

ORIGINAL ARTICLE

Awareness and practices toward choking incidents and first aid management among the general population in Saudi Arabia: a cross-sectional study

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ABSTRACT

Background: Choking is a life-threatening medical emergency requiring immediate recognition and evidence-based first aid management to prevent fatal outcomes. Public awareness regarding choking management in Saudi Arabia remains understudied. This study aimed to evaluate public knowledge, practices, and predictors of choking awareness among the general population in Saudi Arabia.

Methods: A descriptive cross-sectional community-based study was conducted across all five main geographical regions of Saudi Arabia using a validated online Arabic questionnaire. Non-clinical adults aged 18 years and above were included, whereas clinically trained healthcare practitioners and health-profession students were excluded. Data were analyzed using descriptive statistics, Chi-square tests, and binary logistic regression.

Results: A total of 387 participants completed the study. Overall, 49.9% demonstrated good awareness (cutoff $\geq 60\%$), while 50.1% had poor awareness. Non-clinical administrative healthcare employees comprised 41.3% ($n = 160$) of the sample. Geographically, participants were distributed across the Central (32.3%), Western (28.4%), Eastern (18.1%), Southern (12.4%), and Northern (8.8%) regions. Multivariable logistic regression revealed that female gender (AOR = 2.95, 95% CI: 1.88–4.62, $p < 0.001$) and holding a bachelor's degree (AOR = 8.50, 95% CI: 2.80–25.80, $p < 0.001$) were independent predictors of good awareness.

Conclusion: Public awareness regarding choking first aid management in Saudi Arabia is moderate, with prominent gaps in executing practical techniques like abdominal thrusts. Nationwide educational interventions and practical first aid training programs are warranted.

Keywords: Choking, first aid, Heimlich maneuver, public awareness, Saudi Arabia, foreign body airway obstruction.

Introduction

Choking represents a critical medical situation that arises when an object blocks the airway, preventing normal breathing and the exchange of oxygen. The aspiration of foreign objects, particularly food particles, is often responsible for this condition. The manifestations can range from gagging and coughing to complete silence and cyanosis in severe instances, depending on the degree of obstruction [1]. To avoid life-threatening

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outcomes, timely and effective use of evidence-based first-aid practices is essential [2].

Choking is a preventable yet significant contributor to accidental injuries and deaths, particularly affecting at-risk groups such as young children and the elderly [3]. Globally, unintentional injuries continue to be a significant public health burden; while there is limited specific data regarding choking incidents worldwide, it is acknowledged as a preventable factor within this spectrum of injuries [3].

In 2022, choking was the fourth leading cause of unintentional injury-related death in the United States, accounting for 5,553 deaths, with the highest mortality among individuals aged ≥ 70 years [4]. Moreover, in 2,000, approximately 160 children ≤ 14 years died because of airway obstruction due to aspirated or ingested foreign bodies [5].

In Saudi Arabia, studies from Makkah and Qassim show that ingestion of foreign bodies is a widespread and alarming problem among kids aged 1–5 years [6,7]. Survey-based studies conducted in Eastern Province and Al-Ahsa have also shown inadequate public knowledge and poor quality of management of choking emergencies, including infant choking, despite generally positive attitudes toward acquiring first-aid skills [8,9].

Previous studies have consistently identified choking as an important and preventable public health concern. Global statistics [3–5] also indicate that choking remains a significant preventable cause of morbidity and mortality. These reports may not evaluate public awareness directly, but they highlight the fact that many deaths from choking are preventable, hinting at the existence of gaps in recognition and response.

Other national studies in Saudi Arabia [6-9,11] have indicated less knowledge of choking therapy, especially among parents and caregivers, or insufficient exposure to first-aid training courses.

Overall, the combined international and national evidence underscores the urgent need for improving the quality of community-based education and the awareness of first-aid interventions in infant and child choking prevention.

According to the studies cited, there is a distinct scarcity of data assessing the choking awareness and practices of the general population in Saudi Arabia. The existing body of research is heavily skewed toward healthcare professionals or confined to specific regions. Furthermore, a nationwide study among the general population covering all regions is lacking.

