

THE PRACTICE ON ADULT ADVANCED LIFE SUPPORT AND THE INFLUENCING FACTORS AMONG THE NURSING OFFICERS WORKING IN TEACHING HOSPITAL JAFFNA.

Poorvajan,V.1#, Arulmoli,J.1, kamalarupan,L.2 and Jegapragash,V.3

1 MBBS, MD (Anaesthesiology), Consultant Anaesthetist, Teaching Hospital Jaffna; Provincial Coordinator for Resuscitation Committee, College of Anaesthesiologists & Intensivists of Sri Lanka.

2 Department of Nursing, Unit of Allied Health Sciences, Faculty of Medicine, University of Jaffna.

3 Department of Nursing, Unit of Allied Health Sciences, Faculty of Medicine, University of Jaffna.

poorvajan00@gmail.com

Abstract— *Advanced Life Support (ALS) given at the right time with accurate knowledge and skills is essential for improving mortality in Cardiac Arrest; by this means, nursing professionals must be well practiced, competent and confident to deal with medical emergencies. Therefore, this study aimed to assess the level of practice and the influencing factors on adult ALS among the Nursing Officers working in Teaching Hospital Jaffna.*

Hospital based descriptive cross-sectional study was carried out, among all the staff nurses (490) working in Teaching Hospital Jaffna, during one month data collection period. Data was collected by a self-administered questionnaire. Data were processed in SPSS version 23. Chi squared statistical test and Fisher's exact test (2 tailed) were performed to identify the influencing factors.

In this study; majority of the participants were female (76.1%) and most of them were diploma holders (81.3%). More than two-third of the nurses had not received formal in-service training on ALS at all. Overall, only 20.4% nurses had Good practice, approximately half of the nurses (48.5%) had Average practice and the practice score was inadequate among 30.5% of the total study population (n=326). This study also demonstrated the statistical significant relationship of several socio-demographic, educational, personal and hospital related factors related to the practice on ALS.

Conclusion: This study illustrated that; although majority of the nurses had average practice level or more, poor practice was there among significant amount of the study population. Practice deficit should be addressed properly to improve the outcome of the patient.

Keywords— **Advanced Life Support, Practice, Factors, Nurses, Teaching Hospital Jaffna.**

I. INTRODUCTION

A. Background & Justification

Cardiovascular Diseases (CVDs) are the number one cause of death globally: representing 31% of all global deaths and the number is steadily increasing (*Cardiovascular diseases*, 2018; *Cardiovascular diseases (CVDs)*, 2018).

Here in Sri Lanka, CVDs accounted more than 45% of all deaths ('World Health Organization - Noncommunicable Diseases (NCD) Country Profiles, 2014.', 2014).

Cardiac Arrest (CA) is the sudden loss of heart function. Therefore, the ventricles may flutter or quiver, and blood is not delivered to the body (*About Cardiac Arrest / American Heart Association*, 2017). In the first few minutes, the greatest concern is that blood flow to the brain will be reduced so the person will lose consciousness. Death follows unless emergency treatment is begun immediately (*Sudden Cardiac Death, Cardiac Arrest, and Heart Disease*, 2018).

Only 1% of people survive out of hospital CA; however, when early Cardiopulmonary Resuscitation (CPR) is combined with defibrillation and rapid hospital emergency care (ALS), the American Heart Association estimates the chance of survival can increase to 40% (Association, 2010; Soar *et al.*, 2015). In hospitals, healthcare professionals frequently respond to a variety of life-threatening emergencies in various clinical settings, where nurses are the first responders during the emergency situation at the sense of CA. Therefore, the effective and timely planning, intervention and implementation with adequate knowledge, practice and psychomotor skills improve the outcome and reduces the likelihood of death following CA. Although the Australian Resuscitation Council (*Guidelines*, 2016) states that "any attempt at resuscitation is better than no attempt", healthcare professionals are expected to provide evidence-based, high quality ALS (Fuzzard *et al.*, 2016). There is an expectation that registered nurses who care for the critically ill will provide ALS in addition to BLS and Immediate Life Support (ILS) (GeoHazards International, 2015).

ALS can be defined as, "The provision of effective airway management, ventilation of the lungs and production of a circulation by means of techniques additional to those of Basic Life Support (BLS). These techniques may include, but not be limited to, advanced airway management, tracheal intubation, intravenous access/drug therapy and

defibrillation" (Fuzzard *et al.*, 2016). The core aspects of ALS consist of interventions which contribute to the better outcome after a CA known as chain of survival (Soar *et al.*, 2015; ERC, 2017).

