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RESEARCH

An Alternative to the Straddle-Arm Technique for a Conscious Infant Who is Choking: Towards a More Universal Skill

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ABSTRACT

Problem: The practice of straddling the infant's legs on the rescuer's upper arm, during the delivery of back blows and chest thrusts for the relief of foreign body obstruction (choking) in infants is not physically possible for many rescuers. We aimed to identify a more effective set of practices for holding an infant during the delivery of back blows and chest thrusts.

Methods: Using a participatory ergonomic research, study participants trialed alternative techniques in a structured and co-creative discovery process alongside a researcher. This was done with the aid of a custom-developed manikin, weighted and sized to the 50th percentile of a 9–11-month-old. Participant feedback was solicited quantitatively and qualitatively.

Results & Conclusion: Of the 40 initially enrolled, 37 participants completed the study protocol. We concluded that one technique appeared to be most amenable to research participants. This technique involves keeping the infant on the same side of the participant and rolling the baby to allow for the administration of back blows and

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chest thrusts. This paper also presents a thematic summary of the various considerations that became apparent throughout the work with participants. This one technique is put forward as a recommendation for how the skill should be taught, by default, within learning environments.

RÉSUMÉ

Problème: La technique consistant à placer un bébé à califourchon sur l'avant-bras d'un ou d'une secouriste pendant qu'on lui administre des tapes dans le dos et des poussées thoraciques pour désobstruer ses voies respiratoires peut s'avérer physiquement impossible pour certaines personnes. Nous avons cherché à déterminer un ensemble de pratiques plus efficaces pour tenir un bébé lors de l'administration de tapes dans le dos et de poussées thoraciques.

Méthodes: Dans le cadre d'une étude ergonomique participative, les participantes et participants ont testé des techniques de remplacement en suivant un processus de découverte structuré et cocréatif aux côtés d'une personne responsable de la recherche et au moyen d'un mannequin conçu spécialement pour l'étude. La taille et le poids du mannequin correspondaient à ceux d'un bébé âgé de 9 à 11 mois, dans le 50^{e} centile. La rétroaction demandée aux participantes et participants était de nature quantitative et qualitative.

Résultats et conclusion: Sur les 40 personnes initialement inscrites pour participer à l'étude, 37 ont complété le protocole de recherche. Nous avons conclu qu'une des techniques à l'étude semblait convenir à la majorité des participantes et participants. Cette technique consiste à toujours garder le bébé du même côté, et à le retourner pour permettre l'administration de tapes dans le dos et de poussées thoraciques. L'article présente également un résumé thématique de divers constats qui se sont imposés au cours de l'étude. Il recommande l'enseignement de cette technique comme méthode par défaut dans les milieux d'apprentissage.

ABSTRACT

Problema: Practica de a poziționa «călare» sugarul, cu picioarele pe brațul salvatorului, în timpul aplicării loviturilor pe spate și a compresiilor pe piept pentru eliminarea obstrucției cu un corp străin (sufocare) la sugari, nu este posibilă din punct de vedere fizic pentru mulți salvatori. Ne-am propus să identificăm un set mai eficient de practici pentru ținerea unui sugar în timpul aplicării loviturilor pe spate și a compresiilor toracice.

Metode: Utilizând cercetarea ergonomică participativă, participanții la studiu au testat tehnici alternative, într-un proces de descoperire structurat și co-creativ, alături de un cercetător. Acest lucru a fost realizat cu ajutorul unui manechin creat la comandă, ponderat și dimensionat la percentila 50 a unui sugar de 9–11 luni. A fost solicitat feedback cantitativ și calitativ din partea participanților.

Rezultate & Concluzii: Din cei 40 de participanți înscriși inițial, 37 au finalizat protocolul de studiu. S-a ajuns la concluzia că doar una dintre tehnici pare să fie cea mai accesibilă participanților la cercetare. Această tehnică implică menținerea sugarului de aceeași parte a participantului și întoarcerii sugarului pentru a permite administrarea de lovituri pe spate și a compresiilor toracice. Această lucrare prezintă, de asemenea, un rezumat tematic al diferitelor considerații care au devenit evidente pe parcursul activităților cu participanții. Această tehnică este prezentată ca o recomandare pentru modul în care procedurile ar trebui predate în mediile de învățare.

