

Parents' awareness and home preventive measures regarding choking of children under six years old

Mustafa Khudhair Al-Mousawi^{1,*} and Kahtan Hadi Hussein²

Abstract

Background: Choking is the obstruction of the airway caused by a foreign object. Choking is a major contributor to morbidity and mortality among young children. **Objectives:** This study aims to determine the parents' level of awareness regarding choking and evaluate the relationship between awareness level and home preventive measures. **Methods:** A descriptive cross-sectional design was used. A non-probability purposive sampling method was employed to collect data from 210 parents of children below 6 years in Al-Hillah city during the period from 06/02/2025 to 01/03/2025, using a developed questionnaire and direct interview technique. **Results:** Parents showed a highly sufficient level of awareness regarding choking risks and potential hazards of choking, and their awareness of choking signs and management was sufficient. However, they showed insufficient awareness regarding choking complications. Overall, parents demonstrated a sufficient level of awareness and a high level of home preventive measures. **Conclusions:** The present study concluded that parents' level of awareness has a significant positive relationship with parents' home preventive measures regarding choking in children under 6 years. Additionally, the level of awareness was higher among parents living in urban areas with higher levels of education. Home preventive measures for choking were higher among educated mothers of older age.

Keywords: airway obstruction, awareness, choking, home preventive measures, parents

1 Introduction

Choking is the partial or complete mechanical obstruction of airflow into the lungs [1]. On a global scale, choking affects 80% of children under three years old, with an incidence rate of 0.6 per 100,000 children aged 1–2 years [2]. In the US, choking constitutes about 5% of all fatalities among children under four and is the most prevalent cause of mortality within the home for those under six [3]. Young children often play with small objects that can easily get stuck in their mouths and obstruct their airways, making them more susceptible to choking injuries. Food, coins, toys, and balloons are the most frequent choking hazards for children, especially during feeding and playtime [4].

If the airway is not cleared, it can result in loss of consciousness within seconds to minutes, depending on the severity of the obstruction. In severe cases, this can lead to hypoxia, brain ischemia, and death [5]. Adopting preventive steps to protect children from choking injuries is largely facilitated by awareness [6]. This study aimed to determine parents' level of awareness regarding choking and to evaluate the relationship between this awareness level and their home preventive measures.

2 Methods and Materials

2.1 Patients and Methods

A descriptive cross-sectional research design was used to assess parents' level of awareness and their home preventive measures regarding choking in children under the age of 6 years in three hospitals in Al-Hillah city. A non-probability purposive sampling method was used to collect data from 210 parents who had children under the age of 6 years.

¹ Child Health Nursing, Faculty of Nursing, University of Babylon, Babylon Health Directorate, Babil Governorate, Iraq

² College of nursing, University of Babylon, Babil province, Iraq

Mustafa Khudhair Al-Mousawi (nur334.mustafa.khadir@student.uobabylon.edu.iq)

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2.2 Instrument of the Study

The researchers developed and utilized the study questionnaire for data collection purposes after a comprehensive review of the literature. The study questionnaire consists of four parts as follows:

Part One: Demographical characteristics of parents; includes parents' age, sex, residency, educational levels (separately for fathers and mothers), and monthly income of the family in IQD.

Part Two: General questions regarding choking of children; this part includes four questions addressing the number of children under 6 years old in the family, previous incidents of choking in children, whether the situation was life-threatening as perceived by parents, and the frequency of choking incidents in the family.

Part Three: Parents' Awareness of Choking; this part assesses parents' awareness of choking in children under 6 years old. It consists of two scales. Scale one is a three-point Likert scale consisting of 18 items responded to by (Yes, Uncertain, and No), and covers four areas contributing to choking injury including choking risks, signs and symptoms, complications, and management. Scale two assesses parents' awareness of potential choking hazards using a four-level Likert scale (No risk to High risk) and includes 17 items across three categories: eating behavior-related hazards, food-related hazards, and non-food-related hazards.

Part Four: Home Preventive Measures; this part is a three-level Likert scale consisting of 14 items distributed into two categories: preventive measures related to feeding habits, and preventive measures related to household behaviors and toys.

2.3 Statistical Analysis

After official permission was obtained from the Babylon Health Directorate, the data were collected from 6 February 2024 to 1 March 2024 using a direct interview technique. SPSS version 27 was used to perform data analysis through descriptive and inferential statistical methods. The study used descriptive statistics, including frequency, percentage, mean score, and standard deviation. The Chi-square test was used as an inferential statistic.

