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Effect of Video Games Compared to Storytelling on Preoperative Anxiety and Fear among Children undergoing Surgery

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ABSTRACT

Background: Hospitalization and surgery are traumatic experiences for children. Children might lessen their preoperative anxiety and worry through play activities. **The aim of the study:** is to evaluate the effect of video games compared to storytelling on preoperative anxiety and fear among children undergoing surgery. **Design:** a quasi-experimental research design was used. **Sample:** 150 preschool-age children (3-6years) were equally and randomly divided into three groups: two study groups (video games and storytelling group) and control group (fifty children in each group), **Setting:** The current research was applied to the inpatient Ear, Nose and Throat (ENT) department at Minia University Hospital, and the Pediatric surgical hospital which is affiliated with Minia University Hospital. **Tools:** Three tools were utilized in the current study; a structured interview questionnaire, the State-Trait Anxiety Inventory for Children (STAIC), and the Glasses Fear Scale (GFS). **Results:** Preoperative fear and anxiety were lower among studied groups after video games and storytelling than before. The lowest scores of STAIC and GFS were in the video games group, followed by the storytelling group, and finally the control group. A highly statistically significant difference (P=0.000) was detected between the total mean score of STAIC and GFS before and after the test. **Conclusion:** Compared to children in the control group who just received regular medical care, playing video games and using storytelling as a distraction tactic for children facing surgery is an excellent method for easing their preoperative anxiety and worry. **Recommendations:** nurses should work together with medical staff to routinely utilize non-pharmacological methods such as video games and storytelling techniques to reduce the fear of surgery and anxiety among children undergoing surgery.

Keywords: Children, fear, preoperative, surgery, storytelling, video games.

Introduction

Children who undergoing surgery may experience physiological and psychological reaction as a result of the stressful event and potential damage to their overall health. Preoperative anxiety, which has a prevalence of 40–65percent and may occur at any time before a surgery, is the most prevalent psychological issue among children in surgical units. **(Forouzandeh et al., 2020).**

Intense preoperative anxiety can have a negative effect on a child's well-being and mental health, postpone the child's decision to have surgery, slow postoperative resilience as well as rehabilitation, and promote the child's inability to work together with self-care. Additionally, higher levels of postoperative pain are connected with preoperative anxiety. Having less anxiety results in a faster recovery, less medicine being utilized under anesthesia, less pain sensitivity, hospital discharge earlier, and reduced postoperative difficulties and expenses in the long run **(Lilik Lestari, Wanda, and Hayati, 2017).**

The risk of developing anxiety is highest in children between the ages of 3 and 12 yrs ; a child's reaction to new medical encounters is influenced by past stressful medical experiences, such as hospitalization **(Cote et al., 2018).** Separation, losing control, physical harm, and discomfort are some of the major stressors associated with hospitalization. Children's responses to these stresses depend on a variety of factors, including their developmental stage, previous exposure to illness, separation from their parents, or hospitalization, their coping mechanisms, both innate and learned, the gravity of the diagnosis, and the enhanced system they have**(Hockenberry and Wilson, 2019).**

Playing, which is a framework of activities taking into consideration children's psychosocial and cognitive development in order to assist their emotional and physical well-being, is one of the most used interventions to lessen or avoid preoperative anxiety **(Nijhof et al., 2018).** Children's primary occupation is play; through it, they communicate their feelings and suppress undesirable urges in a way that is acceptable to others. Play is also crucial for children mental, emotional, and social development. Children must also express their concerns and anxieties via play in order to deal with the stress of being ill and in the hospital. Children require parents' acceptance and presence during playtime to help them manage their aggressiveness and channel their destructive tendencies **(Hockenberry& Wilson, 2017).**

It has been claimed that non-pharmacological therapies can lessen preoperative dread and anxiety. Storytelling is something that children enjoy. Stories inspire fun and motivation. A narrative has the power to personally engage children. Children who are going through a preoperative period often suffer intense anxiety and terror. Distraction techniques, for example, watching cartoons, playing medicinal video games or therapeutic activities with medical properties, listening

to readings or music that is age-appropriate for the child, will be helpful in easing this worry and fear **(Karbandi et al., 2020).**

A passively redirected subject's attention using an audio-visual disruption, for example, a video game, is a straightforward technique that nurses can use to combat the issue of lack of attention **(Farrag, Elsabely, and Ayed, 2021).** Video games can jog psychologically and classify the linking between a child and his or her psychological pain by directing attention to others, shifting focus away from one's own pain, emphasizing concern for others, thinking more positively, and disrupting other emotions (**Bergomi et al. 2018).**