This gap is particularly concerning, as most choking incidents occur in non-clinical settings, such as homes, schools, and restaurants, where the first person to respond is usually an ordinary person without medical training. Therefore, this study is needed to establish a comprehensive, nationwide baseline of community preparedness.

This research seeks to assess the general public's awareness and self-reported practices related to choking incidents and first-aid management among residents of Saudi Arabia. Additionally, it aims to identify

demographic and experiential factors that correlate with increased awareness and response to emergencies. The results are expected to support the development of targeted educational initiatives and first-aid training programs.

Methodology

Between April 28 and May 16, 2026, a descriptive, cross-sectional, community-based survey was carried out in the five major administrative regions of Saudi Arabia (Central, Western, Eastern, Southern, and Northern). A non-probability convenience sampling method was employed to gather participants through structured digital outreach on major social media networks (including WhatsApp, Telegram, and X). The study included adult residents from the five geographical regions of Saudi Arabia who clicked the link and provided electronic consent.

The target demographic included Saudi residents aged 18 years and older who provided electronic informed consent. To assess general layperson preparation, clinically trained healthcare practitioners (e.g., physicians, nurses, and paramedics) and enrolled health-sciences students were excluded from the initial screening. Participants who reported working in healthcare institutions in a non-clinical or administrative capacity were included in the analysis.

The sample size was estimated using Cochran's formula for large populations: $n = \frac{Z^2 \cdot P \cdot (1-P)}{d^2}$, where $Z = 1.96$ (at a 95% confidence level), $P = 0.50$ (assuming a conservative 50% baseline awareness level), and $d = 0.05$ (5% margin of error). The calculated minimum sample size was 385 participants. To account for potential non-response or incomplete submissions, recruitment targeted 425 responses, yielding 387 fully completed surveys eligible for analysis.

Data were collected using a structured Arabic electronic questionnaire adapted from a previously validated assessment tool developed by Alanazy et al. [9]. Face and content validity were determined through a qualitative evaluation by a group of three emergency medicine consultants who evaluated the clarity, importance, and cultural appropriateness of the items. A pilot study was carried out with 25 non-experts from various age brackets to evaluate how clearly the questions were written and the overall flow of the survey. It took participants around 4–6 minutes to finish the survey, and slight adjustments were made to the wording based on their input. The data from the pilot study was not included in the final analysis. The scale showed good internal consistency, with a Cronbach's alpha value of 0.78 for the combined awareness questions. The final tool comprised three core domains: sociodemographic variables, knowledge/recognition of choking emergencies, and first aid practices. Each correct answer was scored 1 point, while incorrect and "do not know" answers scored 0, consistent with Alanazy et al. [9]. In line with previous health-related KAP literature in Saudi Arabia, an empirical

cutoff score of $\geq 60\%$ was utilized to delineate “good awareness” ($\geq 60\%$) from “poor awareness” ($< 60\%$).

Data Analysis

Data were analyzed using IBM SPSS Statistics for Windows, Version 28.0 (IBM Corp., Armonk, NY, USA). Continuous variables were summarized as means and standard deviations, while categorical variables were reported as absolute frequencies and percentages. Knowledge and practice items were scored by assigning one point for each correct response. A composite awareness score was computed for each participant and converted into a percentage. Bivariate comparisons between demographic variables and awareness levels were conducted using the Chi-square test or Fisher’s exact test where appropriate. Independent predictors of good awareness were identified using binary logistic regression analysis, with adjusted odds ratios (AOR) and 95% confidence intervals (CI) reported. A two-tailed p -value of < 0.05 was considered statistically significant.

Results

A total of 387 participants were included in the final analysis (Table 1). The majority of respondents were aged 18–30 years (61.2%, $n = 237$), 20.9% ($n = 81$) were aged 31–45 years, and 17.8% ($n = 69$) were older than 45 years. Females accounted for 46.3% ($n = 179$), and males accounted for 53.7% ($n = 208$). Regarding educational background, 53.0% ($n = 205$) held a bachelor’s degree, 36.2% ($n = 140$) completed secondary education, 5.7% ($n = 22$) had below-secondary education, and 5.2% ($n = 20$) completed postgraduate studies.

Non-clinical administrative healthcare employment was reported by 41.3% ($n = 160$) of participants.

