

# Assessment of Knowledge, Attitude and Practice towards First Aid Management of Choking and Associated Factors among Governmental and Non-Governmental Kindergarten Teachers in Debre Birhan City, North Shoa, Ethiopia

Belachew Tekleyohannes Wogayehu<sup>1\*</sup> and Tadesse Sisay<sup>2</sup>

<sup>1</sup>Department of Environmental Health, Debre Birhan Health Science College, Debre Birhan, Ethiopia

<sup>2</sup>Department of Nursing, Debre Birhan Health Science College, Debre Birhan, Ethiopia

## Abstract

**Background:** Due to a foreign substance blocking the throat or airway, choking induces tissue damage and cell death within 4-6 minutes especially in children under the age of 4. Few studies have been conducted in Ethiopia on assessing kindergarten teacher's knowledge, attitude and practice about first aid management of choking which is paramount.

**Objective:** To assess knowledge, attitude and practice towards first aid management of choking and associated factors among governmental and non-governmental kindergarten teachers in Debre Birhan city, North Shoa, Ethiopia, 2023.

**Methods:** An institution-based cross-sectional study was conducted in Debre Birhan city, North Shoa, Ethiopia from April to May, 2023. A total of 352 kindergarten teachers was selected in Debre Birhan city for the study. Study participants were selected by stratification of schools in to governmental and non-governmental followed by simple random sampling technique. Data was collected using a structured questionnaire adapted from different sources. Collected data was entered into Epi Data version 4.6 and analyzed by using STATA version 14. Multivariable binary logistic regression model was employed to identify associated factors of knowledge, attitude and practice of kindergarten teachers.

**Results:** A total of 341 kindergarten teachers were involved in the study with a response rate of 96.8%. About 55.7% (95% CI: 50.42-61.02) and 61% (95% CI: 54.76-65.3) of kindergarten teachers had adequate knowledge and positive attitude towards first aid management of choking. Only 46.9% (95% CI: 40.7-51.4) of kindergarten teachers had good practice on first aid management of choking. Long work experience (AOR=6.9, 95% CI: 2.48-18.9), private school (AOR=2.53, 95% CI: 1.54-4.15) and first aid training (AOR=4.41, 95% CI: 2.3-8.45) were determinant factors of knowledge. Private school (AOR=0.58, 95% CI: 0.36-0.95) and good practice (AOR=1.8, 95% CI: 1.12-2.95) were determinant factors of attitude. Long work experience (AOR=3.3, 95%CI: 1.58-6.7), private school (AOR=1.7, 95% CI: 1.12-2.86) and positive attitude (AOR=2.06, 95% CI: 1.3-3.3) were determinant factors of practice of kindergarten teachers.

**Conclusions and recommendation:** Knowledge and attitude of kindergarten teachers towards first aid management of choking is high with low practice. Long work experience, private school, first aid training, positive attitude and good practice were determinant factors. Providing first aid training for kindergarten teachers should be implemented to alleviate the problem.

**Keywords:** Knowledge • Attitude • Practice • Kindergarten teachers • Choking • First aid

**\*Address for Correspondence:** Belachew Tekleyohannes Wogayehu, Department of Environmental Health, Debre Berhan Health Science College, Debre Berhan, Ethiopia, Tel: 251967510754; E-mail: belachewtekleyohannes@gmail.com

**Copyright:** © 2025 Wogayehu BT, et al. This is an open-access article distributed under the terms of the creative commons attribution license which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

**Received:** 05 September, 2024, Manuscript No. JBHE-24-147474; **Editor assigned:** 09 September, 2024, PreQC No. JBHE-24-147474 (PQ); **Reviewed:** 24 September, 2024, QC No. JBHE-24-147474; **Revised:** 11 August, 2025, Manuscript No. JBHE-24-147474 (R); **Published:** 18 August, 2025, DOI: 10.37421/2380-5439.2025.13.181

**Abbreviations:** AOR: Adjusted Odds Ration; DBC-DOE: Debre Birhan City-Department of Education; EMS: Emergency Medical Service; VIF: Variance Inflation Factor

## Introduction

Choking is defined as the disruption of breathing caused by the obstruction of the upper airways by food or other foreign substances [1]. It is one of the leading causes of injury-related morbidity and mortality, especially for children under the age of 4 years [2]. It is a true emergency constituting a life-threatening threat, and everyone nearby the victim must take immediate action to protect their lives [3]. First aid is a basic procedure that anyone, not just medical experts, can use to assist those who are suffering or in danger of dying [4]. Choking and foreign body aspiration are preventable conditions, thus anyone can save the life of a person experiencing cardiac arrest if they have the knowledge and necessary training [5,6]. The majority of urgent or emergency circumstances take place in school. It takes place in an environment where children may suffer accidents, and the teacher is likely to be present and take action. Nevertheless, due to their education-focused training, teachers lack the self-confidence and credentials needed to administer first aid procedures [7,8]. Globally, 973 million persons were injured in 2013, 77.9% of them required some kind of care due to unintentional accidents [9]. Nowadays, children aged (0–14) make up roughly 25% of the global population and up to 31% of the people in low and middle-income countries [10]. Study conducted in Saudi Arabia revealed that only 19.6% and 54.9% of school teachers had good level of knowledge and practice regarding first aid respectively. But this study did not assess the attitude of teachers on first aid [11,12].

