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Assessment of Knowledge, Attitude, and Practice of Nurses in Basic Emergency Care in Selected Health Centres of Addis Ababa, Ethiopia: A Cross-Sectional Study

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Research Article

Keywords: Basic emergency care, knowledge, attitude, practice, nurses, health centres

Posted Date: February 27th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8748367/v1

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Additional Declarations: No competing interests reported.

Abstract

Introduction:

Basic emergency care (BEC) utilizes the " Airway,Breathing, Circulation, Disability, Exposure (ABCDE) " approach to manage acutely ill patients and significantly affects hospital mortality, accounting for 15–16% of deaths globally. Strengthening BEC at the primary healthcare level can reduce mortality and alleviate hospital burdens. In Ethiopia, nurses provide most emergency care, yet data on their knowledge, attitude, and practice (KAP) remains limited. This study assessed nurses' KAP in BEC to identify gaps and recommend improvements.

Objectives

To assess knowledge, attitude, and practice of emergency department nurses on basic emergency care in selected health centres of Addis Ababa, Ethiopia, from November 11, 2023, to January 11, 2024.

Methods

An analytic cross-sectional study was conducted involving staff nurses working in emergency departments who volunteered and were present during data collection. The sample size was 422, selected by multistage sampling. Data were collected via structured questionnaires and analyzed using SPSS version 25. Descriptive statistics and logistic regression identified associations among variables.

Results

Among 382 respondents (91% response rate), 52% demonstrated good knowledge, 63% had a positive attitude, and 55% showed good practice in BEC. Training in BEC was the strongest predictor of knowledge ($p < 0.001$), attitude ($p = 0.015$), and practice ($p < 0.001$). Diploma holders had significantly lower knowledge, less positive attitudes, and poorer practice, while greater work experience positively influenced practice. Knowledge and practice were strongly associated (OR = 6.12, $p < 0.001$), whereas attitude had a weaker, non-significant association with practice.

Conclusions

Nurses in selected Addis Ababa health centres exhibit fair knowledge, attitude, and practice in BEC, with significant room for improvement. Training substantially enhances KAP, while lower educational status negatively impacts performance. Work experience improves practice. Interventions should prioritize training, standardized protocols, and educational advancement.

Introduction

Emergency care involves the identification, diagnosis, stabilization, and treatment of urgent medical and trauma conditions, spanning pre-hospital to emergency unit settings[1]. While high-income countries have well-established emergency systems, low- and middle-income countries (LMICs) are increasingly recognizing the need for robust emergency care systems[2].Globally, injuries, ischemic heart disease, and acute conditions contribute significantly to mortality and morbidity, disproportionately affecting LMICs[3].Ethiopia faces a high burden of road traffic accidents (RTAs) and cardiovascular emergencies, with an estimated road traffic fatality rate of 25.3 per 100,000 people[4–9].

Standardized emergency care protocols and training reduce mortality, yet many LMICs lack formalized emergency care infrastructure and standardized acute care approaches[5, 10, 11]. Nurses in Ethiopia typically serve as first contact providers in emergency care at primary health centres, but data on their knowledge, attitude, and practice regarding BEC is scarce. The World Health Organization (WHO), in collaboration with the International Committee of the Red Cross (ICRC) and the International Federation for Emergency Medicine (IFEM), developed the Basic Emergency Care course to train first-contact health workers in resource-limited settings; however, uptake remains low among nurses and midwives who make up 59% of the healthcare workforce worldwide; only 25% of participants are thought to have received training[12].

There is currently a lack of published research on the effectiveness of coordinated emergency care and the status of nurses' Basic Emergency Care (BEC) performance at the primary healthcare level in low-income countries like Ethiopia. This evidence gap makes it difficult for policymakers to justify and commit significant funding toward strengthening emergency medical services. This study aimed to assess nurses' KAP on BEC in selected health centres of Addis Ababa to close the information gap on BEC at Ethiopia's primary health care levels, inform interventions and policy development.

Conceptual Framework

The conceptual framework for this study, illustrating the relationship between independent variables (socio-demographics, education, and training) and the dependent variables (knowledge, attitude, and practice), is presented in Fig. 1.

[Insert Fig. 1 here]

Methods

Study Design and Setting

An analytic cross-sectional study was conducted from November 11, 2023, to January 11, 2024, in 15 selected health centres across four sub-cities of Addis Ababa, Ethiopia.

Population and Sampling

The source population included all nurses in Addis Ababa, with the study population being nurses working at the selected health centres. A sample size of 422 was calculated assuming 50% proportion, 95% confidence, and 5% margin of error, with 10% contingency. Multistage cluster sampling randomly selected four sub-cities and proportionally 15 health centres. All nurses present during data collection in selected centres were included. The detailed schematic of the sampling stages and participant selection is illustrated in Fig. 2.

[Insert Fig. 2 here]

Data Collection

A structured, self-administered English questionnaire adapted from prior studies and WHO BEC materials assessed socio-demographics, knowledge (15 items), attitude (11 Likert-scale items), and practice (16 items). The tool was validated and piloted on 5% of the sample. Cronbach's alpha assessed internal consistency.

Data Analysis

Data were entered into EPI-Data and analyzed using SPSS version 25. Descriptive statistics summarized variables. Logistic regression identified associations between socio-demographic factors and KAP. Significance was set at $p < 0.05$.

Ethical Considerations

Ethical clearance was obtained from St. Paul Hospital Millennium Medical College IRB and relevant authorities. Written informed consent was secured, and confidentiality maintained.

Results

A total of 420 questionnaires were distributed, with 382 completed and analyzed, yielding a 91% response rate. The demographic profile of the participants is summarized in Table 1.

Table 1
Socio demographic characteristics (N = 382)

Variable(n = 382)	Category	Frequency	Percent
Age	21–30	279	73.04%
	31–40	97	25.39%
	> 40	6	1.57%
Gender	Male	160	41.89%
	Female	222	58.12%
Education Level	Bachelor degree	260	68.06%
	Masters and above	94	24.61%
	Diploma	28	7.33%
Marital Status	Married	148	38.74%
	Unmarried	234	61.25%
Work Experience (in years)	< 2	275	71.99%
	2–5	55	14.4%
	5–10	47	12.30%
	> 10	5	1.31%
Basic Emergency Care Training	No	242	63.35%
	Yes	140	36.65%

[Insert Table 1 here]

The majority of nurses were aged 21–30 years (73%), a distribution further detailed in Fig. 3, and over half were female (58%) (Fig. 4). Most held a bachelor's degree (68%) or higher (24.6%), with only 7.3% diploma holders. Nearly 72% had less than two years of emergency department experience (Fig. 5), and 36.7% had received Basic Emergency Care (BEC) training.

[Insert Fig. 3 here] [Insert Fig. 4 here] [Insert Fig. 5 here]

Regarding knowledge, 52% of participants demonstrated good knowledge of BEC (Fig. 6). The detailed breakdown of responses for each knowledge-based question is presented in Table 2.

Table 2
Knowledge Assessment on Basic Emergency Care Practices: Frequencies and Percentages for each question.