Keywords: infant choking; baby choking; conscious infant choking; relief of foreign body airway obstruction; FBAO; infant

An article previously published within this journal highlighted the physical challenges associated with rescuers assisting infants under one year of age, who are responsive with a foreign body airway obstruction. Based solely on measurements, the combined length of an infant's torso and head exceeded the length of a rescuer's forearm and hand 35.6% of the time in the overall population, and 98.2% of the time in rescuers aged 11 and 12 (see Gesicki & King-Hunter, 2019). This makes the practice of straddling the infant across the arm – a technique that is often taught for this skill – difficult to perform. Although historical guidelines have specified this technique (e.g., AHA, 2002, p. I–277), they since have evolved to describe only the necessity of back blows and chest thrusts themselves (Topjian et al., 2020). Despite this, many instructors within our training agency continue to perpetuate the teaching of the straddle technique, thanks to the absence of an explicit alternative. As a result, we aimed to answer the research question: *How should rescuers be taught to hold and transfer the infant for the delivery of back blows and chest thrusts?*

We recognize that there are multiple manners that could be used to achieve safe delivery of back blows and chest thrusts. However, there are situations where one variant of the skill must be prioritized, such as the practice selected for video recording by a training agency for learner materials, or the practice that instructors initially demonstrate in a group learning environment. We aimed to identify a technique that could become the "default practice" (Gesicki, 2020), particularly in substitution for the infant arm-straddle. We do not intend this practice to serve as the sole acceptable practice. No additional studies on this topic have been identified since the original manuscript in 2019.

METHOD

Our research was constructed as a participatory ergonomic experiment (European Agency for Safety and Health at Work, 2022), analyzing participant feedback with a grounded theory perspective (Flick, 2009). In this approach, all participants followed a structured base protocol, experimenting with a more realistic sized and weighted infant manikin. The researcher and participant worked on a one-to-one basis to optimize (1) ergonomics, (2) effectiveness of skill delivery, and (3) subjective perception of timing and flow in the delivery of the skill. The study design is reminiscent of a time-motion approach often used in operations research (Lopetegui et al., 2014); however, we did not emphasize objective timing in this study in favor of the factors outlined above. The relationship between researcher and participant was intentionally co-creative, permitting the researcher to actively coach each participant (such as when the back blows appeared to be ineffective in strength), offer encouragement in times of frustration, suggest alternatives for consideration, and probe for deeper reflections. The various reflections gained from each participant were allowed to inform the questions posed to subsequent participants. Saturation of participant feedback was used as the determiner of final sample size. Ethics approval was provided by the Community Research Ethics Office (Waterloo, ON, Canada; File #262).

Study Participants

Participants did not require previous exposure to first aid training to participate in this study. We requested participants to have full function in all limbs, to limit the potential for injury. To provide consent, participants were required to be 16 years of age or older. The selection of participants was based on a snowball technique, with initial participants being sampled at Canadian Red Cross events, and further participants being identified as acquaintances of the primary study participants.

Equipment

As highlighted in Gesicki and King-Hunter (2019), a challenge we faced is that commercially available manikins are significantly undersized relative to the target age range of the skill (i.e., up to one year of age; IFRC, 2020). To address this, a sewing pattern (Alice's Bear Shop, n.d.) was scaled and adapted to better resemble the size of an infant, based on the measurements of a 9- to 11-month-old at the 50th percentile (Snyder et al., 1977; the age of this reference is discussed in Gesicki & King-Hunter, 2019). To achieve the reference weight of 9.1 kg (~20 lbs.) for the combined male/female sample (p. 554),

Figure 1: An image of the study manikin (middle), compared to a Vital Signs Inc. ACTAR 911 Infantry (left; later referred to as the "teaching manikin") and a Laerdal Baby Anne (right).

sand was used to fill the manikin. Figure 1 contains an image of the final study manikin compared to two other commercially available models of manikin.

