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The Effects of CAR (Choking Alert Response) Educational Video on Mothers' Knowledge and Skills in Responding to Choking in Toddlers

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ABSTRACT

Background: Choking is an emergency condition caused by airway obstruction due to a foreign object and poses a serious risk to toddlers. Mothers' knowledge and skills in managing choking incidents are essential to prevent severe complications. Health education using engaging educational videos can be an effective intervention, as video media enables rapid and memorable information delivery, helping mothers become more prepared and competent in handling choking situations.
Method: This quantitative study employed a pre-experimental one-group pretest-posttest design. A total of 57 respondents were selected using non-probability incidental sampling. Instruments included a respondent characteristics questionnaire, a choking knowledge questionnaire, and a skills observation checklist. The intervention consisted of the CAR educational video, and data were analyzed using the Wilcoxon test.
Results: The mean age of respondents was 27.75 years. Most participants were housewives (50.9%) and had junior high school education (36.8%). The mean knowledge score increased from 11.00 before the intervention to 19.00 after the intervention. The mean skills score improved from 9.00 to 15.00. Statistical analysis showed a significant effect of the CAR educational video on mothers' knowledge and skills ($p = 0.001$).
Conclusion: The CAR educational video effectively improved mothers' knowledge and skills in managing choking incidents among toddlers.

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1. INTRODUCTION

Choking is a significant cause of morbidity and mortality in toddlers, especially as they begin to explore various foods and objects in their environment. Toddlers are at a higher risk of experiencing respiratory emergencies compared to older children and adults. This vulnerability arises because of their poor coordination and curiosity, making them more prone to choking on food and small objects, potentially leading to cessation of heart and lung functions[12]. As toddlers are at a critical developmental stage, choking incidents are more likely to occur. Foods and non-food objects such as toys, coins, batteries, and latex items are common choking hazards[3].

Choking is a life-threatening emergency that can result in oxygen deprivation, leading to the loss of respiratory reflexes, heart rate cessation, and permanent brain death within minutes[4]. In just a few minutes, a choking episode can severely affect oxygen saturation in the lungs and brain, leading to brain damage or

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even death[7]. For toddlers, effective handling of such emergencies is critical, as early and proper intervention can prevent fatal outcomes. Choking is a health issue that requires rapid and accurate intervention. The American Academy of Pediatrics stresses the importance of swift action in choking emergencies as improper handling can result in life-threatening situations[2].

In the United States, approximately 23,000 people visited emergency departments in 2015 due to choking incidents, with 65% of these victims being children under the age of 3, and 35% aged between 3–5 years[1]. In Indonesia, there is limited data on the prevalence of choking incidents, but cases have been reported frequently. For instance, in December 2019, a 40-day-old infant died from choking on a banana[6]. Another case in Bali involved a toddler choking on lontong sayur[14].

Choking incidents can be managed by anyone, especially family members with young children. The first aid skills required to handle choking emergencies are crucial for parents or caregivers. Quick and efficient intervention by parents can significantly impact a toddler's survival[13]. It is essential for parents to act swiftly if signs of severe airway obstruction are present, including silent coughing, bluish skin, and inability to speak or breathe[5]. Mothers, who are often the primary caregivers, must have knowledge and the skills necessary to provide proper first aid in choking situations[15]. According to a study by Nielsen et al., mothers who have better knowledge of choking procedures are more likely to provide effective first aid and prevent harmful complications[8]. Therefore, it is crucial to provide education that influences or changes parents' behaviors, particularly in choking management[9].

Mothers' knowledge and skills in managing choking incidents are vital, as their actions directly affect the safety of the child. However, many mothers lack awareness of the appropriate measures to take during a choking emergency. This knowledge gap leads to panic and incorrect actions, which could worsen the situation and even result in death[17]. The proper handling of choking involves specific techniques such as abdominal thrusts (Heimlich maneuver), chest thrusts, and back blows[16].