The International Liaison Committee on Resuscitation (ILCOR) formed in 1992 to control, guide and provide a forum for liaison among international principal resuscitation organizations. Worldwide there are three major resuscitation guidelines used immensely, they are; 1) European Resuscitation Guideline, 2) Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care and 3) ALS Education Package of the Australian and New Zealand Committee on Resuscitation.

College of Anaesthesiologists & Intensivists of Sri Lanka is the first provider of internationally accredited Adult ALS courses with cardiac arrest simulation training for all medical professionals, selected nursing officers and some para-medicals in Sri Lanka. They follow the guidelines of European Resuscitation Council (ERC) (*RESUSCITATION SRI LANKA*, 2015). Standardised European ALS course provides evidence-based resuscitation guidelines and skills to healthcare professionals. The ALS course provided through the ALS guideline which is revised and published every five years and the last publication was in 2015 (*ERC Guidelines | ERC Guidelines 2015, 2018*)

It is a valuable research because globally CA is the number one cause of death; and only few studies were done on ALS, world-wide. Furthermore, hardly any researches were done in Sri Lanka; studies conducted among healthcare personnel and students all over the world report less satisfactory knowledge and practice among that population. Thus, there is a need of initializing the concept and important to improve the quality and awareness among nursing staff.

B. Objectives

The general objective of this study was to assess the practice and factors influencing on adult ALS among the nursing officers in Teaching Hospital Jaffna.

Specific objectives:

To assess the practice on adult ALS among nursing officers in Teaching Hospital Jaffna.

To assess the influencing factors (socio-demographic, educational, personal and hospital) in practice on adult ALS among nursing officers in Teaching Hospital Jaffna.

II. METHODOLOGY AND EXPERIMENTAL DESIGN

A hospital based descriptive cross-sectional study was conducted in Teaching Hospital Jaffna, Sri Lanka from

November 2017 to December 2018. In this study, sample size was calculated by using formula $\{n = Z^2p(1-p)/d^2\}$; where calculated sample size was 380 and with the 10% non-responding rate, total estimated sample size was 418 staff nurses. Hence all the 490 permanent male and female nursing officers worked in all the wards, special units, clinics and laboratory of Teaching Hospital Jaffna were included in this study. Nursing officers who were in maternity leave (10), long term / annual leave (15), and in-service training (17) during data collection period were excluded from the study.

Self-administered questionnaire in English was constructed and used to collect the data. All three sections of the questionnaire were developed by the researcher with the help of the supervisors based on European Resuscitation Guidelines. The Questionnaire was validated for its content and scoring by two experts in the specific fields other than the supervisors. The questionnaire consisted of three sections: Section I contained six prepared questions regarding socio-demographic data. Section II consisted of fifteen questions with 19 statements. It covers nurses' practice on ALS procedures, early recognition, ABCDE approach, CPR, defibrillation, emergency trolley, post resuscitation care and ALS algorithm. Section III contained twenty-four close ended statements with various factors (educational, personal and hospital related factors) affecting the practice on ALS. Pre-test was conducted among ten nursing officers, working in Base Hospital Tellippalai and according to the results, alteration and modification was made in the questionnaire with the help of supervisors without affecting the objectives of the study.

Data collection was carried out from 1st to 31st of October 2018. Questionnaire was given to study population during their free time and the purpose, benefits, awareness and ethical aspects of the study were explained. After completion of data collection, the data was entered and analyzed using Statistical Package of Social Science (SPSS) 23. In Scoring: Practice part contains 19 statements. Scores for always, some times and never were two, one and zero respectively to positive statements. Reversed coding was accorded for negative statements. Practice part questions scored totally into 38 marks and then divided into three equal parts for scaling. Scales of the Practice were Good practice: (above 26.5), Average practice: (26.5 - 13.5), and below 13.5 consider as Poor practice. Analysis was done based on study problem, objectives and variables. Chi squared statistical test and Fisher's exact test (2 tailed) were performed to identify the influencing factors on practice.