Scale 1 scores were evaluated through three categories: Insufficient (1–1.99), Sufficient (2–2.49), and Highly Sufficient (2.5–3). Scale 2 used three grading levels: Insufficient (1–2), Sufficient (2.1–3), and Highly Sufficient (3.1–4). Scale 3 used Low (1–1.99), Middle (2–2.49), and High (2.5–3) as its grading system. The minimum and maximum scores from Scales 1 and 2 were used to determine the total awareness level. Scale 1 total scores ranged from 18 to 54, and Scale 2 total scores ranged from 17 to 68. The overall awareness score combined the minimum and maximum overall scores from both scales to produce a total range from 35 to 122. The grading system for overall awareness scores included three levels: Insufficient (35–64), Sufficient (64.1–93), and Highly Sufficient (93.1–122).

3 Results

Study results showed that 51.9% of parents belonged to the age group of 24–34 years, 67.1% were mothers, and 57.1% of parents lived in rural areas. Additionally, 26.2% and 24.3% of fathers completed primary and secondary education respectively, while 13.3% achieved institute or college graduation. Similarly, 26.7% and 28.1% of mothers completed primary and secondary education respectively, while 14.8% of mothers earned institute or college degrees. The monthly income ranged from 0.5–1 million Iraqi Dinar for 57.1% of families, while 26.7% of families earned less than 0.5 million Iraqi Dinar (Table 1).

Table 2 shows that 69.5% of parents reported that choking had occurred to a child in their family. Additionally, 19.9% of parents reported that choking occurred frequently to children in their family, and only 21.2% of parents reported that it was a life-threatening situation.

According to Table 3, the overall awareness mean score was 97.48 ± 12.2 , which is rated as a highly sufficient level. Parents' awareness of choking risk and awareness of potential hazards were highly sufficient

(MS = 2.55 and 3.01, respectively). Additionally, awareness of management and awareness of signs were sufficient (MS = 2.48 and 2.41, respectively), while awareness of complications was insufficient (MS = 1.96).

Table 1: Demographical characteristics of parents

Variables		Freq.	%
Age groups (years)	18-23	28	13.3%
	24-34	109	51.9%
	35-44	54	25.7%
	45 and above	19	9.0%
Sex	Father	69	32.9%
	Mother	141	67.1%
Residence	Rural	90	42.9%
	Urban	120	57.1%
Father education	Illiterate	32	15.2%
	Read & write	44	21.0%
	Primary school	55	26.2%
	Secondary school	51	24.3%
	University	28	13.3%
Mother education	Illiterate	24	11.4%
	Read & write	40	19.0%
	Primary school	56	26.7%
	Secondary school	59	28.1%
	University	31	14.8%
Monthly income	<0.5	56	26.7%
	0.5-1	120	57.1%
	1.01 – 1.5	14	6.7%
	>1.5	20	9.5%

Table 2: History of choking in the family

Variables		Freq.	%
Previous choking injuries	Present	146	69.5%
	Absent	64	30.5%
	Total	210	100%
Was it a life threatening situation?	Yes	31	21.2%
	No	115	78.8%
	Total	146	100%
Does choking occur frequently to children in your family?	Yes	29	19.9%
	No	117	80.1%
	Total	146	100%

Parents' overall home preventive measures level for choking was high (MS = 2.54). Home preventive measures related to feeding habits represented the highest domain (MS = 2.58), followed by home preventive measures related to household behaviors and toys (MS = 2.51), as illustrated in Table 4.

Table 5 presents the relationship between parents' level of awareness regarding choking and their home preventive measures for choking in children under 6 years old. There was a highly significant relationship between parents' level of awareness and their level of home preventive measures (p-value = 0.002).

Table 3: Parents' overall awareness level regarding choking (n=210)

Awareness domain		N	%	M.S.	S.D.
Risk of choking	Ins.	12	5.7%	2.55	0.471
	S.	44	21.0%		
	H.S.	154	73.3%		
Signs of choking	Ins.	27	12.9%	2.41	0.432
	S.	100	47.6%		
	H.S.	83	39.5%		
Complication of choking	Ins.	40	19.0%	1.96	0.381
	S.	140	66.7%		
	H.S.	30	14.3%		
Management of choking	Ins.	10	4.8%	2.48	0.374
	S.	156	74.3%		
	H.S.	44	21.0%		
Potential hazards of choking	Ins.	11	5.2%	3.01	0.466
	S.	96	45.7%		
	H.S.	103	49.0%		
Overall awareness level	Ins.	5	2.4%	97.48	12.2
	S.	135	64.3%		
	H.S.	70	33.3%		
N = number, % = percentile, M.S. = mean of scores, S.D. = standard deviation					

Table 4: Parents' home preventive measures regarding choking in children (n=210)

