CARD (Comfort Ask Relax Distract) for community pharmacy vaccinations in children: Effect on immunization stress-related responses and satisfaction

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ABSTRACT

Introduction: CARD (Comfort Ask Relax Distract) is a vaccine delivery program demonstrated to reduce pain, fear and associated immunization stress-related responses (ISRR) in children undergoing vaccinations at school. This study evaluated CARD's clinical impact when integrated into community pharmacy–based pediatric vaccinations.

Methods: This was a before-and-after CARD implementation study in 5 independent pharmacies offering COVID-19 vaccinations to children aged 5-11 years. No changes were made to practices in the "before" phase. CARD interventions were integrated in the "after" phase (e.g., children prepared a coping plan using a checklist, distraction toolkits were placed in waiting and vaccination spaces, vaccinations were performed with privacy, needles were obscured). Children self-reported ISRR, including fear, pain and dizziness during vaccination, and both children and parents/caregivers (herein, parents) compared the child's experience to their last needle (better, same, worse). In the "after" phase, parents and children reported how much CARD helped (not at all, a little bit, a moderate amount, a lot).

Results: The study was conducted between January 16 and March 20, 2022. Altogether, 152 children participated (71 before and 81 after CARD); demographic characteristics did not differ. Children's self-reported fear was lower after CARD, when assessed continuously (2.5 vs 3.7 out of 10; $p = 0.02$) or dichotomously, using a cut-off of 0 vs >0 (58% vs 80%; $p = 0.01$). Pain was lower when assessed dichotomously (<2 vs ≥2; $p = 0.03$). There was no difference in dizziness. After CARD, children and parents reported more positive experiences compared to the child's last needle ($p = 0.01$, both analyses) and more children and parents reported that distraction and child participation in the process were helpful ($p < 0.001$, both analyses). Overall, 92% of children and 91% of parents said CARD helped.

Conclusion: CARD reduced children's fear and improved vaccination experiences for children and parents when integrated in community pharmacy–based vaccinations. *Can Pharm J (Ott)* 2023;156(Suppl):27S-35S.

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Introduction

Vaccinations have been a primary strategy for controlling the COVID-19 pandemic. Across Canada, community pharmacists are actively engaged in delivering COVID-19 vaccines to children and adults. In prior studies, community pharmacists have reported that vaccinating children is challenging because of heightened levels of anxiety and fear.[1,2] This may contribute to a reluctance to vaccinate this patient population.[3] Delivering vaccines in ways that minimize fear, pain and other immunization stress-related responses (ISRR)[4,5] can improve the vaccination experiences of children, their families and pharmacy vaccinators.

The CARD (Comfort Ask Relax Distract) system[6] is a framework for delivering vaccines that incorporates evidence-based interventions that reduce ISRR, including fear, pain, dizziness and fainting.[7] Prior studies have demonstrated CARD's effectiveness and feasibility in school-based vaccinations[8-10] and mass vaccination clinics.[11] The objective of this study was to integrate CARD in the delivery of pediatric COVID-19 vaccinations in the community pharmacy setting and to evaluate its impact on ISRR and child and parental satisfaction with vaccination. This study is part of a series included in this supplement to *CPJ* devoted to improving the vaccination experience in community pharmacies.[12] Separately, we report on community pharmacists' experiences with COVID-19 vaccinations,[13] their perceptions of CARD,[2] acceptability and feasibility of CARD implementation for pediatric COVID-19 vaccinations,[14] pharmacy technician student perceptions of a CARD training e-module[15] and a CARD implementation guide.[16]

Methods

This project was guided by the Canadian Institutes of Health Research (CIHR) Knowledge-to-Action (KTA) cycle[17] and the Consolidated Framework for Implementation Research (CFIR).[18] These frameworks explain factors involved in translation of research evidence into practice and the positive and negative drivers of implementation of new interventions.

The project was led by a multisectoral and multidisciplinary group of individuals with expertise in vaccination and mitigation of ISRR, community pharmacy practice and implementation science, and it included pharmacy corporate/organizational implementation leaders. Meetings were held to identify objectives, select methodological approaches, modify outcome measurement tools for the context and discuss ongoing progress. The team prioritized the perspectives of children and families (i.e., child and family-centred care). Subgroups of the team oversaw specific project elements: (1) tailoring and creating CARD resources and data collection tools to meet the needs of the project; (2) implementation planning and execution, including data collection; and (3) data entry and analysis. The lead author managed the project and oversaw all elements.