Base Protocol

After welcoming a participant, a researcher proceeded to review the consent form and the general structure of the study with the participant (Figure 2). The participant was then given the option to be video recorded, enabling themes identified later in the project to be abstracted from earlier sessions. Participation was voluntary and without remuneration. Participants were also assured that their instructor status (if any) would not be impacted by their performance in the study.

In the first phase of the study, participants completed a survey that asked for their experiences with (a) first aid training, (b) assisting an infant who was choking, as well as (c) teaching the skill (if applicable). Skill-naïve participants received a full teaching session of the skill, in accordance with current Canadian Red Cross materials (2017). To enable level-setting, all participants watched the current skill demonstration video and were assessed for competence using Canadian Red Cross standards. The practice session was conducted using an ACTAR 911 Infantry manikin (the "teaching manikin").

1. Participant Welcome
2. Completion of the Pre-Participation Survey
3. Capture of Anthropometric Measurements
4. (if relevant) Recollection of any Previous Responses to Infants who were Choking
5. Creative Phase
6. Guided Phase (sitting), with relative ranking
7. Consolidation of the Creative & Guided Phase, leading to the Selection of the Preferred Technique
8. Preferred Method in the Standing Position
9. Preferred Method on the Floor
10. Final Debrief

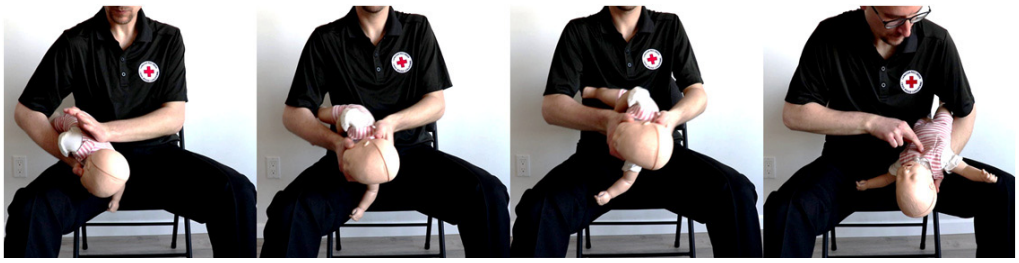
Figure 2: A summary of the various phases of this research study.

The creative phase of the study occurred next. The researcher presented the study manikin to the participant and asked them to apply the skill to assist the manikin. The researcher recorded the evolution of the participant's actions throughout the process.

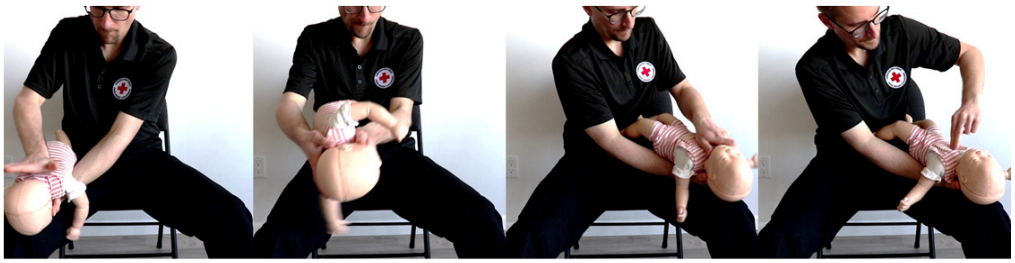
The researcher then proceeded to the guided phase of the study. Four alternative techniques were chosen for use in this study, selected from Gesicki and King-Hunter (2019). The techniques were identified solely by a code-named color to the participant and were presented in random order. If a participant, during the creative phase, came up with an already-documented technique; the researcher showcased that technique first and skipped its respective round. For each round, the researcher showed a reference sheet containing the four stop-motion photos of the skill in action (as shown in Figure 3) and a written description of the skill. Where it aided comprehension, the researcher sat alongside the participant and demonstrated the skill using the teaching manikin. Participants were encouraged to try the technique until they felt as comfortable as possible with it and then to provide their feedback. The process repeated with the remaining techniques.

Once the participant had an opportunity to try all the techniques, they were asked to choose their preferred solution. Their selection was not restricted to the various options explored up to this point; participants were also encouraged to create a new strategy if they were inspired to do so. Participants also were welcome to return to their own solution from the creative phase, if they preferred.