Innovative approaches, such as educational videos, have been increasingly used to improve mothers' knowledge and skills in responding to choking emergencies. Studies have shown that video education is effective in enhancing caregivers' understanding and practical skills in emergency situations[11]. Video-based learning has become an essential part of education due to its ability to engage multiple senses through visual and auditory components, making learning more effective. Educational videos that combine images and sound can be powerful tools in explaining life-saving techniques and providing clear instructions for caregivers.

In response to the need for better knowledge and skills in choking management, this study aims to evaluate the effectiveness of CAR (Choking Alert Response) educational videos in improving mothers' knowledge and skills in managing choking incidents. Previous research has suggested that video-based education is a promising method for health education[10].

2. RESEARCH METHOD

This study employed a quantitative research design with a quasi-experimental approach, specifically a pre-test post-test design, to assess the impact of Choking Alert Response (CAR) video education on mothers' knowledge and skills in responding to choking incidents in toddlers. The quasi-experimental design was chosen as it allows the researcher to compare the knowledge of the participants before and after the intervention, without the need for random assignment. The study aimed to evaluate the effectiveness of video-based education in improving the participants' ability to respond appropriately in choking emergencies.

The research was conducted in Mrebet Village, Purbalingga, with a focus on mothers of toddlers aged 1-5 years. The participants were selected through purposive sampling, ensuring that the sample was representative of the target population, which consisted of mothers who had toddlers under the age of 5 and were willing to participate in the study.

Data collection occurred in three phases: 1) Pre-test: Participants completed a knowledge questionnaire assessing their understanding of choking risks and response techniques. 2) Intervention:

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Mothers viewed a CAR educational video on choking prevention and first aid (lasting 15-20 minutes). 3) Post-test: The same knowledge questionnaire was administered to measure knowledge improvement.

In addition, skill observation was conducted where participants demonstrated their ability to perform first aid techniques (e.g., back blows, abdominal thrusts) on a choking simulation mannequin. Instruments included a structured questionnaire (validated with a Cronbach's alpha of 0.82) to assess knowledge and a checklist to observe first aid performance. Normality testing was conducted prior to hypothesis testing to determine the appropriate statistical method.

Data were analyzed using descriptive statistics and the Wilcoxon signed-rank test to compare pre-test and post-test scores, as the data were not normally distributed. A p-value of less than 0.05 was considered statistically significant.

$$t = \frac{\bar{d}}{s_d/\sqrt{n}}$$

A p-value of less than 0.05 indicated a statistically significant improvement in knowledge. Ethical approval was obtained from Universitas Muhammadiyah Purwokerto, and informed consent was secured from all participants. The study took place from March to April 2024, with pre-test and post-test data collected before and after the intervention, and skill observations following the video session.

3. RESULT AND DISCUSSIONS

The study involved 57 mothers from Mrebet Village, Purbalingga, who participated in the Choking Alert Response (CAR) video education program. Data were collected before and after the intervention to assess knowledge and skills related to choking emergencies in toddlers.

3.1 Univariate Analysis

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics	Frequency (n)	Percentage (%)
Education Level		
Kindergarten (TK)	5	8.8
Elementary School (SD)	15	26.3
Junior High School (SMP)	21	36.8
Senior High School (SMA)	14	24.6
Bachelor's/Diploma	2	3.5
Occupation		
Housewife	29	50.9
Self-employed (Wiraswasta)	9	15.8
Trader (Pedagang)	6	10.5
Farmer (Petani)	4	7.0
Civil Servant (PNS)	1	1.8
Others	8	14.0
Age of Respondents		
Mean ± SD	57	27.75 ± 4.107
Min-Max	57	18-37

Source: Processed Primary Data, 2024.

Based on the data in the table 1, the majority of respondents in the study had a junior high school education (SMP), with 21 respondents (36.8%) in the intervention group. The table also shows that the majority of respondents were housewives, with 29 respondents (50.9%). Regarding the age distribution, the average age of the respondents is 27.75 years, with the youngest respondent being 18 years old and the oldest being 37 years old.

