



The Impact of Animation Videos Demonstrating the Heimlich Manoeuvre on Mothers' Proficiency in Assisting Choking Toddlers: A Preliminary Study

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ABSTRACT

Background: Choking caused by a foreign object entering the mouth is a critical emergency requiring immediate intervention; a delay in providing aid risks airway obstruction, leading to oxygen deprivation that can result in permanent brain damage, disability, or death. Choking incidents frequently affect children aged 1 to 2 years. Many mothers are unaware of the correct way to handle a choking, such as performing the Heimlich manoeuvre. **Purpose:** To evaluate the effect of animation videos demonstrating the Heimlich manoeuvre on mothers' proficiency in assisting choking toddlers. **Methods:** Utilizing a quasi-experimental research design, based on the G*Power formula, a sample size of 40 respondents was determined using simple random sampling, divided into a treatment group of 20 respondents and a control group of 20 respondents mothers with toddlers. Maternal proficiency was measured using validated and reliable questionnaires and observation sheets. The intervention involved watching the video twice daily over four consecutive days, with each session lasting two minutes and seventeen seconds. **Results:** A significant difference in proficiency (knowledge, attitudes, and skills) ($p < 0.001$). A difference in proficiency between the treatment and control groups ($p < 0.001$), with a mean rank for the treatment groups (30.50) and the control groups (10.50). **Conclusions:** The animated videos are a valuable tool for enhancing mothers' proficiency in managing choking incidents, offering a practical alternative for improving prevention and intervention skills.

KEYWORDS

Heimlich manoeuvre, Choking, Animation videos, Toddlers

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1. BACKGROUND

Choking represents a critical emergency that demands immediate attention, potentially leading to respiratory obstruction and, if not promptly addressed, oxygen deficiency (hypoxia), which could result in disability or even death

(Palimbunga et al., 2017). Globally, choking due to foreign objects accounts for 80% of incidents, with the highest occurrence observed in children under 3 years old, particularly those aged 1-2 years (Maria & Deran, 2021). It stands as the fourth leading cause of unintentional deaths, with toddlers

being especially vulnerable ([Salih et al., 2016](#)).

Toddlers, aged 1-3 years, are particularly susceptible to choking incidents due to their developmental stage and inclination to place various objects in their mouths, including food, drinks, small toys, coins, batteries, and buttons ([Denny et al., 2015](#)). A study in Japan recorded 52,366 deaths resulting from food-related choking. The total number of cases hovered around 4000 per year, with the incidence rate shifting from 16.2 to 12.1 per 100,000 population ([Taniguchi et al., 2021](#)).

Research in Japan identified 300 patients who experienced foreign body airway obstruction (FBAO) caused by food. The most frequently performed initial intervention was suctioning ($n = 94/300$; 31.3%), which successfully dislodged the foreign body in 17.0% of those cases ($n = 16/94$). Back blows ($n = 48/300$; 16.0%) and abdominal thrusts ($n = 24/300$; 8.1%) were performed less frequently as initial measures, with success rates of 10.4% ($n = 5/48$) and 20.8% ($n = 5/24$), respectively. Approximately one-third of the patients ($n = 93/300$; 31%) died, and 26.7% ($n = 80/300$) were at high risk of residual disability resulting from the incident ([Norii et al., 2023](#)).

Immediate action is paramount when dealing with a choking victim, as delayed assistance can lead to oxygen deficiency and, ultimately, permanent brain damage or death ([Rifai & Sugiyarto, 2019](#)). The Heimlich Manoeuvre, developed by Dr. Henry Heimlich in 1974, has proven effective in dislodging throat obstructions by applying rapid upward pressure beneath the ribcage ([Roehr, 2017](#)). This technique, considered both rapid and cost-effective, does not require medical expertise to perform ([Onan et al., 2017](#)).