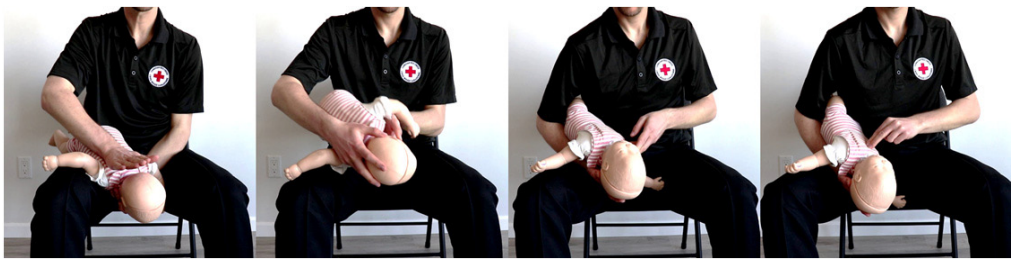
Infant on Alternating Sides (Nicknamed "Blue")
The infant is tucked in-between the rescuer's arm and body for the delivery of back blows. The rescuer then flips the infant onto their opposite side, tucks the infant in the same manner on the new side, and delivers chest thrusts. The arm delivering the skill is opposite of the side that the infant is on.
Originally presented in Gesicki & King-Hunter (2019) as Alternative A [variant].



Infant on Thighs (Nicknamed "Yellow")
The infant is placed face-down by the rescuer on one thigh. The head remains supported for the delivery of back blows. The rescuer then flips the infant onto their opposite thigh for the delivery of chest thrusts. The arm delivering each skill is the one matching the side the infant is on.
Originally presented in Gesicki & King-Hunter (2019) as Alternative C.



Infant on One Side, Back Blows with Matching Arm (Nicknamed "Brown")
The infant remains on one side of the rescuer throughout the skill. The infant is placed face down, supported by the rescuer's leg. The back blows are delivered with the arm that matches the side the infant is on. The rescuer turns the infant over using outwards rotation, tucking the infant in between the rescuer's arm and body. The rescuer delivers chest thrusts with the opposite arm.
Originally presented in Gesicki & King-Hunter (2019) as Alternative B.



Infant on One Side, Back Blows with Opposite Arm (Nicknamed "Green")
The infant remains on one side of the rescuer throughout the skill. The infant is tucked in between the rescuer's arm and body, facing down. The back blows are delivered with the arm that is on the side opposite of the infant. The rescuer turns the infant over using inwards rotation. The rescuer delivers chest thrusts with the arm that matches the side the infant is on.
Originally presented in Gesicki & King-Hunter (2019) as Alternative B [variant].

Figure 3: Pictorial representations of the various techniques presented to study participants in the guided phase of the study.

Participants were then asked to adopt their preferred technique for a standing position, as well as a position based on the floor (e.g., kneeling on the ground). The purpose of this phase was to explore the versatility of the technique should the rescuer not have immediate access to a seated position. Lastly, the study participant was offered an opportunity to debrief their experience throughout the study and contribute any last thoughts, before being thanked for their participation.

The administration of the study protocol took approximately 45 minutes per study participant, ranging between 30 and 90 minutes to allow for participant-researcher discussions and rest breaks for participants.

ANALYSIS

As an iterative study, and in following with a grounded theory approach, the analysis occurred alongside the administration of the study itself. We ended up developing a significant bank of written memos, immediately after the departure of each participant, documenting key insights from their experience. These memos included still captures from video recordings, or re-enactments by researchers in cases where participants did not consent to video recording. Since both researchers were involved in administering the study protocol to participants, regular meetings allowed each to learn about key themes and insights gained by the other. Our memos were supplemented with transcriptions of participant commentary from video recordings, which were coded and cross-referenced to ensure the capture of participant intent. Both researchers were involved in reviewing the coding.

RESULTS

Sample

In total, 40 participants were enrolled in the study. Thirty-seven completed the study protocol in its entirety; two were advised not to continue due to personal health conditions; and one needed to terminate their participation due to factors external to the study. No new themes emerged after the 22nd participant; however, data collection continued with the intention of sampling more first aid naïve and non-instructor participants. The final sample consisted of:

- 20 first aid instructors,
- 8 currently certified participants,
- 3 previously certified participants, and
- 6 first aid naïve participants with no previous exposure to first aid training.