Question	Correct (Frequency, Percent)	Incorrect (Frequency, Percent)
1. Which is a sign of shock?	263 (68.8%)	119 (31.2%)
2. Which of the following is a danger sign in ABCDE assessment of a 2-year-old?	172 (45.0%)	210 (55.0%)
3. A 20-year-old man experiences breathing difficulties after a car accident. He has swollen neck veins, muffled heart sounds, and hypotension. What is the most likely cause of his difficulty in breathing?	125 (32.7%)	257 (67.3%)
4. A 46-year-old man is bleeding from his head after a motorcycle accident, and despite painful stimulus applied by rubbing his sternum, no response is received. What is the AVPU score of the patient?	167 (43.7%)	215 (56.3%)
5. The ABCDE approach is based upon which of the following principles?	172 (45.0%)	210 (55.0%)
6. Which of the following statements regarding emergency oxygen therapy is true?	180 (47.1%)	202 (52.9%)
7. Which of the following cannulae has the fastest flow-rate?	280 (73.3%)	102 (26.7%)
8. Which of the following is not a risk associated with large volume crystalloid infusion?	153 (40.1%)	229 (59.9%)
9. Which of the following is the most common symptom experienced by patients with ACS?	180 (47.1%)	202 (52.9%)
10. Which of the following is a component of the trauma primary survey?	77 (20.2%)	305 (79.8%)
11. A 37-year-old male presents with fever, confusion, and stiff neck. What is the most likely cause of his altered mental status?	179 (46.9%)	203 (53.1%)
12. A child that presents with sunken eyes, small amounts of dark urine, dry mucous membranes, and abnormal skin pinch testing is most likely suffering from:	238 (62.3%)	144 (37.7%)

[Insert Fig. 6 here] [Insert Table 2 here]

While 68.8% correctly identified signs of shock, only 45% correctly answered questions related to the ABCDE approach and pediatric assessment. Knowledge of the AVPU scale was limited (43.7%), and less than half correctly identified symptoms of acute coronary syndrome (47.1%). Knowledge gaps were particularly notable in trauma primary survey components (20.2%).

Attitude assessment revealed that 63.2% of nurses had a favorable attitude toward BEC (Table 3). Most agreed on the necessity of immediate first aid for road traffic accident (RTA) victims (86.4%) and prioritized

BEC as a healthcare agenda (96.9%). However, fear of bloodborne infections was prevalent (85.1%), and many nurses expressed reluctance to provide emergency care for chest pain (86.9%) and respiratory distress cases, citing insufficient training and fear of causing harm.

Table 3
Summary of responses of nurses on the attitudes towards of toward basic emergency care (N = 382).

Attitude questions on BEC	Strongly Disagree (SD)	Disagree (D)	Neutral (N)	Agree (A)	Strongly Agree (SA)	Frequency	Percent (%)
1. I believe that it is necessary to provide first aid immediately for road traffic accident victim in the ED.	0 (0.00%)	42 (10.99%)	10 (2.62%)	272 (71.20%)	58 (15.18%)	382	100
2. I am willing to provide basic emergency care for RTA victim	38 (9.95%)	275 (71.99%)	9 (2.36%)	51 (13.35%)	9 (2.36%)	382	100
3. I am not willing to provide emergency care to RTA because I fear blood as I can be infected by blood borne diseases.	1 (0.26%)	43 (11.26%)	9 (2.36%)	286 (74.87%)	43 (11.26%)	382	100
4. I'm willing to provide emergency care for a patient presented with chest pain	21 (5.50%)	265 (69.37%)	15 (3.93%)	77 (20.16%)	4 (1.05%)	382	100
5. I am not willing to provide emergency care to a patient with chest pain because I don’t know how to provide emergency care to such patient as I am not sufficiently trained	2 (0.52%)	43 (11.26%)	5 (1.31%)	290 (75.92%)	42 (10.99%)	382	100
6. I'm willing to provide emergency care for a patient presented with respiratory distress (RD)	25 (6.55%)	253 (66.23%)	12 (3.14%)	82 (21.47%)	10 (2.62%)	382	100
7. I'm not willing to provide emergency care for a patient with	6 (1.57%)	139 (36.39%)	22 (5.76%)	196 (51.31%)	19 (4.97%)	382	100

Attitude questions on BEC	Strongly Disagree (SD)	Disagree (D)	Neutral (N)	Agree (A)	Strongly Agree (SA)	Frequency	Percent (%)
RD because I could apply wrong treatment and cause harm							
8. I believe I have sufficient basic knowledge to care for a patient with altered mentation	18 (4.71%)	39 (10.21%)	5 (1.31%)	276 (72.25%)	44 (11.52%)	382	100
9. I believe BEC training should be mandatory in the nursing curriculum	9 (2.36%)	177 (46.34%)	37 (9.69%)	138 (36.13%)	21 (5.50%)	382	100
10. I believe politicians/health care providers take up BEC as their priority agenda	1 (0.26%)	8 (2.09%)	3 (0.79%)	302 (79.06%)	68 (17.80%)	382	100
11. I need more BEC training	1 (0.26%)	8 (2.09%)	3 (0.79%)	303 (79.32%)	67 (17.54%)	382	100

[Insert Table 3 here]

Practice evaluation showed that 55.5% reported good practice in BEC (Fig. 7). The specific frequency of clinical actions and procedural responses is detailed in Table 4.

Table 4
Practice Assessment on Basic Emergency Care Practices: Frequencies and Percentages for each question

	Question	Correct (Frequency,%)	Incorrect%)	Total (N = 382)
1	An elderly woman fell at home. She had normal vital signs but complained of neck and knee pain prior to transport. During transport, she starts snoring and gurgling when taking a breath. What is the most appropriate method to immediately manage this problem?	110 (28.8%)	272 (71.2%)	382
2	A 50-year-old man has collapsed in the store, and you are called to assist him. He is unconscious, has a respiratory rate of 4 breaths per minute, and a pulse of 100 beats per minute. There is no trauma. What is the best next step?	106 (27.8%)	276 (72.3%)	382
3	A 2-year-old boy is brought to you for being more sleepy than normal. He is unconscious. You open his airway and place an oropharyngeal airway. What is your next step?	280 (73.3%)	102 (26.7%)	382
4	You are assessing a man who was involved in a car crash. He is very confused, but the remainder of the primary survey is normal. How do you perform a SAMPLE history if the patient is too confused to answer your questions?	170 (44.5%)	212 (55.5%)	382
5	You are evaluating a 21-year-old man who was in a motorcycle crash. He was thrown from the bike and suffered injuries to his face, chest, and legs. When you feel his pelvis, he screams in pain. His vital signs are: blood pressure 90/40 mmHg, heart rate 120 bpm, and respiratory rate 25/min. What should be your next step?	269 (70.4%)	113 (29.6%)	382
6	There was an explosion, and a young woman has been brought in. She has an open airway, a respiratory rate of 30 bpm, a heart rate of 125 bpm, blood pressure of 85/50 mmHg, and she complains of abdominal pain. She is in shock. She has small wounds to her skin but there is no obvious bleeding. What would you do to manage this patient?	326 (85.3%)	56 (14.7%)	382
7	There was a fire in a nearby house, and a patient is brought to you with burned nasal hairs and shortness of breath. What should you do first?	307 (80.4%)	75 (19.6%)	382
8	A 30-year-old woman was stung by a bee and now has difficulty in breathing, facial swelling, and a rash. She has a history of severe allergic reactions to bee stings. What medication should you give her?	221 (57.9%)	161 (42.1%)	382
9	A 7-year-old boy presents with lethargy, vomiting, and diarrhea for the past 4 days. His vital signs are: blood pressure 80/40 mmHg, heart rate 140 bpm, and respiratory rate 18 breaths/min. The patient vomits	336 (87.9%)	46 (12.1%)	382