We employed a before-and-after (i.e., pre-post) CARD implementation design with quantitative and qualitative components. The setting included community pharmacies across southern Ontario, Canada. Pharmacies were eligible if they were members of the Wholehealth Pharmacy Partners group, were providing COVID-19 vaccinations to children 5-11 years and were located within an approximate 150 km radius from Toronto, allowing for site visits from the study team. The pharmacies were selected in collaboration with implementation leaders at Wholehealth and served diverse ethnic populations.

For each pharmacy, a before (pre) implementation period served as the control condition. During this time, no changes to usual practices were made. An after (post) implementation phase served as the experimental condition and followed the integration of CARD interventions into the vaccination process. The time lag between the before and after implementation phases was determined by the vaccine appointment schedule. If there were more than 20 scheduled appointments on a single day, then both phases (before and after CARD implementation) were conducted on the same day. If there were fewer than 20 appointments, multiple clinic dates were included and the first available clinic date after the baseline (before implementation) clinic date was used for the after-implementation phase.

Table 1 summarizes the CARD intervention components that were implemented in the after-implementation phase. In brief, both the waiting and vaccination spaces were altered to include CARD wall posters and distractions/activities (e.g., search and find, mazes, colouring pages with crayons, pipe cleaners)[15,16] and candy treats/rewards (e.g., lollipops, mini chocolate bars) for children. At appointment check-in, children specified their preferred coping strategies for vaccination and answered demographic questions on a paper-based survey. Parents could help children with their coping strategy selections. Children were vaccinated in a private room with the door closed, independently of siblings. A parent/caregiver (herein, called parent) accompanied the child unless the child specified that they preferred to be alone. Furniture in injection spaces was arranged so that children did not face equipment (but viewed CARD posters and distraction items/activities), needles were hidden from view and sharps containers were taped over with letter-sized CARD posters. Vaccinators reviewed the coping and demographic survey and used the coping selections to guide their interactions with children. Alcohol skin cleansing was omitted from the injection procedure[19] and vaccinators performed all injections in a seated position beside children. During both phases, children and parents were invited to answer questions about their vaccination experiences using standardized paper-based feedback surveys.

Study surveys were administered in the before and after CARD implementation phases by research assistants at 2 time points in the vaccination process: (1) at appointment check-in (demographic survey in the before-implementation phase and demographic survey and coping selection survey in after-implementation phase) and (2) after vaccination in the post-vaccination (aftercare) waiting area (feedback surveys). Survey

TABLE 1 Summary of key phases and activities of the CARD intervention

Education of staff providing vaccination services	• Educate about CARD using tools/resources that are available • Select and tailor CARD tools/resources to support local implementation (e.g., signs, posters, distraction kit)
Clinic set-up and processes on vaccination day	• Reduce visual and auditory cues that elicit fear (e.g., create separate waiting and vaccination spaces, obscure equipment and others getting vaccinated from view) • Hang up CARD posters and directional signs • Put distraction kits in waiting and vaccination spaces • Have a yoga mat available for use (applicable to pharmacies without ability for individuals to lie down) • Welcome children/families when they check in • Provide CARD checklist to children/families and review responses • Apply topical anesthetics to those who want it and provide distraction activities for the requisite application time; vaccinate others who are present while waiting for topical anesthetics to take effect • Triage family members according to level of fear and vaccinate children separately (most fearful first) and out of sight of others
Interactions during vaccination	• Inject in a private clinic space with the door closed • Ensure that seating for a support person is available beside the child • Invite child into room and introduce self • Review CARD coping checklist selections and confirm choices • Position child away from equipment (i.e., provide view to CARD posters and activities, allow access to distraction kit) • Provide distraction kits within reach of child (with items such as fidget maze toy, pipe cleaners, candies, colouring pages with crayons, search and find) • Vaccinator positioned sitting down beside child • Hide needle from child view • Omit alcohol skin cleansing step prior to injection • Provide positive feedback to child after injection

questions were read aloud to younger children by research staff and children pointed to answers or provided verbal responses, as applicable. Children answered surveys independently of parents. The content in the surveys is described below.

