



Hospital Authority Convention 2026

Oral Presentation: Clinical Safety and Quality Service III

Animated Cartoon Distraction for Pain Relief in Paediatric Venipuncture: A Pilot Project

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1. Introduction

Introduction

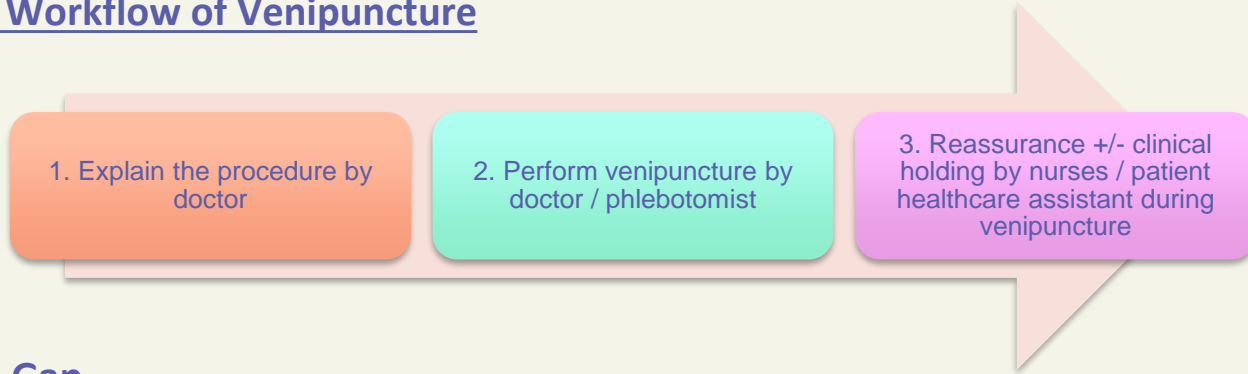
- **Venipuncture** is a common hospital procedure often perceived by children as one of the most distressing and painful experience
- Early negative experience with needle-based procedures can result in long-term **needle phobia**, persisting into adulthood and manifest various adverse responses to needle from lessened capacity to cope with pain, anxiety, physiological changes and even avoidance in medical care



The American Academy of Pediatrics and the American Pain Society recommended minimizing pain and stress levels even in minor procedures such as venous blood sampling

Current Practice & Practice Gap

Current Workflow of Venipuncture



Practice Gap

- Staff is task focused and complain of pain during the procedure is underrated

What can we do to relieve pain during venipuncture???



What kinds of distraction method are effective to our patient????

Literature Review

- Studies consistently demonstrate that **distraction is an effective non-pharmacological strategy to reduce pain during venipuncture for preschool aged child**
- Distraction methods included “animated cartoon”, “vibration”, “cold”, “play puzzle game” or “read story book”
- **Most evidence selected “animated cartoon” as distraction method** in their studies and found to be effective

Translate Evidence into Practice



In 2024, a pilot project was launched to evaluate the effectiveness of nurse-led animated cartoon distraction in preschool-aged children undergoing venipuncture