Moreover, study conducted in Iraq [13] and Malaysia [14] showed that 95% and 77.4% of kindergarten teachers had good knowledge of first aid respectively. However, this study did not assess the practice of teachers towards first aid which is paramount.

Additional study conducted in United Arab Emirates (UAE) [15] revealed that, about 45.8% and 67% of kindergarten teachers had good knowledge and favorable level of attitude towards basic first aid management of choking respectively and about 71.5% of teachers had favorable attitude about basic first aid [16]. In Ethiopia, it is anticipated that by 2030, children under the age of 5 will experience an increase in injury-related mortality from 10,697 to 11,989, while deaths among children aged 0 to 14 will rise to 30,364 from 10,697 in 2015 [17]. Majority of studies conducted in Ethiopia did not assess specifically the knowledge, attitude and practice of kindergarten teachers and its associated factors regarding first aid management of choking.

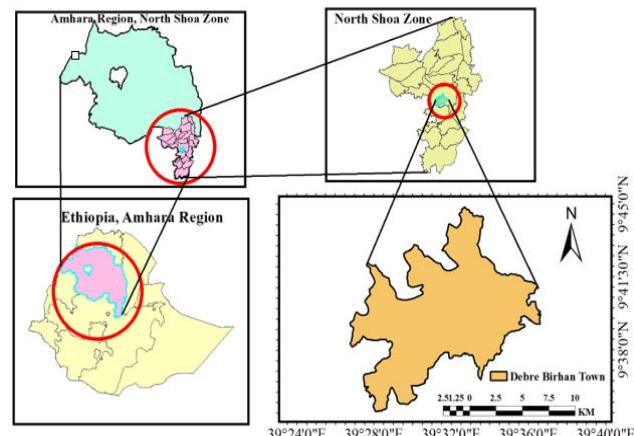
In Ethiopia, kindergarten schools have no permanently assigned health professionals such as medical doctor, nurse and other who were give first aid service for any health related problems. As a result of this, teachers are the first responsible person who were give the primary first aid service for any injuries that happens on children's. Moreover, Emergency Medical Service (EMS) for any medical problems

that happens in schools prior to hospital by school teachers is a must for minimizing mortality and morbidity of school children's [18]. Furthermore, to the best of the investigators knowledge, there was no studies conducted in Debre Birhan to assess knowledge, attitude and practice of kindergarten teachers specifically towards first aid management of choking. Therefore, this study aimed to assess knowledge, attitude and practice towards first aid management of choking and associated factors among kindergarten teachers in Debre Birhan city.

## Materials and Methods

### Study setting

Debre Berhan is a city in the central Ethiopian highlands at an altitude of 2,840 m in North Shewa zone of Amhara region, about 130 km northeast of Addis Ababa. Debre Berhan city was an early capital of Ethiopia and afterward, with Ankober and Angolalla, was one of the capitals of the kingdom of Shewa. The city had a total population of 160,408 living in five sub-cities in 2020 G.C; 73,929 were males and 86,479 females. The city has latitude and longitude of 9°34'0"N to 9°46'30"N and 39°27'0"E to 39°37'0"E respectively. The average annual temperatures during the day and night are 20.7°C and 8.2°C. Average annual rainfall is 1219 mm and the mean relative humidity is 31% (Figure 1).



**Figure 1.** Map of the study area.

### Study design and period

An institution-based cross-sectional study was conducted from April to May, 2023.

### Source population, study population, inclusion and exclusion criteria

All kindergarten teachers' working in both governmental and non-governmental schools in the city were source population whereas

selected kindergarten teachers' working in both governmental and non-governmental schools in the city were study population. Teachers in both governmental and private schools were included in the study. Moreover, teachers who were seriously ill during the study period and who were attending off site training outside the school were excluded from the study. In addition to this, directors of the school were excluded from the study [19].

### Sample size determination and sampling procedure

The sample size for this study was computed by using single population proportion formula for each variable (i.e., knowledge, attitude and practice). Sample size for an associated factor was also calculated by using Epi Info version 7.2 software. Since calculated sample size using factor for attitude gave adequate result than the other, the final sample size for this study was taken as 352.

### Sampling techniques and procedures

Total number of kindergarten schools (both governmental and non-governmental) found in the city were obtained from the city administration bureau of education. Then, schools were stratified in to governmental and non-governmental. Then, based on the recommendation of sampling, 30% of schools were selected from both governmental and non-governmental schools by simple random sampling technique (i.e., from the total of 47 non-governmental kindergarten schools, 14 schools and from the total of 20 governmental schools, 6 schools were selected). Then after, proportional allocation was conducted to get the required number of kindergarten teachers from both governmental and non-governmental schools. List of all kindergarten teachers' in the city were obtained from the city administration bureau of education. Finally, using list of kindergarten teachers' as a sampling frame, required number of kindergarten teachers' were selected by using simple random sampling technique [20].

### Data collection tools and techniques

Data was collected using structured questionnaire adapted from different sources with some modification through face to face interview. The questionnaire basically has four parts. Part I consists of questions about socio-demographic characteristics of teachers, Part II consists of eleven questions to assess knowledge of teachers towards first aid management of choking, Part III consists of seven questions to assess attitude of teachers towards first aid management of choking and Part IV consists of sixteen questions to assess practice of teachers towards first aid management of choking. Six data collectors with profession of BSc nurse, and two supervisors (Senior BSc nurse who had special training on first aid) were participated in this study.