The permission was obtained from the Coordinator of Nursing, the Head, the Dean; Unit of Allied Health Sciences, Faculty of Medicine, University of Jaffna to carry out this research project. Ethical clearance was obtained from the Ethical Review Committee, Faculty of Medicine, University of Jaffna. The permission for the pilot study and data collection was obtained from respective officers of the institution and the participants. All the data of the nursing officers which collected for the research purpose were maintained confidentially and never allowed exposing to anyone other than researchers.

III. RESULT

Estimated total sample size of the study was 418. The target group of this study was all 490 staff nurses working in Teaching Hospital Jaffna. In that, total number of respondents was 326 nursing officers working in Teaching Hospital, Jaffna with the response rate of 74.94%.

Figure 1 shows the socio-demographic characteristics of the study population; Majority (33.1%) of the nurses were in 27-30 years of age category. More than two third (76.1%) of the nurses were female. Higher educational level of the majority was diploma (81.3%) and only 24 (7.4%) nurses completed the undergraduate degree. Considering the present working place, majority of them were working in medical wards (21.5%) and other special units (22.4%), meanwhile 12.3% nurses from Special Emergency Units participated in this study. When considering the working experience in current working place, most of the nurses (38.7%) had less than one-year experience in current working place.

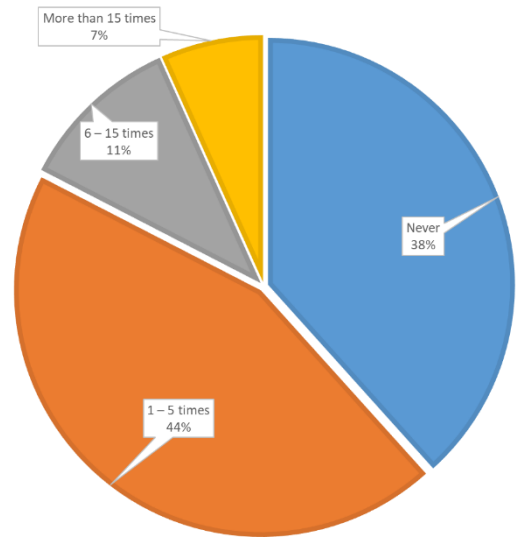


Figure 2. Distribution of frequency of practice on ALS

According to the ERC it is necessary to renew the certificate on BLS/ALS periodically however this study reveals that, majority of the nurses (64.7%) had not received formal in-service training on ALS / CPR even once.

When considering the distribution of frequency of practice on ALS among the nurses working in Teaching Hospital, Jaffna over the last two years of their service (Figure 2); Although, one third of the nurses didn't attempt to provide ALS in the hospital at all, nearly two third of the nurses attempted to provide ALS in the hospital at least one time. Among the ALS provided nurses, majority of the nurses (44.5%) attempted just 1-5 times. The frequency of the nurses provided the ALS at hospital is gradually decreases with the number of attempts.