2. Project Objectives



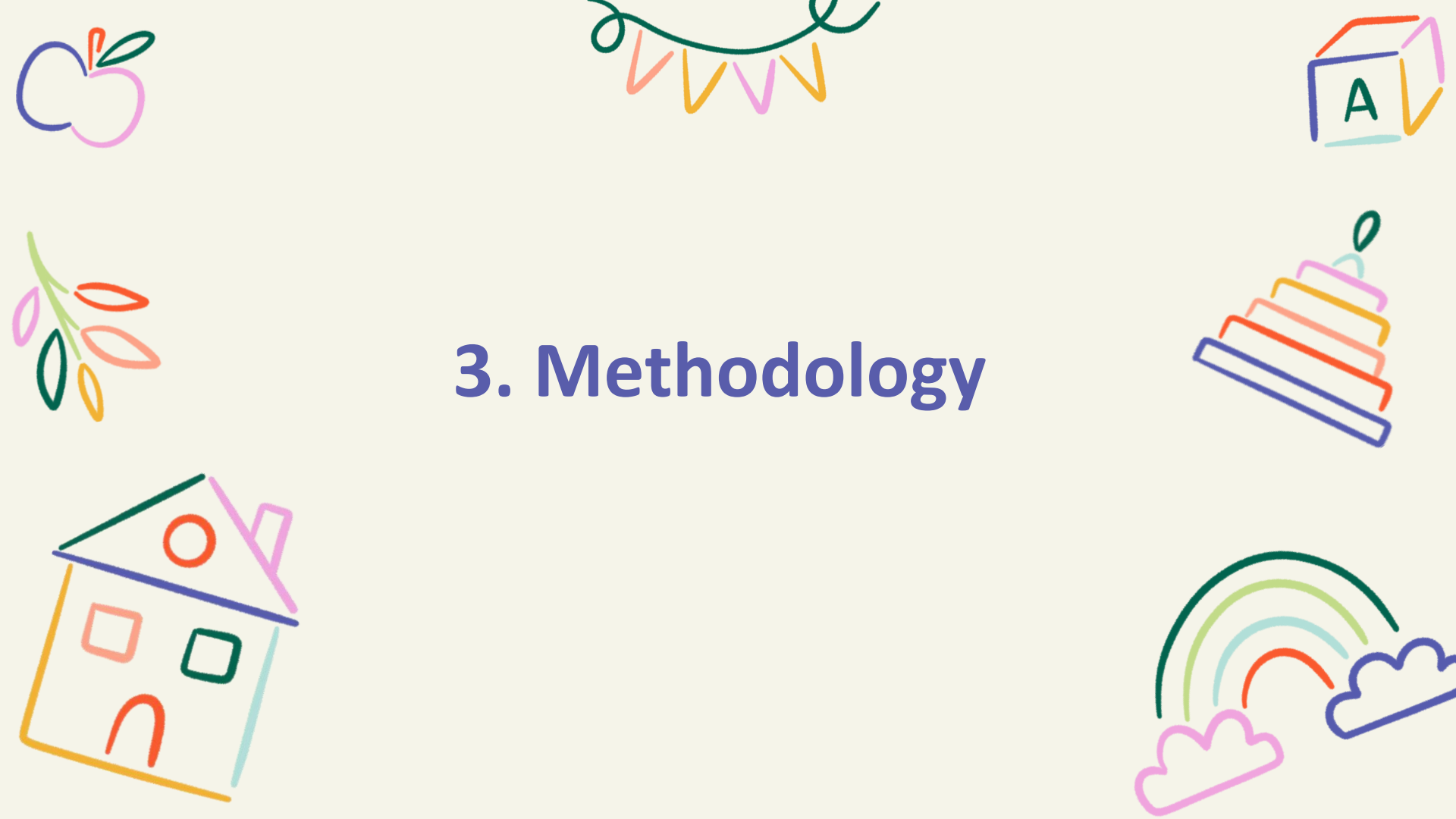
Objectives

1

To reduce pain among preschool-aged children undergo venipuncture through nurse-led animated cartoon distraction

2

To enhance cooperation of preschool-aged children, thereby facilitating smoothness and success of the venipuncture



3. Methodology

Preparation: Tool for Displaying Animated Cartoon



Animated cartoon is play by portable projector

- Portable
- Project large scale image
- Easy to operate, no need extra manpower to operate during the venipuncture procedure



Display in Treatment Room



Display at Bedside



Preparation: Collaboration with Playright

- Hospital play specialist provided expert advice on animation selection
 - Animation with colorful cartoon
 - Animation with nursery rhyme
 - Appropriate for pre-school aged child
 - Total 12 animations selected
 - Duration 3 - 120 mins

智樂 playright

看重孩子 看得起遊戲

VALUE CHILDREN VALUE PLAY



Preparation: Briefing to Nurses

Content of Briefing

1. Purpose & objectives of the project, as well as the project framework & action plan
2. Workflow of venipuncture for experimental and control group
3. Pain assessment by using Face-Leg-Activity-Consolability (FLACC) scale
4. Operation and set up of the projector



Face-Legs-Activity-Cry-Consolability (FLACC) Scale			
Category	Scoring 0	Scoring 1	Scoring 2
Face	No particular expression / smile	Occasional grimace / frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position / relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back & forth, tense	Arched, rigid / jerking
Cry	No cry (awake / asleep)	Moans / whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging / being talked to, distractible	Difficult to console / comfort

Project Design & Sampling

- Design: Quasi-experimental
- Venue: A general paediatric ward & Paediatric Intensive Care Unit
- Period: June – September 2024 (4 months)
- Target: Patients aged 3-6 years old
- Sampling: Convenience sampling
- Sampling criteria:

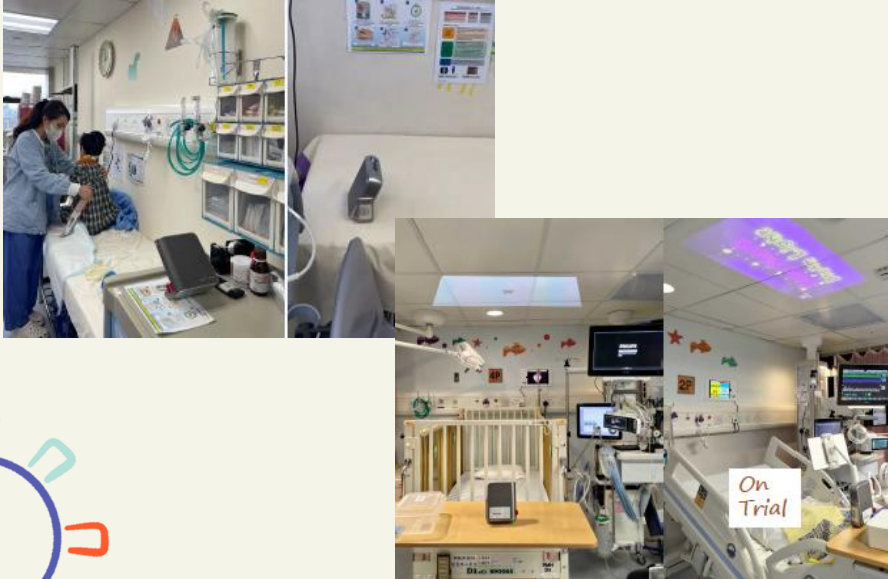
Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none">• Paediatric in-patients aged 3-6 years old undergo venipuncture• Alert & obey commands• Able to respond to painful stimuli	<ul style="list-style-type: none">• Visual and hearing impairment• Intellectual or cognitive impairment• Psychiatric• Neurodevelopmental disorder• Under effect of sedatives / anticonvulsants / analgesic drug• Unconscious• Critically ill