Geographically, participants represented all five major regions of Saudi Arabia: Central region (32.3%, $n = 125$), Western region (28.4%, $n = 110$), Eastern region (18.1%, $n = 70$), Southern region (12.4%, $n = 48$), and Northern region (8.8%, $n = 34$).

Table 2 details participant knowledge regarding choking recognition and risk factors. Overall, 98.4% ($n = 381$) correctly defined suffocation, and 85.3% ($n = 330$) recognized choking as a critical medical emergency requiring immediate intervention. Furthermore, 80.9% ($n = 313$) agreed that laughing or talking while eating increases choking risk, and 86.0% ($n = 333$) recognized small toys as airway hazards for young children. In clinical scenarios, 84.8% ($n = 328$) correctly identified complete airway obstruction characterized by sudden silence, cyanosis, and unresponsiveness.

Table 3 summarizes self-reported first aid practices. Continuing first aid while awaiting emergency services was selected by 71.8% ($n = 278$). However, key procedural deficiencies were noted: only 41.9% ($n = 162$) correctly identified the exact anatomical location and upward direction of abdominal thrusts (Heimlich maneuver), and 38.0% ($n = 147$) identified the correct sequence of 5–10 thrusts. Additionally, hazardous practices were observed, including inappropriate finger sweeps (49.4%) and administration of water during acute choking (45.0%).

Table 1. Sociodemographic characteristics of the study participants, Saudi Arabia ($N = 387$).

Variable	No (%)
Age in years	
18–30	237 (61.2%)
31–45	81 (20.9%)
>45	69 (17.8%)
Gender	
Male	208 (53.7%)
Female	179 (46.3%)
Highest educational level	
Below secondary education	22 (5.7%)
Secondary education	140 (36.2%)
Bachelor’s degree	205 (53.0%)
Post-graduate degree	20 (5.2%)
Non-clinical administrative healthcare employment	
Yes	160 (41.3%)
No	227 (58.7%)
Geographical region	
Central region	125 (32.3%)
Western region	110 (28.4%)
Eastern region	70 (18.1%)
Southern region	48 (12.4%)
Northern region	34 (8.8%)

Table 2. Knowledge of choking and suffocation and related first aid awareness among participants (N = 387).

Knowledge items	No (%)
What is suffocation?	
Foreign object entering the airways	381 (98.4%)
Airway obstruction by any object	6 (1.6%)
Which group is most prone to suffocation?	
Children and the elderly	208 (53.7%)
Children only	178 (46.0%)
Asthma patients	1 (0.3%)
Choking on a foreign object is...	
Serious condition requiring immediate intervention and may lead to death	330 (85.3%)
Temporary condition; symptoms disappear spontaneously	42 (10.9%)
I don't know	15 (3.9%)
Can moving or laughing while eating increase choking risk?	
Yes	313 (80.9%)
No	46 (11.9%)
I don't know	28 (7.2%)
Can Parkinson's/Alzheimer's increase suffocation risk?	
Yes	209 (54.0%)
No	74 (19.1%)
I don't know	104 (26.9%)
Can small toys cause choking in small children?	
Yes	333 (86.0%)
No, unless the toy is very large	38 (9.8%)
I don't know	16 (4.1%)
Case: coughing, wheezing, red face, still speaking	
The person is suffering from suffocation	249 (64.3%)
Not suffocation because they can still breathe/speak	115 (29.7%)
I don't know	23 (5.9%)
Case: sudden silence, gray face, blue lips, unresponsive	
The person is suffering from suffocation	328 (84.8%)
Not choking because they are not coughing	34 (8.8%)
I don't know	25 (6.5%)
What determines the method of intervention?	
Age and weight of the affected person	258 (66.7%)
Only age	119 (30.7%)
Gender	5 (1.3%)
Size of foreign body	1 (0.3%)
Interfere anyway	1 (0.3%)
Awareness of first aid	0 (0.0%)
Don't know	3 (0.8%)
If all procedures fail and the victim loses consciousness...	
Call an ambulance immediately	237 (61.2%)
Keep talking to keep them conscious	129 (33.3%)
Splash cold water	112 (28.9%)
Use a strong scent	84 (21.7%)
I don't know	26 (6.7%)

Figure 1 illustrates overall choking awareness levels. Overall, 49.9% ($n = 193$) demonstrated good awareness, whereas 50.1% ($n = 194$) exhibited poor awareness.

