



EFFECTIVENESS OF ANIMATED CARTOON VIDEOS ON THE LEVEL OF ANXIETY AMONG CHILDREN WITH LEUKEMIA AT PAEDIATRIC MEDICAL WARD, GRH, MADURAI.

A. Sangeetha ¹, L. Selva Regi Ruben ², S. Rajeswari ³

¹ NICU Nursing officer, Government Thiruvavur Medical College Hospital, Thiruvavur.

² Associate Professor, College of Nursing, Madurai Medical College, Madurai

³ Assistant Professor, College of Nursing, Madurai Medical College, Madurai

Abstract:

Background: Leukemia is the most common childhood cancer, often associated with high levels of anxiety during hospitalization. Addressing both physical and emotional needs is crucial for improving outcomes. **Aim:** To evaluate the effectiveness of animated cartoon videos in reducing anxiety among children with leukemia admitted to the pediatric ward at Government Rajaji Hospital, Madurai. **Methods:** A quantitative pre-experimental one-group pretest-posttest design was adopted with 60 leukemic children aged 3–12 years, selected by purposive sampling. Anxiety was measured using the Visual Facial Anxiety Scale before and after a 7-day intervention where children watched animated cartoon videos for 20 minutes twice daily. Data were analyzed using descriptive and inferential statistics. **Results:** Before the intervention, 45% of children had the highest level of anxiety. After watching cartoons, 43.33% had mild anxiety, 35% mild-moderate, and 10% reported no anxiety. The mean anxiety score significantly reduced from 4.01 (SD = 1.08) to 1.48 (SD = 0.83), with a mean difference of 2.53 ($t = 18.42$, $p < 0.001$). Significant associations were found between posttest anxiety levels and variables such as age, junk food habits, duration of illness, and time since treatment initiation. **Conclusion:** Animated cartoon videos effectively reduced anxiety among hospitalized children with leukemia and can be used as a supportive intervention.

Keywords: Leukaemia, children, anxiety, animated cartoons, hospitalization, supportive care.

INTRODUCTION

“Children are the wealth of tomorrow; caring for them ensures a strong India, ready for any challenge.” Children’s health is central to a nation’s future. In recent decades, child mortality has declined significantly, with deaths in under-fives halved between 2000 and 2017. Still, more efforts are needed to improve outcomes further.

Leukemia is the most common cancer in children and teens, accounting for about one-third of cases. Most are acute lymphoblastic leukemia (ALL), followed by acute myeloid leukemia (AML), while chronic forms are rare. In India, about 25,000 children are diagnosed with cancer every year, and nearly 9,000 of them have leukemia. Treatment often brings emotional and psychological challenges, including difficulty with school and daily life, but these can usually be managed with proper support and specialized programs. A newborn’s immune system depends on maternal antibodies provided through breastfeeding. Children with genetic or immune conditions, or who are exposed to infections later than usual, may develop DNA changes that increase their risk of leukemia.

Although childhood cancer is rare, the incidence of ALL has risen slightly since the 1970s, while survival rates have improved greatly. In the United States, childhood cancer mortality declined by over 50 percent between 1975 and 2020. The five-year survival rate for ALL increased from 60 percent to about 90 percent in children under 15, and from 28 percent to over 75 percent in teens aged 15 to 19. ALL peaks between ages one and four, then declines by age ten. Rates are highest among American Indian or Alaska Native and Hispanic children, and about twice as high in White compared to Black children during early childhood.

Leukemia and hospitalization disrupt emotional well-being, privacy, autonomy, and daily routines. Anxiety, fatigue, sleep problems, and irritability are common. Experts recommend keeping routines, attending school when possible, and maintaining peer relationships to ease stress. School re-entry programs and hospital educators help classmates and teachers understand the illness, reducing fear and stigma. Families also face emotional and financial pressures, but social workers and peer-support programs are available to help them cope. Cartoons and animation provide comfort and distraction, helping children process emotions and lift their mood. Familiar shows bring back positive memories and offer a temporary escape from stress.

Despite its challenges, leukemia is now much more treatable thanks to medical advances and holistic care. Supporting both physical and emotional health helps children face illness with resilience and hope, ensuring a stronger future.

NEED FOR THE STUDY

In 2022, 4,74,519 new leukemia cases were reported worldwide, with an incidence rate of 5.4 per 1,00,000. Rates were higher in boys than girls and varied five-fold globally. In India, childhood cancer prevalence is 1.6–4.8 percent, with over 50,000 new cases annually. In the West, survival rates for some childhood cancers reach 80–90 percent.