Interventions

- Samples were allocated into 2 groups:

Experimental Group

- Receive venipuncture with animated cartoon via a portable projector

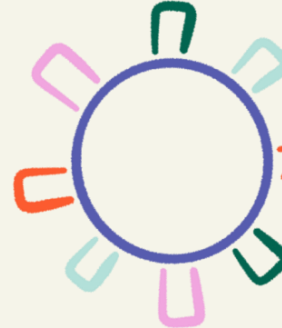


Control Group

- Undergo venipuncture without animated cartoon distraction



Outcome Measures



1. Demographic data

- Age, gender & past experience of venipuncture

2. Pain level

- Face-Leg-Activity-Consolability (FLACC) scale
- Score at pre, during & post venipuncture

Face-Legs-Activity-Cry-Consolability (FLACC) Scale			
Category	Scoring 0	Scoring 1	Scoring 2
Face	No particular expression / smile	Occasional grimace / frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
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3. Venipuncture smoothness and success

- Venipuncture attempt

4. Satisfaction ratings from parents & carers and doctors

- Six-point Likert scale questionnaire

瑪嘉烈醫院兒童及青少年科
服務意見問卷

為了改善兒科服務質素，
請您幫助我們填寫問卷，謝謝您的寶貴意見！

Experimental Group

病人以往抽血次數： _____ 次

請圈出您的選擇

滿意度

1. 抽血前的解釋和建議或/病人是否清楚抽血過程 1 2 3 4 5 6

2. 抽血期間，健康護理能安撫病人 1 2 3 4 5 6

3. 對於整體的抽血安排感到滿意 1 2 3 4 5 6

其他意見及建議：

瑪嘉烈醫院兒童及青少年科
服務意見問卷

Control Group

為了改善兒科服務質素，
請您幫助我們填寫問卷，謝謝您的寶貴意見！

如您希望我們聯絡，請填妥以下資料：

姓名： _____ 病人以往抽血次數： _____ 次

填寫日期： _____

滿意度的寶貴意見！
您的資料，僅作統計及聯絡之用

請圈出您的選擇

滿意度

4. 抽血前的語言解釋和建議/病人是否清楚了解整個抽血過程 1 2 3 4 5 6

5. 抽血期間護理次數以分散病人注意力能安撫病人 1 2 3 4 5 6

6. 抽血期間護理手段有多數分散病人注意力能減少病人痛苦 1 2 3 4 5 6

7. 抽血期間護理手段有多數滿足病人的心理需要 1 2 3 4 5 6

8. 整體而言，我對是次抽血安排感到滿意 1 2 3 4 5 6

其他意見及建議：

如您希望我們聯絡，請填妥以下資料：

姓名： _____ 聯絡電話： _____

填寫日期： _____

滿意度的寶貴意見！
您的資料，僅作統計及聯絡之用

Survey for parents / carers

Evaluation questionnaires of using animated cartoon as distraction method during peripheral venous puncture

Department of Paediatric and Adolescent Medicine

Compare to your previous experience on peripheral venous puncture.
Please give a " " in the appropriate box(es) below:

