



# Knowledge attitude and practice towards foreign body aspiration management among kindergarten teachers in south-west Amhara, rural Ethiopia

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**Background:** Aspiration of a foreign body (FB) is the act of unintentionally ingesting food, drink, or typically items. In every country on earth, it is the main cause of death. Aspirations of a foreign body in kids are typically emergency situations and account for a significant part of accidental fatalities. Problems are made worse by a lack of community understanding about foreign body aspiration.

**Objective:** To assess the level and determinants of knowledge, attitude, and practice towards the first aid management of foreign body aspiration and airway obstruction among kindergarten teachers in northwest Amhara, Ethiopia, 2022.

**Methods:** An institution-based cross-sectional study was undergone on kindergarten teachers.

**Result:** The result of this study showed that 78.4% of the participants had good knowledge or scored equal or more than the mean score. The total score of the attitude was calculated by rating the respondent's correct-full responses on the attitude questions; a total of 337 (93.4%) answered all the six questions above the mean level of 5.98, indicating that 93.4% of the respondents have a positive attitude.

**Discussion:** In the present study, 78.4% of kindergarten teachers demonstrated good knowledge. In contrast, a study conducted in Addis Ababa, and Ethiopia, revealed that only 37% of participants exhibited good knowledge regarding foreign body aspiration management, significantly lower than the current study's findings. Additionally, the same study found that 93% of kindergarten teachers held a positive attitude toward foreign body aspiration management, aligning with the results of a cross-sectional study in Addis Ababa, and Ethiopia, where the attitude score was 95.1%.

**Conclusion and recommendation:** The result of this research shows that majority participants of this study have good knowledge and attitude towards foreign body aspiration management, but poor practice about it.

**Keywords:** attitude, awareness, community, foreign body aspiration, management (first aid), practice

## Introduction

Foreign body aspiration can be a life-threatening incident that requires immediate evacuation of the inhaled substance. Diagnosis of foreign body aspiration is typically difficult due to vague

## HIGHLIGHTS

- Diagnosis of foreign body aspiration is typically difficult.
- Participants have good knowledge and attitude.
- However, participants possess poor practice.

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symptoms, a lack of precise diagnostic tools, and being disregarded by the clinician<sup>[1–3]</sup>. In extremes of age, foreign body aspirations are significant sources of morbidity and mortality<sup>[4]</sup>. Aspiration is most often seen in youngsters, but it can also occur in adults<sup>[5]</sup>.

Infections, ulcerations, obstructive pneumonitis, and airway blockage can all result from the foreign body. Early suspicion and diagnosis are critical since delayed detection or removal can lead to significant problems<sup>[6–8]</sup>. Foreign body aspiration (FBA) can cause asphyxiation and death. Pediatric patients have been identified as the most vulnerable victims because of their poor chewing abilities due to a lack of posterior teeth, a proclivity to put items into mouths, and a proclivity to have frequent forceful, unrestrained inspirations when frightened, laughing, or coughing<sup>[9–11]</sup>.

Foreign body aspiration appears in a variety of clinical manifestations, many of which are not accompanied by a trustworthy witness to provide clinical history, particularly in youngsters. The degree of difficulty will be determined by several factors, including the patient's age, the type of foreign body ingested, and the time between inhalation and removal<sup>[12,13]</sup>.

Early detection and treatment are critical for preventing death as well as the less serious but still substantial sequelae of recurring acute respiratory distress, chronic and recurrent pneumonia, and pulmonary abscess<sup>[14,15]</sup>.

As a result, it appears that parents who are aware of FBA are aware of the symptoms that accompany it. Unfortunately, only half of the parents they interviewed were confident in their ability to spot an episode of FBA, which would likely result in a delay in diagnosis. According to the research, educated caregivers are five times more likely than uninformed caregivers to notice an FBA<sup>[16,17]</sup>.

According to research conducted in the United States of America (USA), most teachers are lacking in understanding of emergency care and basic life support techniques. There were significant shortcomings in the detection and treatment of student crises needing airway interventions. According to the findings of a research, one-third of the instructors polled had no formal first-aid training<sup>[18]</sup>.