	Question	Correct (Frequency,%)	Incorrect%)	Total (N = 382)
	when you try to give anything by mouth. What is your most immediate management?			
10	You are assessing a 23-year-old man who was stabbed in the chest. You expose the chest to find one stab wound in the right anterior chest with minor bleeding. He is complaining of severe difficulty in breathing, and there are no lung sounds on the right side. His neck veins are distended and his skin is cool and sweaty. His vital signs are: blood pressure 86/56 mmHg, heart rate 136 bpm, and respiratory rate 28 bpm. What is your next step?	95 (24.9%)	287 (75.1%)	382
11	A 46-year-old man comes in to check his blood pressure. His vital signs are: blood pressure 160/90 mmHg, heart rate 120, respiratory rate 18, and blood glucose is 5 mmol/l. While you are examining him, he has a seizure/convulsion. What treatment should you give?	157 (41.1%)	225 (58.9%)	382
12	A 36-week pregnant woman is having a seizure/convulsion. She has a recent history of high blood pressure as well. What treatment should you give?	252 (65.9%)	130 (34.1%)	382
13	When planning a transfer of a patient, you should consider which of the following factors?	371 (97.1%)	11 (2.9%)	382
14	When should formalized patient handover occur?	172 (45.0%)	210 (55.0%)	382
15	A 5-year-old child fell from a tree. The mother runs in and gives you the child to look after. The child is unconscious and blue. What is the first thing you assess?	214 (56.0%)	168 (44.0%)	382
16	A woman who is 37 weeks pregnant has been hit by a car. She has been stabilized and does not have a head injury but remains in cervical spine immobilization. Bystanders have laid her flat on the ground to immobilize the spine. While she is awaiting transport to the nearest obstetric center, she tells you she does not feel well, and when you check her blood pressure, it is 78/50 mmHg. What is the first thing you should do?	139 (36.4%)	243 (63.6%)	382

[Insert Fig. 7 here] [Insert Table 4 here]

Significant deficiencies were observed in airway management, with 71.2% unable to manage airway obstruction appropriately during transport, and 72.3% failing to identify correct interventions for respiratory depression. Conversely, management of shock (85.3%) and patient transfer considerations (97.1%) were well understood. A notable gap existed in formal patient handover timing, with 55% answering incorrectly.

While checking for associations across all three domains (knowledge, attitude, and practice), we first performed a multicollinearity diagnostic check for all predictor variables. In all models, tolerance values remained above 0.25 and Variance Inflation Factor (VIF) values were below 4. This confirmed that the independent variables were suitable for reliable coefficient estimation without significant multicollinearity concerns, as detailed in Table 5 (Knowledge), Table 8 (Attitude), and Table 11 (Practice).

Table 5
Checking multicollinarity for predictors of knowledge

Predictor variables	Tolerance	VIF
1.Age	0.518	1.929
5.Working experience in emergency and trauma unit:in months	0.717	1.394
2.Gender	0.854	1.171
3.Educational status	0.841	1.189
6.Have you ever been trained on basic emergency care before?	0.82	1.219
4.Marital status	0.579	1.728
Keys: VIF, variance inflation factor		

Table 8
Cheking multicollinarity for predictors of attitude

Predictor variables	Tolerance	VIF
1.Age	0.546	1.831
5.Working experience in emergency and trauma unit:in months	0.695	1.439
2.Gender	0.858	1.166
3.Educational status	0.812	1.231
6.Have you ever been trained on basic emergency care before?	0.794	1.26
4.Marital status 2	0.592	1.69
Keys: VIF, Variance Inflation Factor.		

Table 11
Cheking multicollinarity for predictors of practice

Predictor variables	Tolerance	VIF
1.Age	0.532	1.878
5.Working experience in emergency and trauma unit:in months	0.751	1.331
2.Gender	0.852	1.173
3.Educational status	0.865	1.157
4.Marital status 2	0.6	1.667
6.Have you ever been trained on basic emergency care before?	0.847	1.18
Over all attitude	0.969	1.032
Over all knowledge	0.901	1.11
Keys:VIF, **Variance Inflation Factor**.		

[Insert Table 5 here] [Insert Table 8 here] [Insert Table 11 here]

Following the diagnostic checks, a bivariable logistic regression was conducted to screen for potential predictors for each outcome. Variables demonstrating an association with a p-value < 0.25 were considered candidates and were entered into the final multivariable models. These bivariable associations are summarized in Table 6 (Knowledge), Table 9 (Attitude), and Table 12 (Practice).

Table 6

Bivariable analysis of the relationship between Socio demographic factors and knowledge(N = 382)

Variables(n = 382)	Knowledge status		P-value	Cor.Cof(B)(CI)
	Good (%)	Poor (%)		
Age			0.733	0.008(-0.039 to 0.055)
21–30	146 (52.33%)	133 (47.67%)		
31–40	50 (51.54%)	47 (48.45%)		
> 40	3 (50%)	3(50%)		
Gender				
Male(ref)	94 (58.75%)	66 (41.25%)		
Female	105 (47.3%)	117 (52.7%)	0.027	-0.462(-0.872 to-0.051)
Educational Status				
Bachelor degree(ref)	133 (51.15%)	127 (48.85%)		
Masters and above	59 (62.77%)	35 (37.23%)	0.054	0.476(-0.008 to 0.960)
Diploma	7 (25.00%)	21 (75.00%)	0.012	-1.145(-2.034 to 0.255
Marital Status			0.637	0.067
Married(ref)	79 (39.7%)	69 (37.7%)		
Unmarried	120 (60.3%)	114 (62.3%)	0.690	-0.084(-0.496 to 0.328
Working Experience			< .001	0.015(0.007 to 0.023)
< 2years	124 (46.79%)	141 (53.21%)		
2-5years	31 (58.49%)	22 (41.51%)		
5-10years	32 (68.09%)	15 (31.91%)		
> 10years	3 (60.00%)	2 (40.00%)		
Trained on BEC?				
No(ref)	88 (36.36%)	154 (63.64%)		
Yes	111 (79.29%)	29 (20.71%)	< .001	1.902(1.416 to 2.387)

Keys : Cor. coeff (B) ,Regression coefficient (B)

Table 9

Bivariable analysis of the relationship between Socio demographic factors and Attitude(N = 382)

Variables (n = 382)	Attitude status		P value	Cor.Cof(B)(CI)
	Favourable (%)	Unfavourable (%)		
Age Category			0.768	0.007(-0.040 to 0.054)
21–30	125 (44.64%)	155 (55.35%)		
31–40	42 (43.29%)	55 (56.70%)		
> 40	4(80%)	1 (20%)		
Gender				
1. Male(ref)	78 (48.75%)	82 (51.25%)		
2. Female	3 (2.27%)	129 (97.77%)	0.184	-0.277(-0.686 to 132)
Educational Status				
1. Bachelor degree(ref)	117 (45%)	143 (55%)		
2. Masters an above	47 (50%)	47 (50%)	0.405	-0.201(-0.272 to -0.673)
3. Diploma	7 (25%)	21 (75%)	0.048	-0.896(-1.788 to -0.008)
Marital Status				
1. Married(ref)	68 (45.95%)	80 (54.05%)		
2. Unmarried	103 (44.01%)	131 (55.98%)	0.712	-0.078(-0.492 to 0.336)
Work experience			0.035	0.008(0.001 to 0.015)
< 2years	117 (88.63%)	15 (11.36%)		
2-5years	26 (47.27%)	29 (52.73%)		
5-10years	24 (51.06%)	23 (48.94%)		
> 10years	4 (80.00%)	1 (20.00%)		
Trained on BEC?				
1. No(ref)	92 (38.01%)	150 (61.98%)		
2. Yes	79 (56.5%)	61 (43.5%)	< 0.001	0.747(0.324 to 1.170)

Keys:Cor.coff(B), Regression coefficient (B);CI, confidence interval

Table 12
Bivariable analysis of level of practice

Variables (n = 382)	Practice Level		P-value	Cor.Cof(B)(CI)
	Good(%)	l Poor(%)		
Age			0.669	0.010(-0.037 to 0.058)
21–30	154 (54.6%)	126 (45.4%)		
31–40	55 (56.5%)	42 (43.5%)		
> 40	3 (60%)	2 (40%)		
Gender				
Male	97 (60.6%)	63 (39.4%)		
Female	115 (51.8%)	107 (48.2%)	0.087	-0.359(-0.772 to 0.053))
Educational Status				
Bachelor degree	136 (52.3%)	124 (47.7%)		
Masters and above	70 (74.3%)	24 (25.7%)	< 0.001	0.978(0.454 to 1.502)
Diploma	6 (21.4%)	22 (78.6%)	0.004	-1.392(-2.327 to -0.457)
Marital Status				
Married	91 (61.6%)	57 (38.4%)		
Unmarried	121 (51.71%)	113(48.29%)	0.062	-0.399(-0.818 to 0.019)
Working Experience			< .001	0.024(0.015 to 0.034)
< 2 years	131 (47.7%)	144 (52.3%)		
2–5 years	41 (74.1%)	14 (25.9%)		
5–10 years	38 (80.4%)	9 (19.6%)		
> 10 years	2 (40.0%)	3 (60.0%)		
Trained on BEC?				
No	100 (41.3%)	142 (58.7%)		
Yes	112 (80.0%)	28 (20.0%)	< .001	1.737(1.250 to 2.224)