Home preventive measures		N	%	M.S.	S.D.
Feeding habits	Low	16	7.6%	2.58	0.462
	Middle	32	15.2%		
	High	162	77.1%		
Household behaviors and toys	Low	22	10.5%	2.51	0.419
	Middle	45	21.4%		
	High	143	68.1%		
Overall home preventive measures	Low	17	8.1%	2.54	0.42
	Middle	35	16.7%		
	High	158	75.2%		
N = number, % = percentile, M.S. = mean of scores, S.D. = standard deviation					

Figure 1 shows the positive relationship between parents' awareness and home preventive measures. Parents who have a high level of awareness demonstrate a higher level of home preventive measures.

Table 6 presents the relationship between parents' awareness and home preventive measures with their demographic characteristics. The results indicate significant relationships between parents' residency, fathers' educational level, and mothers' educational level (p-values = 0.039, 0.001, and 0.001, respectively). The awareness level was higher among parents who live in urban areas and those who completed secondary school or higher education. Age group and maternal education levels showed a significant relationship with parents' home preventive measures (p-values = 0.004 and 0.024, respectively). The home preventive measures of parents aged 45 and above exceeded those of younger parents, while parents aged 35–44 years performed better than those under 35 years. Mothers who completed secondary education or higher demonstrated

better preventive measures than mothers with lower educational backgrounds.

Table 5: Relationship between parents' level of awareness regarding choking and their home preventive measures

Level of awareness	Home preventive measures			χ^{2*}	DF	P value
	Low	Middle	High			
Ins.	2	0	3	16.874	4	0.002
S.	14	17	104			
H. S.	1	18	51			
Total	17	35	158			
χ^2 =chi square test, D.F. = degree of freedom, P value = probability value						

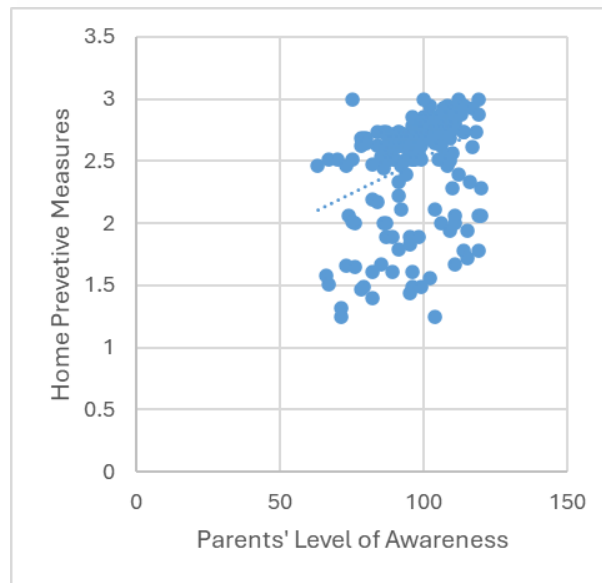


Figure 1: Relationship between parents' awareness of choking and home preventive measures

4 Discussion

Assessing parents' awareness of choking hazards in children under 6 is crucial for identifying their need for educational programs. This can enhance prevention efforts, promote child health, and reduce complications and morbidity associated with foreign body airway obstruction and aspiration [7]. According to the present study, more than two-thirds of parents have experienced a choking incident. Research conducted by Chang et al. [8] in the US reported high numbers of such incidents among children under five. Young children tend to put objects in their mouths as part of their natural exploration and learning process. Also, their lack of chewing and swallowing coordination and smaller airways compared to older age groups put them at higher risk of choking. However, 80% of those parents whose children had experienced choking in the past responded that choking was not a recurring condition for their children under 6 years old. This result is consistent with a study done by Ala'Alajjuri et al. [9], which found that 84% of parents reported that

Table 6: Relationship between parents' level of awareness regarding choking and home preventive measures with their demographical characteristics

Variables		Awareness level		Preventive Measures	
		MS	P-value	MS	P-value
Age groups (years)	18-23	97.75	0.649	2.36	0.004
	24-34	95.37		2.35	
	35-44	97.83		2.56	
	45 and above	101.05		2.70	
Sex	Father	97.22	0.564	2.46	0.802
	Mother	97.61		2.51	
Residence	Rural	94.10	0.039	2.44	0.677
	Urban	100.02		2.53	
Father education	Illiterate	90.03	0.001	2.43	0.153
	Read & write	93.11		2.37	
	Primary school	97.87		2.45	
	Secondary school	99.20		2.53	
	University	108.96		2.77	
Mother education	Illiterate	85.83	0.001	2.30	0.024
	Read & write	93.50		2.44	
	Primary school	99.00		2.41	
	Secondary school	98.07		2.56	
	University	107.77		2.74	
Monthly income	<0.5	101.16	0.061	2.55	0.682
	0.5-1	95.13		2.44	
	1.01 – 1.5	95.50		2.44	
	>1.5	102.70		2.66	
MS= Mean of Score, P value = probability value (significant in < 0.05)					

choking occurred once every couple of years, and 79.8% did not view choking incidents as dangerous threats even though such incidents present severe risks. This may be attributed to the fact that parental awareness and child behavior improve through experience and exposure to such events.