Descriptions of Previous Rescues

Seven of the 37 participants (19%) described a previous rescue attempt. Two of the seven had performed the skill as professional rescuer, while the remaining five described situations from their personal lives. The professional rescuers distinctly remembered using the straddle-arm technique. The remaining participants were able to recount some aspects of their rescues:

- two participants described lifting the infant upside-down by its legs, causing the infant to vomit and clearing the obstruction;
- one participant remembered having to kneel on the ground, rolling the infant side-to-side on their own thighs because of the infant's kicking;
- one participant recalled performing abdominal thrusts; and
- one participant remembered doing back blows and chest thrusts but could not remember how they positioned the infant.

Instructor Perspectives on the Skill

As mentioned, 20 of the 37 participants (54%) were current instructors of first aid. All instructors reported demonstrating the straddle-arm technique in their classes. Of the 20:

- seven identified that they never have considered the realism of the straddle-arm technique;
- nine identified that they had considered the realism of the straddle-arm technique, but continued to exclusively demonstrate the straddle-arm technique in their classrooms; and
- four identified that they had considered the realism of the straddle-arm technique, and informed their learners of this concern as they teach.

When asked about their approach in assessing learner performance of the skill:

- seven stated they *require* learners to demonstrate the straddle-arm technique;
- nine stated they *prefer* learners to demonstrate the straddle-arm technique;
- two stated that they *do not care* how learners position the infant, as long as the learner is able to safely and effectively deliver the back blows and chest thrusts; and
- two stated that they do not care which technique is used by layperson learners but require the straddle-arm technique in professional-level courses.

Of the 20 facilitators, 12 reported never having a learner question the realism of the straddle-arm technique. The remaining stated that learners have questioned the technique in their classrooms before.

Creative Phase

When first presented with the study manikin, participants settled into the following techniques during the creative phase of the study:

- 13 continued to attempt the straddle-arm technique despite any challenges;
- 9 ended up with *infant on alternating sides* technique;
- 7 ended up with *infant on one side, back blows with opposing arm* technique;
- 4 ended up with *infant on one side, back blows with matching arm* technique;
- 1 ended up with *infant on thighs* technique; and
- 3 claimed to be unable to come up with a suitable technique.

Guided Phase

Throughout the guided phase, participants experienced the four alternatives. The *infant on alternating sides* technique was the least preferred by participants. Participants generally described it as being "a lot of work," as it was "hard to keep the legs tucked in," or to move the infant from one side of the rescuer's body to the other. This technique, of all four, was the only one to receive sarcastic responses from participants, such as "*sure*…," or laughs in response to the perceived ridiculousness of the skill. However, participants did mention that once they were able to secure the infant's legs, the skill felt relatively safe and secure.

The *infant on thighs* technique was ranked third of the four techniques. Participants appreciated being able to use their thighs for support of the study manikin. They also felt that it demanded less movement from the rescuer than the *infant on alternating sides* technique did. Any participants who experienced either of the *infant on one side* techniques, before trying the *infant on thighs* technique, quickly elected to end their practice with the technique citing the significantly increased comfort of those techniques. Otherwise, participants cited the challenge of supporting the study manikin's head, the lack of perceived fluidity with the motion, and the fatigue associated with the technique.

The techniques that kept the study manikin on the same side of the rescuer were the most endorsed techniques by participants. Any concerns expressed with the *infant on one side, back blows with matching arm* technique were usually limited to forearm or wrist strength of the rescuers (as identified by three participants). Between the two variants, twenty-three participants identified that *infant on one side, back blows with opposing arm* allowed for an easier turn. Two instructors stepped into their facilitator roles at this point in the study, even commenting: "I like it. It's easy. It would be so easy to teach people as well." A first aid-naïve study participant reported that the variant felt "[…] the most intuitive; you're not thinking about hand placement or steps."