[Insert Table 6 here] [Insert Table 9 here] [Insert Table 12 here]

The final multivariable logistic regression revealed that prior BEC training was the strongest independent predictor across all domains: good knowledge (OR = 5.96, p < 0.001), favorable attitude (OR = 1.85, p = 0.011), and good practice (OR = 3.68, p < 0.001).Educational status was also a significant predictor for knowledge and practice; specifically, diploma holders had significantly lower odds of good knowledge (OR

= 0.33, p = 0.023) and good practice (OR = 0.20, p = 0.003) compared to those with higher degrees. However, educational status did not reach statistical significance regarding nurses' attitudes (p = 0.062).The detailed multivariable results are presented in Table 7 (Knowledge), Table 10 (Attitude), and Table 13 (Practice).

Table 7
Multivariable analysis of the relationship between Socio demographic factors and knowledge(N = 382)

Variables	Estimate	Standard Error	Odds Ratio	95% Confidence Interval	p value
2. Gender (Female)	-0.22	0.239	0.803	(0.503, 1.281)	0.356
3. Educational status (Masters and above)	-0.147	0.291	0.863	(0.488, 1.527)	0.612
3. Educational status (Diploma)	-1.106	0.487	0.331	(0.127, 0.860)	0.023
5. Working experience in emergency and trauma unit (months)	0.004	0.005	1.004	(0.995, 1.013)	0.395
6. Have you ever been trained on basic emergency care before? (Yes)	1.785	0.274	5.962	(3.486, 10.198)	< .001

Table 10
Multivariable analysis of the relationship between Attitude and socio-demographic factors

Variable	Estimate	Odds Ratio (95% CI)	p-value
Gender (Female)	-0.144	0.866 (0.562, 1.335)	0.515
Educational status (Masters and above)	-0.086	0.918 (0.549, 1.535)	0.744
Educational status (Diploma)	-0.862	0.422 (0.171, 1.043)	0.062
Working experience in emergency and trauma unit (in months)	0.004	1.004 (0.996, 1.012)	0.361
Have you ever been trained on basic emergency care before? (Yes)	0.618	1.855 (1.154, 2.982)	0.011
Keys: CI, confidence interval			

Table 13
Multivariable analysis of level of practice

Variable	Estimate	Odds Ratio (95% CI)	p
Educational status 2 (Masters and aboe)	0.517	1.676 (0.925, 3.037)	0.088
Educational status 2 (Diploma)	-1.601	0.202 (0.071, 0.573)	**0.003**
Marital status (Single)	0.171	1.187 (0.723, 1.948)	0.498
Marial status (Widowed)	-1.561	0.210 (0.019, 2.268)	0.199
Marital status (Divorced)	-17.648	2.165×10^{-8} (0.000, ∞)	0.979
Working experiencein emergency and trauma unit (months)	0.021	1.021 (1.010, 1.032)	**< .001**
Have youever been trained on basic emergecy care before? (Yes)	1.303	3.682 (2.156, 6.287)	**< .001**
Keys:CI,confidence interval			

[Insert Table 7 here] [Insert Table 10 here] [Insert Table 13 here]

Educational status was a significant predictor for knowledge and practice; specifically, diploma holders had significantly lower odds of good knowledge (OR = 0.33, p = 0.023) and good practice (OR = 0.20, p = 0.003) compared to those with higher degrees. However, educational status did not reach statistical significance regarding nurses' attitudes (p = 0.062).

Additionally, while checking for associations between the outcomes, a strong positive association was found between knowledge and practice (OR = 6.12, p < 0.001) (Table 14 and Table 15).

Table 14
Chisqaure test of attitude and knowledge with practice

Variables		Poor practice	Good practice	X^2	OR(CI%)	p value	Phi-coefficient /Cramer's V
Attitude status				11.111	0.701(0.28 -1.115)	< .001	0.171
	Unfavourable	110	101				
	Favourable	60	111				
Knowledge level				92.073	2.163(1.699–2.628	< .001	0.491
	Poor	128	55				
	Good	42	157				
Keys:OR,odds ratio; CI,confidence interval							

Table 15
Multivariable analysis of association between practice level with socio demographic factors, attitude and knowledge Keys:CI,confidence interval

Variable	Odds Ratio (95% CI)	p
Educational Status 2 (Masters and above)	1.886 (0.987, 3.603)	0.055
Educational Status 2 (Diploma)	0.288 (0.100, 0.829)	0.021
Marital Status (Single)	1.044 (0.606,1.798)	0.876
Marital Status (Widowed)	0.261 (0.019, 3.659)	0.318
Marital Status (Divorced)	1.177e-08 (0.000, ∞)	0.978
Working Experience in Emergency and Trauma Unit (months)	1.021 (1.009, .033)	< .001
Trained on Basic Emergency Care (Yes)	1.932 1.059, 3.525)	0.032
OVERALL ATTITUDE (FAVOURABLE)	1.254 (0.753, 2.088)	0.385
OVERALL KNOWLEDGE(GOOD)	6.119 (3.625, 10.328)	< .001

[Insert Table 14 here] [Insert Table 15 here]

Discussion

This study highlights that nurses working in selected health centres of Addis Ababa are predominantly young(73%) and female(58%), consistent with regional workforce demographics. The higher educational

attainment among participants (68% bachelor's, 24.6% master's) contrasts with studies from Addis Ababa pre-hospital settings and Rwanda, where diploma-level nurses predominate. This educational profile may reflect advancements in educational access, variations in healthcare policies and increased professional development opportunities[13–16].

The majority of nurses had less than two years of emergency experience, aligning with findings from Rwanda that report high turnover and a young workforce in emergency care settings. This demographic composition may influence skill acquisition and confidence in emergency interventions. Only 36.7% of nurses had received BEC training, revealing a critical gap in preparedness. This proportion is lower than reported in Rwanda (68.6%) but comparable to Tanzania (47%). Limited training access and resource constraints likely contribute to this deficiency, potentially compromising emergency care quality[14, 17].

Knowledge levels were moderate, with 52% demonstrating good knowledge. While recognition of shock signs was relatively strong (68.8%), knowledge deficits were evident in paediatric ABCDE assessment, trauma primary surveys, and AVPU scale use. Comparatively, higher knowledge levels in Rwanda and the Netherlands, where ABCDE knowledge exceeds 80% and 88% respectively, suggest that systematic training and resource availability improve competencies[14, 18]. Another alarming finding of the study was the low awareness of acute coronary syndrome symptoms (47.1%) which contrasts with the result of a study done in india where nurses' knowledge regarding acute coronary syndrome was higher(57%)[19].This underscores the need for enhanced cardiovascular emergency education.

Attitudes toward BEC were generally favorable (63.2%), with strong recognition of the importance of immediate first aid for RTA victims (86.4%) and prioritization of BEC in healthcare agendas (96.9%). However, pervasive fear of bloodborne infections (85.1%) and reluctance to manage chest pain and respiratory distress highlight psychological and educational barriers. These findings mirror studies from Rwanda and Kenya reporting favorable attitudes tempered by fear and training inadequacies[14, 20].The high prevalence of fear underscores the need for infection control training and confidence-building measures.