In the prevaccination waiting area, children and parents answered a demographic survey, including questions about gender (boy, girl, other) and baseline level of needle fear (1 = not at all, 2 = a little bit, 3 = a medium amount, 4 = a lot). For the CARD group, children additionally selected their preferred coping strategies for their vaccination from the CARD checklist. In the postvaccination waiting area, children and parents independently completed feedback surveys inquiring about ISRR, how the current experience compared to the last needle experience, strategies that either helped or worsened the experience, suggestions for the future and, for the CARD group, how much CARD helped. Children aged 8 years or older used numerical rating scales (0-10) to self-report level of fear, pain and dizziness (from 0 = no fear/pain/dizziness to 10 = most fear/pain/dizziness possible). Children 5-7 years of age used the Faces Pain Scale–Revised[20] (0-5) and the Children's Fear Scale[21] (1-5) to score fear and pain, respectively, and reported on dizziness using a scale from 0 (none) to 3 (a lot). Parents reported their perceptions of their children's pain and fear and their own fear using a numerical rating scale (0-10). Children and parents reported on the child's experience with their vaccination compared to the child's previous needle procedure, and parents also reported on their own experience with their child's vaccination compared to the child's previous needle (1 = better, 2 = same, 3 = worse, 4 = don't know/remember). Parents and children both answered open-ended questions about what helped, what made the experience worse and suggestions for the future. Feedback obtained from children and parents' surveys was summarized for each vaccinator and considered for site- and vaccinator-specific changes at 2 time points: 1) upon implementation of CARD (i.e., after the before/pre phase, to

inform CARD implementation) and 2) during CARD implementation (i.e., during the after/post phase, to inform fine-tuning of CARD implementation).

In addition, researchers used checklists to track details of CARD implementation and each appointment encounter, including coping interventions used (e.g., distraction items, topical anesthetics) and whether appointments were prolonged because of excessive levels of fear (>20 minutes). Separately, feedback was obtained from vaccinators and implementation leaders using surveys and focus group discussions. Those results are summarized in a separate article in this series.[14] All tools and methods were adapted from prior studies, where they were demonstrated to be feasible and to discriminate between CARD and control groups.[6,10]

The project received approval from the Research Ethics Board at the University of Toronto. Consent was waived for data collection to allow for population-level information; however, all families were informed that feedback was being requested to inform better practices in the pharmacy and they could refuse to participate.

Sample size calculation and statistical analysis

The primary outcome was child self-reported fear score during vaccination. We estimated that 100 vaccinations per group were needed to detect a 1-point reduction in the level of fear with a standard deviation of 2.5, with 80% power and alpha = 0.05. We included 5 pharmacies with appointment offerings totaling 240 children, which allowed for a buffer of 20% to account for "unfilled spots" and "no shows."

The pattern of responses to survey questions was summarized using descriptive statistics. Child self-reported fear, pain and dizziness scores were compared between groups with a *t*-test. Scores for pain, fear and dizziness in children aged 5-7 years were standardized to a 0-10 scale so they could be combined with older children's scores for analysis.[22] Symptom scores were also dichotomized into no = 0 or yes = 1, using a cut-off of 0 or >0 for fear and dizziness and <2 or ≥2 for pain and compared using chi-square test.[10] Parental reports were similarly analyzed. Qualitative feedback about what helped, what made it worse and suggestions for future vaccination from children and parents was summarized into themes by 2 researchers and then counted. The distribution of frequencies was compared using chi-square test. The distributions of ordinal variables before and after CARD implementation, including child and parent ratings of experience compared to the child's last needle, were compared using Mann-Whitney *U* test. A backward regression model was used to test factors associated with child fear scores. Variables included in the model were group (CARD or control), child age, child gender, COVID-19 vaccine dose number (1 or 2), child baseline level of fear and pharmacy site (1-5). A *p*-value of <0.05 was considered significant. All data were analyzed using SPSS statistical software (version 28.0).

Results

The study was conducted between January 16 and March 20, 2022. Of 240 available COVID-19 vaccination appointments across the 5 pharmacy sites, 175 bookings were made and 154 children presented with parents for their appointments. Two children left the pharmacy before getting vaccinated, leaving 152 eligible children for participation (71 in the before phase and 81 in the after phase).

All children and parents agreed to complete study surveys. Demographic characteristics are displayed in Table 2. There were no significant differences between groups. Altogether, 6 vaccinators (5 pharmacists, 1 nurse) were involved in administering vaccinations. All vaccinators had more than 5 years of experience with administering vaccinations. The after-CARD implementation phase was carried out on the same day as the before phase in one pharmacy. In all other pharmacies, it occurred later (range, 2-7 days). For the pharmacy carrying out implementation on the same day, this occurred on 2 separate calendar dates, each with a different vaccinator unaware of the other's involvement.