In Tamil Nadu, New Delhi recorded the highest childhood cancer rates (203.1 per million for boys, 125.4 for girls). Chennai sees about 159 new cases per million each year, and Madurai reports around 182, with 87 leukemia cases treated at Government Rajaji Hospital. Children with leukemia often face emotional challenges, including anxiety, anger, and stress, with anxiety and depression observed in 53.9 and 45.6 percent, respectively.

Cartoons can support emotional well-being by teaching positive values and offering comfort. Illness impacts children's daily life and psychological health, highlighting the need for more child-friendly hospital care. Between 2016 and 2019, 9.4 percent of children aged 3–17 had diagnosed anxiety, and 4.4 percent had depression. Anxiety and depression have risen over time, with diagnoses increasing steadily since 2003.

AIM OF THE STUDY:

The aim of the study to evaluate the effectiveness of animated cartoon videos on the level of anxiety among children with leukemia.

MATERIALS AND METHODS

Study design and participants:

This study adopted a quantitative evaluative approach using a pre-experimental one-group pretest-posttest design. It was conducted at the Paediatric Medical Ward, Government Rajaji Hospital, Madurai, among hospitalized leukemic children aged 3–12 years. A total of 60 children were selected as the sample using non-probability purposive sampling.

Inclusion and exclusion criteria:

Inclusion criteria were children aged 3–12 years, of both genders, admitted to the hematology-oncology ward, and able to watch videos. Children who were critically ill, mentally ill, visually challenged, or treated as outpatients were excluded.

Tools:

The research tool consisted of three sections. Section A collected socio-demographic details, Section B included clinical variables, and Section C was the Visual Facial Anxiety Scale (VFAS), which scores anxiety from 0 (none) to 5 (highest). No scores were assigned to Sections A and B. The VFAS scores were categorized as none, mild, mild-moderate, moderate, moderate-high, and highest anxiety.

Ethical clearance:

Ethical clearance was obtained from the Institutional Ethical Committee of Madurai Medical College. Permissions were secured from the Dean of Madurai Medical College, Principal of the College of Nursing, and Director of the Institute of Child Health and Research Center. Informed written and verbal consent was obtained from caregivers, ensuring anonymity, confidentiality, and the right to withdraw at any stage.

Data collection procedure:

Formal written permissions were obtained from the Institutional Ethical Committee, Madurai Medical College, the Principal of the College of Nursing, and the Dean and Director of the Paediatric Department at GRH, Madurai. Data collection was carried out from 03 June 2024 to 06 July 2024. Each session began with self-introduction, rapport building, and explaining the study's purpose to the caregivers. Sixty children meeting the inclusion criteria were enrolled. On the first day, socio-demographic and clinical data were collected, and a pretest was conducted using the VFAS. Animated cartoon videos (Tom and Jerry, Chhota Bheem, Doraemon, Mr. Bean) were shown for 20 minutes each morning and evening for seven days. The posttest was conducted on the seventh day using the same scale. There were no dropouts, and confidentiality was maintained throughout.

Data analysis:

For data analysis, descriptive and inferential statistics were used. Frequencies and percentages described socio-demographic and clinical variables. Means and standard deviations compared pretest and posttest anxiety scores. The paired t-test assessed the effectiveness of the cartoon videos in reducing anxiety, and the Chi-square test analyzed associations between posttest anxiety and socio-demographic or clinical variables. All procedures adhered to ethical guidelines to protect the rights and welfare of participants.

RESULT:**Demographic variables:**

Among the children, 45% were aged 6–9 years, 28.33% were 10–12 years, and 26.67% were 3–5 years. The majority were boys (75%) and Hindu (95%), with smaller proportions being Christian (3.33%) and Muslim (1.67%). Most came from nuclear families (92%), while 8% were from joint families. Regarding mothers' education, 50% had completed higher secondary, 21.66% diploma or above, and 5% had no formal education. Fathers' education showed similar patterns, with 48.3% completing higher secondary, 25% diploma or above, and 1.67% with no formal education. Mothers were mostly homemakers (45%), followed by daily wage workers (33.33%), while fathers were mainly private employees (58.33%) or daily wage workers (33.33%). Over half (51.67%) of families earned ₹7,316–₹21,913 monthly, 45% earned below ₹7,315, and only 3.33% earned ₹21,914–₹36,526. On junk food habits, 60% ate occasionally, 25% never, and 15% frequently. (Table 1)

Clinical variables:

Table 2 shows the frequency and percentage distribution of anxiety among children with leukemia based on selected clinical variables. Most subjects (93.33%) had no family history of cancer, while 6.67% reported it in grandparents. Regarding the type of leukemia, 68% had acute lymphoblastic leukemia, 3.33% had acute myeloid leukemia, and none had chronic forms. For illness duration, 50% were ill for less than 1 year, 21.67% for 1–2 years, 20% for 3–4 years, and 8.33% for more than 5 years. Concerning time since treatment initiation,

56.67% started within 15 days, 33.33% within 15 days to 1 month, 6.67% after 2 months, and 3.33% after 3 months. Finally, 98.33% received chemotherapy, and 1.67% received radiation therapy.