### Outcome and explanatory variables

Outcome variables were of three types:

- Knowledge
- Attitude
- Practice

### Explanatory variables fell into two categories

**Socio-demographic factors:** Sex, age, marital status, religion, educational status, professional background and school type

**Occupation factors:** Work experience and first aid training.

### Operational definitions

**First aid:** It is defined as emergency care or treatment given to an ill or injured person before regular medical aid can be obtained.

**Choking first aid:** It is the immediate care given to choking person until full medical treatment is available.

**Adequate knowledge:** Participants who score greater than the mean score out of 11 knowledge questions will be considered as having adequate knowledge.

**Inadequate knowledge:** Participants who score less than or equal to the mean score out of 11 knowledge assessment questions were be considered as having inadequate knowledge.

**Positive attitude:** Participants who score greater than the mean score out of 7 attitude assessment questions were be considered as having positive attitude.

**Negative attitude:** Participants who score less than or equal to the mean score out of 7 attitude questions were be considered as having negative attitude.

**Good practice:** Participants who score greater than the mean score out of 16 practice assessment questions were been considered as having good practice.

**Poor practice:** Participants who score less than or equal to the mean score out of 16 practice assessment questions were be considered as having poor practice.

### Data management and analysis

At the end of each day of data collection, the data was verified for completeness and missing values. Data obtained from the face to face interview on knowledge, attitude and practice of teachers about first aid management of choking were entered in to Epi-Data version 4.6 before being exported into STATA version 14 for descriptive and factor analysis. Then after, data was exported in to STATA version 14 software. Once data was exported, it was checked for any missing values. Moreover, basic quality assurance measures were performed using descriptive statistics results from cross-tabulations (contingency coefficient) and frequency distributions before doing statistical analysis. After that, categorization and re-categorization of variables was conducted for both continuous and categorical independent variables. Finally, after ensuring the quality of data, descriptive statistics was employed to summarize socio-demographic characteristics of the study participants using frequency distribution that was displayed using tables.

The Hosmer and Lemeshow test was used to determine the model's overall goodness. P value of greater than 0.05 ( $P>0.05$ ) implies a strong fit to the data and overall model fitness. To test multicollinearity of independent variables, the Variance Inflation Factor (VIF) was utilized. Value of  $VIF<10$  indicates no problem of multicollinearity between independent variables. Knowledge of kindergarten teachers about first aid was measured using eleven knowledge questions. Then after, the knowledge of teachers was dichotomizing in to adequate knowledge and inadequate knowledge. In this case, a score of greater than the mean value to knowledge related questions was considered as having adequate knowledge, while less than or equal to the mean value indicated as having inadequate knowledge.

Assessment of teachers' attitude towards first aid was conducted by using four point Likert scale as individuals responding strongly agree with value of 4, agree with value of 3, disagree with value of 2 and strongly disagree with value of 1. Then after, the score was dichotomized into positive and negative attitude for each question. Practice of kindergarten teachers about first aid was measured using sixteen practice questions. Then after, the practice of teachers was dichotomize in to good practice and poor practice. Analysis of data with respect to factors affecting knowledge, attitude and practice of teachers was conducted depending on the nature of variables. Bivariable binary logistic regression model was employed to determine the Crude Odds Ratio (COR) and 95% CI for the association between dependent and independent variables for knowledge, attitude, and practice of teachers. After that, those variables that had  $P<0.25$  in the bivariable binary logistic regression was considered as candidate variables to be entered into multivariable binary logistic regression to adjust the possible effect of confounders. Based on the result of Adjusted Odds Ratio (AOR) at 95% CI, variables having  $P<0.05$  was considered as statistically significant predictors of knowledge, attitude and practice of teachers about first aid management of choking.

### Data quality assurance

To ensure data quality, structured questionnaire adapted from different sources was used. The questionnaire was translated from English to Amharic by language experts (in to local language commonly spoken by communities) and then back again to English to ensure its consistency. All data collectors and supervisors had got two days of training by the principal investigator and performed practical exercises to be familiar with the data collection tool. Before the actual data collection, content validity was conducted by senior nurse.

Then after, pre-test was conducted among 10% of the total sample size in Shewarobit town through random selection of teachers. Internal consistency of items in the questionnaire was checked by Cronbach's alpha ( $\alpha$ ). Cronbach's alpha value greater than 0.7 ( $\alpha>0.7$ ) was the acceptable value for the reliability of the questionnaire. Two senior Nurses who have special training on first aid were assigned in this study as a supervisor for data collection to monitor the data collection process regularly on the questionnaire to assure data quality. The questionnaire was verified on a regular basis for completeness and consistency by each data collector. Incomplete data due to data collector's problems were recollected again and incomplete data due to withdrawal of study participants from the interview, absence of study participants after three times re-visit and unwillingness of study participants for the study was considered as non-response. Finally, all the collected data from the interview was cleaned and cross-checking was made before analysis.

### Ethical considerations

Ethical clearance was taken from Ethical Review Committee (ERC) of Debre Birhan University Asrat Woldeyes campus, College of Medicine and Health Sciences. An official letter was written to Debre Birhan city administration, Education bureau to grant permission to undertake a study. Permission letter was obtained from the above sectors requesting facilitation to conduct a research. The aim and method of the study and importance of their participation was clearly stated to each study participants. The study participants who fulfilled the criteria for the study and agreed to participate was given an Amharic written consent and signed before data collection started. The respondents were informed that they have full right to withdraw at any time when they feel discomfort. Confidentiality of information given by each respondent was properly maintained by avoiding possible identifiers such as name of the study participants.