Practice results reveal significant gaps, particularly in airway management and formal patient handover protocols. The inability of over 70% of nurses to manage airway obstruction and respiratory depression contrasts with better performance in shock management and patient transfer planning. Similar deficits have been reported in Uganda, emphasizing the challenge of translating knowledge into clinical skills[21]. The poor understanding of handover timing (55% incorrect) indicates communication weaknesses that may jeopardize patient safety, a concern echoed in studies from Turkey and other settings[22]. While 55.5% of nurses report "good" practice, the 44.5% who feel underprepared highlight a significant gap in emergency care confidence. Addressing the challenges faced by this substantial minority is essential for improving overall clinical quality.

Training emerged as the most influential modifiable factor, strongly associated with improved knowledge ($OR = 0.596, p < 0.001$), attitude($OR = 1.85, p = 0.015$), and practice($OR = 3.68, P < 0.001$).Diploma holders consistently showed lower KAP levels (having $OR = 0.33, p = 0.018$ and $OR = 0.2, p = 0.003$ for knowledge and practice respectively), highlighting educational disparities affecting emergency care competence. Greater

work experience enhanced practice (OR = 1.02,P < 0.001), reflecting skill acquisition through clinical exposure. These associations align with previous Ethiopian and international studies emphasizing the critical role of education and training in emergency care proficiency[23, 24].

The strong correlation between knowledge and practice (OR = 6.12, p < 0.001) confirms that knowledge underpins effective clinical performance, consistent with the Health Belief Model framework guiding this study[25]. The weaker association between attitude and practice (OR = 1.254, p = 0.385) suggests that positive disposition alone is insufficient without adequate knowledge and skills.

Overall, the findings emphasize the urgent need for comprehensive, targeted training programs, standardized protocols, and supportive policies to enhance emergency care delivery at the primary healthcare level in Ethiopia and similar LMIC settings.

Limitations

The study was limited to 15 health centres in Addis Ababa, restricting generalizability across Ethiopia. The cross-sectional design limits causal inference. The scarcity of comparable local studies constrains contextual analysis. Future longitudinal and multi-site research is needed.

Recommendations

Management and Policy:

- Develop and enforce standardized emergency care protocols across health centres.
- Mandate regular BEC training for all nursing staff.
- Provide scholarships and support for diploma nurses to pursue higher education.
- Establish mentorship programs pairing experienced with less experienced nurses.

Practice:

- Implement regular hands-on training and simulation exercises to build clinical competence.
- Foster teamwork and collaboration in emergency care settings.
- Conduct routine audits to monitor and improve emergency care delivery.
- Tailor training to address prevalent local emergency scenarios.

Education and Training:

- Design targeted refresher courses based on socio-demographic factors.
- Promote continuous professional development with incentives.
- Integrate simulation-based learning into nursing curricula.

- Encourage interdisciplinary training to enhance collaboration.
- Cultivate a culture of lifelong learning and certification in emergency care.

Research:

- Conduct longitudinal and larger-scale studies to assess emergency care competencies over time.
- Investigate barriers to training uptake and develop strategies to improve access and participation.

Conclusions

Nurses working in selected health centres of Addis Ababa demonstrate fair knowledge, attitude, and practice in basic emergency care, with notable gaps in pediatric assessment, airway management, and handover protocols. Training significantly enhances all aspects of KAP, while lower educational attainment adversely affects performance. Increased work experience improves practice. The interrelated nature of knowledge, attitude, and practice underscores the need for comprehensive, multifaceted interventions.

primary health care.

LIST OF ACRONYMS AND ABBREVIATIONS

ABCDE: Airway, Breathing, Circulation, Disability, Exposure

ALS: Advance Life Support

BLS: Basic Life Support

BEC: Basic emergency care

ED: Emergency department

GNI: Gross National Income

HC: Health Centre

KAP: Knowledge, Attitude and Practice

LMIC: Low and Middle Income Countries

MOH: Ministry of Health

NHHC: Non hospital health centre

NGO: None Governmental Organization

RTA: Road Traffic Accident

SDG: Sustainable developmental goals

US$: American dollar

WHA: World Health Assembly

WHO: World Health Organization

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Institutional Review Board of St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. This study was conducted in accordance with the Declaration of Helsinki. Permission to conduct the study was obtained from the respective administrative bodies of the selected health centres. Written informed consent was obtained from all participants prior to data collection. Confidentiality of the information was maintained throughout the study.

Consent for publication

Not applicable (as the data is anonymized).

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The author declares that there are no competing interests.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' Contributions

- **BH:** Conceived the study, designed the methodology, collected and analyzed the data, interpreted findings, and drafted the manuscript.
- **AZ:** Supervised the study, provided expert guidance on methodology, data interpretation, and critical revision of the manuscript.
- **BB:** Assisted in study design, supervision, and critical revision of the manuscript.
- **MS:** Contributed to study supervision, data interpretation, and manuscript review.
- **All authors** read and approved the final manuscript.

Acknowledgements

The authors would like to acknowledge St. Paul's Hospital Millennium Medical College, the Department of Emergency Medicine and Critical Care, and the administrators of the selected health centres for their institutional support. Special thanks are extended to all nurses who participated in the study for their time and cooperation.

Declaration of AI and AI-assisted technologies in the writing process: During the preparation of this manuscript, the authors used Gemini (an AI tool) for the purpose of language editing and formatting assistance only. This was done to improve the clarity and readability of the text. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the final content of the published article. The tool was not used to generate data, interpretations, or clinical conclusions.