Mothers play a pivotal role in both preventing and aiding their children during choking incidents ([Siahaan, 2019](#)). Unfortunately, many mothers are uninformed about proper choking response procedures ([Saputro, 2018](#)). Training the public or parents in choking treatment is crucial to guaranteeing a swift and efficient response during choking emergencies. There are several methods available to achieve this goal, including Community First Aid courses, Online Training modules, distribution of educational materials such as brochures, posters, and pamphlets, organizing public demonstration events, and broadcasting public service announcements on television, radio, or social media platforms. By employing these

diverse methods, communities can equip individuals with the knowledge and skills to identify and respond effectively to choking incidents, potentially saving lives during emergencies.

Animation videos have been identified as highly effective educational tools compared with alternative methods, such as printed materials (Wilson et al., 2012; Imamah, 2012; Govender et al., 2019; Fatmawati, 2020). Additionally, videos have been found to be well received, engaging, informative, and relevant to their audiences, with the potential to influence behaviour (Rosidawati, 2020).

The video on the Heimlich manoeuvre (abdominal thrusts) has been aligned with current pediatric first-aid guidelines, based on standards set by the American Heart Association and the Indonesian Ministry of Health, to reduce the risk of internal injury from incorrect technique.

The clinical guidelines for producing the animated video are based on recommendations from the American Heart Association, the American National Red Cross, and the Indonesian Ministry of Health. The principles for immediate management of choking, specifically in cases involving suspected foreign body obstruction when symptoms may not yet have fully

manifested, include assessing the severity of the airway obstruction. Indicators include a silent cough accompanied by breathing difficulties, cyanosis (bluish skin discoloration), and even a loss of consciousness. First aid involves delivering five forceful blows with the heel of the hand; the infant is held face-down to deliver back blows between the shoulder blades, or chest thrusts are administered while the infant is positioned face-up (American National Red Cross, 2026). For children over one year of age, the child should be encouraged to cough forcefully to clear the airway. If the child is conscious, the foreign object is expelled using abdominal thrusts (American National Red Cross, 2026; American Heart Association, 2015).

Other measures parents can take to minimize the risk of choking in children include: cutting food into small pieces, supervising children while they eat, avoiding conversation with children during meals, keeping small and hazardous objects (such as buttons, hair clips, batteries, needles, and coins) out of children's reach, and selecting age-appropriate toys. If there are toys that are not suitable for the child's age, store them in a secure, inaccessible place (Indonesian Ministry of Health, 2022).

The objective of this study was to assess the impact of animated videos illustrating the Heimlich manoeuvre on mothers of toddlers, to assist them in handling choking incidents. Our hypothesis posited that an animated video is an effective and valuable educational tool for training lay rescuers. The findings of this study are anticipated to serve as a foundation for recommending the use of health promotion media to advocate appropriate and effective methods for managing choking incidents in toddlers.

Bangunmulyo Village, located in Pakel District, Tulungagung Regency, East Java, is a rural-suburban area characterized by limited access to formal health education facilities and activities. The significant distance to hospitals poses a challenge in obtaining prompt medical assistance during pediatric emergencies. This issue is particularly critical in cases of choking, where delays in administering first aid can increase the risk of serious complications.

This situation is compounded by preliminary findings indicating that none of the mothers in the study population had received formal training on managing choking incidents in children. Limited opportunities for emergency education or training may mean that the community's

capacity to provide an initial response to choking incidents is suboptimal. However, mothers, as the individuals closest to the child, occupy a strategic position as first responders when choking occurs in the home environment.

Regarding socioeconomic characteristics, the majority of the women are homemakers, while others work as traders or self-employed individuals. These conditions highlight the need for an educational approach that is simple, easy to understand, accessible, and directly applicable in emergency situations. Consequently, enhancing mothers' knowledge and skills regarding first aid for choking children is a vital component of community empowerment and the strengthening of family preparedness, particularly in communities with limited access to healthcare services.