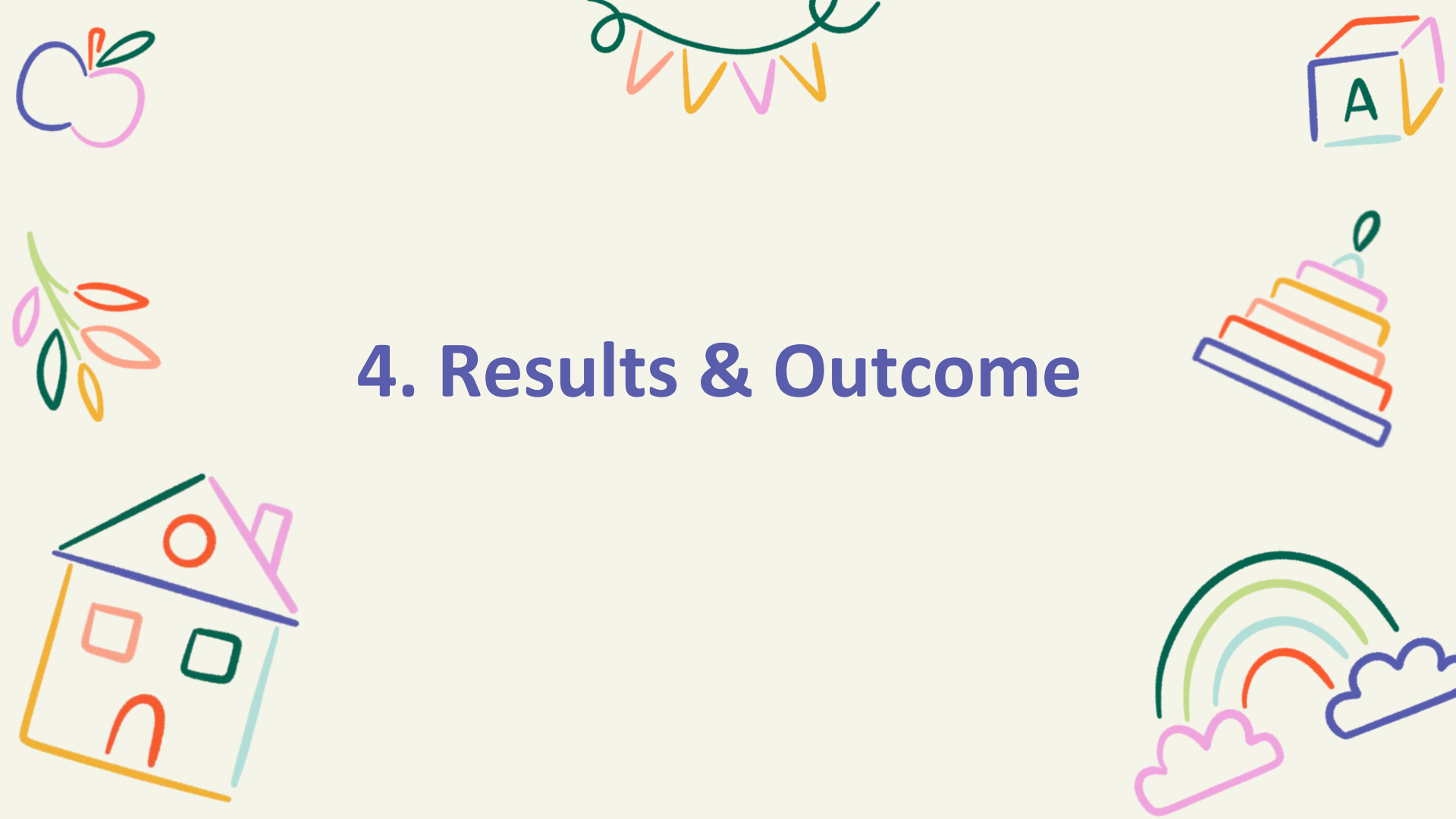
Item No.	Description	Strongly disagree	Disagree	Slightly disagree	Slightly Agree	Agree	Strongly agree
		1	2	3	4	5	6
1	Animated cartoon as distraction method is effective to distract patients						
2	This distraction method can facilitate the procedure of peripheral venous puncture						
3	This distraction method can shorten the procedure time of peripheral venous puncture						
4	The ambience in treatment room is improving						
5	The overall arrangement is satisfactory						

Other Comments: _____

Name (optional): _____

Survey for doctors

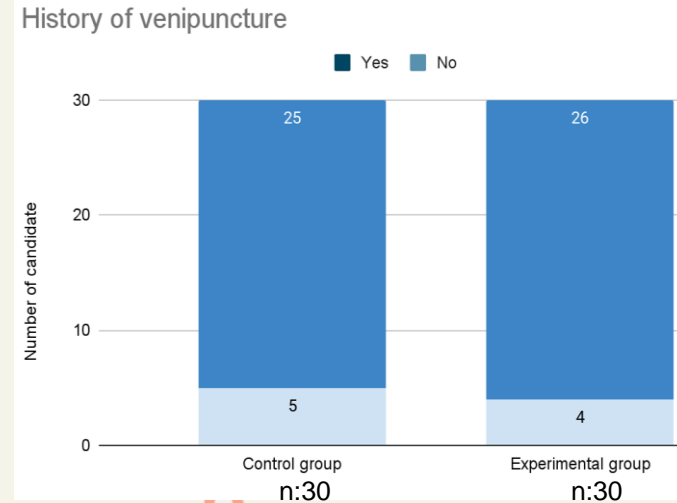
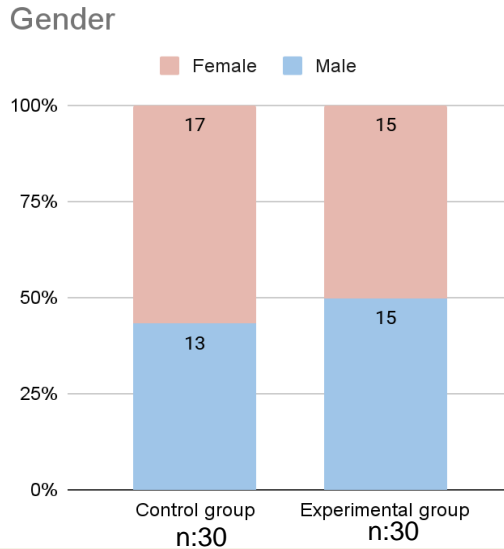
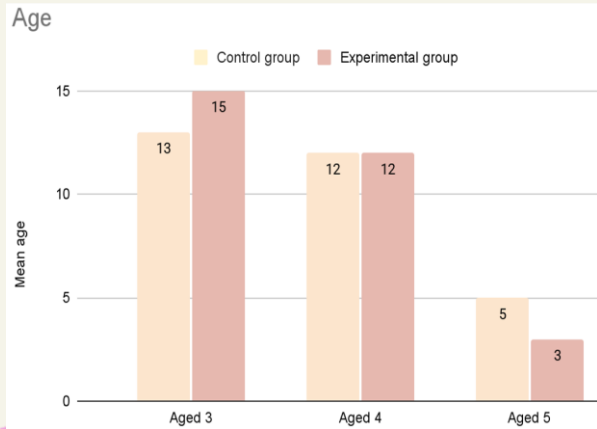