According to Table 3, parents have a high awareness of the risks of choking, with 73.3% achieving high scores. The study by Kiliçaslan et al. [10] found that 69.17% of mothers in Turkey considered choking from foreign body aspiration as a significant danger for children aged 6 months to 5 years. A study conducted in Saudi Arabia found that 60.3% of parents were aware of the risks associated with choking from foreign body obstruction [11], which is slightly lower than the current study.

Parents in this study demonstrated sufficient awareness about choking signs, as approximately one-third of them achieved a high awareness score (mean score = 2.41). The quasi-experimental research by Syan et al. [12] in Egypt revealed that 39.5% of mothers of preschool children correctly recognized choking signs and symptoms. An analytical study of 390 Saudi adults revealed that three-quarters of participants correctly recognized both complete and partial airway obstruction symptoms, which contradicts the current study results.

The parents showed insufficient awareness about choking complications (mean score 1.96). The results from Younis et al. [14] in Egypt matched the findings of this study, as they conducted a pre-post study and found that most mothers lacked knowledge about choking complications before the intervention. The study by Alzahrani et al. [15] revealed that parents demonstrated higher awareness about choking complications,

since 47.4% identified loss of consciousness, 72.5% recognized death, and 38.7% recognized brain damage. This may be attributed to the focus of parents on prevention and immediate response to choking rather than addressing severe complications.

Parents exhibited sufficient awareness regarding choking management with a mean score of 2.48. The results showed that choking management awareness was high among 36.7% of participants. The study conducted by Thirunavukkarasu et al. [13] supported this finding, since 43.3% of their research participants demonstrated high knowledge levels. The research conducted by Edirisinghe et al. [16] demonstrated that mothers showed poor understanding of this subject matter at an 88.3% rate, thus indicating varying degrees of awareness. These findings demonstrate the need to maintain continuous targeted educational programs that will help fill existing knowledge gaps. All parents and caregivers must receive comprehensive training in choking management because this will improve both child safety and emergency preparedness.

Parents demonstrated a high level of awareness regarding potential hazards affecting children's eating behaviors, with nearly three-quarters recognizing that activities like playing, laughing, or talking while eating pose choking risks, resulting in a mean score of 3.03. This finding is supported by research from Alzahrani et al. [15], where 92.2% of participating parents identified similar behaviors as hazardous for choking in children.

Parents demonstrated sufficient awareness of food types that may pose choking risks for children, with the highest recognition for nuts and seeds (mean score = 3.07), followed by popcorn (3.04), whole grapes and cherries (3.01), and hard candies (3.0). This aligns with a study in Croatia, which found that most parents recognized nuts and popcorn as choking hazards for children under 5 [17]. However, a study in Iran assessing video-based education revealed that only 43.6% of mothers identified whole grapes as a choking risk, indicating a lack of awareness regarding certain food types, which contradicts the findings of the present study [18]. However, the study results showed parents had lower awareness about non-food choking hazards, as their mean score reached 2.82. The research findings from Alzahrani et al. [15] show that 67.1% of parents identified small toys as choking hazards, but this contradicts the results from Ala'Alajjuri et al. [9], which found that mothers perceived toys as more dangerous than nuts and popcorn.

Cultural norms often influence how people view safe environments, leading them to focus more on meal-time supervision while being lenient about potential hazards in play areas and other household spaces.

The research showed that half of the parents demonstrated high awareness about choking hazards since their average score reached 3.01 ± 0.644 . An Egyptian interventional study showed that mothers demonstrated 43.5% awareness of choking hazards before participating in an educational program [12]. A study in Saudi Arabia showed that parents recognized both organic and inorganic choking hazards [19]. The results of a Saudi Arabian study involving 1,301 adults showed low awareness about choking hazards, which contradicts the current research findings [20].