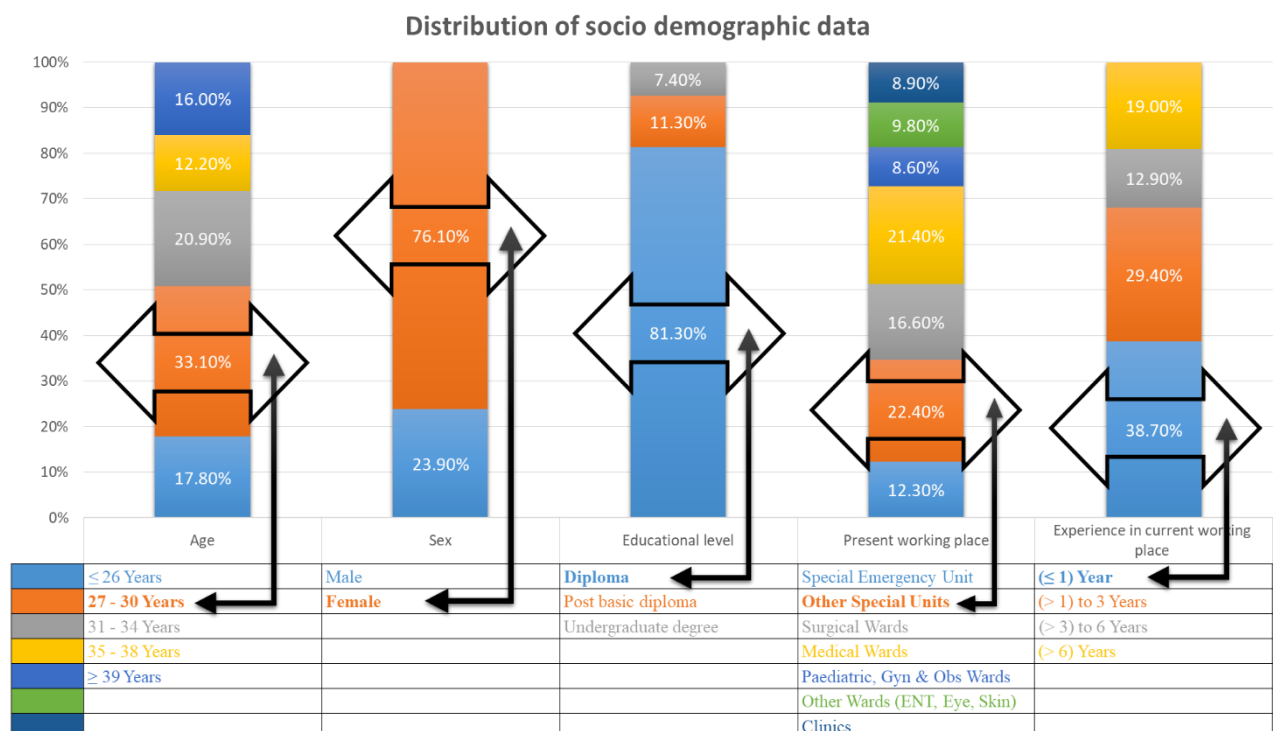


Figure 1. Distribution of socio demographic characteristics of the nursing officers working in Teaching Hospital Jaffna

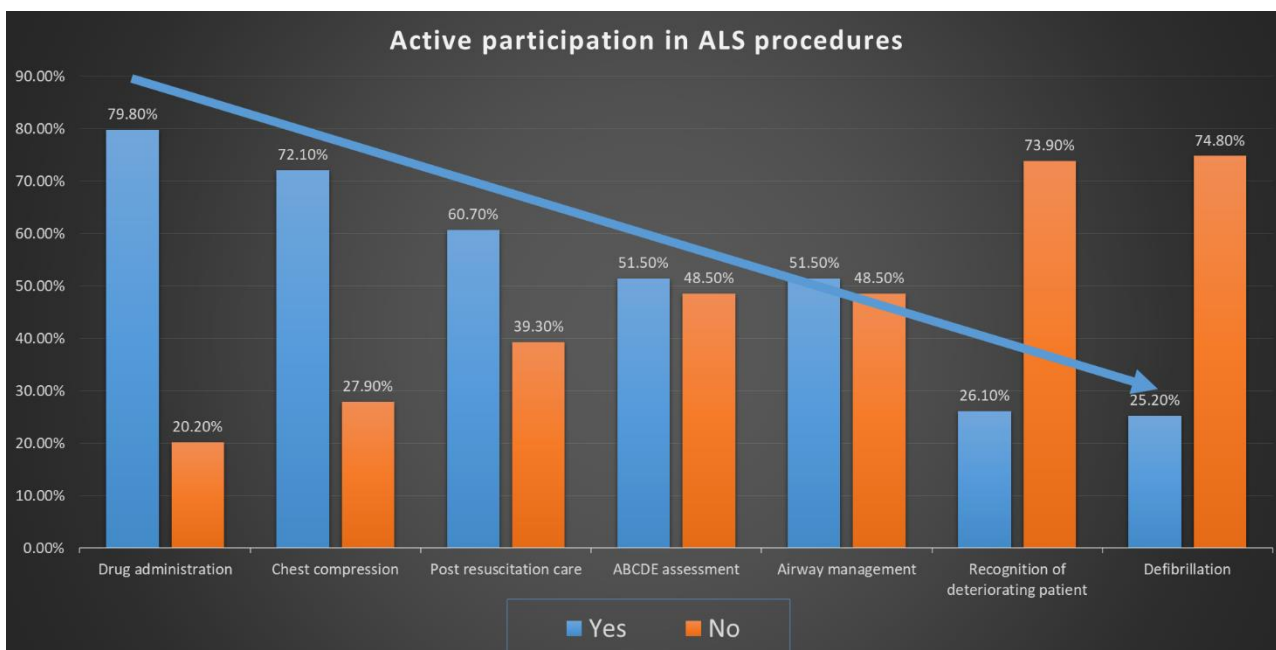


Figure 3. Distribution of active participation of various ALS procedures among the nurses working in Teaching Hospital Jaffna

Figure 3 illustrates the distribution of active participation of various ALS procedures where, Majority of the nurses actively participated in both drug administration (79.8%) and chest compression (72.1%). Whereas, more than half of the nurses participated in post resuscitation care (60.7%), ABCDE assessment (51.5%) and airway management (51.5%). Just one fourth of the nurses participated individually in recognition of deteriorating patient and defibrillation even though these are the most important concerns of the nurses.