Table 2. Distribution of Average Knowledge Scores of Respondents

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Variable	Mean ± SD	Median	Min	Max
Pretest Knowledge	11.03 ± 1.731	11.00	7	15
Posttest Knowledge	18.92 ± 1.556	19.00	15	21

Source: Processed Primary Data, 2024.

Knowledge scores increased markedly after the intervention, demonstrating improved understanding of choking management following CAR video education (Table 2).

Table 3. Distribution of Average Skill Scores of Respondents

Variable	Mean ± SD	Median	Min	Max
Pretest Skill	8.92 ± 1.334	9.00	5	12
Posttest Skill	15.15 ± 0.797	15.00	13	16

Source: Processed Primary Data, 2024.

Practical skill performance also improved after the intervention, indicating that video-based education effectively enhanced psychomotor competence in choking response (Table 3).

3.2 Bivariate Analysis

The bivariate test used was the Wilcoxon test, as the data did not follow a normal distribution, making it suitable for non-parametric testing. The results of the Wilcoxon test are presented as follows:

Tabel 4. Distribution of Knowledge and Skills of Mothers with Toddlers Before and After Receiving CAR Video Education

Experiment Group	Median (Minimum-Maximum)	p-value
Pretest Knowledge (n=57)	11 (7-15)	0.001
Posttest Knowledge (n=57)	19 (15-21)	
Pretest Skill (n=57)	9 (5-12)	
Posttest Skill (n=57)	15 (13-16)	0.001

Source**:** Processed Primary Data, 2024

The Wilcoxon signed-rank test showed a significant difference between pretest and posttest scores ($p = 0.001 < 0.05$), which means that there is a significant difference in the knowledge and skills of mothers with toddlers before and after the video education on CAR (Choking Alert Response). In other words, the CAR video education has a significant impact on the knowledge and skills of mothers regarding choking in toddlers.

The findings confirm that video-based health education is effective in improving maternal knowledge and skills in managing choking emergencies. Educational videos provide structured demonstrations that simplify complex first aid procedures, allowing participants to observe and imitate correct techniques. This aligns with previous studies reporting that audiovisual learning enhances comprehension and retention in emergency education contexts.

The improvement in skills observed in this study highlights the importance of combining visual instruction with practical simulation. Mothers were able to recall procedures more accurately after watching the CAR video, supporting multimedia learning theory which emphasizes dual-channel processing through visual and auditory stimuli.

Education level also appeared to influence learning outcomes, as participants with higher educational backgrounds adapted more quickly to the material. This supports earlier findings indicating that caregiver education contributes to effective emergency response behavior.

This study has several limitations. First, the research employed a one-group pretest-posttest design without a control group, which limits causal comparison. Second, the sample size was relatively small and restricted to one village, reducing generalizability. Third, skill assessment was conducted immediately after the intervention, so long-term retention of knowledge and skills could not be evaluated.

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Future studies should include randomized controlled designs with larger and more diverse populations to strengthen external validity. Longitudinal assessments are also recommended to evaluate knowledge and skill retention over time. Additionally, integrating interactive or simulation-based digital learning media may further enhance emergency preparedness among caregivers.

4. CONCLUSION AND RECOMMENDATION

This study confirms that the Choking Alert Response (CAR) educational video significantly improved mothers' knowledge and practical skills in managing choking emergencies among toddlers, in accordance with the study objectives. The findings demonstrate that video-based health education serves as an effective learning medium for enhancing caregiver preparedness in emergency response situations.

The study contributes to health education practice by providing empirical evidence that audiovisual learning can improve both cognitive understanding and psychomotor skills in community-based emergency training. The implementation of structured educational videos may support preventive health programs by increasing early response capability and reducing the risk of complications caused by choking incidents in toddlers.

It is recommended that healthcare providers integrate video-based choking management education into routine maternal and child health promotion programs. Further research involving controlled experimental designs and long-term evaluation is needed to strengthen evidence regarding the sustainability of learning outcomes.

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