Bivariate analysis (Table 4) revealed that good awareness was significantly higher among females compared to

males (64.8% vs. 37.0%, $p < 0.001$) and among bachelor's degree holders compared to lower educational levels (65.4% vs. 18.2%, $p < 0.001$). No significant associations were observed regarding age groups ($p = 0.518$) or non-clinical administrative healthcare employment ($p = 0.711$).

233 **Table 3.** Participants' awareness responses on first aid practices and management of choking incidents (N = 387).

Question	Response option	No (%)
When should you call an ambulance?	After all necessary procedures were carried out and failed	128 (33.1%)
	After one failed attempt	134 (34.6%)
	Immediately upon encountering any choking case	108 (27.9%)
	I don't know	17 (4.4%)
What should you do until the ambulance arrives?	Continue administering first aid	278 (71.8%)
	Ask for help from anyone present	28 (7.2%)
	Do nothing and stay calm	58 (15.0%)
	I don't know	23 (5.9%)
Inserting fingers into the victim's mouth	Correct behavior	143 (37.0%)
	Wrong behavior	196 (50.6%)
	I don't know	48 (12.4%)
Bring a glass of water for the injured person	Correct behavior	117 (30.2%)
	Wrong behavior	213 (55.0%)
	I don't know	57 (14.7%)
Encouraging the patient to cough	Correct behavior	257 (66.4%)
	Wrong behavior	61 (15.8%)
	I don't know	69 (17.8%)
Prevent the victim from breathing	Correct behavior	84 (21.7%)
	Wrong behavior	216 (55.8%)
	I don't know	87 (22.5%)
Turning the child upside down and shaking	Correct behavior	183 (47.3%)
	Wrong behavior	134 (34.6%)
	I don't know	70 (18.1%)
How to perform back blows?	Bend victim forward, then hit	265 (68.5%)
	Hit immediately without positioning	58 (15.0%)
	No difference between methods	15 (3.9%)
	Do not recommend back blows	21 (5.4%)
	I don't know	28 (7.2%)
How many back blows?	1–2 blows	118 (30.5%)
	About 5 blows	128 (33.1%)
	7–10 blows	72 (18.6%)
	I don't know	69 (17.8%)
If back blows don't work	Move to another first aid procedure	253 (65.4%)
	Increase strike power	67 (17.3%)
	Wait for the ambulance	31 (8.0%)
	I don't know	36 (9.3%)
Was the Heimlich maneuver performed correctly?	Yes	208 (53.7%)
	No	101 (26.1%)
	I don't know	78 (20.2%)
How is pressure applied in the Heimlich?	Above the navel, back, and upward	162 (41.9%)
	Below the navel, back, and upward	102 (26.4%)
	Above the navel, back, and downward	19 (4.9%)
	Below the navel, back, and downward	34 (8.8%)
	I don't know	70 (18.1%)
How many Heimlich thrusts?	5–10 times	147 (38.0%)
	Only once	54 (14.0%)
	Depends on age	105 (27.1%)
	I don't know	81 (20.9%)
Who should avoid abdominal pressure?	Pregnant women	322 (83.2%)
	People with morbid obesity	133 (34.4%)
	Children <1 year	179 (46.3%)