Table 2 shows the frequency of distribution of practices on ALS procedures. Nurses as the bedside caregivers, close monitoring of a deteriorating patient is their responsibility. However, only less than half of the total participants (45.3%) practiced it always. According to the study finding, a poor practice of “in an emergency situation they call the doctor for help and wait until his arrival” was distributed among majority (76.1%) of the nurses. Nearly two third of the nurses never use SBAR tool to communicate with co-workers related to the care. In an emergency management; more than half of the nurses (54.7%) don’t care about team work, leadership and others instruction, just do their part in their own very quickly. In this study, majority of the nurses don’t check the safety of the victim and others: always (50.8%) and sometimes (18.3%).

During chest compression, movement at the wrist joint was made always by one third of the nurses and sometimes by another one third of the nurses. Only one third (30.0%) of the total nurses always consider about high quality CPR during their practice. It’s obvious that the CPR should be stopped immediately, if a patient become conscious; Majority of the nurses (45.0%) always follow the correct practice and one third follow it sometimes only.

Nurses can deliver the sock if they are confident enough to confirm the shockable rhythm; however according to this study finding, majority of the nurses (83.8%) had never practiced that. Majority of the nurses (95.7%) never gave Adrenalin 1mg IV without doctor’s order, very few practiced it sometimes without doctor’s order. Although, administration of Adrenalin without the dilution is harmful, it was always practiced by 43.4% nurses and sometimes practiced by 21.7% nurses. Checking the expiry date and label of the medication is very important even in an emergency management. However, nearly half of the nurses (51.7%) never practiced it.

More than three fourth of the nurses agreed that they have an emergency trolley in their wards always (96.6%) and always they check the emergency trolley daily (86.9%). Approximately half of the nurses always had good practice of checking the availability of the emergency medications (54.7%), checking the expiry date of medications (55.0%) and checking the availability of the equipment (47.4%). Nearly two third of the nurses (58.4%) with poor practice never check the working condition of defibrillator. In the post resuscitation care, placing the patient in a recovery position is important even though more than half of the nurses (55.0%) never practiced.

Table 1. Distribution of level of practice on ALS among the nurses working in Teaching Hospital Jaffna (n=326)

Knowledge Level	Frequency (n=326)	Percentage (%)
Good Practice (< 26.5)	67	20.4
Average Practice ($26.5-13.5$)	159	48.5
Poor Practice (<13.5)	100	30.5

Table 2. Distribution of practice on ALS procedures

Statements regarding practice on ALS:	Always	Sometimes	Never
	<i>f</i> (n) (P %)	<i>f</i> (n) (P %)	<i>f</i> (n) (P %)
I monitor the deteriorating or seriously ill patient closely and frequently	148 (45.3%)	117 (35.8%)	62 (19.0%)
When an emergency situation arises, I call the doctor for help and wait until his arrival	169 (51.7%)	80 (24.5%)	78 (23.9%)
I use Situation-Background-Assessment-Recommendation (SBAR) tool to communicate with other individuals related to the care	26 (8.0%)	107 (32.7%)	194 (59.3%)
In an emergency management, I don't care about team work, leadership and others instruction, just I do my part in my own very quickly	179 (54.7%)	55 (16.8%)	93 (28.4%)
In an emergency situation, I don't waste the time by assessing safety, response, airway and breathing. I directly check the circulation, and start the CPR	166 (50.8%)	60 (18.3%)	101 (30.9%)
During chest compression, I make the movement at the wrist joint	106 (32.4%)	111 (33.9%)	110 (33.6%)
While giving CPR, I consider about high quality (Proper rate, depth and recoil)	98 (30.0%)	75 (22.9%)	154 (47.1%)
While I'm giving the CPR, if a patient become conscious; Immediately I stop the CPR	147 (45.0%)	104 (31.8%)	76 (23.2%)
If I confirm the shockable rhythm in an unconscious patient; As soon as possible early, I give the shock	18 (5.5%)	35 (10.7%)	274 (83.8%)
If I confirm the non-shockable rhythm in an unconscious patient, As soon as possible early I give Adrenalin 1mg IV without doctor's order	00 (0.0%)	14 (4.3%)	312 (95.7%)
If there is an emergency, I administer the Adrenalin without the dilution	142 (43.4%)	71 (21.7%)	114 (34.9%)
In an emergency management, I don't waste the time by checking the expiry date and label of the medication	169 (51.7%)	67 (20.5%)	91 (27.8%)
We have an emergency trolley in our ward	316 (96.6%)	2 (0.6%)	9 (2.8%)
Check the emergency trolley daily	284 (86.9%)	29 (8.9%)	14 (4.3%)
Check the availability of the emergency medications	179 (54.7%)	102 (31.2%)	46 (14.1%)
Check the expiry date of medications	180 (55.0%)	115 (35.2%)	32 (9.8%)
Check the availability of the equipment	155 (47.4%)	103 (31.5%)	69 (21.1%)
Check the defibrillator for working condition	94 (28.7%)	42 (12.8%)	191 (58.4%)
In the post resuscitation care, I turn the patient to the recovery (left lateral) position	75 (22.9%)	72 (22.0%)	180 (55.0%)