## Results

### Socio-demographic and occupational characteristics of kindergarten teachers

In this study, out of 352 kindergarten teachers selected for this study, 341 kindergarten teachers were participated for this study with a response rate of 96.8%. Out of 341 kindergarten teachers participated in this study, majority, (94.7%) were female (Table 1).

Variables		Frequency	Percentage (%)
Sex	Female	323	94.7
	Male	18	5.3
Age (years)	20-24	100	29.3
	25-29	212	62.17

	30-34	26	7.62
		3	0.88
Religion	Orthodox	166	48.7
	Protestant	84	24.6
	Muslim	61	17.9
	Catholic	30	8.8
Marital status	Single	92	26.9
	Married	244	71.6
	Divorced	5	1.5
Educational status	Certificate	3	0.9
	Diploma	317	92.9
	Degree	21	6.2
Professional background	Natural science	55	16.13
	Social science	38	11.14
	Common course	248	72.73
School type	Private	205	60.12
	Governmental	136	39.88
Work experience (years)	1-5	156	45.75
	6-10	137	40.18
	≥11	48	14.08
First aid training	Yes	77	22.6
	No	264	77.4

**Table 1.** Socio-demographic and occupational characteristics among kindergarten teachers in Debre Birhan city, April 15-May 15, 2023 (n=341).

### Knowledge of kindergarten teachers towards first aid management of choking

Out of the total respondents, 190 (55.7%) (95% CI: 50.42-61.02) of kindergarten teachers had adequate level of knowledge towards first aid management of choking whereas the remaining 151 (44.3%) of

kindergarten teachers had inadequate knowledge towards first aid management of choking. In this study, majority (95%) of kindergarten teacher had adequate knowledge on the universal sign of choking and about 63 (18.5%) of kindergartens teacher know about factors that lead to choking among preschool children (Table 2).

Question	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Universal sign of choking	324	95	17	5
Factors leading to pre-school children	63	18.5	278	81.5
Golden time for providing choking first aid	67	19.7	274	80.3
Symptoms of complete air way obstruction	187	54.8	154	45.2
Symptoms of partial air way obstruction	218	63.9	123	36.1

Choking induced by aspiration of fluid	45	13.2	296	86.8
--	----	------	-----	------

**Table 2.** Kindergarten teacher's knowledge towards first aid management of choking in Debre Birhan city, April 15-May 15, 2023 (n=341).**Attitude of kindergarten teachers towards first aid management of choking**

Out of the total respondents, 208 (61%) (95% CI: 54.76-65.3) of kindergarten teachers had positive attitude towards first aid management

Question	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%
Choking should need immediate management	334	97.9	7	2.1	0	0	0	0
Everybody should know about first aid management of choking	319	93.6	16	4.6	5	1.5	1	0.3
Choking does not cause death or life threatening condition even if not treated	7	2.05	6	1.76	10	2.93	318	93.26
It is possible to manage choking at the school without taking a victim to the health institution	14	4.11	91	26.69	232	68.04	4	1.17
We should sweep our fingers blindly into throat of choked victim and take him/her to the health institution as soon as possible	72	21.11	112	32.84	130	38.12	27	7.92
You must not provide choking first aid without knowledge	53	15.54	144	42.23	139	40.76	5	1.47
If choking first aid is not given within golden time, it may lead to death	336	98.53	2	0.59	1	0.29	2	0.59

**Table 3.** Kindergarten teacher's attitude towards first aid management of choking in Debre Birhan city, April 15-May 15, 2023 (n=341).**Practice of kindergarten teachers towards first aid management of choking**

Out of the total respondents, 160 (46.9%) (95% CI: 40.7-51.4) of kindergarten teachers had good practice towards first aid management of choking (Table 4).

Question	Response	n	%
Occurred choking in presence outside school	Yes	140	41

	No	201	59
Provided choking first aid (n=140)	Yes	134	95.7
	No	6	4.3
Occurred choking in presence inside school	Yes	182	53.4
	No	159	46.6
Provided choking first aid (n=182)	Yes	162	89
	No	20	11
Action taken initially for a 4 year old children who develop difficulty of breathing and speaking with complete obstruction of airway and food is not visible	Giving him a glass of water	118	34
	Do finger sweep to identify and remove object	49	14
	Hitting at the back of neck	35	10
	Abdominal thrust	0	0
	Slapping at the back	139	40
Number of times for conducting 'Slapping at the back'	3 times	152	44.6
	2 times	55	16.13
	5 times	126	36.95
	10 times	8	2.35
Location of the body for performing 'Slapping at the back' and 'abdominal thrust'	Between breast bone and the base of the ribs	25	7.3
	Below the shoulder and at the umbilicus	205	60.1
	Between shoulder blades and the base of the ribs	92	26.98
	Just below the neck and the base of ribs	9	2.64
	I don't know	10	2.93
Actions initially done for child who had choking and coughing	Chest thrust	6	1.76
	Slapping at the back	317	92.96
	Giving a glass of water	16	4.69
	Abdominal thrust	0	0
	Encourage him to cough and call ambulance	2	0.59
Actions taken in school for choked student who had difficulty of breathing and speaking and whenever you provide choking first aid, his condition worsen and suddenly he lost consciousness and breathless	Slapping at the back	322	94.43
	Give two rescue breathing and do CPR	16	4.69
	Do CPR	1	0.29
	Contact responsible school authority	1	0.29
	I don't know what to do	2	0.59
Actions taken for choked KG teacher by food and he can't speak, breath or cough up	Give him a glass of water	80	23.46
	Give back slaps	238	69.79
	Do abdominal thrusts	14	4.11
	Put your finger down on his throat	0	0
	Chest thrust	0	0
	'Give back slaps' and 'Do abdominal thrusts' are answers	9	2.64