Research done in Turkey to assess primary school teachers' first-aid skills and attitudes revealed that the majority of teachers lacked appropriate first-aid knowledge. The result indicates that teachers might need the necessary knowledge to perform life-saving actions. As instructors' ages grow, competent first-aid practice becomes increasingly unlikely. Furthermore, female teachers' understanding of first aid was significantly greater than male instructors<sup>[19]</sup>.

Physical education instructors in Irish schools have also shown a lack of expertise on how to treat students in an emergency<sup>[20]</sup>. This is consistent with earlier North American research, which indicated that 30% of instructors had no particular training in first aid and 40% had never been certified in CPR<sup>[21]</sup>.

### **Justification of the study**

Tomorrow's citizens are today's youngsters. They deserve to inherit a world that is safer, fairer, and healthier. There is no more vital responsibility than protecting their habitat. In today's world, risk lurks not just on the roadways, but also in homes, playgrounds, and schools, in both developed and developing countries.

Though several articles emphasize the problem's sensitivity, knowledge, attitude, and practice in rural Ethiopia have yet to be fully addressed. This research will offer baseline data on teachers' knowledge, attitudes, and practices regarding foreign body aspiration and airway obstruction care. Furthermore, the data produced in this study may be used by relevant bodies for planning and assessing the teacher's knowledge, attitude, practice, and measurement in order to solve challenges.

### **Objective**

#### **Main objective**

To assess the level and determinants of knowledge, attitude, and practice towards the first aid management of foreign body aspiration and airway obstruction among kindergarten teachers in northwest Amhara, Ethiopia, 2022.

#### **Specific objectives**

1. To assess the level of knowledge, attitude, and practice towards the first aid management of foreign body aspiration and airway obstruction.
2. To determine factors associated with knowledge of first aid

management of foreign body aspiration and airway obstruction.

## **Materials and methods**

### **Study design and participant**

We conduct an institution-based cross-sectional study to assess the level and determinant of kindergarten teachers' KAP towards foreign body aspiration and airway obstruction management in rural Ethiopia using a self-administered questionnaire during the period of 05 May to 20 June 2022. Any teacher of the kindergarten school included in the study who agreed to fill out the questionnaire was eligible to participate. This study was reported in line with strengthening the reporting of cohort, cross-sectional, and case-control studies in surgery (STROCSS) criteria<sup>[22]</sup> and registered on [www.researchregistry](http://www.researchregistry) with research registry 8995, which is available at Browse the Registry – Research Registry.

### **Sample size determination and sampling technique**

The sample size was determined using a single population proportion formula, which is  $n = (Z_{\alpha/2})^2 P(1 - P)$ . In a previous study similar to this done in Ethiopia, the proportion was 37%, and by assuming 95% CI with a 5% margin of error, and at a 95% confidence level ( $P = 35\%$ ) was taken.

$$P = 0.37 \text{ and } q = 1 - p = 0.63, d = 5\%, Z_{\alpha/2} = 1.96.$$

$$N = ((1.96)^2 * (0.37 * 0.63)) / (0.05)^2 = 357$$

where  $n$ , sample size;  $P$ , sample proportion;  $q$ ,  $1 - p$ ;  $d$ , desired a degree of precision;  $Z$ , the standard normal value at 95% confidence level.

The total calculated sample size was 357 after adding a 10% nonrespondent rate. The data collection procedure included an observational checklist and interview-based questionnaire.

From 11 woredas of South Gondar zone, five woredas namely; Debre Tabor, Gyint, Dera, Estie, and Andabet woredas were selected by simple random sampling method. Finally, we surveyed all 26 schools kindergarten schools found in those woredas.

