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# ENHANCING MOTHERS' SKILLS IN ASSISTING CHOKING TODDLERS THROUGH ANIMATED HEIMLICH MANEUVER VIDEOS: A PILOT STUDY

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## Abstract

Choking is a critical emergency often seen in toddlers, requiring immediate action to prevent fatal outcomes. Many mothers find it challenging to manage such incidents effectively due to insufficient knowledge. Animated demonstrations of the Heimlich Manoeuvre present a promising approach for health education. This study aimed to evaluate the effect of animation videos demonstrating the Heimlich Manoeuvre on mothers' proficiency in aiding choking toddlers. Utilizing a quasi-experimental research design, the study included 60 mothers with toddlers, with a sample of 40 selected through purposive sampling and divided evenly into treatment (20) and control (20) groups. Maternal proficiency was measured using validated and reliable questionnaires and observation sheets. The intervention involved watching the video twice daily over two consecutive days, with each session lasting two minutes and seventeen seconds. The Wilcoxon test results showed a p-value of less than 0.05 for the treatment group and 0.150 for the control group, indicating a significant impact of the animation video on the mothers' ability to assist choking toddlers. The Mann-Whitney test also revealed a significant difference between the treatment and control groups' pre- and post-test results, with a p-value of less than 0.05. The animated videos effectively engaged multiple sensory pathways, making the instructions easy to understand, remember, and replicate. Mothers who repeatedly viewed the video according to the study's protocol demonstrated improved skills in assisting choking toddlers. These findings suggest that animation videos are a valuable tool for enhancing mothers' proficiency in managing choking incidents, offering a practical alternative for improving prevention and intervention skills.

Keywords: Chocking, Heimlich Maneuver, Video.

## 1. INTRODUCTION

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(12). 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 (7). It stands as the fourth leading cause of unintentional deaths, with toddlers being especially vulnerable (18).

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(3). The World Health Organization (WHO) reported 17,537 choking cases among toddlers aged 1-3 years in 2011, with food being the cause in 59.5% of cases, foreign objects in 31.4%, and other causes in 9.1%(4). A study conducted at Dr. Harjono Regional General Hospital, East Java, revealed 157 choking cases in 2009 and 112 cases the following year(20). According to Pusponegoro (2009), 90% of toddler deaths are caused by airway obstruction due to choking on foreign objects(14)

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(15). The Heimlich Maneuver, developed by Dr. Henry Heimlich in 1974, has proven effective in dislodging throat obstructions by applying rapid upward pressure beneath the ribcage(16). This technique, considered both rapid and cost-effective, does not require medical expertise to perform (11).

Mothers play a pivotal role in both preventing and aiding their children during choking incidents(20). Unfortunately, many mothers are uninformed about proper choking response procedures (19). 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 provide individuals with the necessary knowledge and skills to identify and effectively respond to choking incidents, thereby potentially saving lives during emergencies.

Animation videos have been identified as highly effective educational tools in comparison to alternative methods such as printed materials (23) (8), (6), (5). Additionally, videos have been found to be well-received, engaging, informative, and relevant to their audiences, showing potential to influence behaviour (17).

The objective of this study was to assess the impact of animation videos illustrating the Heimlich manoeuvre on mothers with toddlers, aiding them in handling choking incidents. Our hypothesis posited that animation video is an effective and valuable educational tool to train lay rescuers. The findings of this study are anticipated to serve as a foundation for suggesting the utilization of health promotion media aimed at advocating for appropriate and effective methods to manage choking incidents in toddlers.

## 2. METHODOLOGY

The study is quantitative research with the quasi- experimental study method. The design used was a Non-equivalent Control Group with two groups, pretest-post-test. This research was conducted for about 4 days, fro April 14-17th April, 2024, by administering questionnaires offline. The population was all mothers with toddlers (aged 1-3 years) who lived at Bangunmulyo Subdistrict, Pakel, East Java, Indonesia. The sample size was determined based on the Cohen Table for high power in nursing research using a t-test with power (p)=0.80, significant level (α)=0.10 and effect size (d)=0.40 obtained 57 respondents then adding 20% for preventing drop out then getting 68 respondents who were divided into 34 respondents for the intervention group and 34 respondents for control groups. In this study, the inclusion criteria consisted of mothers with normal hearing and vision, while the exclusion criteria encompassed mothers who had never viewed the animated video demonstration of the Heimlich manoeuvre method.

Purposive sampling, a non-randomized approach, was utilized to choose participants for the study. The sampling strategy involved a total of 45 individuals, with 20 assigned to the treatment group, 20 to the control group, and 5 designated as reserves. 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.

In this study, pretest questionnaires were distributed to both the control and intervention groups. Once both groups confirmed their willingness to participate, pretest 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, utilizing a laptop as the medium. Researchers accompanied the intervention group to facilitate the download and ensure accessibility of the videos. This intervention occurred twice daily for two consecutive days, with each viewing session lasting 2 minutes and 17 seconds to absorb the video content. Prior to the second-day viewing, researchers contacted participants to remind them to continue watching the video and provided an opportunity for any queries or discussions with the researcher. Conversely, the control group did not have access to the animated video.

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.