4. Results & Outcome

Demographic Data

- A total of 30 samples were recruited in control group and experimental group respectively



Demographic Data

- Data process by IBM SPSS Statistics

group	N	Mean	Std. Deviation	Std. Error Mean
sex				
control group	30	.43	.504	.092
experimntal group	30	.50	.509	.093
age				
control group	30	3.73	.740	.135
experimntal group	30	3.60	.675	.123

		Levene's Test for Equality of Variances		t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.			One-Sided p	Two-Sided p			Lower	Upper
sex	Equal variances assumed	.525	.472	-.510	58	.306	.612	-.067	.131	-.328	.195
	Equal variances not assumed			-.510	57.995	.306	.612	-.067	.131	-.328	.195
age	Equal variances assumed	.179	.674	.729	58	.234	.469	.133	.183	-.233	.499
	Equal variances not assumed			.729	57.516	.234	.469	.133	.183	-.233	.499

		Standardizer ^a	Point Estimate	95% Confidence Interval	
				Lower	Upper
sex	Cohen's d	.506	-.132	-.638	.376
	Hedges' correction	.513	-.130	-.629	.371
	Glass's delta	.509	-.131	-.637	.377
age	Cohen's d	.708	.188	-.320	.695
	Hedges' correction	.717	.186	-.316	.686
	Glass's delta	.675	.198	-.313	.705

a. The denominator used in estimating the effect sizes.
 Cohen's d uses the pooled standard deviation.
 Hedges' correction uses the pooled standard deviation, plus a correction factor.
 Glass's delta uses the sample standard deviation of the control (i.e., the second) group.

According to Independent Samples t-test:
There are no significant difference in the age, gender or past experience various between the control and experimental groups

→ Strengthens the internal validity

→ Supports the ability to make causal inferences about the effectiveness of the intervention

Pain Level

Pain score throughout venipuncture



The mean pain score 'during' and 'post' venipuncture is lower in experimental group than in control group

Pain Level

Data processed by IBM SPSS Statistics

Group Statistics				
group	N	Mean	Std. Deviation	Std. Error Mean
Pre_score				
control group	30	4.00	.263	.048
experimental group	30	4.00	.263	.048
During_score				
control group	30	6.00	1.365	.249
experimntal group	30	4.60	.498	.091
Post_score				
control group	30	5.00	1.050	.192
experimntal group	30	3.03	.490	.089

Levene's Test for Equality of Variances				t-test for Equality of Means						
	F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					One-Sided p	Two-Sided p			Lower	Upper
Pre_score	.000	1.000	.000	58	.500	1.000	.000	.068	-.136	.136
					.500	1.000	.000	-.068	-.136	.136
During_score	9.686	.003	5.279	58	<.001	<.001	1.400	.265	.869	1.931
			5.279	36.598	<.001	<.001	1.400	.265	.862	1.938
Post_score	6.153	.016	9.293	58	<.001	<.001	1.967	.212	1.543	2.390
			9.293	41.056	<.001	<.001	1.967	.212	1.539	2.394

Independent Samples Effect Sizes				
	Standardized ^a	Point Estimate	95% Confidence Interval	
			Lower	Upper
Pre_score	Cohen's d	.000	-.506	.506
	Hedges' correction	-.266	-.000	-.499
	Glass's delta	.263	.000	-.506
During_score	Cohen's d	1.027	1.369	.785
	Hedges' correction	1.041	1.345	.784
	Glass's delta	.498	2.810	1.922
Post_score	Cohen's d	.820	2.399	1.726
	Hedges' correction	.830	2.368	1.703
	Glass's delta	.490	4.013	2.860

a. The denominator used in estimating the effect sizes.
 Cohen's d uses the pooled standard deviation.
 Hedges' correction uses the pooled standard deviation, plus a correction factor.
 Glass's delta uses the sample standard deviation of the control (i.e., the second) group.