The research showed that 33.3% of parents demonstrated high awareness about choking, but other studies produced different results. A study in Iran showed that mothers achieved a mean awareness score of 16.53 out of 24, which indicated that 60% of mothers had good awareness [21]. A study in the UAE revealed that only 12.4% of participants demonstrated good knowledge about choking [9]. The different levels of awareness might result from how people receive information regarding choking risks and potential hazards but fail to successfully address choking complications and management. The implementation of specific educational programs would assist in closing these knowledge gaps.

Parents in the present study demonstrated a high level of home preventive measures against choking in children under 6, with mean scores of 2.58 for feeding-related choking and 2.51 for household and toy-related choking. A study by Salman et al. [22] found that most parents supervised their children and ensured they remained seated during meals. In contrast, an interventional study by Syan et al. [12] revealed that only 31.7% of mothers avoided foods that pose choking risks, highlighting gaps in awareness and practice.

Regarding household safety, a study in Saudi Arabia found that 66.1% of parents kept hazardous objects out of reach [19]. Conversely, a Turkish survey indicated that only 33.7% of mothers avoided giving hazardous

objects to children [23], suggesting cultural differences in awareness and practices related to choking hazards. This disparity underscores the varying levels of understanding and resources available to different populations regarding choking prevention.

Overall, 75.2% of parents in the current study exhibited high levels of preventive measures, consistent with a Turkish survey where 63.4% of parents recognized and implemented choking prevention strategies [24]. However, Syan et al. [12] reported that only 16% of participants had recognized effective measures prior to an educational program. These findings may reflect the impact of targeted educational efforts or cultural variations in safety awareness, emphasizing the need for ongoing education to equip parents with essential knowledge for preventing choking incidents effectively.

The relationship between parents' awareness and home preventive measures became evident with a significant positive correlation at $p\text{-value} = 0.002$. People with better knowledge about choking risks tend to establish protective measures for choking prevention. Research conducted in Indonesia revealed a minimal relationship between maternal knowledge about choking hazards and their actual protective actions [25]. A pretest-posttest study conducted in Egypt demonstrated that improving mothers' understanding of choking risks helped them adopt safer home prevention strategies [26].

Numerous studies confirm that better awareness leads to improved preventive practices, yet some investigations present conflicting results. The implementation of preventive measures faces challenges due to several factors, including beliefs about natural injuries, distractions, and resource constraints [27]. People who understand choking risks better tend to practice preventive measures because they recognize dangerous situations and potential hazards. Parents who possess information about choking hazards tend to develop a safety-focused mindset through meal supervision and food selection. Although awareness stands as a fundamental component, it remains equally vital to work on eliminating obstacles that prevent the execution of safety measures.

The analysis demonstrated that awareness levels correlated with educational background and living area. The research findings showed that parents holding higher educational qualifications and those residing in urban areas demonstrated enhanced awareness levels. Urban mothers with higher levels of education demonstrated superior knowledge about choking hazards [14]. A study in Ethiopia demonstrated that parental knowledge directly correlated with educational status because parents who received higher education showed superior knowledge [28]. The availability of child safety educational resources and community programs in urban areas allows parents to benefit from them. The educational achievement of parents directly influences their ability to think critically, which leads to better safety-related decisions. Educated parents actively join child safety training programs that help them learn about choking hazards more effectively.

The results demonstrated that home preventive measures depend significantly on both parental age and educational background. The data show that both mature parents and those with advanced education levels exhibited better preventive practices. The findings of a Turkish research study support this conclusion, as they found age to be an important factor in mothers' preventive practices [29]. The research conducted by Almutairi & Alharbi [30] discovered that neither age nor education demonstrated any significant impact on preventive practice implementation. More experienced mothers tend to develop superior preventive methods because their extensive parenting history leads to increased awareness. Better access to safety information, together with resources, enables educated parents to perform their choking prevention practices more effectively.

5 Conclusions

The research concluded that parents show sufficient awareness about child choking. The study revealed that parents demonstrated sufficient knowledge about choking risks, yet their understanding of choking complications remained inadequate. The research showed that parents took effective preventive measures

at home to protect their children from food and household item dangers, and their awareness levels directly influenced these protective actions. The research showed that educated parents who lived in urban areas demonstrated a better understanding of choking in children under six years old, and mothers with higher education levels took better preventive measures at home.

6 Recommendations

Healthcare providers should establish educational programs to teach parents about choking complications, signs, and management, including accessible resources such as pamphlets and online guides. The educational program should focus on parents in rural areas with lower education and young mothers. The evaluation of long-term educational intervention effectiveness requires additional research to determine how demographic factors affect parental awareness.

Ethical Clearance

An approval letter was received to conduct the study from the Scientific Research and Ethical Committee at the College of Nursing, University of Babylon (Issue number: 61, Date: 21/1/2025).

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