According to the results of this study, overall practice level on adult ALS among the nurses working in Teaching Hospital, Jaffna (n=326) distributed as, approximately half of the nurses (48.5%) had Average practice and 20.4%

nurses had Good practice (Table 1). However, the practice score was inadequate among 30.5% of the total study population. Furthermore, majority of the nurses gained 10 marks in high frequency (Mode). The maximal mark

obtained by the nurses was 35 and the minimal was six.
The mean marks was 19.60 (SD 7.183).

Table 3. Distribution of socio demographic data of nurses in relation to levels of practice on ALS

Socio demographic factors	Levels of practice on ALS			Statistical Tests
	Good Practice	Average Practice	Poor Practice	
Age				X ² 3.291 ³ Df 8 p-value 0.915
Sex				0.079 ² 2 0.961
Educational level				
Diploma	39 (14.7%)	136 (51.3%)	90 (34.0%)	46.362 ²
Post basic diploma	11 (29.7%)	16 (43.2%)	10 (27.0%)	4
Undergraduate degree	17 (70.8%)	7 (29.2%)	0 (0.0%)	< 0.001
Present working place				
Special Emergency Unit	19 (47.5%)	21 (52.5%)	0 (0.0%)	
Other Special Units	22 (30.1%)	33 (45.2%)	18 (24.7%)	
Surgical Wards	9 (16.7%)	26 (48.1%)	19 (35.2%)	47.232 ²
Medical Wards	7 (10.0%)	36 (51.4%)	27 (38.6%)	12
Pediatric, Casualty, Gyn &Obs Ward	4 (14.3%)	16 (57.1%)	8 (28.6%)	< 0.001
Other Wards	3 (9.4%)	16 (50.0%)	13 (40.6%)	
Clinics	3 (10.3%)	11 (37.9%)	15 (51.7%)	
Experience in current working place				3.642 ² 6 0.725

When considering the levels of practice of the nurses in relation to Socio demographic data (Table 3); Good practice was distributed among more than 70% of the total undergraduate nurses whereas it was just 14.7% among the diploma holders with the statistical significant of (p < 0.001). Compared to the poor practice, good practice on ALS was distributed mostly among the nurses working in Emergency Unit and Other Special Units with the statistical significant of p < 0.001. When considering the other socio demographic data of the nurses; Age (p = 0.915), Sex (p = 0.961), experience in current working place (p = 0.725) were not statistically significant.

Table 4. Distribution of participation in formal training of ALS in relation to levels of practice on ALS

Factors related to formal training and learning methods of ALS	Good Practice		Average Practice		Poor Practice		Statistical Tests
	Yes	No	Yes	No	Yes	No	
	f(n)	f(n)	f(n)	f(n)	f(n)	f(n)	Df
	P%	P%	P%	P%	P%	P%	P value
Have you ever had formal teaching on Advanced Life Support / Cardiopulmonary Resuscitation (CPR)?	48	19	67	92	0	100	96.589 ² 2 < 0.001

Table 4 shows the levels of practice of the nurses in relation to the participation in formal training on ALS; Compared to the poor practice, good practice on ALS was highly distributed among the nurses those attended the formal training on ALS/ CPR. None of the nurses who attended the formal in-service training on ALS got poor practice level. There is a strong statistically significant difference can be seen with the p value less than 0.001.