Children having surgery exhibit less distressing behavior when told stories as a diversion method. Children also love listening to stories that inspire them, are enjoyable, and allow them to become personally invested in the plot **(Anggraeni & Widiyantin, 2019).** According to some academics, reading short stories to preschoolers while they are in the hospital is a beneficial method **(Delvecchio et al., 2019).**

Understanding how children experience concerns and anxiety associated with surgery is crucial for nurses. Nurses must comprehend the meanings of fear and anxiety as well as the ways in which children express their anxieties in order to provide children's support. Children can communicate their fear in different ways, including by not talking much or by shrinking into themselves, as well as by briefly explaining their anxieties **(Hockenberry& Wilson, 2018).** All age groups of children worry before a medical operation, according to previous studies, but younger children worry and feel uneasy more generally**(van Dijk, 2017).**

Significance of the study:

Children experience significant anxiety and fear before surgery, and studies as well as research from around the world have revealed that preoperative anxiety is a global worry for healthcare providers. Controlling anxiety and fear in children before an operation is an important challenge in pediatric nursing practice. The provision of play is not usually given sufficient time in the nursing plan of care, as play is not often given a high priority in the hospitalized child's total care **(El-Moazen et al., 2018).**

One of the most terrifying medical procedures for children is surgery. Over 5 million children have surgery each year, and about 50% to 75% of them experience significant fear and anxiety before the procedure. About 30% of children spend at least one night in the hospital during their childhood. Therefore, it should come as no surprise that up to 65%of children connect to anxiety during the preoperative period. Anxiety in the preoperative is linked to a number of issues that could appear right away or later **(Obeidat & Khalaf, 2018).**

Scarce research studies were conducted nationally on the impact of video games and storytelling on preoperative anxiety as well as fear of children undergoing surgery. So, the aim of the current research is to evaluate the effect of video games compared to storytelling on preoperative anxiety and fear among children undergoing surgery, which may improve the

preoperative anxiety and fear of those children, and this in turn would decrease the cost of care. Moreover, the application of those distractive methods by the nurses would improve their performance and enhance their systematic approach of thinking while dealing with children undergoing surgery.

Aim of the study:

To evaluate effect of video games compared to storytelling on preoperative anxiety and fear among children undergoing surgery**.**

Hypothesis of the research:

- Children undergoing surgery who will received either video games or storytelling are expected to have lower level of anxiety and fear than control group.
- Anxiety level and fear are expected to be lessening posttest as compared to pretest in both study groups.

Subject and method

Design of the research

The current research used a quasi-experimental research design

Setting

The research was applied at the inpatient Ear, Nose and Throat (ENT) ward in Minia University Hospital, and the Pediatric surgical hospital which is affiliated with Minia university hospitals.

Participants

Sample size and type: a purposive sample of 150 children, who entered the previous mentioned setting and who throughout an eight-month period, matched the case selection criterion (no. 150 children). The sample was classified into 3 equal groups; the video games group (fifty children), the storytelling group (fifty children), and the control group (fifty children). **Inclusion criteria:** children aged from 3-6 years, conscious children who are cooperative with the researcher and children who admitted before surgery for preparation. On the other hand, the **exclusion criteria:** children with cognitive health problems such as epilepsy, children with mental problems such as mental retardation, and children who use any anxiolytic drugs during the preoperative period. **The sample size** was 50 for each group with sufficient for effect size (ES), which was controlled at a level of confidence 95% and a power test of 80%. By using a table of numbers randomly generated from a list of children accessible in the pediatric surgery unit at the pediatric surgical hospital, children were classified into two intervention groups (video games and storytelling) and control groups. Children who had been referred to the hospital for elective surgical operations like tonsillectomy, appendectomy, hernia surgery, and congenital defect correction were the participants.

Research tools for data collection

The following tools were used to gather the necessary data.

Tool 1: Children's bio socio-demographic characteristics: A Structured interview questionnaire was utilized by the researchers after they had looked over the relevant literature, and it had two parts:

The first part: Demographic traits of the child as: Age, gender as well as residence.

The second part: Clinical data. It involved previous hospitalization, number of previous hospitalizations, previous, and present admission diagnoses.