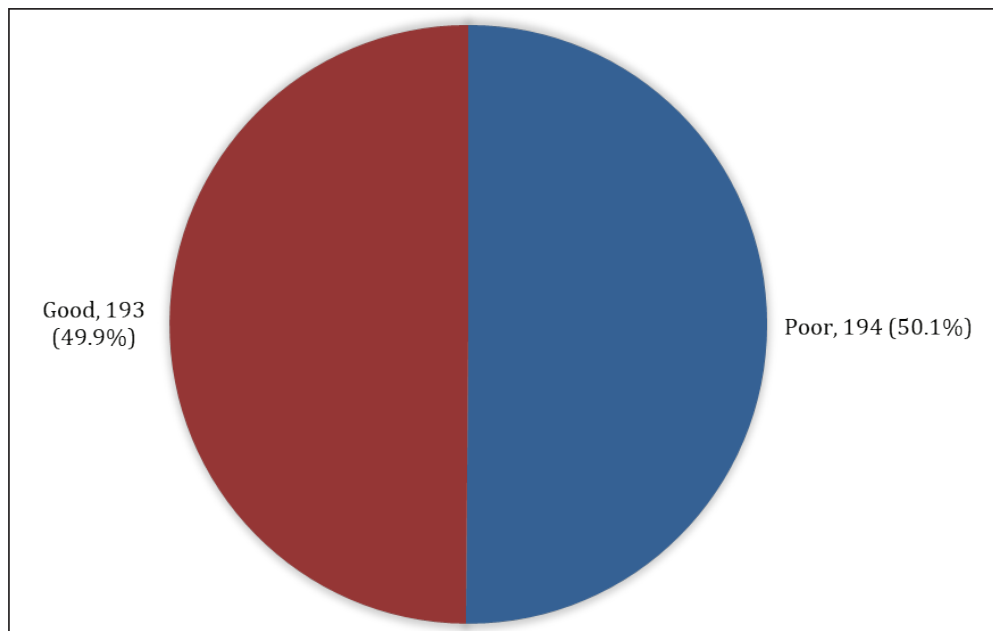


Figure 1. Overall awareness level regarding choking incidents and first aid management among participants, Saudi Arabia (N = 387). 234

Table 4. Association between participants' overall awareness level and sociodemographic characteristics (N = 387). 235

Factors	Overall awareness level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					0.518
18–30	119	50.2	118	49.8	
31–45	37	45.7	44	54.3	
> 45	38	55.1	31	44.9	
Gender					0.001*
Male	131	63.0	77	37.0	
Female	63	35.2	116	64.8	
Highest educational level					0.001*^
Below secondary education	18	81.8	4	18.2	
Secondary education	91	65.0	49	35.0	
Bachelor's degree	71	34.6	134	65.4	
Post-graduate degree	14	70.0	6	30.0	
Non-clinical administrative healthcare employment					0.711
Yes	82	51.3	78	48.8	
No	112	49.3	115	50.7	

P = Pearson X² test ^^: Exact Probability test.

* p < 0.05 (significant).

236 In the multivariable logistic regression model (Table 5),
 237 female gender was an independent predictor of good
 238 awareness (AOR = 2.95, 95% CI: 1.88–4.62, $p < 0.001$).
 239 Participants holding a bachelor's degree had significantly
 240 higher odds of good awareness compared to those with
 241 below-secondary education (AOR = 8.50, 95% CI: 2.80–
 242 25.80, $p < 0.001$).

243 Discussion

244 This nationwide cross-sectional study assessed public
 245 awareness and first aid practices regarding choking

incidents among adults in Saudi Arabia. Overall, awareness 246
 was almost evenly divided, with 49.9% of participants 247
 demonstrating good awareness and 50.1% showing poor 248
 awareness. Although participants generally recognized 249
 choking as a serious emergency and identified several 250
 warning signs and risk factors, important deficiencies 251
 remained in practical choking management, particularly 252
 regarding the correct performance and sequence of 253
 back blows and abdominal thrusts and the avoidance 254
 of potentially harmful interventions. Collectively, these 255
 findings suggest that recognition of choking is relatively 256

Table 5. Multiple logistic regression model for predictors of good awareness about choking incidents and first aid management

257

Predictors	OR _A	95% CI	p-value
Age in years			
18–30	Ref		
31–45	1.18	0.73–1.91	0.504
>45	0.83	0.49–1.41	0.485
Gender			
Male	Ref		
Female	2.95	1.88–4.62	0.001*
Education			
Below secondary	Ref		
Secondary	2.28	0.73–7.08	0.351
Bachelor's	8.5	2.80–25.8	0.001*
Postgraduate	2.38	0.60–9.41	0.391
Non-clinical administrative healthcare employment			
No	Ref		
Yes	0.95	0.63–1.44	0.624

ORA = Adjusted odds ratio

CI = Confidence interval.

* $p < 0.05$ (significant).

258 acceptable, whereas knowledge of appropriate first aid
259 management remains inadequate.