### **Data collection tool and procedure**

We recruited BSc anesthetists as data collectors between April 27 and 28. The recruited data collectors were briefed on the nature of the study and the data collection strategy. In addition, we assigned a supervisor to oversee the data collection process. Data was collected from selected study participants using a pretested questionnaire. The questionnaire was pretested in 18 participants from one of the kindergartens in Debre Tabor town, which was not included in the study. The questionnaire contains three parts. The first part of the question contains questions used to assess socio-demographic characteristics of kindergarten teachers, such as sex, age, level of education, year of experience, marital status, type of kindergarten they teach, and monthly income. The second part of the questionnaire has nine questions that are used to assess kindergarten teachers' knowledge. The third part has six questions to assess kindergarten teachers' attitude and the fourth part consisted of seven questions to assess participants' practice towards choking management. Data was collected during the period of 05 May to 20 June 2022. Consent was taken from

participants after detailed information on the topic and the objectives of the study has been given. The principal investigator and supervisor checked the completeness of data every day.

### Data processing and analysis

After collection, data were summarized and coded. Data were entered into a statistical package for social sciences (SPSS) Windows version 24 for data cleaning up and analyzing. Data cleanup was performed by checking for frequencies and missed values and variables. A descriptive statistical analysis was used to show the characteristics of the participants. Binary logistic regression was used to identify factors associated with the patient's level of awareness of patients' rights. The cut point used during bivariate analysis was a *P*-value of less than 0.2 considered as fit for multivariable analysis. The crude and adjusted odds ratios with their corresponding 95% CIs were computed. *P*-values of less than 0.05 were considered significant. The analysis result was presented as frequencies, means, SD, and percentages using tables and pie charts.

### Ethical consideration

All the study related activities were initiated after obtaining the relevant approval from XX University, College of Health Science ethical review board approval with an IRB number of XXUCHS 140/2014. Only those who verbally provided their informed permission were enrolled in the research.

### Patient and public involvement

No patient is involved.

### Operational definitions

#### Knowledge about foreign body aspiration management

knowledge items with equal weight with a scoring system designed to assess the level of knowledge, and good knowledge is those who scores above the mean level, and those who scores below the mean level taken as having poor knowledge<sup>[23,24]</sup>.

#### Attitude about foreign body aspiration management

Those who were responded above the mean were considered as had good (positive) attitude and below the mean was considered as had negative attitude<sup>[23,24]</sup>.

## Result

In this study, a total of 358 respondents kindergarten school teachers were participated, among them 302 (84.4%) were females. The mean ages of the participants with SD were (34 ± 0.606). Regarding to the education level of the respondent, 219 (61.2%) of respondents were diploma holders, and 139 (38.8%) have a bachelor of science (Table 1).

#### Knowledge towards foreign body aspiration management

From a total of 358 participants, 283 (78.4%) answered all 8 question's right, 64 (17.8%) answered 7 question's right, and 11 (3.0%) of them answered 6 question's right, with this the mean knowledge score of the participants is 7.5, based on this result 283 (78.4%) of the participants had good knowledge or scored

**Table 1**

**Demographic and baseline characteristics of the study participants, North Gondar, Ethiopia, 2022 (N = 358).**

Variable	Category	Frequency (%)
Sex	Male	56 (15.6%)
	Female	302 (84.4%)
Age	25–30	158 (44.1%)
	30–49	176 (49.2%)
	≥ 50	24 (6.7%)
	Educational status	Diploma
Year of experience	Degree	139 (38.8%)
	1–5	176 (48.8%)
	6–10	148 (41.0%)
School type	≥ 11	34 (4%)
	Government	193 (53.9%)
	Private	165 (46.1%)
Total monthly income	< 3000	129 (35.7%)
	≥ 3000	229 (63.4%)

equal or more than the mean score.

An eight-item questionnaire regarding knowledge of foreign body aspiration was administered. All the respondents answers as they know peanuts and other nuts can cause accident's involving foreign body aspiration, toys can cause accidents involving foreign body aspiration, should not allow a child to walk or lough while he/she is eating, you should not give peanuts to a child younger than 3 years old.

From the total of 358 study participants, only 11 (3.1%) of the respondents did not recognize sudden choking is one of the symptoms of foreign body aspiration 5 (1.4%) did not know that sudden coughing is one of the symptoms of foreign body aspiration. Three hundred fifty-one (97.5%) of the respondents know that foreign body aspiration is most frequently seen in children aged 0–2 years old, the least answered question among knowledge questions in which 24 (6.7%) of the respondents answered they did not know when a child is holding a small toy in his/her mouth, you should not make him/her cry when trying to take it out.