The following additional reflections emerged about the *infant on one side* technique:

- Early in the study, some participants identified that both options sometimes felt foreign. After the sixth participant, we found that participants preferred holding the baby on whichever side they previously had become accustomed to (e.g., as parents). Barring that, the dominant side was preferred.
- In the photographs of the techniques shown to participants (as shown in Figure 3), the rescuer is shown to have a knees-apart posture. However, some

participants felt more comfortable in a knees-together position. In a post-hoc analysis, height was identified as a statistically significant factor: laying the infant across both their legs was associated with shorter participants (both legs [n = 12, M = 165.0 cm, SD = 7.8], single leg [n = 17, M = 175.6, SD = 8.4], $t(28) = -3.52$, $p < 0.05$). Two participants adopted a mixed approach, performing the back blows over one of their thighs and chest thrusts over both.

Consolidation/Identification of Preferred Technique

The participants' final choice of preferred techniques is summarized in Table 1.

The participants who selected either of the *infant on one side* techniques were unable to describe why the other variant felt less comfortable, and no other factors could be identified to explain the difference in preference. The participant who chose *infant on thighs* selected this technique only upon strong urging of the researcher to pick one, with no clear preference at the end of the study. The participant who selected *infant on alternating sides* did so, without offering any negative statements about the *infant on one side* techniques (using statements such as "I actually like this one," "it's not that bad," and "this seems like the best to manage ergonomically"). Three participants explicitly commented that the two *infant on one side* techniques felt much more realistic than the straddle-arm technique, which they had previously tried on their own children.

Most Preferred Technique	Number of Participants Selecting Technique
infant on one side, back blows with opposing arm	26
infant on one side, back blows with matching arm	9
infant on thighs	1
infant on alternating sides	1
original technique from the creative phase	0
a newly designed technique	0
arm-straddle technique	0

Table 1: Count of participants endorsing each technique (seated position).

Body Position Variants

We then asked participants to adopt their preferred technique for various body positions. When asked to perform the skill standing, participants began to crouch in a position that resembled sitting in a chair. Any participants who were unable to sustain a crouched position for long quickly went to a kneeling position. Participants' feedback was very similar: "impossible," "this doesn't work," and "a huge no-no in my book – it is so unsafe for both rescuer and infant."

When we asked participants to kneel, some participants preferred to kneel on both knees (n = 13). Others preferred to have one knee up, 12 preferred that knee to be the one on the same side as the infant, whereas four preferred the opposite knee. Three participants reported comfortable success with sitting on the ground. In their variant of the technique, participants kept the leg on the same side as the infant straight. They would then bend the other leg, tucking the other foot underneath the thigh of the straight leg. This provided enough space for the infant's head to be positioned at a downward angle, while simultaneously supporting the infant's weight. One participant preferred a crouched position over a floor-based position. One participant was unable to perform the skill comfortably, and three proactively elected not to participate in this portion of the study.

DISCUSSION

Overall, participants seemed to strongly prefer the *infant on one side, back blows with opposing arm* technique. Its variant, the *infant on one side, back blows with matching arm* technique, is similar enough that a group of learners using both techniques should not be too distracting. The two techniques combined were preferred by all but two of the 37 participants. These two techniques proved to be versatile enough for rescuers to use while seated on a chair while kneeling, and while seated on the ground. After exposure to the techniques, participants did not return to the arm straddle technique.

One of the leading reflections from this study is the power that artifacts, in the form of manikins, have in shaping how a skill is learned. Pols highlights how artifacts can enable humans to "adopt new goals" or "help us do things we would not otherwise be able to do" (2012, p. 576). The portability and cost-effectiveness of manikins, as reflected in their early patents, certainly contributed to the pervasiveness of CPR training (e.g., Laerdal, 1970 [Laerdal adult]; Ramamurthy, 1986 [Ambu infant]; Brault et al., 1991 [ACTAR adult]; Epstein et al., 1994 [ACTAR infant]; Laerdal, 1994 [Laerdal infant]).