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Figures

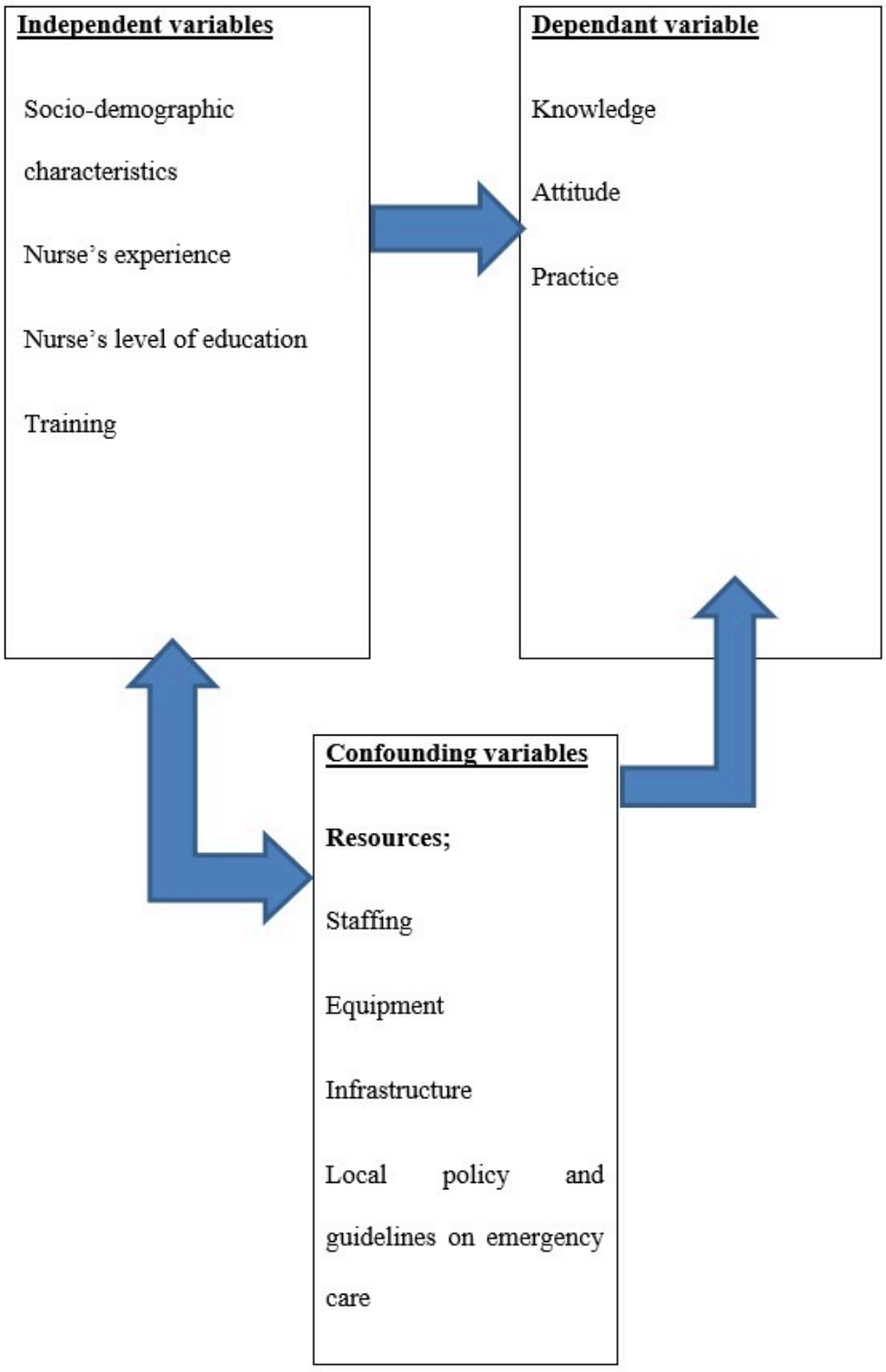


Figure 1

Knowledge, attitude and practice(KAP) conceptual frame work

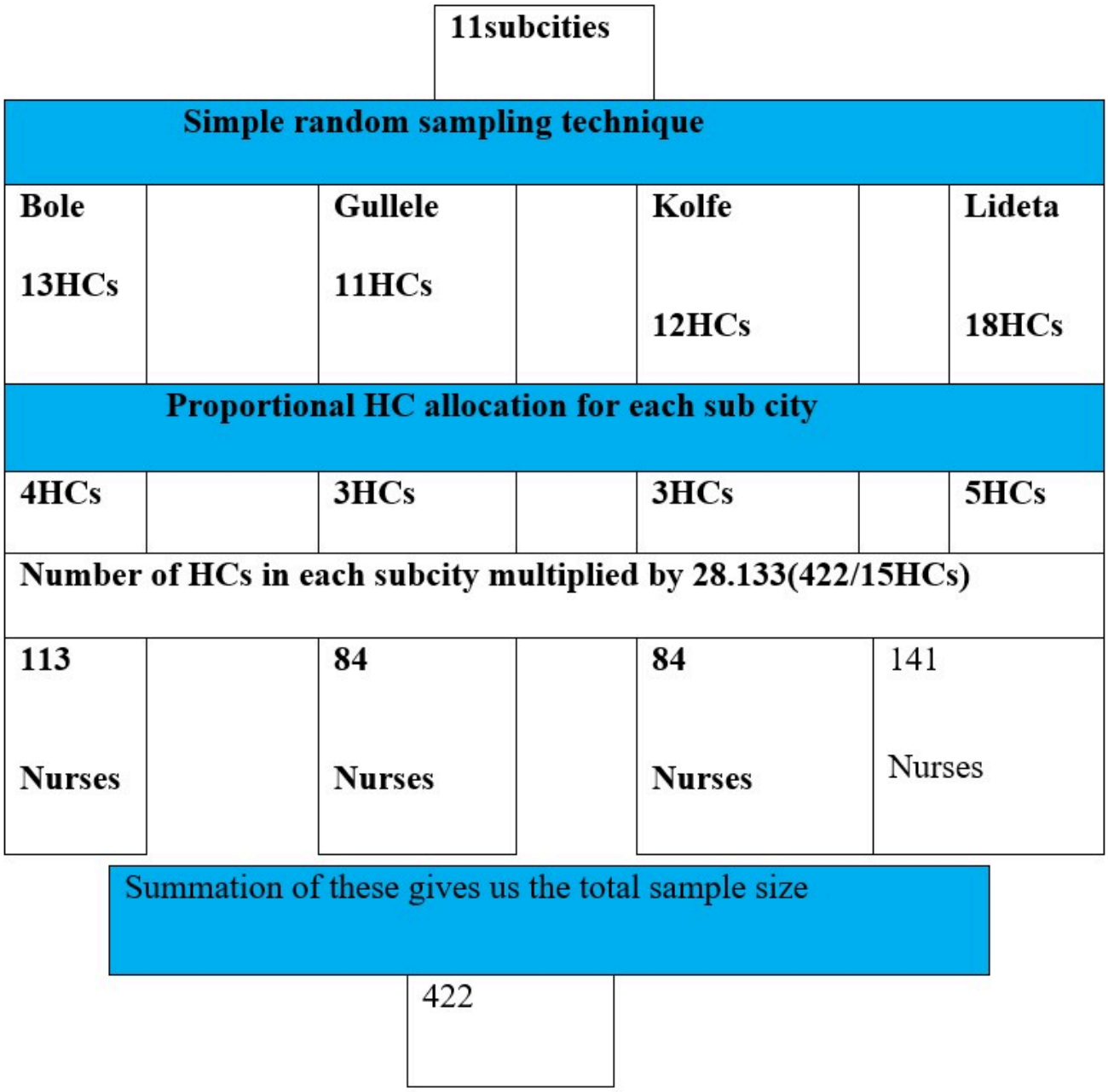


Figure 2

Schematic presentation of sampling procedure and selection