Actions taken 6 years old girl suffered from choking while eating, she can be able to speak	Encourage her to cough	298	87.39
	Help her to buckle her throat	0	0
	Give her a water to drink	43	12.61
	Give her a peace of injera	0	0

**Table 4.** Kindergarten teacher's practice towards first aid management of choking in Debre Birhan city, April 15-May 15, 2023 (n=341).

### Factors associated with knowledge of kindergarten teachers towards first aid management of choking

First bivariable binary logistic regression was employed to identify candidate variables for multivariable binary logistic regression at p value of less than 0.25. In bivariable binary logistic regression, variables such as age, work experience, school type, first aid training, attitude and practice of kindergarten teachers were significantly associated with knowledge of kindergarten teachers towards first aid management of choking at  $p<0.25$  making them candidate variables for multivariable binary logistic regression. But in multivariable binary logistic regression, work experience, school type and first aid training were significantly associated with knowledge of kindergarten teachers

towards first aid management of choking at P value of less than 0.05 ( $p<0.05$ ) provided that the effect of other variables were adjusted. Kindergarten teachers who had work experience between 6-10 years were 52% less likely to have adequate knowledge on first aid management of choking as compared to those kindergarten teachers who had work experience between 1-5 years ( $AOR=0.48$ , 95% CI: 0.28-0.8) provided that the effect of other variables were adjusted. Again, kindergarten teachers who had work experience of  $\geq 11$  years were 6.9 times more likely to have adequate level of knowledge as compared to those kindergarten teachers who had work experience between 1-5 years ( $AOR=6.9$ , 95% CI: 2.48-18.9) provided that the effect of other variables were adjusted (Table 5).

Variables	Knowledge of KG teachers		COR (95% CI)	AOR (95% CI)	P-value
	Adequate knowledge	Inadequate knowledge			
Age (years)	20-24	61	39	1	1
	25-29	118	94	0.8 (0.49-1.3)	–
	30-34	9	17	0.33 (0.13-0.83)	–
	35	2	1	1.27 (0.11-14.5)	–
Work experience (years)	1-5	85	71	1	1
	6-10	62	75	0.69 (0.43-1)	0.48 (0.28-0.8) $\leq 0.000^*$
	$\leq 11$	43	5	7.18 (2.7-19.1)	6.9 (2.48-18.9) $\leq 0.000^*$
School type	Private	129	76	2.08 (1.34-3.24)	2.53 (1.54-4.15) $\leq 0.000^*$
	Governmental	61	75	1	1
First aid training	Yes	58	19	3.05 (1.72-3.40)	4.41 (2.3-8.45) $\leq 0.000^*$
	No	132	132	1	1
Attitude	Negative	68	65	1	1
	Positive	122	86	1.35 (0.87-2.1)	1.54 (0.93-2.53) 0.092
Practice	Good	93	67	1.2 (0.78-1.84)	0.84 (0.52-1.38) 0.501
	Poor	97	84	1	1

**Note:** 1: Reference category, \*: Significant level at  $p<0.05$ , COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio

**Table 5.** Bi-variable binary and multivariable binary logistic regression analysis of factors associated with kindergarten teacher's knowledge towards first aid management of choking in Debre Birhan city, April 15-May 15, 2023.

## Factors associated with attitude of kindergarten teachers towards first aid management of choking

In bivariable binary logistic regression, variables such as religion, professional background, work experience, school type, knowledge and practice of kindergarten teachers were significantly associated with the attitude of kindergarten teachers towards first aid management of choking at  $p<0.25$  making them candidate variables for multivariable binary logistic regression. But in multivariable binary logistic regression, school type and practice were significantly

associated with attitude of kindergarten teachers towards first aid management of choking at  $P$  value of less than 0.05 ( $p<0.05$ ) provided that the effect of other variables were adjusted. Kindergarten teachers who had worked in private school were 42% less likely to have positive attitude on first aid management of choking as compared to those kindergarten teachers who had worked in governmental school ( $AOR=0.58$ , 95% CI: 0.36-0.95) provided that the effect of other variables were adjusted (Table 6).

Variables	Attitude of KG teachers		COR (95% CI)	AOR (95% CI)	P-value
	Positive attitude	Negative attitude			
Religion	Protestant	49	35	0.81 (0.34-1.92)	-
	Orthodox	92	74	0.72 (0.32-1.61)	-
	Muslim	48	13	2.14 (0.82-5.59)	-
	Catholic	19	11	1	-
Professional background	Natural science	26	29	0.5 (0.28-0.9)	-
	Social science	23	15	0.86 (0.43-1.73)	-
	Common course	159	89	1	-
Work experience (years)	1-5	89	67	1	-
	6-10	84	53	1.19 (0.75-1.9)	-
	$\geq 11$	35	13	2.03 (0.99-4.13)	-
School type	Private	118	87	0.69 (0.44-1.09)	0.032*
	Governmental	90	46	1	1
Knowledge	Adequate	122	68	1.36 (0.88-2.10)	-
	Inadequate	86	65	1	-
Practice	Good	112	48	2.1 (1.32-3.23)	1.8 (1.12-2.95)
	Poor	96	85	1	0.016*

**Note:** 1: Reference category, \*: Significant level at  $p<0.05$ , COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio

**Table 6.** Bi-variable binary and multivariable binary logistic regression analysis of factors associated with kindergarten teacher's attitude towards first aid management of choking in Debre Birhan city, April 15-May 15, 2023.