Cohen's d effect size small(d=0.2), medium (d=0.5), large (d>=0.8)

By independent samples t-test

1. Pain score during venipuncture:

p-value < .001

Cohen's d effect size = 1.027 (large)

There is a **highly significant difference** between the control group (M = 6.00, SD = 1.365) and the experimental group (M = 4.60, SD = 0.498)

2. Pain score after venipuncture:

p-value < .001

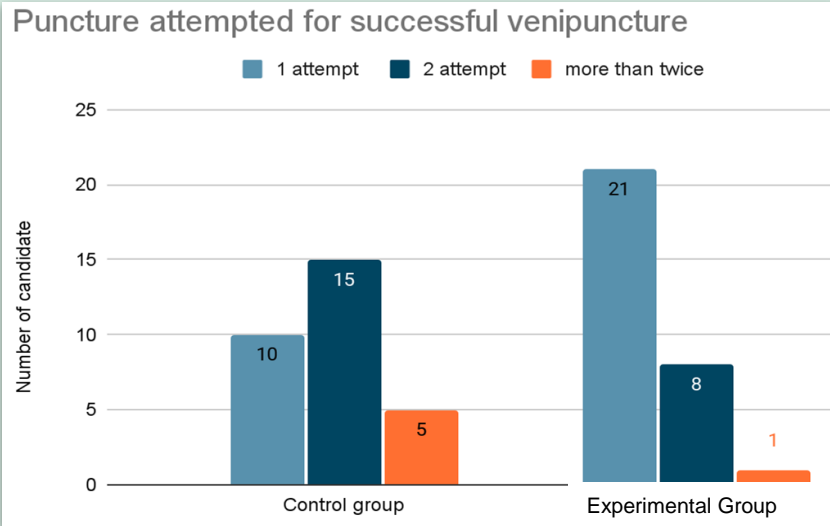
Cohen's d effect size = 0.820 (large)

There is a **highly significant difference** between the control group (M = 5.00, SD = 1.050) and the experimental group (M = 3.03, SD = 0.490)

Patients in experimental group demonstrated significantly lower pain score during venipuncture (mean 4.6 vs. 6, p < .001, Cohen's d = 1.027) and after the procedure (mean 3 vs. 5, p < .001, Cohen's d = 0.820)

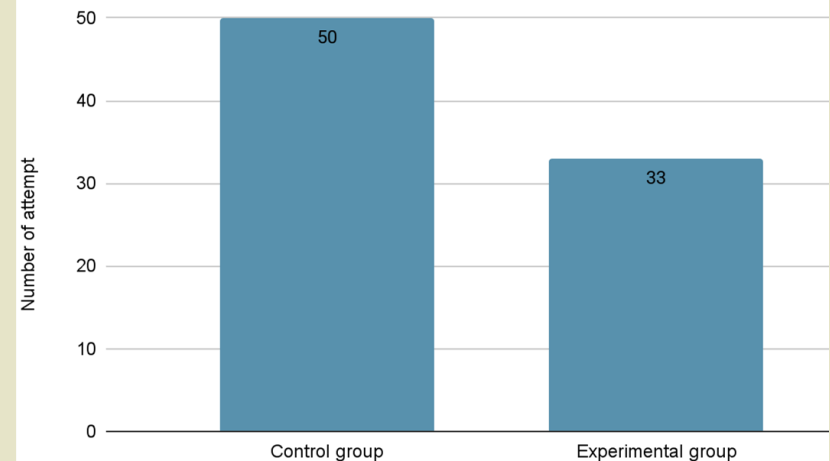
Venipuncture Attempt

In experimental group, higher successful rate in 1st attempt



Among 30 episodes of venipuncture, 50 attempts required in control group while experimental group required 33 attempts

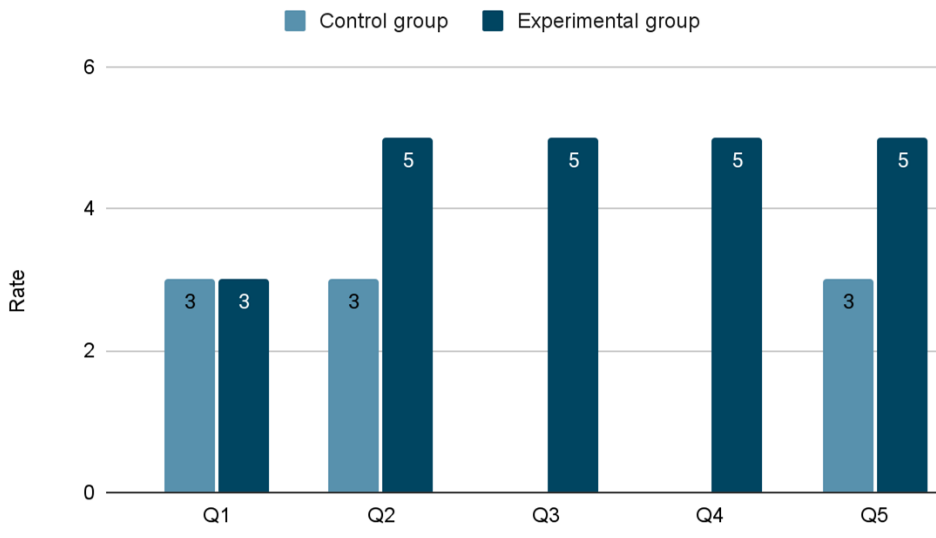
Total number of attempt



Procedural success improved with fewer attempts required in experimental group than control group (mean 1.1 vs 1.6)