Bangunmulyo Village in Pakel District, Tulungagung Regency, East Java, is a rural, outlying area characterized by limited access to facilities and formal health education. The significant distance to the nearest hospital poses a challenge to obtaining rapid medical assistance during pediatric emergencies. This issue is particularly critical in cases of choking, where delays in administering first

aid increase the risk of serious complications.

Preliminary findings confirm that none of the respondents (mothers) had previously received formal training on how to assist a choking child. Limited opportunities for emergency education or training have resulted in suboptimal community capacity to provide an initial response to choking incidents. Yet, mothers as the individuals closest to the child are strategically positioned to act as first responders during home-based emergencies.

Socio-economically, the majority of the respondents are homemakers, while others work as traders or self-employed individuals. These circumstances highlight the need for an educational approach that is simple, easy to understand, accessible, and directly applicable in emergency situations. Enhancing mothers' knowledge and skills regarding choking first aid is a vital step toward community empowerment and strengthening family preparedness, especially in communities with limited access to healthcare services.

2. METHODS

Design

The study is quantitative research using a quasi-experimental study design. The design used was a non-equivalent control group with two groups, a pre-post-test. This research was conducted for about 4 days, from April 14th to 17th April, 2023, by administering questionnaires offline.

Sample and setting

The population comprised all mothers with toddlers (aged 1-3 years) living in Bangunmulyo Subdistrict, Pakel, East Java, Indonesia. Simple random sampling was used as the sampling technique. Based on the G*Power formula, a sample size of 40 respondents was determined. Each eligible mother was assigned a unique identification number, which was written on a slip of paper; these slips were uniformly folded and placed into a sealed container. The slips were thoroughly mixed, and the researcher drew the identification numbers one by one until 40 participants were selected. Each selected identification number was then matched to the corresponding mother within the sampling frame. The participants were subsequently divided into an intervention group (20 participants) and a control group (20 participants). Selected

participants were contacted and invited to take part in the study. Participation was voluntary, and informed consent was obtained prior to data collection. If a participant declined to participate, they were replaced by drawing another identification number from the remaining sampling frame using the same random selection procedure. In this study, the inclusion criteria were mothers with normal hearing and vision. In contrast, the exclusion criteria were mothers who had never viewed the animated video demonstration of the Heimlich manoeuvre.

The intervention group was provided with an animated video detailing the management of a child with choking, whereas the control group potentially acquired similar knowledge through their general reading or personal experiences.

Variable

The independent variable was the educational intervention (animation video demonstration of the Heimlich manoeuvre). The dependent variable was maternal proficiency, encompassing knowledge, attitudes, and psychomotor skills in managing choking toddlers.

Instruments

The tools used to assess mothers' abilities included questionnaires and observation checklists, both of which were validated and tested for reliability. This assessment was based on 15 items that measured knowledge, attitudes, and skills.

The knowledge assessment consisted of five questions covering: 1) understanding of the Heimlich manoeuvre; 2) common terminology related to the Heimlich manoeuvre; 3) the purpose of the manoeuvre; 4) the steps involved; and 5) a demonstration of how to perform it.

Attitudes were measured using five statements on a Likert scale, where participants expressed agreement or disagreement with: 1) using the Heimlich manoeuvre to relieve choking in a conscious child; 2) appropriate positioning behind the child; 3) appropriate fist formation; 4) appropriate positioning the hands above the child's navel; and 5) proper conducting method of abdominal thrusts.

The skills assessment involved a checklist with five observation points for performing the Heimlich manoeuvre: 1) kneeling behind the victim; 2) making a fist with one hand; 3) placing the fist with the thumb against the abdominal wall, two fingers above the navel and below the

xiphoid process; 4) clasping the fist with the other hand to encircle the victim's abdomen; and 5) applying backward and upward pressure until the foreign object is expelled.