In the same paper, Pols also highlights that artifacts can "increase the likelihood that people will perform, or abstain from performing certain actions" (2012, p. 576). The same features that increased the portability of manikins – such as the wide splay of many infant manikin legs, their relatively short length, and light weight – also increased the likelihood that the straddle technique was seen as universal. The instructional video accompanying ACTAR infant manikin kits attempted to caution instructors about this, asking instructors to "remind your students to handle [the manikin] as gently and carefully as an actual infant" because the manikins are "not as heavy as an actual human infant" (Vital Signs Inc., 1993). At the same time, the video demonstrates a group of learners performing the straddle-arm technique while standing completely straight: something that this data suggests would be quite challenging. The Laerdal (1970) patent suggests a design that would allow it to be filled with a "weight comparable to that of a human body so that manipulation of the manikin corresponds to conditions existing in reality" (col. 8, lines 5–9), which would have protected against this. However, this feature is not available in modern layperson CPR manikins. The straddle-arm technique continues to prevail, with manikins that enable its application, and without another default practice to take its place.

This conversation dovetails into the question of simulation realism; a conversation that continues to evolve within various safety-orientated disciplines. Newell's Model of Constraints (1986) describes how any movement performed by a person is a function of the individual, the environment, and the task at hand. The environmental factor, be it the weight of an infant manikin, or the weight of an actual infant, will naturally change the movement performed. Individual factors also play a role, just as height was identified as a potential influence in this study. Contextual factors, such as the ability of the rescuer to be in a seated position at the time of rescue, also would vary the performance of the skill. Although higher levels of realism are not automatically the best option in education, the level of realism of a training aid should match the needs of the task at hand as well as the needs of the learners (Doozandeh, 2020). As a result, offering a more appropriately sized and weighted manikin may very well maximize a rescuer's ability to act with willingness and confidence in an emergency.

However, training agencies must always consider the context of their learning interventions before mandating such manikins. Namely, would requiring such a learning aid limit access to learning the skill? Even without introducing more appropriately sized and weighted manikins, teaching the skill in a way that more closely resembles real-life circumstances would certainly bring rescuers one step closer to more successful skill delivery in an emergency.

Further research could investigate how youth, older adults, and those with mobility differences interact with this skill. These explicit groups of learners may reveal additional factors not yet considered in this work. In addition, although thematic saturation was reached, we note that the proportion of first aid-naïve participants in this study is low in comparison to first aid-trained participants. This could be supplemented with research on how this technique is applied in classrooms. The study manikin was also not designed to objectively measure force or timing, as feedback manikins are able to offer in CPR learning (Greif et al., 2020). Lastly, study participants often recognized that real infants would pose an additional challenge by kicking while choking and being conscious: a factor that the non-mechanical manikin in this study could not represent. Despite these limitations, further work would benefit from a much more focused study, thanks to the identification of a strongly preferred technique in this study. These limitations should not delay the implementation of the technique proposed here, given the challenges of the straddle-arm technique and its pervasiveness amongst instructors.

CONCLUSION

This work highlights a new recommendation on how an infant should be held and maneuvered while delivering alternating back blows and chest thrusts for relieving a foreign body airway obstruction, assuming that it continues to be recommended in clinical guidelines. This work validates that straddling the infant's legs on either side of the rescuer's upper arm, a practice often taught in classrooms, is not physically feasible at the upper end of the age range the skill is intended for. As an alternative, the technique that generally is most comfortable for most learners would be summarized as follows:

1. Pick the infant up and place their lower body between your upper arm and your own body, on whichever side feels most comfortable (this is usually your dominant side or the side you usually pick up children on). Their head should be supported by the hand of the same arm.
2. You can choose to sit on something (like a chair), kneel on the ground, or sit on the ground. You may find it easier to place the infant over both of your knees or over just one of your knees.
3. Administer five back blows using your opposite hand.
4. Gently roll the infant towards you (inwards) so that they are face-up, supporting the head with the hand that administered back blows. Use your leg(s) to support the infant's weight. Provide chest thrusts with the hand that was supporting their head (i.e., with the same arm that the infant was on).
5. Repeat back blows and chest thrusts until the object clears, or the infant becomes unresponsive.

By showcasing a technique that is more physically possible in classrooms, facilitators of first aid will ensure that fewer in-the-moment adjustments need to be made by rescuers when they are ultimately called upon to assist a responsive choking infant.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

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