Survey from Parents / Carers

Satisfaction rating in the survey from parents / carers



Questions in Survey

Q1	Before blood taking, picture illustration can clearly demonstrate the whole blood taking procedure.
Q2	During blood taking, watching animated cartoon as distraction method is effective to comfort patient.
Q3	During blood taking, watching animated cartoon as distraction method is effective to reduce patients' pain.
Q4	During blood taking, watching animated cartoon can satisfy the psychological need of patient.
Q5	I am satisfied on the overall blood taking arrangement.

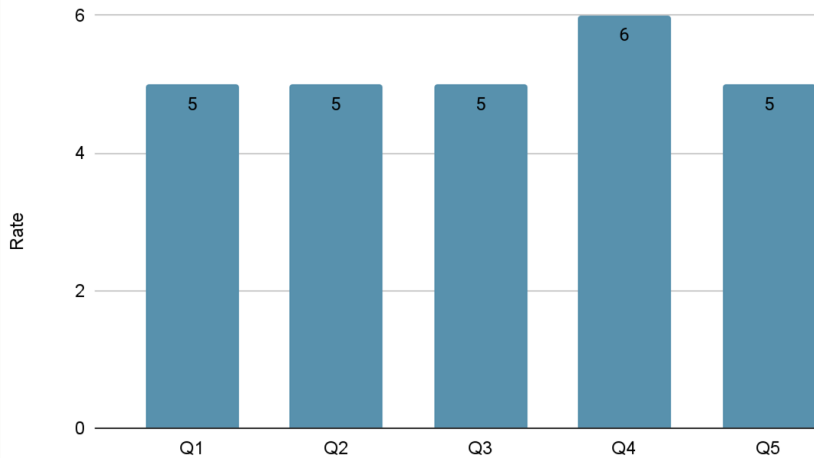
Rating scale

- 1= strongly disagree
- 2= disagree
- 3= slightly disagree
- 4= slightly agree
- 5= agree
- 6= strongly agree

Parents / carers satisfaction increased, with mean score rising from 3 in control group to 4.6 in experimental group

Survey Results from Doctors

Satisfaction rating in the survey from doctors



Questions in Survey

Q1	Animated cartoon as distraction method is effective to distract patients
Q2	This distraction method can facilitate the procedure of peripheral venous puncture
Q3	This distraction method can shorten the procedure time of peripheral venous puncture
Q4	The ambiance in treatment room is improving
Q5	The overall arrangement is satisfactory

Doctors in the experimental group (n=30) reported enhanced distraction, smoother venipuncture, and improved efficiency, with a mean satisfaction score of 5.2

Rating scale

- 1= strongly disagree
- 2= disagree
- 3= slightly disagree
- 4= slightly agree
- 5= agree
- 6= strongly agree

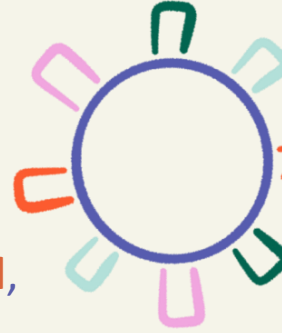


5. Conclusion





Conclusion



- Nurse-led animated cartoon distraction **reduced patient's pain level, improved cooperation, and enhanced procedural efficiency** in paediatric venipuncture
- Given its feasibility and positive outcomes, animated cartoon distraction is **recommended as a supportive strategy** to optimize paediatric patient experience in venipuncture



Thank You





Acknowledgement

Ms Lee W S B (P&AM/DOM)
Ms Wong K N (P&AM/NC PIC)
Ms Lam S T (P&AM/ C3 WM)
Ms Fong K S (P&AM / D3 & PICU WM)
Hospital Play Specialists (Playright)
C3 ward, D3 ward & PICU Nursing Staff