Scoring was as follows: 1 point for each correct answer, appropriate attitude, and correct action; 0 points for incorrect answers, inappropriate attitudes, and incorrect actions. The ability to assist was then categorized as: good = 76-100% (12-15 correct actions), sufficient = 56-75% (9-11 correct actions), and poor = <56% (<9 correct actions). The instrument used to evaluate mothers' ability to assist choking toddlers showed strong validity, with a construct validity r-value of 0.688, which is greater than the critical value of 0.632, and a reliable Cronbach's alpha score of 0.86.

The intervention procedure using staged animation video (3 sections): section 1 is describing the definition of the Heimlich manoeuvre, section 2 is describing the purpose of the Heimlich manoeuvre, and section 3 showing the proper technique of Heimlich manoeuvre. The procedure for playing this animation video is carried out for 4 days.

Intervention

The intervention involved an animated video demonstrating the Heimlich

manoeuvre (for choking), leading to: 1) video viewing; 2) the development of knowledge and attitudes; and 3) the acquisition of new skills for assisting a choking toddler.

The video-viewing activity took place twice daily for four consecutive days, with each session lasting 2 minutes and 17 seconds to ensure participants could fully absorb the content. Before the second day's viewing, the researcher contacted participants to remind them to continue watching the video and to provide an opportunity for questions or discussion.

Mothers developed knowledge and attitudes regarding the Heimlich manoeuvre demonstration. They gained knowledge concerning the definition, purpose, and management of the Heimlich maneuver. Attitudes encompassed willingness to use the manoeuvre during a choking incident, use of the manoeuvre for initial management, fist-making technique, correct fist placement, and execution of thrusts.

Mothers acquired new skills for assisting a choking toddler by performing the Heimlich manoeuvre demonstration on their own children. These skills were assessed using an observation checklist while the mothers performed the demonstration within the allotted time. The

assessment indicators included: 1) the rescuer kneeling behind the victim; 2) making a fist with one hand; 3) placing the fist with the thumb against the victim's abdominal wall, positioned two fingers above the navel and below the xiphoid process; 4) grasping the fist with the other hand so that both hands encircle the victim's abdomen; and 5) performing thrusts in a backward and upward direction until the foreign object is expelled.

The hands-on practice of the Heimlich manoeuvre by mothers on their children, specifically regarding psychomotor skills, requires more detailed implementation, particularly concerning the determination of a longer practice duration.

Data collection

In this study, pre-test questionnaires were distributed to both the control and intervention groups. Once both groups confirmed their willingness to participate, pre-test questionnaires assessing knowledge and attitudes toward dealing with choking toddlers, along with observational instruments detailing the steps of administering the Heimlich manoeuvre, were administered to both groups. The research intervention entailed screening an animated video illustrating

first-aid techniques for choking toddlers, using a laptop as the medium. Researchers accompanied the intervention group to facilitate the download and ensure the videos' accessibility.

Data analysis

The data analysis method employed frequency and percentage for univariate analysis, while the Wilcoxon signed-rank test used for within-group (pre-test and post-test) comparison. The Mann-Whitney U test used for between-group comparisons, comparing the post-test or change scores between the intervention and control group.

Ethical consideration

Data collection was conducted after obtaining ethical approval from the Research Ethics Committee of STIKES Karya Husada Kediri, as evidenced by the ethical clearance certificate number 088/EC/LPPM/STIKES/KH/IV/2023, issued on April 12, 2023.

3. RESULTS

This study included 40 respondents, with 20 mothers in the intervention group and 20 in the control group.