Tool 2: State-Trait Anxiety Inventory for Children

This was designed by **Spielberger (1970)** which adapted and translated by the researcher to quantify the temporary anxious condition. The scale assesses anxiety that is typically situation-specific and occurs over a shorter period of time. Children are questioned about their feelings at various times in the twenty statements that make up the scale. The 5 subscales—sadness, worry, fear, uncertainty, and anxious—are used for group tool statements. Children were asked to express how they felt about their operations in their responses. Children answer to the STAIC by choosing 1 of the 3 options (rarely, occasionally, or frequently). Values of 1, 2, and 3 were allocated to various response categories.

Scoring system: The item scores are added together to produce the overall score, which were sixty. For statistical analysis, values between twenty and thirty were regarded as minimal anxiety, thirty to forty as average, forty to fifty as above average, and sixty and beyond as extremely high levels of anxiety. The tool was translated into Arabic and then retranslated into English by **El- Samman et al. (2009).**

Tool 3: The glasses fear scale

It is a variation of the visual analog scale, which was developed by **Aiken (1959)** and modified by **Gift (1989),** and adopted by the researcher in the current study. This scale is designed to gauge children's self-reported levels of fear. Six cylinders or glasses make up the child's version. The first cylinder, which is empty, symbolizes "no fear or not scared at all," while the following 5 cylinders, which range from "low fear to very fearful," are filled with varying degrees of "fear," and the last cylinder, which is fully filled, symbolizes "extreme fear and most scared." Each glass is given a number value from zero to five for statistical purposes. **Cavender et al. (2004)** discovered evidence for the scale's construct validity in a distraction study of children between the ages of four and eleven who were getting procedures. **Wong and Baker (1988)** reported a respectable level of test-retest reliability, confirming the Glasses Scale's concurrent validity in children aged three to eighteen years.

Validity and reliability

Nine nursing professionals with expertise in pediatric as well as psychiatric mental health nursing were provided with the study's data collection instruments to assess translation and to test the content validity. Reliability was conducted to evidence the consistency of the tool. The reliability coefficients between items of STAIC were 0.86, and for glasses fear scale was 0.76.

Pilot study

The fifteen children, who represented 10% of the sample, were used to test the tools' usability and clarity, as well as gauge how long data collecting would take. The children from the

pilot research were included in the whole sample; no tool modifications were made in light of the pilot study's findings.

Field of work

Before applying of the study, official permission was obtained from the directors of the inpatient ENT wards at the Minia University Hospital, and the Pediatric surgery unit at the Pediatric Surgical Hospital, as well as from the heads of both units. The investigators introduced themselves to the child and the parent fulfilled the study criteria and discussed the aim of the research. In the preoperative days, a written informed consent was taken from each child's parent who fit the inclusion criteria after explaining the research's nature and purpose.

Data collection was performed from July 2022 to February 2023. Data collection was done as part of the hospital's daily operations. The study took place twice a week on weekdays from 9 to 11 a.m. The participants completed the questionnaire in roughly 25–30 minutes.

The investigators collected personal data about the child using the (tool 1 part I) from all children on an individual basis at their bedside area. Children's disease history was obtained by the research investigator using tool 1 part II. It also includes items related to previous hospitalization, their times, and their causes.

Tools II and III were utilized as a pre- and post-intervention by the researchers.

Then all children were exposed to the pre-test sheet (tools 2 and 3). Assessment of children level of anxiety and fear was done before the surgery within the preoperative days as scheduled by the pediatric surgeon (pre-test). The preoperative level of anxiety and fear was evaluated on an individual basis STAIC (tool 2) and GFS (tool 3).

Control group:

The day before surgery, children got the usual instruction and care. It covered before and after care of the operation as well as information about fasting periods, personal hygiene, vital signs, and dressing, care of the wound, and the utilization of analgesic medications to ease discomfort after surgery.

Video games group:

In order to choose the proper games for the children ages, a list of suitable games for kids aged three to six was provided; some of them were picked. Pediatric psychotherapists have approved of all the chosen games. Football Box; Tabeta; Bally; Tiz Dast; Borjak1; Balloons; Urchin; Ekhtelaf Tasveer Sina o Samin, and Three Swipes were some of the games on this list. The children were given a selection of games to choose from so they could play what they liked. Babae and Borjak1, two video games, were used because they were simple to play with; four children (three or four years old). In addition to receiving standard care the day before the surgery, each child played a game that was age-appropriate (and had been downloaded onto the researcher's phone) for fifteen to twenty minutes. If the child had never played a video game before, it was taught to them.