References



- Alfatavi, H. H. M., Sadeghi, T., AL-Dakheel, M.B. H.M, Noghabi, F. A., & Moeini, M. S. (2022). Effects of Whistling Compared with Buzzy Device During Blood Sampling on Pain and Fear in Children’s Emergency Department. *Comprehensive Child and Adolescent Nursing*, 45(4), 414–424. <https://doi.org/10.1080/24694193.2022.2091683>
- Bergomi, P., Scudeller, L., Pintaldi, S., & Dal Molin, A. (2018). Efficacy of Non-pharmacological Methods of Pain Management in Children Undergoing Venipuncture in a Pediatric Outpatient Clinic: A Randomized Controlled Trial of Audiovisual Distraction and External Cold and Vibration. *Journal of Pediatric Nursing*, 42, e66–e72., <https://doi.org/10.1016/j.pedn.2018.04.011>
- Chavan, S., & Naregal, P. (2021). Effectiveness of cartoon animation video on pain during venepuncture among 3-6 year old children. *Sri Lanka Journal of Child Health*, 50(2), 299. <https://doi.org/10.4038/sljch.v50i2.9577>
- Gandhar, S. S., Deshpande, J., & Borude, S. (2016). Effectiveness of Cartoon Movies as Distracter on Pain among Children Undergoing Venipuncture [Review of Effectiveness of Cartoon Movies as Distracter on Pain among Children Undergoing Venipuncture]. *International Journal of Science and Research* , 5(6). <http://dx.doi.org/10.21275/v5i6.NOV164843>
- Gold, J. I., SooHoo, M., Laikin, A. M., Lane, A. S., & Klein, M. J. (2021). Effect of an Immersive Virtual Reality Intervention on Pain and Anxiety Associated With Peripheral Intravenous Catheter Placement in the Pediatric Setting. *JAMA Network Open*, 4(8), e2122569. <https://doi.org/10.1001/jamanetworkopen.2021.22569>
- Gupta, H. V. (2014). Comparison between the Analgesic Effect of two Techniques on the Level of Pain Perception During venipuncture in Children up to 7 Years of Age: A Quasi-Experimental Study. *JOURNAL of CLINICAL and DIAGNOSTIC RESEARCH*. <https://doi.org/10.7860/jcdr/2014/9731.4675>





References

- Høvik, L. H., Gjeilo, K. H., Lydersen, S., Rickard, C. M., Røtvold, B., Damås, J. K., Solligård, E., & Gustad, L. T. (2019). Monitoring quality of care for peripheral intravenous catheters; feasibility and reliability of the peripheral intravenous catheters mini questionnaire (PIVC-miniQ). *BMC Health Services Research*, 19(1). <https://doi.org/10.1186/s12913-019-4497-z>
- Isiyel, E. (2023). Effect of an Active Distraction Method for Pediatric Venipuncture Related Pain and Anxiety. *Erciyes Medical Journal*. <https://doi.org/10.14744/etd.2022.13707>
- James, J., Ghai, S., Rao, K. L. N., & Sharma, N. (2012). Effectiveness Of “” Animated Cartoons “” As A Distraction Strategy On Behavior Response To Pain Perception Among Children Undergoing. Venipuncture. *Nursing and Midwifery Research Journal*,. <https://doi.org/10.33698/nrf0142>
- Koller, D., & Goldman, R. D. (2012). Distraction Techniques for Children Undergoing Procedures: A Critical Review of Pediatric Research. *Journal of Pediatric Nursing*, 27(6), 652–681. <https://doi.org/10.1016/j.pedn.2011.08.001>
- Krishnegowda, M., Unki, P., Manuja, L. M., & Kerudi, M. P. (2023). Effectiveness of cartoon video as a distraction strategy on pain perception during venepuncture among children. *Journal of Medical and Scientific Research*, 11(1), 42–46. <https://doi.org/10.17727/jmsr.2023/11-9>
- Kuo, H.C., Pan, H.H., Creedy, D. K., & Tsao, Y. (2016). Distraction-Based Interventions for Children Undergoing Venipuncture Procedures: A Randomized Controlled Study. *Clinical Nursing Research*, 27(4),467–482. <https://doi.org/10.1177/1054773816686262>





References

- Mishra, T. A. & Subedi, A.(2023). Effectiveness of Video-Assisted Distraction Technique in Reduction of Pain Among Preschool Children Undergoing Vein Puncture. *Journal of Nepal Paediatric Society*, 43(1), 22–27. <https://doi.org/10.60086/jnps484>
- Niaz, F., Tariq, S., Ahmed, A. M., Afzal, Y., Shaikh, T. G., Nashwan, A. J., & Ullah, I. (2023). Virtual reality for pain and anxiety management in children undergoing venipuncture procedures: A systematic review and meta-analysis. *Global Pediatrics*, 4, 100060. <https://doi.org/10.1016/j.gped.2023.100060>
- Rezai, M. S., Goudarzian, A. H., Jafari-Koulaee, A., & Bagheri-Nesami, M. (2017). The Effect of Distraction Techniques on the Pain of Venipuncture in Children: A Systematic Review. *Journal of Pediatrics Review*, 5(1), 1–11. <https://doi.org/10.17795/jpr-9459>
- U.K, S., Pitre, S., Rashad Dabou, E. A. A., & Adam, S. (2022). Effect of Watching Animated Cartoon Film on Level of Pain during Venipuncture among Children Admitted in Ministry Hospital Ras Al Khaimah. *International Journal of Current Research and Review*, 14(04), 106–111. <https://doi.org/10.31782/ijcrr.2021.14117>
- Wang, Z. X., Sun, L. H., & Chen, A. P. (2008). The efficacy of non-pharmacological methods of pain management in school-age children receiving venepuncture in a paediatric department: a randomized controlled trial of audiovisual distraction and routine psychological intervention. *Swiss Medical Weekly*, 138(3940). <https://doi.org/10.4414/smw.2008.12224>