Table 1. Data on the respondent characteristics

Characteristics	Intervention Group n (%)	Control Group n (%)
Age (years)		
21-25	9 (45.0)	8 (40.0)
26-30	8 (40.0)	7 (35.0)
31-35	2 (10.0)	4 (20.0)
36-40	1 (5.0)	1 (5.0)
Education		
Junior high school	3 (15.0)	3 (15.0)
Senior high school	13 (65.0)	15 (75.0)
Bachelor's degree	4 (20.0)	2 (10.0)
Occupation		
Housewife	14 (70.0)	12 (60.0)
Entrepreneur	1 (5.0)	5 (25.0)
Trader	2 (10.0)	3 (15.0)
Others	3 (15.0)	0 (0.0)
Number of children		
< 2 children	15 (75.0)	11 (55.0)
≥ 2 children	5 (25.0)	9 (45.0)
Mann-Whitney U		0.162

Table 1 shows the demographic characteristics of the respondents, including age, education, occupation, and number of children, for both the intervention and control groups. Overall, the demographic profiles of both groups demonstrate good homogeneity, indicating that the samples were comparable at baseline.

The majority of respondents in both groups were young adults aged 21-30 years (85% in the intervention group and 75% in the control group). The predominant education level was senior high school (65% in the intervention group and 75% in the control group). Regarding occupation, most respondents were housewives (70% in the

intervention group and 60% in the control group). Regarding the number of children, the majority of participants had fewer than 2 children (75% in the intervention group and 55% in the control group).

Statistical analysis using the Mann-Whitney U test yielded a p-value of 0.162 ($p > 0.05$). This result indicates that there were no statistically significant differences in the demographic characteristics between the intervention and control groups. This confirms that the two groups were equivalent at baseline, ensuring that any observed differences in outcomes can be attributed to the intervention rather than pre-existing demographic disparities.

Table 2. Difference in proficiency (knowledge, attitudes, and skills) between the treatment and control groups

Variables		Treatment Group		Control Group	
		Pre test	Post test	Pre test	Post test
Proficiency: (knowledge, attitudes, skills)	Mean total score (%)	5.25 (34.96%)	14.80 (48.66%)	5.15 (34.3%)	5.4 (35.97%)
	Median (min-max)	5.00 (4.00-8.00)	15.00 (14.00-15.00)	5.00 (3.00-7.00)	5.50 (3.00-7.00)
	Mean (SD)	Mean (SD)	14.80 (0.410)	5.15 (0.933)	5.40 (1.095)

Table 2 presents the comparison of proficiency levels (knowledge, attitudes, and skills) between the treatment and control groups at pre-test and post-test measurements. Descriptive analysis results showed that the mean total score of the treatment group increased substantially from 5.25 (34.96%) at pre-test to 14.80 (48.66%) at post-test. In contrast, the control group showed minimal improvement from 5.15 (34.3%) to 5.40 (35.97%).

The median value in the treatment group increased significantly from 5.00

(range: 4.00-8.00) to 15.00 (range: 14.00-15.00), whereas the control group increased only from 5.00 (range: 3.00-7.00) to 5.50 (range: 3.00-7.00). The smaller standard deviation (SD) in the post-test of the treatment group (0.410) compared to the control group (1.095) indicates better homogeneity within the treatment group after the intervention. These findings demonstrate the effectiveness of the intervention provided in improving participants' proficiency.

Table 3. Wilcoxon test results

Proficiency (knowledge, attitudes, skills)	Treatment Group (Pre test-Post test)	Control Group (Pre test-Post test)
Wilcoxon test results	0.001	0.150

Based on table 3, a significant difference in proficiency (knowledge, attitudes, and skills) was observed between the pre and post-intervention stages following the presentation of the animated video demonstration of the Heimlich

manoeuvre ($p < 0.001$). However, the significance value for the control group was $p = 0.150$, indicating no significant difference in proficiency (knowledge, attitudes, and skills) between the pre and post-intervention stages.

Table 4. Difference in proficiency within the treatment and control groups

Proficiency (knowledge, attitudes, skills)	Treatment Group	Control Group
Post test	Mean rank 30.50	10.50

Table 4 presents the comparison of mean rank scores for proficiency (knowledge, attitudes, and skills) at the post-test stage between the treatment and control groups. The analysis reveals a substantial disparity in performance outcomes, with the treatment group achieving a significantly higher mean rank (30.50) compared to the control group (10.50).