Storytelling group

Storytelling for the intervention group was divided into two phases. The first phase involved

telling a story that lasted for about thirty minutes using an entertaining and educational booklet format. This format consisted of pages with attractive and colorful graphics as well as one story or sentence per page while the child was being made to repeat the story. In the second stage, the child and the researcher talk about the story. Preoperative evaluation and post-intervention pre-operation (the day before the surgery) are two phases of data collection.

Ethical considerations

The research was conducted with primary approval from the Minia University Faculty of Nursing's Research Ethical Committee. After thoroughly explaining the aim and scope of the study, parents of minors provided signed informed consent. Parents and children were made aware that sharing in the research was optional, and that parents had the right to withdraw from the research at any time for any reason without having any bearing on how they would be caring for their children. The privacy of each child and their parents was guaranteed.

Statistical analysis

Data entry was executed on an appropriate personal computer. After data collection, it was edited, classified, and arranged. The SPSS version (IBM 25), which incorporates the test of significance present in widely used statistical texts was used to examine the data. One-way ANOVA (between groups); percentages, distribution, mean, and standard deviation; chi-square test; Kendall's W test. Probability (P-value) is the indicator of significance, and a value of less than 0.05 was considered significant. With a declining P-value (*), the finding becomes more significant.

Results of the research

Table (1) indicates children's personal data. It was observed that, the mean age of the two studied groups (video games and storytelling), and control groups was (4.38±0.939, 4.36±0.852, and 6.45±1.82) respectively. In relation to gender & residence of children, near to half of them were male (44%, 52%, and 48%) respectively, and more than half (58%, 54%, and 50%) of the video games, storytelling, and control groups were from urban areas. Also, there was no statistically significant difference between the three groups regarding their personal data.

Table (2) shows children's medical data, the highest percentage of children (70%, 64%, and 62%) in the video games, storytelling, and control groups had no history of previous hospitalization. Also, the majority (92%, 100%, and 90%) of them respectively had no previous surgery. Regarding present admission diagnosis, about one third of children in the video games, storytelling, and control group (28%, 26%, and 28%) were underwent tonsillectomy. As well (30%, 24%, and 26%) of children were undergoing adenoidectomy followed by appendectomy and hernia repair. On the contrary, a minority of them were undergoing congenital defect repairs and correction of bone fractures.

Table (3) shows the level of anxiety among the video games, storytelling, and control groups. The majority of children before the implementation of video games and storytelling

had above-average anxiety (72%, 66%, and 70%, respectively) in three groups and about (20%, 24%, and 22%) of them experienced high anxiety levels. Whereas this level changed to low anxiety 100% in the video games group and in the storytelling group, it changed to low anxiety among 64% of them. On the other hand, in the control group who received routine care only, more than two-thirds 68% of them had above average and one-third 32% of them had average anxiety after receiving routine care only.

Table (4) Illustrates that there was no statistical significant differences between the three groups regarding the total mean score of anxiety before intervention (46.99±2.03, 46.36±1.29, and 46.74±2.54, respectively), with p value 0.108. On the other hand, after the implementation of video games and storytelling alongside of routine care, there was a statistical significant difference at P< 0.0001. The lowest total mean scores of anxiety were in the video games group, followed by the storytelling group, and finally the control group who take only the routine services (21.45±1.47, 25.64±4.9, and 41.39±3.04 respectively).

Table (5) illustrates the percentage distribution of fear in the video games, storytelling and control group, it was evident that (66%,64%, and 66%, respectively) of them experienced severe fear before intervention, followed by about one quarter of them being very fearful (24%, 28%, and 26%, respectively). Furthermore, most children (86%, followed by 80%) had their fear reduced to a low level after implementation of video games and storytelling groups. On the other hand, in the control group who received routine care only the majority of 70% of them had moderate fear and one-third of 30% of them had severe fear.

Table (6) demonstrates that there was no significant difference between the three groups in relation to the total mean score of glasses fear scale before implementation of video games and storytelling and control groups (2.47±1.84, 2.59±1.58, and 2.74±1.86, respectively). On the other hand, after the implementation of video games and storytelling alongside of routine care there was a high statistically significant difference at P< 0.0001. The lowest total mean score of glasses fear scale were in the video games group, followed by the storytelling group, and finally, the control group who received routine care only (0.2±0.5, 0.4±1.1, and 2.1±1.4, respectively).