The data analysis method employed frequency and percentage for univariate analysis, while the Mann-Whitney test was utilized to assess differences in the mean values of knowledge between pretest and post-test respondents in both the intervention and control groups. The Mann-Whitney test was selected due to the non-normal distribution of the data sets, as indicated by the Kolmogorov-Smirnov test. The Data collection was carried out after obtaining ethical approval letter 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, 2024.

## 3. RESULTS

This study included 40 respondents, with 20 mothers in the intervention group and 20 in the control group. The majority were of reproductive age, ranging from 21 to 40 years old. Most of them were housewives rather than career women. Surprisingly, none had ever received information on choking management, and none had undergone cardiopulmonary resuscitation (CPR) training. Table 1 summarizes the demographic characteristics of respondents.

***Table 1.*** *Data on the respondent characteristics (n=40)*

| Characteristics | Intervention group N (%) | Control group N (%) |
|---|---|---|
| **Age (years old)** | | |
| 21 – 25 | 9 (45) | 8 (40) |
| 26-30 | 8 (40) | 7 (35) |
| 31-35 | 2 (10) | 4 (20) |
| 36-40 | 1 (5) | 1 (5 |
| **Education** | | |
| Junior High School | 3 (15) | 3 (15) |
| Senior High School | 13 (65) | 15 (75) |
| Bachelor's Degree | 4 (20) | 2 (10) |
| **Occupation** | | |
| Housewife | 14 (70) | 12 (60) |
| Entrepreneur | 1 (5) | 5 (25) |
| Trader | 2 (10) | 3 (15) |
| Others | 3 (15) | 0 (0 |
| **Number of children** | | |
| < 2 children | 15 (75) | 11 (55) |
| ≥ 2 children | 5 (25) | 9 (45) |

***Table 2.*** *Average Value of Pretest and Post-test knowledge of Heimlich Manoeuvre between Intervention Group and Control Group (n=40).*

| Variables | Intervention | | Control | |
|---|---|---|---|---|
| | ***Pre test*** | ***Post test*** | ***Pre test*** | ***Post test*** |
| Mean | 34.96 | 98.66 | 34.36 | 35.97 |

Based on Table 2, the average value (mean) of knowledge in the pretest and post-test of the intervention group is 34.96 and 98.66, respectively, and the mean value of knowledge in the pretest and post-test of the control group was 34.36 and 35.97, respectively. The Wilcoxon test results showed a p-value of less than 0.05 for the treatment group and 0.150 for the control group. The Mann-Whitney U test yielded a p-value of less than 0.05, indicating a statistically significant difference between the intervention and control groups.

## 4. DISCUSSION

According to the findings of the Mann Whitney post-test conducted on both the treatment and control groups, the obtained p-value for mothers' proficiency in aiding choking toddlers was below 0.05, signifying a discernible variance in the alteration of mothers' capabilities 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.

Our study's findings align closely with those of Fatmawati (2020), whose research indicated that modelling through animated videos enhances mothers' preparedness for toilet training and their ability to effectively conduct such training with their children. This suggests that animated modelling videos represent a viable alternative for enhancing the implementation of toilet training. Furthermore, findings from a research article by Govender et al. (2019) revealed that providing head and neck cancer patients with animated videos aimed at encouraging them to express their thoughts during the viewing of two brief animation videos depicting the swallowing process yielded positive outcomes. The results indicated that animated videos were well-received, captivating, informative, and pertinent to most of the patients. Consequently, animated videos not only serve as educational aids but also exhibit potential in influencing patients' inclinations toward participating in preventative interventions aimed at preserving optimal swallowing function post-cancer treatment.

Animated demonstration videos serve as a more potent tool for health education compared to traditional methods like printed materials due to their direct visual engagement, whereas

reading through print media often leads to monotony (Wilson et al., 2012; Suartini and Supardi, 2020). This efficacy can be attributed to the holistic sensory perception process exhibited by respondents towards such media, fostering heightened interest in participation and nurturing curiosity. Additionally, the retention of information is significantly influenced by the effectiveness of sensory functions involving optic nerves, vestibulocochlear nerves, and the frontal brain area acting as an associative centre for stimulus capture, thus 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 and Supardi, 2020; Aribowo, 2018).

Through these auditory and visual processes, the animated demonstration video empowers mothers with the understanding of how to execute the Heimlich manoeuvre to aid choking toddlers. Consequently, mothers develop a keen interest and motivation to practice this manoeuvre. Their behavioural response undergoes a transformation 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 using animated videos, which serve to elucidate the intended message of the researcher. Mothers acquire novel insights via the provided animated demonstration video, enabling them to implement the knowledge accurately. The utilization of animation videos streamlines the information delivery process due to its succinct and lucid nature. Ultimately, participants grasp and comprehend the content, prompting interest, behavioural change, and fostering a commitment to effectively aid choking victims (Notoatmodjo, S. 2012).

The results of this study indicated changes in individual knowledge after the educational intervention. This is consistent with earlier research by Edyati (2014) and Basniati et al. (2020), which indicates that improved knowledge is also seen in individuals who receive health counselling via lectures or videos. Additionally, Sumarningsih's (2015) research showed a rise in family knowledge after 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.

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 using animation video demos of the Heimlich manoeuvre can be effective in preventing deaths due to improper choking incidents, particularly when extended to broader community education initiatives.

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