The markedly higher mean rank in the treatment group indicates that participants

who received the intervention demonstrated superior proficiency levels relative to those in the control group. This finding suggests that the intervention had a robust positive effect on enhancing the participants' knowledge, attitudes, and skills. The use of mean ranks implies that a nonparametric statistical test, likely the Mann-Whitney U test, was used to evaluate differences between these two independent groups.

Table 5. Difference in proficiency between the treatment and control groups

Proficiency (knowledge, attitudes, skills)		Treatment-Control Group
Post test	Mann-Whitney U	0.001

Based on Table 5, the Mann-Whitney test comparing post-test scores between the treatment and control groups yielded a p-value of 0.001, indicating a difference in proficiency between the groups.

None of the participants in the control group had previously received training in choking first aid, nor had they ever assisted someone who was choking. Based on this, the researcher posits that while training can be acquired through prior experience, the respondents in this study lacked such experience or information regarding the Heimlich manoeuvre; consequently, their ability to assist a choking victim remained in the "poor" category due to the absence of

prior relevant experience and the lack of new information on the subject.

4. DISCUSSION

According to the Mann-Whitney post-test results for both the treatment and control groups, the p-value for mothers' proficiency in assisting choking toddlers was below 0.05, indicating a significant difference in mothers' ability to assist choking toddlers between the treatment and control groups. Given this significant disparity, it can be concluded that the animated video demonstration of the Heimlich manoeuvre has a demonstrable

impact on enhancing mothers' capacity to aid choking toddlers.

Research results indicate that a Personal Digital Assistant (PDA)-based expert system significantly improves the performance of untrained rescuers providing emergency aid. With the widespread availability of Internet-compatible mobile devices, it appears feasible to enhance the quality of first aid provided by bystanders at the scene ([Erti & Christ, 2007](#)). Other research findings indicate that although teaching strategies can enhance leadership, teamwork, and team members' performance, exposure to a video followed by a CPR simulation improves an individual's skills more effectively than a CPR simulation followed by video exposure ([Wang et al., 2016](#)). The results indicated that animated videos were well-received, captivating, informative, and pertinent to most patients. Consequently, animated videos not only serve as educational aids but also have the potential to influence patients' willingness to participate in preventive interventions aimed at preserving optimal swallowing function post-cancer treatment.

Animated demonstration videos are a more potent tool for health education than traditional methods like printed materials, as they enable direct visual engagement,

whereas reading print media often leads to monotony ([Wilson et al., 2012](#); [Suartini & Supardi, 2020](#)). This efficacy can be attributed to the holistic sensory perception process exhibited by respondents towards such media, which fosters heightened interest in participation and nurtures curiosity. Additionally, information retention is significantly influenced by the effectiveness of sensory functions involving the optic nerves, vestibulocochlear nerves, and the frontal brain area, which acts as an associative centre for stimulus capture, thereby facilitating favourable reception of information. Increased sensory involvement in the information assimilation process enhances the capacity to grasp stimuli, resulting in better comprehension and retention of information ([Suartini & Supardi, 2020](#); [Aribowo, 2018](#)).

Through these auditory and visual processes, the animated demonstration video empowers mothers to understand how to perform the Heimlich manoeuvre to help choking toddlers. Consequently, mothers develop a keen interest and motivation to practice this manoeuvre. Their behavioural response transforms when faced with a choking child, leading to potential life-saving actions and averting fatalities ([Nurhayati & Mariyam, 2013](#)).

In this study, the approach involved educating participants on the Heimlich Manoeuvre through animated videos that conveyed the researcher's intended message. Mothers gain new insights from the provided animated demonstration video, enabling them to apply the knowledge accurately. The use of animated videos streamlines information delivery due to their succinct, lucid nature. Ultimately, participants grasp the content, prompting interest and behavioural change, and fostering a commitment to effectively aid choking victims (Notoatmodjo, 2012).