260 Several findings warrant further interpretation. Female
261 participants had almost three times higher odds of
262 good awareness than males, while participants with a
263 bachelor's degree had substantially higher odds of good
264 awareness than those with below-secondary education.
265 Higher educational attainment may facilitate access to
266 reliable health information, comprehension of emergency
267 instructions, and exposure to first aid education,
268 consistent with associations reported in previous
269 studies [8,10–14]. Participants with postgraduate
270 education also demonstrated higher adjusted odds of
271 adequate first aid knowledge (AOR = 2.38); however,
272 this association was not statistically significant (95%
273 CI: 0.60–9.41; $p = 0.391$). The wide CI likely reflects
274 the small postgraduate subgroup ($n = 20$, 5.2%) and
275 the resulting limited statistical precision; therefore, this
276 finding should be interpreted cautiously rather than as
277 evidence of an independent association. In addition, non-
278 clinical administrative healthcare employment was not
279 significantly associated with overall awareness. Because
280 clinically trained healthcare professionals and health-
281 profession students were excluded, employment within
282 a healthcare institution alone may not provide sufficient
283 exposure to practical choking management, reinforcing
284 the potential value of structured first aid education even
285 for non-clinical healthcare employees.

286 These findings have important public health implications
287 because choking frequently occurs in community
288 settings where immediate assistance is often provided
289 by family members, teachers, colleagues, or bystanders.
290 Current resuscitation guidance emphasizes appropriate
291 recognition and sequential evidence-based intervention
292 for foreign body airway obstruction [2], highlighting
293 the importance of translating awareness into practical
294 competence. Structured practical training may therefore
295 be more effective than passive awareness alone because
296 choking management requires correct sequencing and

physical technique. Educational evidence supports this
approach, with a randomized study demonstrating that
young schoolchildren could learn and retain choking-
management skills following structured theoretical and
practical training [15]. Incorporating age-appropriate
first aid education into schools, universities, workplaces,
childcare settings, and community health programs may
improve preparedness. Social media may complement
these initiatives by increasing public reach but should not
replace supervised practical skills training.

This study has several strengths. It included a relatively
large sample, assessed both recognition and practical first
aid knowledge, and used multivariable logistic regression
to identify independent predictors of good awareness. It
also addressed choking management across adult and
pediatric scenarios. However, several limitations should
be acknowledged. The study employed a non-probability
convenience sampling approach conducted through
online social media engagement, which naturally leads
to selection bias. This is reflected in the demographic
imbalance within our sample, where a significant
proportion of younger adults aged 18–30 years (61.2%)
and individuals with a university education (53.0%)
were overrepresented. As a result, these findings
may not accurately represent the awareness levels of
older age groups, less educated individuals, or those
with lower digital literacy, which limits the overall
generalizability of the results to the broader Saudi
population. Additionally, while content validity was
reviewed qualitatively by an expert emergency medicine
panel and internal consistency was verified (Cronbach's
 $\alpha = 0.78$), quantitative content validity indices were
not calculated, and awareness level classification was
based on an empirical $\geq 60\%$ threshold consistent with
regional literature rather than an international clinical
cutoff. Additionally, the inclusion of non-clinical
administrative healthcare employees (41.3% of the
sample) represents a potential confounder; although
clinically trained professionals were strictly excluded,