#### Attitude towards foreign body aspiration management

When we see the results of the attitude questions that were given to the participants, 98.4% of the respondents agreed with foreign body aspiration should need immediate management, 100% thought everybody should know about the first aid management of FBA, 98.4%. It is so, much simple to prevent foreign body aspiration among the communities, 100% disagree that foreign body aspiration does not cause death or life-threatening if not get treated, and 100% of the respondents agreed on it's possible to manage foreign body aspiration at home without taking to the health service, and also 100% of the respondents agreed on we should take the foreign body aspirated patients to the health service as much as possible.

The total score of the attitude was calculated by rating the respondent's correct-full responses on the attitude questions; a total of 337 (93.4%) answered all the questions 6 above the mean level of 5.98, indicating that 93.4% of the respondents have a positive attitude (Table 2).

#### Practice of foreign body aspiration management

Seven questions were given to the participants in order to evaluate the respondents' practices for managing foreign body aspiration,

**Table 2**  
**Factors associated with knowledge of kindergarten teachers towards foreign body aspiration management.**

Variable	Good knowledge	Poor knowledge	COR (95% CI)	AOR (95% CI)	P
Year of experience					
1–5	129	47	1a	1	0.01
6–10	132	16	0.35 (0.11–1.12)	0.37 (0.20–0.66)	
11–15	30	4	0.63 (0.11–3.61)	0.54 (0.21–1.38)	
School type					
Governmental	160	31	1a	1	0.60
Private	131	36	1.24 (0.67–2.30)	1.14 (0.68–1.97)	
Monthly income					
< 3	95	34	1a	1	0.08
≥ 3	196	33	0.62 (0.3–1.2)	0.49 (0.29–0.82)	
Attitude towards foreign body aspiration					
Good attitude	274	9	0.22 (0.08–0.61)	0.17 (0.7–0.4)	0.000
Poor attitude	63	12	1a	1	

<sup>a</sup>factor associated.

AOR, adjusted odds ratio; COR, Crude odds ratio.

including two questions about experience and five questions on decision-making abilities. Among 358 total participants, 128 (35.7%), had an experience to witness a choking episode at least once in their life. Among those, only 30 (23.4%) had provided first aid on spot. A total of 98 study participants who experienced an airway emergency but did not participate in its management stated the following as their reason for not participating: lack of knowledge (21.4%), fear of complications (45.9%), fear of medico-legal issues (15.3%), and fear of communicable disease transmission (17.3%).

Regarding to the question what will you do if you face choking in the school for a total of 358 patients 257 (71.78%) of the participants prefer taking the person choked to the hospital as a first-line action, 33 (8.6%) hitting the back of the neck, 45 (12.5%) slapping the back, 23(6.4%) abdominal thrust, no participant mention chest thrust as a possible solution to perform for choking (Table 2).

### Factors associated with knowledge towards foreign body aspiration management

Year of experience, school type, monthly income, and attitude towards foreign body aspiration management were significant in Bivariate analysis with the *P*-value  $\leq 0.2$ . But, monthly income and school type were not significant and fail to appear in the final multivariate logistic regression model. On the other hand, the year of experience of the teachers and attitude towards foreign body aspiration were significantly associated in multivariate logistic regression model with a *P*-Value of  $\leq 0.05$  (Table 2).

### Discussion

The purpose of this research was to look at kindergarten teachers' knowledge, attitudes, and practices regarding foreign body

aspiration management and several insights were gained from this cross-sectional study. Aspiration of foreign objects into the airway presents an infrequent but potentially lethal clinical scenario. According to the WHO, choking is a major factor in unintentional deaths that occur in both adults and children<sup>[25]</sup>. From 2000 to 2014, roughly 2600 pediatric aspiration events occurred in the American emergency department. Nearly 300 annual deaths occur in the United States population related to foreign bodies<sup>[26]</sup>. Additionally, Ethiopia reported high mortality rates and prolonged morbidity related to foreign body aspiration<sup>[27]</sup>.