Table 1 Percentage Distribution of Socio-Demographic Characteristics in Studied Groups n= 150 children

Items	Group of video games n=50		Group of storytelling n=50		Group of Control n=50		X2	p-value
	No	%	No	%	No	%		
Age								
3>4	21	42	17	34	16	32	0.249	0.883 NS
4>5	11	22	18	36	15	30		
5≥6	18	36	15	30	19	38		
Mean±SD	4.38±0.939		4.36±0.852		4.44±0.862			
Gender								
Male	22	44	26	52	24	48	6.72	0.917 NS
Female	28	56	24	48	26	52		
Residence								
Urban	29	58	27	54	25	50	0.897	0.298 NS
Rural	21	42	23	46	25	50		

Table 2 Percentage Distribution of Children Medical Data in Study and Control Groups n=150

Items	Group of video games n=50		Group of storytelling n=50		Group of Control n=50	
	No	%	No	%	No	%
Previous hospitalization						
Yes	15	30	18	36	19	38
No	35	70	32	64	31	62
Number of previous hospitalization						
Once	10	66.7	9	50	11	57.9
Twice	5	33.3	9	50	8	42.1
Previous surgery						
Yes	4	8	0	0	5	10
No	46	92	50	100	45	90
Present admission diagnosis						
Tonsillectomy	14	28	13	26	14	28
Adenoidectomy	15	30	12	24	13	26
Appendectomy	8	16	7	14	9	18
Hernia repair	5	10	9	18	7	14
Congenital defect repairs	4	8	6	12	5	10
Correction of bone fracture	4	8	3	6	2	4

Table 3 Percentage Distribution of Children in the Video Games, Storytelling, and Control Groups' for Anxiety Levels before and after the Intervention, n=150

Level of anxiety	Group of video games n=50		Group of storytelling n=50		Group of Control n=50	
	before	After	before	After	before	After
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Low	0 (0)	50 (100)	0 (0)	32 (64)	0 (0)	0 (0)
Average	4 (8)	0 (0)	5 (10)	18 (36)	4 (8)	16 (32)
Above average	36 (72)	0 (0)	33 (66)	0 (0)	35 (70)	34 (68)
High	10 (20)	0 (0)	12 (24)	0 (0)	11 (22)	0 (0)

Table 4 Mean Level of Anxiety in Video Games, Storytelling, and Control Group before and after Intervention n=150

Anxiety level	Group of video games n=50	Group of storytelling n=50	Group of Control n=50	F	P-Value
	Mean± SD	Mean± SD	Mean± SD		
before intervention	46.99± 2.03	46.36± 1.29	46.74± 2.54	4.45	0.108
After intervention	21.45± 1.47	25.64± 4.9	41.39± 3.04	126.13	0.0001**

Table 5 Percentage Distribution of the Video Games, Storytelling, and Control Group Regarding Children Level of Fear before and after Intervention n=150

Level of fear	Group of video games n=50		Group of storytelling n=50		Group of Control n=50	
	before	After	before	After	before	After
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
No Fear	0 (0)	4 (8)	0 (0)	2 (4)	0 (0)	0 (0)
Low Fear	0 (0)	43 (86)	0 (0)	40 (80)	0 (0)	0 (0)
Moderate Fear	5 (10)	3 (6)	4 (8)	8 (16)	3 (6)	35 (70)
Sever Fear	33 (66)	0 (0)	32 (64)	0 (0)	34 (68)	15 (30)
Very fearful	12 (24)	0 (0)	14 (28)	0 (0)	13 (26)	0 (0)
Extreme fear	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table 6 Comparison between Total Mean Score of Glasses Fear Scale in the Studied Groups' before and after Intervention n=150

Items	Group of video games n=50	Group of storytelling n=50	Group of Control n=50	F	P-Value
	Mean±SD	Mean±SD	Mean±SD		
Fear scale before intervention	2.47±1.84	2.59±1.58	2.74±1.86	0.480	0.627NS
Fear scale before intervention	0.2±0.5	0.4±1.1	2.1±1.4	42.821	0.0001**

Discussion

Preoperative anxiety is a worried or anxious mood that develops before surgical intervention. In addition, anxiety is one of the most frequent preoperative issues in children and can be brought on by a variety of things, including maternal anxiety, the mood of the child, age, the effectiveness of earlier medical care, the rooms of the operation, parental separation, and an uneasy operating room environment (**Shoja et al., 2018)**.So, the current research aims to evaluate the impact of video games compared to storytelling on anxiety and fear in children during preoperative period.