## Factors associated with practice of kindergarten teachers towards first aid management of choking

First bivariable binary logistic regression was employed to identify candidate variables for multivariable binary logistic regression at  $p$  value of less than 0.25. In bivariable binary logistic regression, variables such as sex, marital status, work experience, school type, and attitude of kindergarten teachers were significantly associated with the attitude of kindergarten teachers towards first aid management of choking at  $p<0.25$  making them candidate variables for

multivariable binary logistic regression. But in multivariable binary logistic regression, work experience, school type and attitude were significantly associated with practice of kindergarten teachers towards first aid management of choking at  $P$  value of less than 0.05 ( $p<0.05$ ) provided that the effect of other variables were adjusted. Kindergarten teachers who had work experience of  $\geq 11$  years were 3.3 times more likely to have good practice about first aid management of choking as

compared to those kindergarten teachers who had work experience between 1-5 years ( $AOR=3.3$ , 95% CI: 1.58-6.7) provided that the effect of other variables were adjusted. Kindergarten teachers who had worked in private school were 1.7 times more likely to have good

practice about first aid management of choking as compared to those kindergarten teachers who had worked in governmental schools ( $AOR=1.7$ , 95% CI: 1.12-2.86) provided that the effect of other variables were adjusted (Table 7).

Variables	Practice of KG teachers		COR (95% CI)	AOR (95% CI)	P-value
	Good practice	Poor practice			
Sex	Female	155	168	1	-
	Male	5	13	0.42 (0.15-1.2)	-
Marital status	Single	41	51	0.2 (0.02-1.87)	-
	Married	115	129	0.2 (0.02-2.0)	-
	Divorced	4	1	1	-
Work experience (years)	1-6	63	93	1	1
	6-10	63	74	1.26 (0.79-1.99)	1.36 (0.83-2.2)
	≥ 11	34	14	3.6 (1.8-7.22)	3.3 (1.58-6.7)
School type	Private	106	99	1.63 (1.04-2.52)	1.7 (1.12-2.86)
	Governmental	54	82	1	1
Attitude	Positive	112	96	2.1 (1.32-3.23)	2.06 (1.3-3.3)
	Negative	48	85	1	1

**Note:** 1: Reference category, \*: Significant level at  $p<0.05$ , COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio

**Table 7.** Bi-variable binary and multivariable binary logistic regression analysis of factors associated with kindergarten teacher's practice towards first aid management of choking in Debre Birhan city, April 15-May 15, 2023.

## Discussion

In the current study, it was found that about 55.7% (95% CI: 50.42-61.02) of kindergarten teachers were found to have adequate knowledge towards first aid management of choking. The finding of this study was in line with study conducted in Ethiopia (59.7%) and Spain (57%). However, the finding of the present study was higher than study conducted in Ethiopia (37%), Egypt (17.5%), South Africa (12.1%), Turkey (15.5%), United Arab Emirates (45.85%) and India (4.1%). The difference might be because of the disparity in study setting and sample size. The finding of the present study was relatively lower than study conducted in Ethiopia (71%), Saudi Arabia, Qassim (87.6%), Malaysia (77.4%) and Greece (63.8%). The inconsistency might be due to the variation in previous first aid training in which only 22.6% of kindergarten teachers in the current study had previous first aid training about first aid management of choking.

The finding of the present study also revealed that about 61% (95% CI: 54.76-65.3) of kindergarten teachers were found to have positive attitude towards first aid management of choking. Most kindergarten teachers in this study strongly agree about the need of immediate management of choking and everybody should know about first aid management of choking. The finding was relatively comparable with the study conducted in Greece. However, the result of

the present study was lower than the study conducted in Ethiopia (95.1%), Democratic Republic of Congo, Kinshasa (91.3%), United Arab Emirates (67%), Pakistan (94.4%), Saudi Arabia (91.4%) and Spain (95%). The observed variation might be due to the difference in previous first aid training in which only 22.6% of kindergarten teachers in the current study had previous first aid training about first aid management of choking. But about 45.5% of kindergarten teachers had received first aid training about first aid management of choking in Ethiopia and also about 79.9% and 33.8% of teachers had received first aid training in Saudi Arabia and United Arab Emirates respectively.

Moreover, the result of the current study also revealed that 46.9% (95% CI: 40.7-51.4) of kindergarten teachers had good practice on first aid management of choking. The finding of this study is consistent with the study conducted in Ethiopia and Egypt in which about 46.3% and 50% of teachers had good practice on first aid management respectively. However, the finding of the current study was higher than the study conducted in Saudi Arabia, Riyadh (31.8%), Palestine (24.1%) and Pakistan (21.6%). The variation might be due to the difference in study participants in which the present study was conducted in kindergarten teachers whereas the former study was conducted in teachers other than kindergarten teachers and knowledge level. Moreover, the result of the present study was lower than the study

conducted in Ethiopia, Gondar (85.8%), Indonesia (78.8%), and India, Mysore (54.6%). The possible justification for the difference might be due to the difference in previous first aid training in which only 22.6% of kindergarten teachers had first aid training about first aid management of choking. In addition to this, the difference might be due to educational level of teachers in which only 6% of teachers in the current study had completed with degree whereas about 64.8% of teachers completed with degree in Ethiopia.