According to this study, 81.2% of the kindergarten teachers in the south Gondar zone, Amhara, Ethiopia, have good knowledge of foreign body aspiration management. This result is in line with a study done in Saudi Arabia<sup>[28]</sup>. However, in comparison to a study done in Addis Ababa, Ethiopia, showed that only 37% of the participants had good knowledge towards foreign body aspiration management, which is much lower than the finding of the current study result<sup>[23]</sup>, this difference might be due to the research was done 3 years back by which recently teachers can have an easy media access, previous exposure to choked child and awareness campaign might positively affect their knowledge in addition it might be due to the difference in the knowledge assessment tool we used.

Looking to the specific knowledge questions, this study showed that only 11 (3.1%) of the respondents did not recognize sudden choking is one of the symptoms of foreign body aspiration, in contrary a study done in Toyama, Japan, showed that (27.7%) of the respondent did not know sudden choking is a symptom of foreign body aspiration<sup>[24]</sup>, which is much higher than our study result this difference might be due to the difference in the respondent group which is mothers in Japan.

According to this study, (93%) of kindergarten teachers have a good attitude toward foreign body aspiration management. This finding is in line with the finding of a cross-sectional study done in Addis Ababa, Ethiopia, in which the attitude score is (95.1%) and a study conducted in Saudi Arabia, where participants have overwhelmingly positive attitudes<sup>[23,28]</sup>. This might be secondary to the similarity of the tool we used with the study done in Addis Ababa, Ethiopia.

Years of experience of the teachers and having a good attitude towards foreign body aspiration were significantly associated with having good knowledge of foreign body aspiration management. In a research done in Japan, experience (being a bachelor mother) was associated with poor knowledge. This might be secondary to the mere effect of experience and exposure for the knowledge of the individuals<sup>[24]</sup>. On the contrary, a research undergone in Addis Ababa, Ethiopia, showed that only previous first aid experience was significantly associated<sup>[23]</sup>, but we did not assess this variable in our study because there was no experience of first aid training at all among our study participants.

### Strengths and limitations of the study

1. This study utilized a standardized tool to assess the study's outcome variable.
2. This study is a multicenter study that addresses kindergarten schools in the five woredas of south Gondar zone, which enhances the relevance of the study result.
3. First, because our study was cross-sectional, the temporal relevance of our findings may change over time or with the implementation of large-scale prevention measures.

4. Because this was a self-reported questionnaire, respondents may have chosen socially desired options rather than their actual KAP.
5. Findings of KAP may not be directly applicable to other contexts or the broader population.
6. KAP studies provide a snapshot at a specific point in time.

## Conclusion and recommendation

The result of this research shows that majority participants of this study have good knowledge and attitude towards foreign body aspiration management, but poor practice about it.

Years of experience and having a good attitude towards foreign body aspiration were significantly associated with having good knowledge of foreign body aspiration management.

We recommend researchers to work on this area with high quality different method and to show the best ways, we can reduce the magnitude of the problem.

We recommend the schools to give training for their teachers about foreign body aspiration management.

## Ethical approval

Ethical approval for this study was obtained from Debre Tabor University College of health science ethical review board approval with an IRB number of DTUChS 140/2014 on 22 April 2022.

## Consent

Informed consent was taken from study participants after telling them the aim of the study, benefit, harm of participating in the study, and they have been told as they can withdraw from the study at any step if they feel so. Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request. Written informed consent was obtained from the patient's parents/legal guardian for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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## Author contribution

All authors equally contributed to the study concept or design, data collection, data analysis or interpretation, and writing the paper.

## Conflicts of interest disclosure

The authors declare no conflicts of interest.

## Research registration unique identifying number (UIN)

1. Name of the registry: <http://www.researchregistry.com>
2. Unique identifying number or registration ID: research-registry8995.

3. Hyperlink to your specific registration (must be publicly accessible and will be checked): <https://www.researchregistry.com/browse-theregistry#home/>

## Guarantor

Keder Essa Oumer.

## Data availability statement

The data-set containing all the required data is found at the primary author which can be accessed with a justifiable request.

## Provenance and peer review

Not commissioned, externally peer-reviewed.

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