The current study found no statistically significant alteration between the study (video games and storytelling) and control groups in terms of the personal data of youngsters. This might be as a result of the sample's homogeneity. This is consistent with **Mohamed and Elattar (2019)** who did the study "Effect of play intervention on children's preoperative anxiety and vital signs" which reported that between the two groups, there was no statistically significant connection in the children's personal traits.

The findings of the actual research showed that the average age of the two groups was 4 years. This is supported by **Rostami et al., (2022)** in a study about" Effect of video games on preoperative anxiety in a sample of Iranian children aged three to six who are having elective surgery " that stated that the average age in the intervention and control group was four years.

Concerning the gender of the studied children, the actual study indicated that approximately 50% of the three groups were males. This was supported by **Forouzandeh et al., (2020)** study about" The impact of interactive games versus painting on Iranian children's anxiety preoperatively" which found that 60% of them were male.

Regarding the history of previous hospitalization for children, the current research indicated that most children had no previous history of length of stay in the hospital. A minority of children have history of hospitalisation. Similarly, a study done by **Sofia and Aranha (2023)** about" Anxiety and Postoperative Self-Efficacy in Children going to Surgery: The Effects of Game-Based Learning "discovered that the majority of children had never been hospitalized before.

Concerning previous surgery, the current research indicates that the majority of children had no history of previous surgery. Similarly, a randomized clinical trial conducted by **Forouzandeh et al., (2020)** to explore the impact of interactive games as instead of painting on preoperative anxiety in Iran indicated that most of the children in their study of children had no previous surgery.

Concerning diagnosis among the studied children, the current research clarified that about two-thirds of children underwent tonsillectomy and adenoidectomy. The same results were also reported by **Getahun et al., (2020)** a research about" anxiety preoperative in pediatric patients: Prevalence and risk variables in cross-sectional research "found that nearly two thirds of children underwent ENT surgery.

Regarding the level of anxiety among studied children going to surgery, the current research results state that the majority of children experienced above-average anxiety on STAIC before the implementation of video games and storytelling and about one-fifth of them experience a high anxiety level. This could be interpreted as those children were not receiving any intervention rather than routine care for relieving preoperative anxiety and fear.

This result is consistent with **Saharan (2017)** who conducted an experimental study in Yamuna, Nagar, and Haryana analyzing the impact of treatments with play on hospitalized children's anxiety and found that the majority of the children in the pre-test experience severe anxiety.

In the same context **El-Moazen et al., (2018)** conducted research about the " Effect of specific play actions on children having abdominal surgery's preoperative anxiety and terror levels " which evidenced that more than two thirds of the children experienced above-average anxiety on STAIC before implementation of play activities, followed by about one-fifth of them experiencing a high anxiety level.

The results of the current research indicated that implementing video games plus routine care changed the level of anxiety from Three-quarters have above average anxiety to the majority of them have low anxiety. This could be interpreted as video games distribution being a simple method, which diverts a child's attention from stimulus of anxiety via rerouting inactively the Child's attention. So, Video games distraction could be used as a method to take the child's concern away from his own pain, fear, and anxiety to focus on games and enjoying them.

This was in line with **Dost et al.(2023)** Prospective Randomized Study, "Is Preoperative Anxiety impacted by viewing Short Videos on Social Media?", which found that watching brief social media videos in the preoperative room for waiting significantly reduced anxiety's preoperative degree in pediatric patients aged five to twelve compared to the control group.

Also, our study results state that implementing storytelling intervention plus routine care change level of anxiety from 66% above average anxiety to 64% lower anxiety. This may be taken to mean that the majority of preschoolers enjoy listening to stories, especially if they are entertaining and instructional and consist of pages with nice pictures and one line or sentence per page. However, only 68% of the control group, who only received routine care, report having above-average levels of anxiety.

These were with **Sarıalioğlu et al., (2023)** who applied randomized controlled research into "The impact of Storybook Reading on Children's Fear and Anxiety Preoperative" and discovered that, when compared to the control group, reading a storybook with a preoperative preparation theme decreased children's fear and anxiety prior to surgery. This difference was statistically significant.