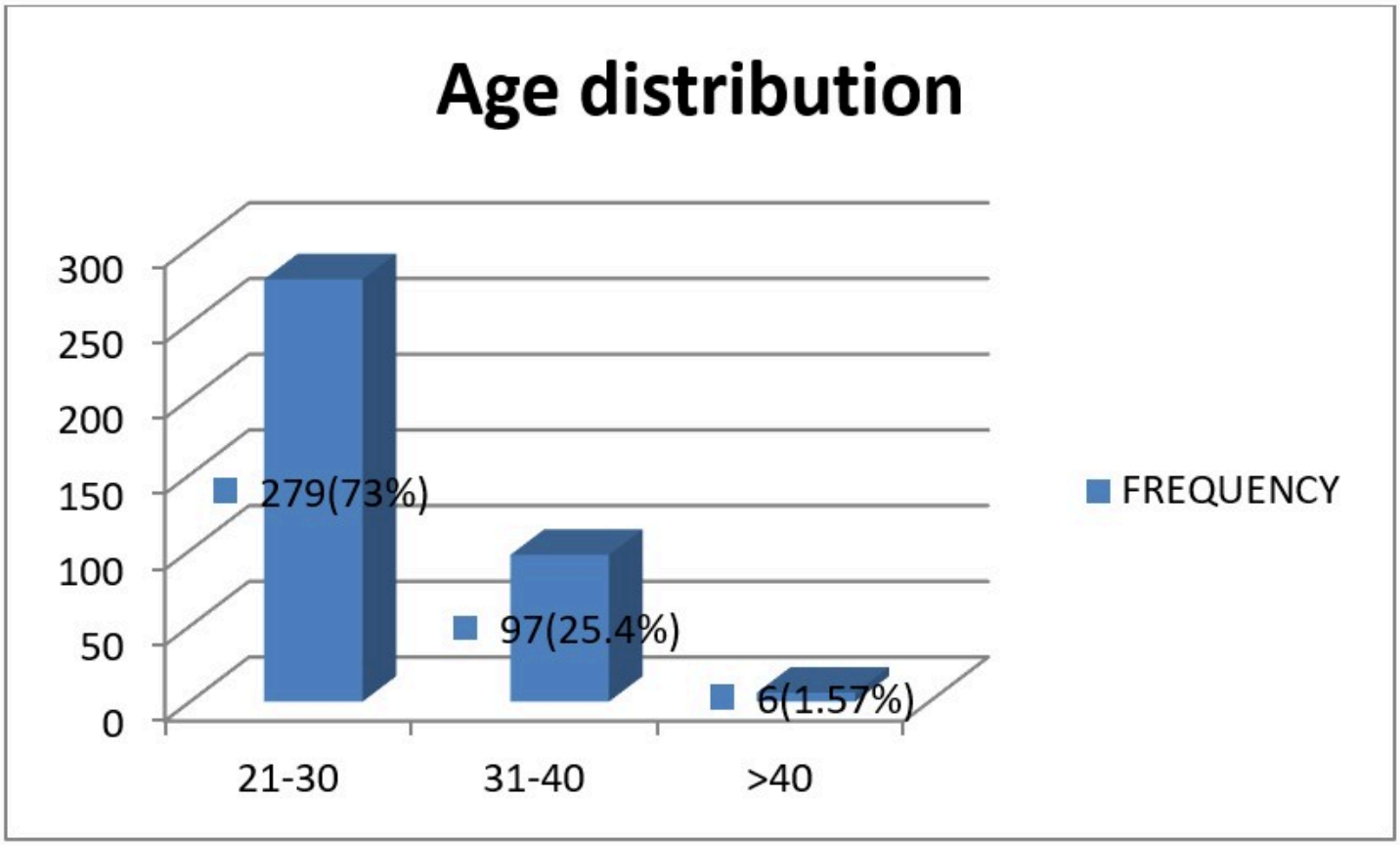


Figure 3

Age distribution of respondents

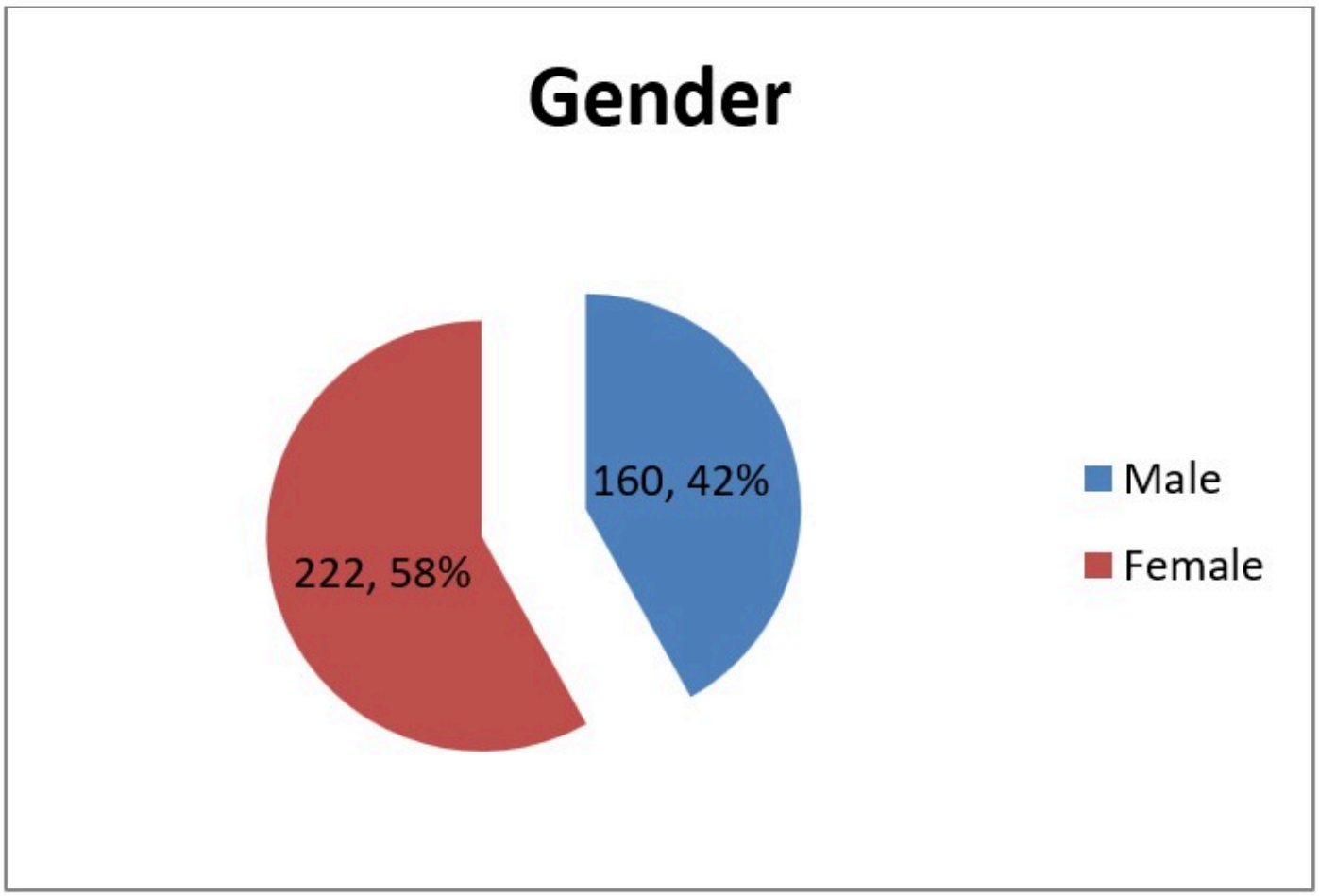


Figure 4

Gender of respondents

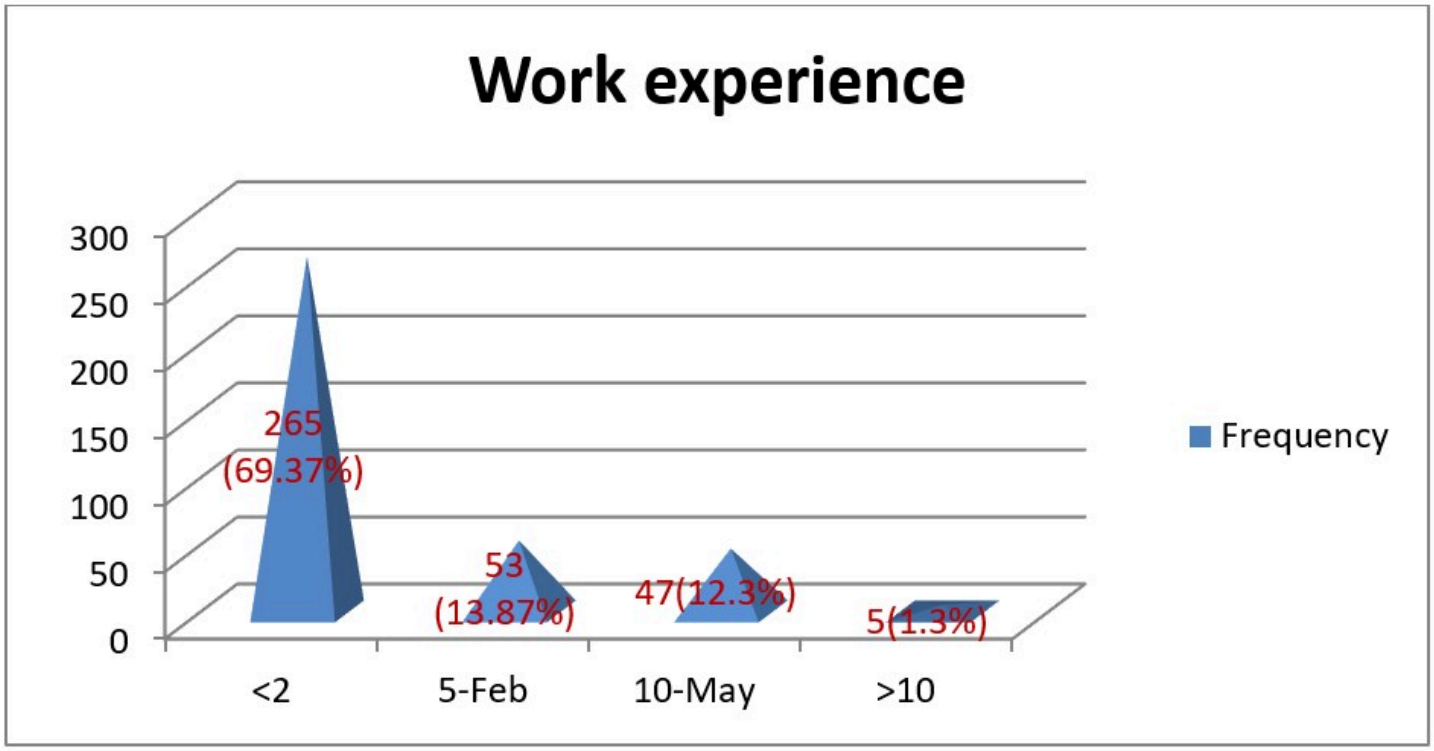


Figure 5

Respondents working experience