The results of this study indicated changes in individual knowledge after the educational intervention. This is consistent with earlier research by Basniati et al. (2020), which indicates that improved knowledge is also observed among individuals who receive health counselling via lectures or videos. Additionally, Sumarningsih's (2015) research showed an increase in family knowledge following education on child choking prevention and treatment. Indeed, the adjustments in respondents' knowledge following the intervention or health education reflect efforts to motivate or align objectives with health standards and principles.

In our opinion, individual characteristics can significantly influence the acquisition of knowledge and skills. Those who exhibit positive attitudes, demonstrate interest, stay focused, and actively participate in learning activities are more likely to experience changes in behaviour. Moreover, the effectiveness of disseminated information heavily relies on educator initiatives. The competencies, behaviours, and appeal of instructional materials employed by educators can stimulate audience engagement, thereby enhancing interest, attention, and retention.

Our research findings indicate that individual characteristics influence the improvement of mothers' knowledge and skills following exposure to an animated video demonstration of the Heimlich maneuver. Mothers who demonstrated a positive attitude, showed interest, remained focused, and actively participated in learning activities were more likely to experience positive behavioral changes. Furthermore, the effectiveness of information dissemination relies heavily on the educator's initiative. The educator's competence and conduct, combined with engaging learning materials, can foster audience involvement, thereby enhancing

interest, attention, and information retention.

The intervention consisting of an animated video demonstration of the Heimlich manoeuvre administered twice daily for four consecutive days. It was designed to facilitate easy recall and understanding, thereby helping mothers improve their practical skills. Additionally, the schedule was tailored to the mothers' availability, making the process more engaging and preventing boredom; this approach boosted motivation to practice and fostered the attitudinal and behavioral changes necessary to better equip mothers to assist a choking toddler.

One way rural community nurses can utilize digital technology, such as WhatsApp groups, is by sharing demonstration videos of the Heimlich manoeuvre; this offers an ideal way to provide targeted support to the community in a practical manner, eliminating the need for long-distance travel. From the perspective of service providers and systems, digital technology offers additional means to facilitate continuity and transitions of care (e.g., post-acute care). It serves as a powerful tool for population health management. This represents current evidence regarding the

use of digital technology services in healthcare.

Community nurses conduct monitoring and evaluation as a follow-up measure to ensure the animated Heimlich manoeuvre video is viewed correctly; this involves providing mothers with a logbook to fill out while watching the video and performing the demonstration at home, as well as asking follow-up questions during Posyandu visits.

We comprehend that a limited sample size, attributed to restricted participant access, may increase the probability of both Type I and Type II errors. Nonetheless, this preliminary study allows us to assess current methodologies and identify potential issues and challenges, especially concerning the development of an engaging and informative animated video. It provides an opportunity to refine our research protocols before undertaking larger-scale investigations.

5. CONCLUSIONS

The study found that the Heimlich manoeuvre animation demo video enhances mothers' ability to assist choking toddlers. In the treatment group, there was a notable improvement in this ability after exposure to the intervention, with all respondents

shifting from inadequate to proficient levels.

However, there was no significant change in the control group before and after the intervention, with all respondents remaining inadequate in assisting choking toddlers. The findings suggest that implementing health education through animated video demos of the Heimlich manoeuvre can be effective in preventing deaths from choking incidents, particularly when extended to broader community education initiatives.

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AUTHOR CONTRIBUTIONS

All authors contributed to the conception and design of the study. MMH collected the data and drafted the manuscript. MMH and RA supervised the study, performed the statistical analysis and

critically revised the manuscript. WSA and K contributed to the methodology, performed the statistical analysis and critically revised the manuscript. All authors read and approved the final version.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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DATA AVAILABILITY

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

DECLARATION OF USE OF AI

During the preparation of this work, the authors used Grammarly to assist with language and grammar editing. The authors take full responsibility for reviewing, verifying, and revising all AI-assisted output, and for ensuring the accuracy, validity, originality, and integrity of the manuscript's content.

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