional states of the women could change their perception of pain intensity level. Also, the women who used the virtual reality application were satisfied with it and their anxiety level decreased, which reduced their perception of pain. This is supported by evidence that: the higher the level of fear and anxiety, the greater the sensation of pain, and vice versa, according to the "fear-tension - pain cycle".

4) The mean anxiety scores during and after the episiotomy repair

The results of this study showed that the average anxiety scores went down during and after episiotomy repair, and the difference between the study group (the VR group) and the control group was statistically significant. These results agree with a study by Sahin and Basak (2020), which looks at the impact of progressive muscle relaxation during surgery and the use of virtual reality on patient satisfaction, anxiety, and vital signs. According to the research, there was a statistically significant difference in anxiety between the VR group and the control group. Moreover, Mohamed et al. (2022) found that there was a decrease in anxiety scores following episiotomy repair both immediately

after using virtual reality and an hour later, with a highly statistically significant difference between the study and control groups.

Also, the results of this study concurred with Hoffman et al. (2018) and Morris et al. (2019), who showed a decrease in anxiety levels throughout the use of virtual reality. Also, the results supported those of David et al. (2019), who demonstrating that the VR group had significantly lower anxiety scores than the non-VR group. Shourab et al., (2016), who assess the virtual reality and anxiety in primiparous women during episiotomy repair, reported that, anxiety scores were lower in the intervention group during and after episiotomy repair at (P = 0.000). This agreement might be due to, that virtual reality technology is recognized as a safe, and effective non-pharmacological anxiolytic agent that allows for the reduction of regular pharmacological sedative doses due to their effect on anxiety.

5) Mothers' level of satisfaction with the use of virtual reality applications

According to the current findings, one-third of the sample and about one-half of those who participated were satisfied with how virtual reality was being used. Sridhar et al. (2020) who evidenced that most of participants had a pleasant experience with the VR intervention. In addition, this finding matched by those of Ebrahimian &Bilandi (2020), who reported a substantial difference in maternal satisfaction with childbirth in the intervention group compared to the control group. Moreover, Mohamed et al., (2022) showed that the majority of the study sample were satisfied with the VR application. Also, Sahin & Basak (2020), clarified that there was a significant difference between the control group, the progressive muscle relaxation, and virtual reality groups in mean satisfaction scores at ($P < 0.05$). The findings of the current study showed that about half of the study sample reported that they were "most certain" that they would prefer to use a virtual reality application in the future. This result was in agreement with Cowles et al., (2019): who showed that 77% of women reported that they would like to use VR again during future labor. This agreement might be due to, the literature emphasizing that the use of VR is effective pain management among women during pain management and associated with increased women's satisfaction level.

Conclusion

Findings of the current study concluded that virtual reality is a new effective and non-pharmacological method to reduce pain intensity and anxiety level. Moreover, it is a more effective tool for distracting women during episiotomy repair.

Recommendations

Based on the current study findings, the researchers recommended the following:

- Raise nurses' awareness regarding the usage of the virtual reality as a modality during episiotomy repair. Virtual reality is an effective complementary non-pharmacological method for reducing pain during episiotomy repair. It is a non-invasive and analgesic method

without drug addiction and does not cause any side effects.

- Further research is still needed to examine the impact of other effective and safe non-pharmacological methods on obstetrics and gynecology

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