336	administrative presence within healthcare settings might	Conflict of interest	395
337	have inadvertently exposed these individuals to informal	The authors declare no competing financial or non-financial	396
338	health information, potentially influencing baseline	interests.	397
339	awareness. Finally, the study instrument did not capture		
340	several key experiential and behavioral variables, which	Funding	398
341	is a significant design limitation. In particular, the history	This study received no external funding.	399
342	of formal accredited first aid training, widely recognized		
343	as the strongest determinant of choking management	Ethics Approval and Consent to Participate	400
344	competency, was not assessed. Furthermore, data	Ethical approval for this study was granted by the	401
345	regarding participants' primary sources of health	Biomedical Research Ethics Committee at Umm Al-Qura	402
346	information, personal experience witnessing choking	University, Makkah, Saudi Arabia (Approval No: HAPO-	403
347	incidents, and perceived self-efficacy or confidence	02-K-012-2026-02-3220; Date of Approval: 07/02/2026; Ref	404
348	in performing emergency maneuvers were omitted.	No: BKJZ070126). Informed electronic consent was obtained	405
349	Future nationwide investigations should incorporate	from all participants prior to study participation.	406
350	these multidimensional predictors to clarify their role		
351	in mediating theoretical knowledge and practical rescue	Author contributions	407
352	performance.	SSA, RAB, AAA, MYA, and AMA contributed to study	408
353	Future nationwide studies should employ probability-	conceptualization, methodology design, and protocol	409
354	based sampling where feasible and recruit more balanced	development. RMA, SAH, NMA, and WAA coordinated	410
355	demographic and educational subgroups to improve	field data collection and curation. SSA, RAB, AAA, and MYA	411
356	representativeness and statistical precision. They should	performed statistical analysis and data visualization. SSA,	412
357	also assess previous formal first aid training, sources	RAB, AAA, and AMA drafted the initial manuscript. All authors	413
358	of health information, prior choking experiences, and	reviewed, refined, and approved the final manuscript.	414
359	confidence in performing emergency maneuvers to		
360	better identify factors associated with both theoretical	Data availability	415
361	knowledge and practical competence. Overall, the	Data are available from the corresponding author upon	416
362	present study demonstrates that, despite reasonable	reasonable academic request.	417
363	public recognition of choking and its risks, important		
364	gaps remain in evidence-based first aid management	AI use statement	418
365	among adults in Saudi Arabia. These findings support the	Artificial intelligence software (Gemini) was utilized	419
366	need for accessible, structured, and practical choking first	exclusively for English language editing, academic phrasing	420
367	aid education to improve community preparedness and	enhancement, and document structural alignment according	421
368	appropriate emergency responses.	to journal submission guidelines.	422
369	Conclusion		
370	In conclusion, awareness of choking recognition and	Author details	423
371	first aid management among the Saudi population was	Sara S Al-zahrani ¹ (https://orcid.org/0009-0005-6449-2301), Roaa Ahmad Ali Bajafar ¹ (https://orcid.org/0009-0006-0499-5617), Abutaleb Ahmed Alsayed ^{1,4} (https://orcid.org/0009-0003-1514-2749), Mohammed Yahya	424
372	moderate, with nearly half of participants classified as	Alsayed ² , Abdulrahman Mohammed AlTurki ³ , Rahaf Musaad	425
373	having poor awareness. Although most respondents	Alsaedi ¹ (https://orcid.org/0009-0001-0004-1895), Shahad	426
374	recognized choking as a serious medical emergency,	Ali Halwani ¹ , Nada Mudayni Alamri ¹ (https://orcid.org/0009-0007-7390-7868), Wejdan Abdullah Alkedaisi ¹ (https://orcid.org/0009-0005-3744-1912)	427
375	substantial deficiencies and misconceptions remained	1. Department of Medicine, College of Medicine, Umm Al-	428
376	regarding evidence-based first aid procedures. Female	Qura University, Al-Qunfudhah, Saudi Arabia.	429
377	gender and bachelor-level education were independently	2. Department of Emergency Medicine, King Fahd Medical	430
378	associated with better awareness. National initiatives	City, Riyadh, Saudi Arabia.	431
379	should prioritize practical, standardized, and regularly	3. Department of Emergency Medicine, King Fahd Medical	432
380	repeated choking first aid training through schools,	City, Riyadh, Saudi Arabia.	433
381	workplaces, healthcare centers, and community	4. Department of Emergency Medicine, South Al Qunfudhah	434
382	programs. Future community-based research should	General Hospital, Al Qunfudhah, Saudi Arabia.	435
383	systematically assess how prior hands-on training,		436
384	sources of information, and individual self-confidence	References	437
385	influence the management of choking incidents in real-	1. Dodson H, Sharma S, Cook J. Foreign body airway	438
386	life settings.	obstruction. StatPearls [Internet]Treasure Island (FL):	439
387	List of abbreviations	StatPearls Publishing; 2024., Available from https://www.ncbi.nlm.nih.gov/books/NBK499941/	440
388	AOR Adjusted Odds Ratio		441
389	CI Confidence Interval	2. Olasveengen TM, Semeraro F, Ristagno G, Castren M,	442
390	OR Odds Ratio	Handley A, Kuzovlev A, et al. European Resuscitation	443
391	SPSS Statistical Package for the Social Sciences	Council Guidelines 2021: basic life support. Resuscitation.	444
392	KAP Knowledge, Attitude, and Practice	2021;161:98–114. https://doi.org/10.1016/j.resuscitation.2021.02.009	445
393	Consent for Publication	3. World Health Organization. Injuries and violence:	446
394	Not applicable.	fact sheet. Geneva: World Health Organization; 2024.	447