Furthermore, the current research results illustrate that there was no significant alteration between the three groups in the relation of the

total average score of STAIC before the implementation of video games and storytelling and the control groups (46.99±2.03, 46.36±1.29, and 46.74±2.54, respectively). On the other hand, after the implementation of video games and storytelling alongside of routine care, there was a significant statistical difference at P< 0.0001. Also, the lowest total mean scores for STAIC were in the video games group, followed by the storytelling group, and finally the control group who received routine care only (21.45±1.47, 25.64±4.9, and 41.39±3.04 respectively). These results support the first proposed hypothesis of the present research and indicate the impact of video games and storytelling on reduction of preoperative anxiety. Also, video games were more effective as a distractive method, followed by the storytelling method.

The participants in the intervention group reported a much lower degree of anxiety than those in the control group, according to statistics, as evidenced by **Dwairej et al.'s (2020)** randomized clinical trial study about "Video game distribution and anesthesia mask practice decease children's preoperative anxiety". **Sekhavatpour et al., (2019)** also mentioned a randomized controlled trial study, which indicated that reading animated illustrated books to children could be helpful in lowering anxiety and attitude problems following surgery. These books seem to have the potential to be both a fresh and inventive method of child care and distraction.

Concerning the level of fear among studied children based on GFS, the current research revealed that more than two thirds of them experienced severe fear in the three groups before implementation of video games and storytelling intervention, followed by about one-quarter of them being very fearful. Furthermore, the highest percentage of children had their fear diminished to a low level after the implementation of video games and storytelling groups. On the other hand, in the control group who received only the routine services, the majority of them had moderate fear and one-third of them had severe fear. These results indicate that video games and storytelling have a significant impact on decreasing the level of fear among children who participated in the current research. These findings also support the second hypothesis proposed in the current study.

Similarly, in a randomized controlled trial study by **Yaz et al., (2022)** the instructional animation film was found to be a successful strategy in lowering preoperative fear, postoperative pain, and increasing child cooperation with 132 children aged from 6 to 12 years. In Egyptian research by **Amer et al., (2021)** the results of research comparing 100 children going to the surgery to children in the control group who received standard hospital care found that storytelling is an effective distribution technique for decreasing preoperative anxiety and fear in children going to the surgery.

Furthermore, our research results illustrate that there was no significant relation among the three groups regarding the total average score of glasses fear scale pre the implementation of video games and storytelling and control groups

(2.47±1.84, 2.59±1.58, and 2.74±1.86, respectively). On the other hand, after the implementation of video games and storytelling in routine care, there was a high statistically significant difference at P< 0.0001. The lowest total mean score of glasses fear scale were in the video games group, followed by the storytelling group, and finally the control group who received routine care only (0.2±0.5, 0.4±1.1, and 2.1±1.4, respectively). From the researcher's interpretation, those methods of distraction had the capacity to break the link between a youngster and their fear, anxiety, pain, and distress, which lowered the fear level and indicated the positive impact of video games, which are followed by storytelling.

This was similar to a randomized clinical trial study by **Özalp Gerçeker et al., (2020)** on 136 children aged from 5-12 years, which found that the total mean score of fear was decreased in the intervention group compared to the control group with a statistically significant difference. This result corresponds with **Aranha et al., (2020)** who found that total mean score of fear lower after using therapeutic play with statistical significance differences between intervention and control group.

Conclusion

The current research's results concluded that video games and storytelling are effective in alleviating preoperative anxiety and fear. Children in intervention groups had lower preoperative anxiety score on STAIC than before and lower preoperative fear scores on GFS than before. Also, the lowest preoperative totals mean scores of STAIC and GFS were in the video games group, followed by the storytelling group, and finally the control group who took only the routine care. So, video games and storytelling among children undergoing surgery are appropriate, easy, effective, and economical methods for minimizing preoperative anxiety and fear without any side effects for pediatric patients. Also, the nurses can utilize them as a part of the care they give to children, and these results support the proposed current study hypotheses.

Recommendations

The following recommendations were made in light of the findings from the current investigation:

Educate parents as well as nurses about video games and storytelling as distractive methods for decreasing anxiety as well as fear in children undergoing surgery.

Further research must be done on the impact of video games and storytelling as distractive methods in reducing preoperative pain and maintaining V/S at a normal level, especially in children who had severe preoperative pain, as in cases with fractures.

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Conflicts of interest

There are no overlapping interests.

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