Level of Anxiety:

In the pretest, nearly half of the children (45%) exhibited the highest level of anxiety, followed by 25% with moderate-high, 16.66% with moderate, and 13.33% with mild-moderate anxiety. None of the children reported mild or no anxiety before the intervention. After watching animated cartoon videos, anxiety levels significantly reduced, with 43.33% showing mild anxiety, 35% mild-moderate, and 10% reporting no anxiety. Moderate anxiety decreased to 11.67%, while no children remained in the moderate-high or highest anxiety categories in the posttest. (Table3)

Comparison of Mean score:

The mean anxiety score in the pretest was 4.01 with a standard deviation of 1.08, which reduced to 1.48 in the posttest with a standard deviation of 0.83, resulting in a mean difference of 2.53. The paired t-test showed a highly significant reduction in anxiety levels after the intervention, with $t = 18.42$, $df = 59$, and $p = 0.0001$. (Table 4)

Association between the post-test level of anxiety with demographic variables:

The association between post-test anxiety levels among children with leukemia and their selected socio-demographic and clinical variables was analyzed using the Chi-square test. Among socio-demographic variables, age ($\chi^2 = 20.967$, $p = 0.021$) and habit of eating junk food ($\chi^2 = 22.205$, $p = 0.014$) showed statistically significant associations. Among clinical variables, duration of illness ($\chi^2 = 25.624$, $p = 0.042$) showed a significant association. Other socio-demographic and clinical variables did not show any significant association with post-test anxiety levels.

Table 1: Distribution of Children with Leukemia at Paediatric Medical Ward according to their demographic variables. **N = 200**

S. No.	Socio-demographic Variables	Category	(f)	%
1	Age (years)	3–5	16	26.67%
		6–9	27	45%
		10–12	17	28.33%
2	Gender	Male	45	75%
		Female	15	25%
3	Religion	Hindu	57	95%
		Christian	2	3.33%

		Muslim	1	1.67%
4	Type of Family	Nuclear	60	100%
		Joint	0	0%
		Extended	0	0%
5	Educational Status of Mother	Non-formal	3	5%
		Primary	4	6.67%
		Secondary	10	16.67%
		Higher secondary	30	50%
		Diploma and above	13	21.66%
6	Educational Status of Father	Non-formal	1	1.67%
		Primary	5	8.33%
		Secondary	10	16.67%
		Higher secondary	29	48.33%
		Diploma and above	15	25%
7	Occupation of Mother	Homemaker	27	45%
		Daily wages	20	33.33%
		Private employee	8	13.33%
		Self-employed	4	6.67%
		Government employee	1	1.67%
8	Occupation of Father	Private employee	35	58.34%
		Daily wages	20	33.33%
		Self-employed	5	8.33%
		Government employee	0	0%
9	Family Income (₹)	< 7,315	27	45%
		7,316–21,913	31	51.67%
		21,914–36,526	2	3.33%
		> 36,527	0	0%
10	Habit of Eating Junk Food	Never	15	25%
		Occasionally	36	60%
		Frequently	9	15%

Table 2: Distribution of Children with Leukemia at Paediatric Medical Ward according to their clinical variables.
N = 200

S. No.	Clinical Variables	Category	(f)	%
1	History of Cancer in Family	Siblings	0	0%
		Parents	0	0%
		Grandparents	4	6.67%
		Others	0	0%
		None	56	93.33%
2	Type of Leukemia	Acute Lymphoblastic (ALL)	59	98.33%
		Acute Myeloid (AML)	1	1.67%
		Chronic Lymphocytic (CLL)	0	0%
		Chronic Myeloid (CML)	0	0%
3	Duration of Illness	< 1 year	30	50%
		1–2 years	13	21.67%
		3–4 years	12	20%
		> 5 years	5	8.33%
4	Time Since Treatment Began	< 15 days	34	56.67%
		15 days–1 month	20	33.33%
		2 months	4	6.67%
		3 months	2	3.33%
5	Type of Treatment	Chemotherapy	59	98.33%
		Radiation Therapy	1	1.67%

Table: 3 Comparison Frequency and percentage distribution Pre and Post test level of Anxiety among Children with Leukemia.
N=200