Table 3 displays children's self-reported symptoms and feedback. Mean fear scores were lower after CARD vs before CARD (2.5 vs 3.7; $p = 0.02$), and fewer children experienced fear (58% vs 80%, defined as any score >0; $p = 0.01$). Mean pain scores did not differ between the after and before CARD phases (2.4 vs 3.0; $p = 0.15$); however, when pain scores were dichotomized (<2 vs ≥2), fewer children experienced pain after CARD implementation (32% vs 51%; $p = 0.03$). Both mean and dichotomized dizziness scores did not differ significantly between groups. Distraction items were used by 42 (52%) vs 5 (7%) children after CARD implementation compared to before, respectively ($p < 0.001$). Topical anesthetics were used by 11 (14%) children after CARD vs 0 (0%) before CARD ($p < 0.01$). Appointments were prolonged due to excessive fear in 2 (3%) children after CARD vs 8 (11%) before CARD ($p = 0.06$).

After CARD implementation, both children and parents reported more positive experiences for themselves compared to the child's last needle ($p = 0.01$ both analyses); parents' perceptions of their child's experience compared to their last needle approached significance ($p = 0.05$). Parents' reports of their child's pain and fear as well as their own fear demonstrated no significant differences between groups. Overall, 92% of children and 91% of parents reported that CARD helped; the median rating was "a moderate amount" for children and "a lot" for parents (Table 3).

The analysis from qualitative feedback about what helped, made it worse and suggestions for the future is summarized in Table 4. The pattern of responses differed between groups for some coping-promoting strategies, with more children and parents in the after/post-CARD implementation phase citing distraction, child participation in the vaccination process and candy/treats as helpful. In addition, more children in the

TABLE 2 Demographic characteristics

	Control ($n = 71$)	CARD ($n = 81$)	p-value*
Child age in years	8.6 ± 2.1	8.1 ± 2.0[†]	0.20
Child sex, male	42 (59)	37 (46)	0.14
Baseline level of fear[‡]	2.2 ± 1.0	2.1 ± 1.0	0.75
COVID-19 vaccine, first dose	27 (38)	19 (24)	0.08
No. of children in family	1.5 ± 0.5	1.6 ± 0.6	0.62
Present with a sibling who was also getting vaccinated	34 (51)	41 (48)	0.86
No. of vaccines administered by site[§]			0.93
Site 1	30 ± 42	38 ± 47	
Site 2	11 ± 16	14 ± 17	
Site 3	11 ± 16	9 ± 11	
Site 4	10 ± 14	10 ± 12	
Site 5	9 ± 13	10 ± 12	

Values are frequency (%) or mean ± standard deviation.
*Chi-square test or *t*-test, as appropriate.
†$n = 80$.
‡1 = not at all, 2 = a little bit, 3 = medium amount, 4 = a lot.
§Site 1 included 2 vaccinators; all other sites included 1 vaccinator.

after-CARD phase reported topical anesthetics as helpful and more parents reported pharmacy staff effort and relationship building as helpful. Fewer children in the after-CARD phase cited prior education and experience with vaccination as helpful. Regarding what made the experience worse, fewer parents reported fear cues (i.e., stimuli that elevate fear) in the after-CARD phase. There were fewer suggestions for the future from children and parents in the after-CARD phase.

The results from the linear regression identified 2 factors to be significantly associated with fear scores: group allocation (i.e., CARD or control) ($p = 0.02$) and child baseline level of fear ($p < 0.001$). Higher fear scores were associated with the control condition and a greater baseline fear level.

Discussion

We undertook a small-scale implementation project to evaluate CARD as a vaccine delivery framework for community pharmacy–based vaccination practice in children aged 5-11 years. CARD implementation was associated with a reduction in children's self-reported fear (measured continuously and dichotomously 0 vs >0) and pain (measured dichotomously <2 vs ≥2/10) and more positive experiences for children and parents when compared to the child's previous needle procedure. More children used distraction items and topical anesthetics as coping strategies and both children and parents overwhelmingly reported that CARD was helpful for the child's vaccination.

