

Playing the CARD (Comfort, Ask, Relax, Distract) game to learn about coping with needles: Results from user testing

Anthony Illersich¹, Lucie Bucci², C Meghan McMurtry³, Moshe Ipp^{4,5}, Tina Zita⁶, Shenthuraan Tharmarajah^{4,5}, Victoria Gudzak^{4,5}, Noni MacDonald⁷, Anna Taddio^{4,5}

¹University of Waterloo, ²Immunize Canada ³The University of Guelph, ⁴Leslie Dan Faculty of Pharmacy, University of Toronto, ⁵The Hospital for Sick Children, ⁶Peel District School Board, ⁷Department of Pediatrics, Dalhousie University

Background and Objective

- The CARD (Comfort, Ask, Relax, Distract) system is a framework for educating children about ways to cope during needle procedures. Each letter category (C-A-R-D) includes strategies that reduce pain, fear and fainting.
- Children have recommended learning about CARD using an internet game. We therefore created a web-based CARD game.
- In the game (**Figure 1**), characters introduce CARD and then educate players about coping strategies in the different letter categories. Minigames (e.g., breathing game) are embedded for practice and reinforcement of learning. Players then play a variety of minigames in the arcade (e.g., line matching).
- The objective of this study was to evaluate acceptability of the CARD game in child-parent dyads after children played the game.

Methods

- Population and setting:**
 - A convenience sample of 15 child-parent dyads from 3 child age strata (6-8, 9-10, and 11-12 yrs) were recruited from an outpatient pediatric clinic in Toronto, Canada.
- Procedures:**
 - Children play-tested the game on a cell phone or tablet in the presence of a parent. Parents were able to assist their child while they played.
 - Researchers virtually monitored children playing the game.
 - Children and parents answered demographic questions and questions about the game before and after playing.
 - Quantitative data were summarized descriptively; qualitative data were analyzed using content analysis.



Figure 1. CARD game screenshot

Results

Table 1 displays characteristics of the participants; **Table 2** displays knowledge and attitudes about the game; **Figure 2** displays qualitative feedback.

Table 1. Participant characteristics	All children (n=15)	Child 6-8 yrs (n=5)	Child 9-10 yrs (n=5)	Child 11-12 yrs (n=5)
Child sex, n (% male)	7 (47)	2 (40)	2 (40)	3 (60)
Ethnicity, n (% white)	13 (87)	4 (80)	5 (100)	4 (80)
Siblings, n (% yes)	12 (80)	3 (60)	5 (100)	4 (80)
Parent sex, n (% female)	10 (67)	2 (40)	4 (80)	4 (80)
Age, median (range)	42 (39-55)	41 (40-44)	39 (39-42)	46 (43-55)
Assisted child, n (% yes)	6 (40)	4 (80)	2 (40)	0 (0)

Table 2. Knowledge and attitudes after playing	All children (n=15)	Child 6-8 yrs (n=5)	Child 9-10 yrs (n=5)	Child 11-12 yrs (n=5)
Child				
Less fear (vs. baseline), n (%)	9 (60) [†]	3 (60) [†]	3 (60) [†]	3 (60) [†]
Self-efficacy, n (%)	11 (85) ^{**}	3 (75) [*]	4 (80)	4 (100) [*]
Recalled ≥1 coping strategy, n (%)	15 (100)	5 (100)	5 (100)	5 (100)
Learned something new, n (%)	13 (87)	3 (60)	5 (100)	5 (100)
Would use a newly learned coping strategy in future, n (%)	13 (87)	3 (60)	5 (100)	5 (100)
Would play again, n (%)	12 (86) ^{***}	4 (80)	5 (100)	3 (75) [*]
Would tell others about the game, n (%)	13 (93) ^{***}	4 (100) [*]	4 (80)	5 (100)
Parent				
Helpful to child, n (%)	13 (100) ^{**}	3 (100) [†]	5 (100)	5 (100)
Would use game for future needle procedure, n (%)	11 (92) ^{††}	4 (80)	3 (100) [†]	4 (100) [*]
Would tell others about the game, n (%)	15 (100)	5 (100)	5 (100)	5 (100)

[†] N=2 children in each of the three age categories had same level of fear as before playing game.

^{*} n=4, ^{**} n=13, ^{***} n=14, ^{††} n=12, [†] n=3.

Results

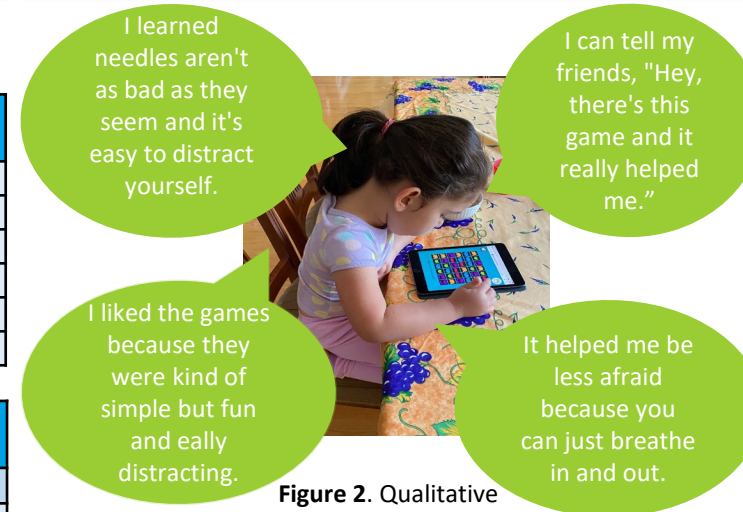


Figure 2. Qualitative feedback

Discussion

- To our knowledge, this is the first web-based game that educates children about ways to cope with needles ahead of time as well as provides activities that children can play during actual needle procedures.
- Both children and parents perceived the CARD game as acceptable. The majority of children reported that playing the game reduced their level of needle fear.
- Future studies are recommended to evaluate effectiveness and feasibility of the game for upcoming needle procedures in children across the targeted age range, such as COVID-19 vaccinations.



Scan here if you want to play!