S. No.	Level of Anxiety	Pretest		Posttest	
		(f)	%	(f)	%
1	None	0	0%	6	10%
2	Mild	0	0%	26	43.33%
3	Mild-Moderate	8	13.33%	21	35%
4	Moderate	10	16.66%	7	11.67%
5	Moderate-High	15	25%	0	0%
6	Highest	27	45%	0	0%

Table: 4 Comparison Between Pretest and Post test of mean, standard deviation, mean score difference on the level of Anxiety among children **N=200**

Variables		Mean	Mean difference	Standard deviation	df	Paired “t” test
Level of Anxiety	Pre test	4.01	2.53	1.08	59	t=18.42 P=0.0001 VHS***
	Post test	1.48		0.83		

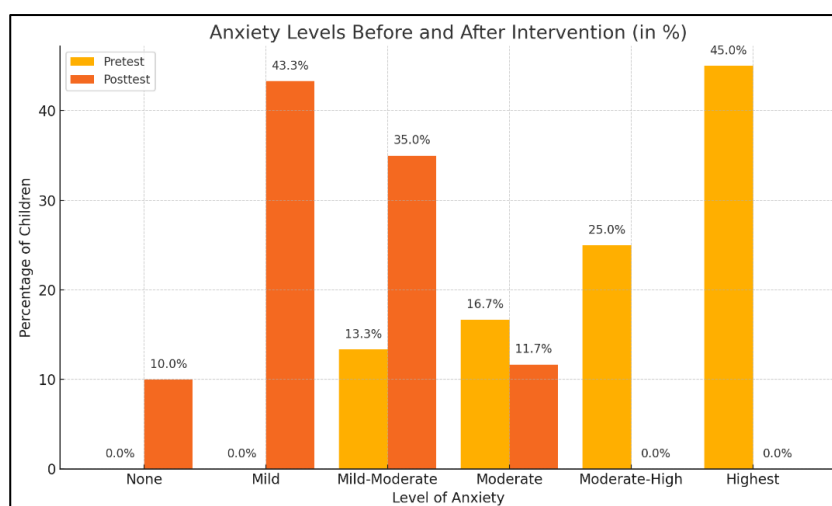


Figure: 1 Bar diagram representing the comparison between pretest and post-test mean score

DISCUSSION:

This study assessed the level of anxiety among children with leukemia admitted to the pediatric ward at Government Rajaji Hospital, Madurai, and evaluated the effect of animated cartoon videos on reducing their anxiety. A quantitative pre-experimental one-group pretest-posttest design was used with 60 children, selected through purposive sampling. Anxiety was measured using the Visual Facial Anxiety Scale before and after the intervention.

Most participants were aged 6–9 years (45%), male (75%), Hindu (95%), and from nuclear families (92%). About half of the mothers and fathers had higher secondary education. Mothers were mainly homemakers (45%), and fathers were private employees (58%). More than half of the families earned ₹7,316–₹21,913 per month. Nearly all children had no family history of cancer, and most (98.3%) had acute lymphoblastic leukemia. Half had been ill for less than a year, and chemotherapy was the main treatment.

Before the intervention, 45% of children showed the highest anxiety level, and 25% had moderate-high anxiety. After the intervention, anxiety significantly reduced, with 43.33% showing mild anxiety, 35% mild-moderate, and 10% reporting no anxiety. The mean anxiety score decreased from 4.01 (SD = 1.08) to 1.48 (SD = 0.83),

showing a significant improvement. Posttest anxiety levels were significantly associated with age, junk food habits, duration of illness, and time since treatment began.

These findings are supported by studies such as Aakanksha Bajpai & Ilayaraja (2017), who found high anxiety levels among hospitalized children in Moradabad, and Samah Hamdy Hafeez (2022), who reported a significant reduction in anxiety through virtual video games in children undergoing chemotherapy. Similarly, J. Jeyareka (2022) demonstrated that animated cartoon videos significantly reduced anxiety and distress among children with cancer in a true experimental study.

CONCLUSION:

The study concluded that animated cartoon videos are effective in reducing anxiety among children with leukemia. Animated cartoons can thus be used as a supportive intervention to alleviate anxiety in hospitalized leukemic children. The study also concluded that there is a significant association between the posttest anxiety levels and selected socio-demographic and clinical variables, indicating that these factors influence the children's emotional response during treatment.

RECOMMENDATION:

It is recommended that the study be replicated on a larger sample to improve generalizability of the findings. Further research can also explore which types of animated cartoon videos are most effective in reducing anxiety, as well as assess the impact of longer viewing durations beyond one hour on anxiety levels in children with leukemia.

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