- Available from: <https://www.who.int/news-room/fact-sheets/detail/injuries-and-violence>
4. National Safety Council. Choking: Injury Facts. Itasca (IL): National Safety Council; 2022. Available from: <https://injuryfacts.nsc.org/home-and-community/safety-topics/choking/>
 5. Centers for Disease Control and Prevention (CDC). Nonfatal choking-related episodes among children-united States, 2001. *MMWR Morb Mortal Wkly Rep*. 2002;51(42):945–8.
 6. Besharah BO, Al-Thubaity FA, Al-Qurashi A. Pediatric foreign body aspiration and ingestion in Makkah, Saudi Arabia: a retrospective study. *Saudi Med J*. 2023;44(5):482–8. <https://doi.org/10.15537/smj.2023.44.6.20230090>
 7. Alenezi MM, Alharbi SH, Almutairi AK. Clinical spectrum of pediatric aerodigestive foreign bodies in Qassim region, Saudi Arabia. *Ann Saudi Med*. 2025;45(1):34–41. <https://doi.org/10.5144/0256-4947.2025.177>
 8. Thirunavukkarasu A, Alanazi AR, Al-Rasheedi AN, Alruwaili DK, Abdel-Salam DM, Alriwely NS, et al. Assessment of knowledge, attitude, and practice toward first aid management of choking hazards among Eastern Province Saudi adults: an observational study. *Front Public Health*. 2024;12:1376033. <https://doi.org/10.3389/fpubh.2024.1376033>
 9. Alanazy A, Alruwaili A, Al-Hassan HH, Almulhim A, Altaher NA, Alhomoud AS, et al. Awareness of first aid among adults in Al-Ahsa City, Saudi Arabia, with focus on infant choking responses. *J Family Med Prim Care*. 2024;13(9):3658–64. https://doi.org/10.4103/jfmpc.jfmpc_1952_23
 10. Ranjous Y, Al Balkhi A, Alnader I, Rkab M, Ataya J, Abouharb R. Knowledge and misconceptions of choking and first-aid procedures among Syrian adults: a cross-sectional study. *SAGE Open Med*. 2024;12:20503121241249399. <https://doi.org/10.1177/20503121241249399>
 11. Alenezi MM, Bohulaigah ZH, Aldajani NF, Alotaibi LG, Alshammari MF. Assessment of knowledge, attitude, and practice of first aid management of choking among primary school teachers in Riyadh, Saudi Arabia: a cross-sectional study. *Cureus*. 2024;16(1):e51519. <https://doi.org/10.7759/cureus.51519>
 12. Maalim Issack A, Jiru T, Wubetie Aniley A. Assessment of knowledge, attitude and practice on first aid management of choking and associated factors among kindergarten teachers in Addis Ababa governmental schools, Addis Ababa, Ethiopia. a cross-sectional institution-based study. *PLoS One*. 2021;16(7):e0255331. <https://doi.org/10.1371/journal.pone.0255331>
 13. Asmar I, Almahmoud O, Jebara F, Jabar N, Kahala A, Ramadan J, et al. Knowledge and practices of choking first aid skills among Palestinian mothers of children under five. *J Neonatal Nurs*. 2023;29(5):728–34. <https://doi.org/10.1016/j.jnn.2023.01.004>
 14. Yang J, Ling Z, Chen YC, Wang X, Pan H. Public awareness and application of the Heimlich maneuver: a survey of Shenzhen residents. *Cureus*. 2025;17(7):e88957. <https://doi.org/10.7759/cureus.88957>
 15. Tse E, Plakitsi K, Voulgaris S, Alexiou GA. ChokeSafe: empowering children with life-saving choking-management skills. *Children (Basel)*. 2024;11(3):299. <https://doi.org/10.3390/children11030299>