Kindergarten teachers who had work experience of  $\geq 11$  years were almost 7 times more likely to have adequate level of knowledge as compared to those kindergarten teachers who had work experience between 1-5 years. The finding was consistent with the study conducted in Ethiopia in which teachers who had more than 10 years' work experience had about 4 times more knowledge than teachers with less than 5 years' work experience. This might be as the number of years that teachers stay in school increase, the probability of getting the chance of first aid training increase and similarly as the length of stay increase, the probability of facing repeated cases of choking increase which leads to have adequate knowledge on first aid management of choking. Kindergarten teachers who had worked in private school were 2.53 times more likely to have adequate level of knowledge as compared to those kindergarten teachers who had worked in governmental schools. The result was in agreement with the study conducted in Ethiopia in which kindergarten teachers teaching in private kindergarten had about sixteen times more chance of being knowledgeable about first aid than those who teach in government kindergartens. The reason for this might be teachers who had worked in private school who received first aid training were higher than those teachers who had worked in governmental school who received first aid training in this study. The finding also showed that kindergarten teachers who had previous first aid training were 4.41 times more likely to have adequate level of knowledge as compared to those kindergarten teachers who had no previous first aid training. The finding was similar with the study conducted in Ethiopia in which kindergarten teachers with previous first aid training experience were about 2.9 times more knowledgeable than those who had not it. The finding of the present study was also in agreement with the study conducted in India and Iran. The reason for this might be having training about first aid increases the acquisition of knowledge towards first aid.

The result of the study revealed that kindergarten teachers who had worked in private school were 42% less likely to have positive attitude on first aid management of choking as compared to those kindergarten teachers who had worked in governmental school. This might be because private schools are business-oriented, they did not focus on fulfillment of good standards and structure of the school including first aid kits and there is no strict structure that may assist teachers to develop positive attitude especially on first aid management of choking. The finding of this study also revealed that kindergarten teachers who had good practice were almost 2 times more likely to have positive attitude about first aid management of choking as compared to those kindergarten teachers who had poor practice. The possible justification for this might be practice give more information on both the severity of choking and the need of immediate management of choking which increase the attitude of teachers towards first aid management of choking.

The present study showed that, work experience, school type and attitude were significantly associated with practice of kindergarten teachers about first aid management of choking. The result revealed that kindergarten teachers who had work experience of  $\geq 11$  years were 3.3 times more likely to have good practice about first aid management of choking as compared to those kindergarten teachers who had work experience between 1-5 years. The finding of the present study was also in agreement with the study conducted in India. The possible justification for this might be the long stay in teaching, the higher the probability to adapt the work environment and to develop and share good practical experience on first aid. Again, kindergarten teachers who had worked in private school were almost 2 times more likely to have good practice about first aid management of choking as compared to those kindergarten teachers who had worked in governmental schools. The reason for this might be kindergarten teachers in this study who had worked in private school had adequate knowledge than those teachers who had worked in governmental school which leads to have good practice. Moreover, kindergarten teachers who had positive attitude were 2 times more likely to have good practice about first aid management of choking as compared to those teachers who had negative attitude. This might be in this study, kindergarten teachers who had positive attitude and received first aid training were high in number which tend to develop good practice as a result of first aid training.

## Conclusion

The knowledge and attitude of kindergarten teachers towards first aid management of choking was high whereas the practice was low. Long work experience, working in private school and having previous first aid training were associated factors of knowledge of kindergarten teachers towards first aid management of choking. Working in private school and having good practice were associated factors of attitude of kindergarten teachers towards first aid management of choking. Long work experience, working in private school and having positive attitude were associated factors of practice of kindergarten teachers towards first aid management of choking.

## Limitation of the Study

Even though the study has its own strength, similarly the study has some limitations. Due to cross-sectional study design used in this study, cause and effect relationship was not assessed. In addition to this, due to lack of adequate investigations/or studies especially on first aid management of choking limit comparison with other study.

## Acknowledgments

The authors express their gratitude to the respondents of this study who gave valuable information for this study. We are also grateful to the data collectors, the supervisors, and the Debre Berhan City Administration Education Bureau who provided permission letters for the study.

## Consent for Publication

Not applicable.

## Availability of data and materials

The datasets generated and/or analyzed during the current study is not publicly available due to study participant privacy consent agreements but are available from the corresponding author on reasonable request.

## Competing Interests

The authors declare that they have no competing interests.

## Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

## Authors' Contributions

BTW and TK contributed to the conception and design of the study. BTW conducted the investigation. BT and TK performed data management and analysis. BTW wrote and edited the manuscript. Both authors contributed to the article and approved the submitted version.