CARD is a vaccine delivery framework that incorporates evidence-based interventions[7] that promote coping and a more person-centred approach to vaccination, helping to make the experience more positive. Educating children about available options for coping, eliciting information about their preferred coping strategies and inviting them to be active participants in directing their coping are all elements of providing a more person-centred approach to vaccination delivery. Interestingly, a substantial number of children and parents in the CARD group commented that child participation and having choices helped children cope with vaccination. This finding echoes our prior work[23] and is evidence of the importance of engaging children as active participants and providing choices regarding coping strategies for their subsequent experiences with vaccination. In addition, we found no evidence of an impact of child gender, age or experience with vaccination (in terms of whether it was their first or second dose of COVID-19 vaccination) on child self-reported fear levels. Only group (after CARD vs before) and baseline level of fear were significantly associated with fear. Based on these results, we recommend systematic integration of CARD across all medical encounters involving needles in children rather than selected implementation in children with particular characteristics. This approach has the potential to

TABLE 3 Child self-reported and parent-reported immunization stress-related responses, experiences relative to the last needle and perception about helpfulness of CARD

	Control ($n = 71$)	CARD ($n = 81$)	*p*-value
Child-reported outcomes			
Child fear score, Mean (SD) *primary outcome*	3.7 (3.5)	2.5 (3.1)	0.02
Child fear, N with score > 0 (%)	57 (80)	47 (58)	0.01
Child pain score, Mean (SD)	3.0 (2.5)	2.4 (2.5)	0.15
Child pain, N (%)	36 (51)	26 (32)	0.03
Child dizziness score, Mean (SD)	0.5 (1.5)	0.3 (1.1)	0.44
Child dizziness, N (%)	10 (14)	8 (10)	0.58
Child experience relative to their last needle, Median (25th, 75th centile)	2 (1,2)[a]	1 (1,2)[b]	0.01
Child report of how much CARD helped, Median (25th, 75th centile)	N/A	2 (1,3)[c*]	N/A
Parent-reported outcomes			
Child fear score, Mean (SD)	3.5 (3.1)	3.6 (3.1)	0.75
Child fear, N with score > 0 (%)	56 (79)	64 (79)	1.0
Child pain score, Mean (SD)	2.1 (2.0)	1.8 (1.9)	0.35
Child pain, N (%)	40 (56)	32 (40)	0.06
Parent fear score, Mean (SD)	0.9 (2.0)	0.7 (0.9)	0.52
Parent pain, N (%)	19 (29)	23 (27)	0.93
Parent report of child experience relative to the child's last needle, Median (25th, 75th centile)	2 (1,2)[d]	1 (1,2)[e]	0.05
Parent report of own experience relative to the child's last needle, Median (25th, 75th centile)	2 (1,2)[d]	1 (1,2)[f]	0.01
Parent report of how much CARD helped, Median (25th, 75th centile)	N/A	3 (1,3)[g**]	N/A

Groups were compared using Chi-square test *t*-test or Mann Whitney *U* test, as appropriate.
Explanation of outcomes (see text for details):
- Fear and pain scored from 0-10; fear and dizziness dichotomized (yes/no) using cut-off of 0; pain dichotomized using cut-off of 2
- Experience relative to last needle rated as 1 = better, 2 = same, 3 = worse
- How much CARD helped rated as 0 = not at all, 1 = a little bit, 2 = moderate amount, 3 = a lot
Number of responses: [a]$n = 45$; [b]$n = 48$; [c]$n = 50$ [d]$n = 68$; [e]$n = 73$; [f]$n = 71$; [g]$n = 79$.
*46 [92%] of children said it helped.
**74 [91%] of parents said it helped.

lead to the greatest impact with respect to reducing negative experiences and future development of needle fears.[24,25]

We obtained feedback from children and parents throughout the implementation process. There were multiple purposes for this, including being able to benchmark usual practices, fine-tuning implementation of individual components of CARD and assessing the overall impact of CARD. This approach was consistent with our foundational work with CARD in the school vaccination setting.[6] Obtaining feedback from children and parents about their symptoms and experiences is strongly recommended to guide evaluation efforts related to the quality of vaccination service delivery.[10] This ensures that the perceptions of vaccinators are informed by the patient experience, which increases the likelihood that expected outcomes will be achieved. Patient and family feedback can also be incorporated into clinical notes to guide future vaccination encounters.