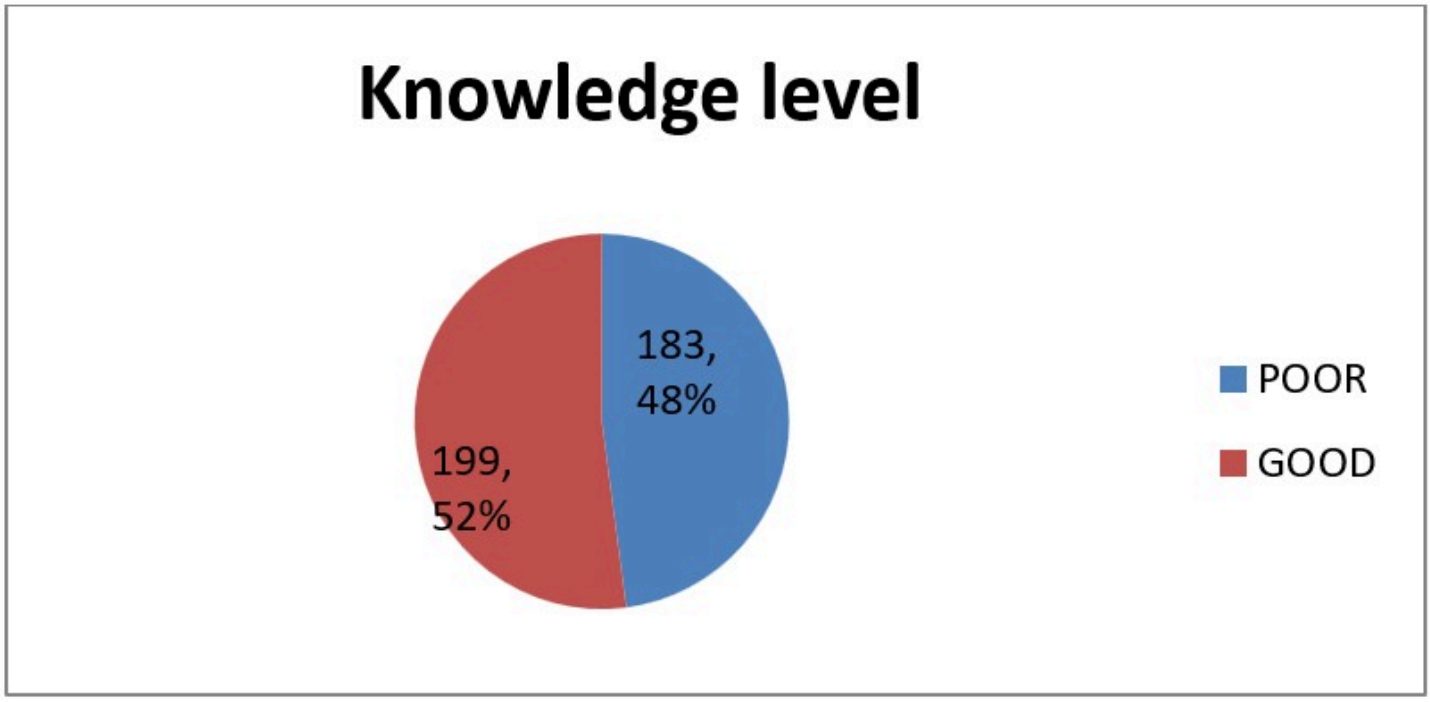


Figure 6

Overall knowledge level of nurses with regard to basic emergency care(BEC) (N=382)

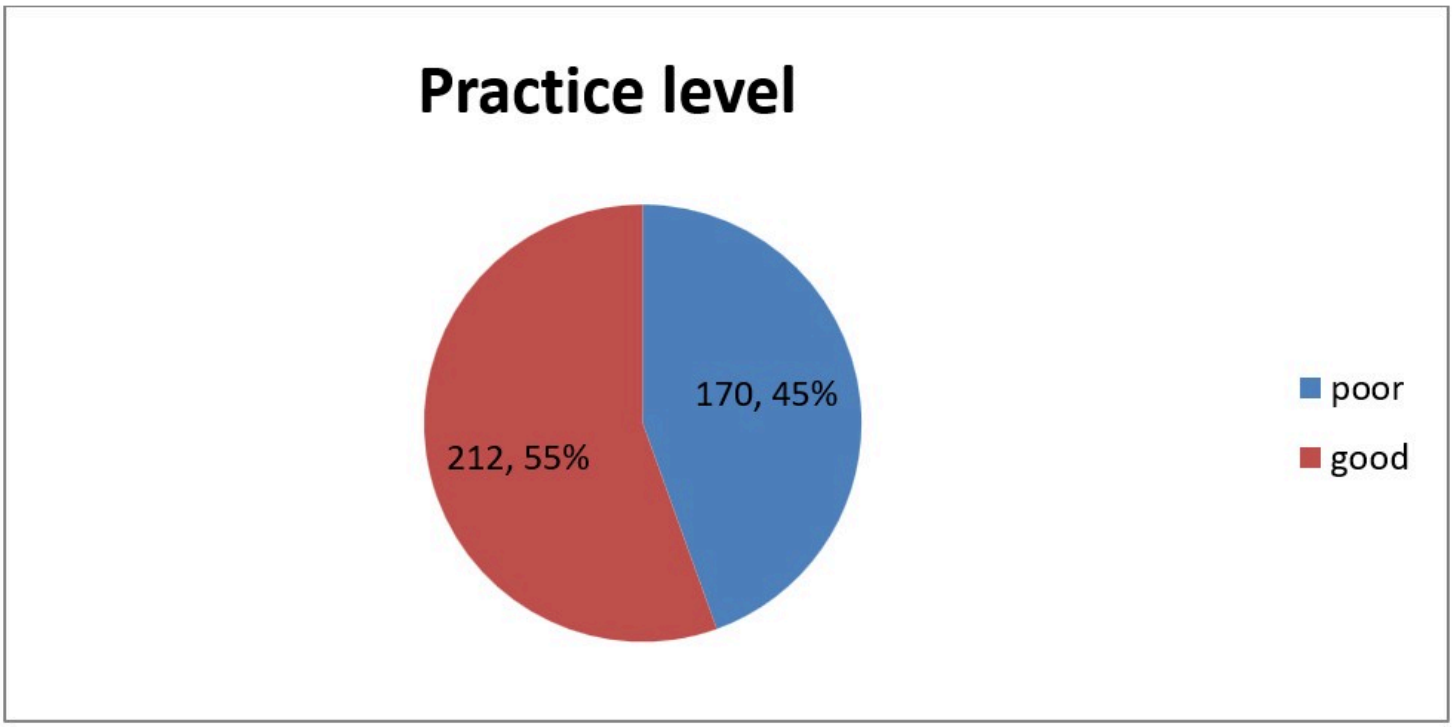


Figure 7

Overall level of practice of nurses with regard to basic emergency care (BEC) (N=382).