## References

- Boada, Imma, Antonio Rodriguez Benitez, Santiago Thió-Henestrosa, and Josep Soler. "A serious game on the first-aid procedure in choking scenarios: Design and evaluation study." *JMIR Serious Games* 8 (2020): e16655.
- AlAteeq, Mohammed A, Abdullah K Alsulayhim, Fahad AlHargan, and Ibrahim S. AlSamaani, et al. "Morbidity patterns of non-traffic unintentional injuries among the pediatric age group attending the emergency department at king Abdul-Aziz medical city, Riyadh, Saudi Arabia." *Cureus* 12 (2020).
- Hamadneh, Shereen, Liqaa Raffee, Jehan Hamadneh, and Manal Kassab, et al. "Knowledge and attitudes toward infant BLS among babysitters and nursemaids working in rural Northwest Jordan." *J Emerg Med Trauma Acute Care* 2020 (2020): 7.
- Anmut W, M Mesele, and T Tekalign. "Knowledge, attitude and practice towards first aid among kindergarten teachers of Jimma town, south west, Ethiopia, 2017." *J Emerg Med Prim Care RD-EMP* 10008 (2019).
- Ganfure, Gemechu, Gemechu Ameya, Ababe Tamirat, and Bikila Lencha, et al. "First aid knowledge, attitude, practice, and associated factors among kindergarten teachers of Lideta sub-city Addis Ababa, Ethiopia." *PLoS One* 13 (2018): e0194263.
- Haagsma, Juanita A, Nicholas Graetz, Ian Bolliger, and Mohsen Naghavi, et al. "The global burden of injury: Incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013." *Inj Prev* 22 (2016): 3-18.
- Charalambous, Charalambos. "Investigation of the Teacher's Knowledge and Attitude towards Providing First Aid in the School Environment." *Int J Caring Sci* 14 (2021): 1468-1472.
- Al-Tameemi, Hussein MA, and Fatima W. Khudair. "Knowledge and attitudes of primary school teachers toward first aid in Al-Najaf Al-Ashraf City." *Int J Curr Res Acad Rev* 4 (2016): 64-79.
- Midani, Omar, Tala Tillawi, Ahmad Saeer, and Mohammad Bakir Hammami, et al. "Knowledge and attitude toward first aid: A cross-sectional study in the United Arab Emirates." *Avicenna J Med* 9 (2019): 1-7.
- Mirwanti, Ristina, Aan Nuraeni, Ayu Prawesti, and Etika Emaliyawati, et al. "Attitude and knowledge of elementary school teachers towards first aid on emergency condition in children." *Int Conf Disaster Manage Infect Control* 17 (2017): 1-10.
- Li, Qingfeng, Olakunle Alonge, Collene Lawhorn, and Yirga Ambaw, et al. "Child injuries in Ethiopia: A review of the current situation with projections." *PLoS One* 13 (2018): e0194692.
- Workneh, Belayneh Shetie, Enyew Getaneh Mekonen, and Mohammed Seid Ali. "Determinants of knowledge, attitude, and practice towards first aid among kindergarten and elementary school teachers in Gondar city, Northwest Ethiopia." *BMC Emerg Med* 21 (2021): 73.
- Abelairas-Gómez, Cristian, Aida Carballo-Fazanes, Santiago Martínez-Isasi, and Sergio López-García, et al. "Knowledge and attitudes on first aid and basic life support of pre-and elementary school teachers and parents." *Am Pediatr (Engl Ed)* 92 (2020): 268-276.
- Joseph, Nitin, Thanneermalai Narayanan, Saifuddin bin Zakaria, and Abhishek Venugopal Nair, et al. "Awareness, attitudes and practices of first aid among school teachers in Mangalore, south India." *J Prim Health Care* 7 (2015): 274-281.
- Hosapatna, Mamatha, Nandini Bhat, Jayaprakash Belle, and Sangeetha Priyadarshini, et al. "Knowledge and training of primary school teachers in first aid-a questionnaire based study." *Kurume Med J* 66 (2019): 101-106.
- Sönmez, Yonca, Ersin Uskun, and Azize Pehlivan. "Knowledge levels of pre-school teachers related with basic first-aid practices, Isparta sample." *Turk Pediatri Ars* 49 (2014): 238.
- Syan, Shadia Abd Elmoniem, Nora Abd-Elhamid Zaki, Amira Hassan Abd-Alfatah Ahmed, and Fatma Elzahraa Kamal Alsayed Ali. "Effect of educational Program about first aid and prevention of choking for mothers of Preschool age children." *Assiut Sci Nurs J* 10 (2022): 1-11.
- Taklual, Wubet, Maru Mekie, and Chalachew Yenew. "Determinants of first aid knowledge and basic practice among elementary school teachers in Debre Tabor City, Northwest Ethiopia." *medRxiv* (2019): 19005439.
- Khalid, Tehreem, Sana Bashir, Farwa Joseph, and Humda Riaz, et al. "Knowledge, Attitude and Practices of First Aid Management among School Teachers." *J Bahria Univ Med Dent Coll* 10 (2020): 306-309.
- Diango, Ken, John Yangongo, Vera Sistenich, and Eric Mafuta, et al. "Awareness, attitude and perceived knowledge regarding First Aid in Kinshasa, Democratic Republic of Congo: A cross-sectional household survey." *Afr J Emerg Med* 12 (2022): 135-140.

**How to cite this article:** Wogayehu, Belachew Tekleyohannes, and Tadesse Sisay. "Assessment of Knowledge, Attitude and Practice towards First Aid Management of Choking and Associated Factors among Governmental and Non-Governmental Kindergarten Teachers in Debre Birhan City, North Shoa, Ethiopia." *J Health Edu Res Dev* 13 (2025): 181.