Importantly, the positive effects of CARD were achieved with minimal preparation of children and parents: most learned about CARD on the day of vaccination when they were introduced to the CARD checklist at appointment check-in. This education was accommodated within the usual workflow, which included consenting procedures and waiting time between appointments. Children and parents were able to grasp the concepts and choices and to use their preferred coping strategies during the subsequent vaccinations. Feedback from vaccinators involved in the implementation suggests that providing the education earlier on, during appointment booking,[14] may have the added benefit of increasing confidence of

TABLE 4 Child and parent feedback about what helped with vaccination, what made it worse and recommendations for future

	Children			Parents		
	Control ($n = 71$)	CARD ($n = 81$)	*p*-value*	Control ($n = 71$)	CARD ($n = 81$)	*p*-value*
What helped						
Distraction items/activities	3 (4)	51 (63)	<0.001	2 (3)	37 (46)	<0.001
Parent presence	21 (30)	20 (25)	0.62	5 (7)	6 (7)	1.0
Child participation	0 (0)	21 (26)	<0.001	3 (4)	29 (36)	<0.001
Candy	5 (7)	20 (25)	0.007	3 (4)	16 (20)	0.008
Prior education/experience with vaccination	12 (17)	3 (4)	0.01	12 (17)	15 (19)	0.30
Looking away	18 (25)	12 (15)	0.15	2 (3)	2 (2)	1.0
Pharmacy staff effort and relationship building	1 (1)	2 (2)	1.0	1 (1)	29 (36)	<0.001
Topical anesthetic	0 (0)	9 (11)	0.01	0 (0)	6 (7)	0.06
Vaccinator attributes	4 (6)	0 (0)	0.10	7 (10)	4 (5)	0.39
What made it worse						
Fear cues	13 (18)	9 (11)	0.30	9 (13)	1 (1)	0.01
Suggestions for the future						
Distraction items/activities	17 (24)	5 (6)	0.004	18 (25)	3 (4)	<0.001
Candy	6 (8)	1 (1)	0.08	6 (8)	1 (1)	0.08
Child participation	2 (3)	0 (0)	0.42	5 (7)	1 (1)	0.16
Fear cues (reduce/remove)	8 (11)	2 (12)	0.06	5 (7)	1 (1)	0.16

Values are frequency (%). Only codes with ≥5 responses by children or parents are included.
*Chi-square test.

children and families that their needs and preferences will be met within the pharmacy (vs other vaccination settings) and increase the number of children and families who choose to be vaccinated in pharmacies.

Consistent with our prior studies with CARD in the school setting, distraction was the most used coping intervention.[8] It is important to note, however, that topical anesthetics were used by 14% of children (i.e., about 1 in 7) after CARD was introduced. Contrary to concerns regarding workflow and topical anesthetics,[26] this intervention could be accommodated within usual workflows despite the additional waiting time of 20 minutes for the preparation used (i.e., liposomal lidocaine). Children typically played with distraction items that were provided by the pharmacy in the designated waiting areas while waiting the requisite time, and other children may have been vaccinated during that time.

Elsewhere in this supplement, we report on the perspectives of the vaccinators and corporate/organizational implementation leaders[14] regarding acceptability and feasibility of CARD and expansion to other populations. In another article in this series, we include a CARD implementation guide with a repository of tools, strategies and guidance for integration into the vaccination process, including new tools created because of this work.[16]

Limitations include lack of randomization, which introduces a risk of baseline imbalance between groups. However, the timeline between pre and post phases was short, and no significant differences in demographics of participants were observed. Strengths include population-level data (primary outcome data were available for all children), reducing selection and attrition bias while also improving generalizability. Sites were located across geographic locations serving

populations of diverse ethnic backgrounds, including 27% to 76% European, 2% to 45% South Asian and 3% to 36% Southeast Asian (Census Profile, 2016 Census, Statistics Canada–Ethnic origin). In addition, children and parents were blinded to the hypothesis and independently provided responses to surveys, reducing outcome assessment bias.

Vaccination experiences for children are important because they can shape future vaccination behaviours. Community pharmacies are playing an increasing role in the delivery of vaccinations, including providing vaccine administration services in children as young as 2 years. Most recently, vaccination privileges have been expanded to include COVID-19 vaccine administration in infants.[27] Embedding systematic approaches to reduce the stress of vaccination for vaccine recipients is highly relevant and timely in the context of this expanded clinical role. This study found that CARD was effective and acceptable to children and parents for pharmacy-based vaccinations in children aged 5-11 years, making the vaccination a more positive experience. Future implementation efforts should incorporate child and family education about CARD at the time of appointment booking, to provide the opportunity for children and parents to plan their coping strategies, including wearing attire that makes it easier to perform vaccinations, bringing comfort and distraction items to the appointment and/or using a topical anesthetic, potentially further bolstering the effectiveness of CARD. ■

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