When considering the number of attempts to provide ALS in relation to the levels of practice (Table 5); Compared to

the poor practice, good practice was highly distributed among the nurses attempted to provide ALS more than 15 times (40.9%) and vice versa. Number of attempts to provide ALS have a strong positive statistically significant association in the practice on ALS (p < 0.001).

Table 5. Distribution of attempts to ALS procedures in relation to levels of practice

Attempts to provide ALS	Levels of practice on ALS			Statistical Tests			
	Good Practice	Average Practice	Poor Practice				
	f(n)	P%	f(n)	P%	f(n)	P%	X ² Df p-value
Never	6	(4.8%)	50	(40.0%)	69	(55.2%)	77.289
1 – 5 times	42	(29.2%)	74	(51.4%)	28	(19.4%)	-
6 – 15 times	10	(28.6%)	23	(65.7%)	2	(5.7%)	< 0.001
> 15 times	9	(40.9%)	12	(54.5%)	1	(4.5%)	

Table 6 shows the distribution of personal factors in relation to the levels of practice of the nurses; Leadership skills (p = 0.001), Psychological issues (p = 0.002), Effective communication (p = 0.002), Self-confidence (p = 0.009) have a solid statistically significant difference.

Table 6. Distribution of personal factors of nurses in relation to levels of practice on ALS

Personal Factors	Good Practice			Average Practice			Poor Practice			Statistical Tests
	Most Influence	Less Influence	No Influence	Most Influence	Less Influence	No Influence	Most Influence	Less Influence	No Influence	
	f(n)	f(n)	f(n)	f(n)	f(n)	f(n)	f(n)	f(n)	f(n)	X ² Df
	P%	P%	P%	P%	P%	P%	P%	P%	P%	P value
Leadership skills	57	8	2	98	41	20	53	33	14	18.892 ² 4 0.001
Psychological issues	31	23	13	56	41	62	29	20	51	16.943 ² 4 0.002
Effective communication	48	18	1	84	62	13	40	49	11	17.440 ² 4 0.002
Self confidence	56	11	0	120	30	9	62	29	9	13.199 ² 4 0.009
Previous experiences in ALS procedures	61	6	0	124	34	1	75	24	1	7.833 ² 4 0.054
Fear to deal with critically ill patient	19	18	30	45	32	82	24	14	62	6.319 ² 4 0.178
Tiredness	17	33	17	50	82	27	27	47	26	3.956 ² 4 0.412
Own interest in ALS procedures	50	16	1	114	38	7	74	20	6	2.316 ² 4 0.687

When considering the level of practice of the nurses in relation to educational factors (Table 7); Motivation of the practitioner who taught ALS/CPR (p < 0.001), Learned or practiced with the help of college/co-worker (p = 0.003), Training programmes attended during service (p = 0.004),

Learned knowledge regarding ALS in my own (p = 0.011) have a solid statistical significant difference.

Table 7. Distribution of educational factors of nurses in relation to levels of practice on ALS

Educational Factors	Good Practice			Average Practice			Poor Practice			Statistical Tests
	Most Influence	Less Influence	No Influence	Most Influence	Less Influence	No Influence	Most Influence	Less Influence	No Influence	
	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	X ² Df P value
Motivation of the practitioner who taught ALS/CPR	46 14.1%	18 5.5%	3 0.9%	72 22.1%	65 19.9%	22 6.7%	32 9.8%	48 14.7%	20 6.1%	23.252 ^a 4 <0.001
Learned or practiced with the help of college/co-worker	37 11.3%	21 6.4%	9 2.8%	66 20.2%	67 20.6%	26 8.0%	25 7.7%	54 16.6%	21 6.4%	16.065 ^a 4 0.003
The training programmes attended during service	60 18.4%	6 1.8%	1 0.3%	122 37.4%	30 9.2%	7 2.1%	72 22.1%	28 8.6%	0 0.0%	14.000 - 0.004
The learned knowledge regarding ALS in my own	37 11.3%	19 5.8%	11 3.4%	62 19.0%	50 15.3%	47 14.4%	31 9.5%	30 9.2%	39 12.0%	12.999 ^a 4 0.011
Posting to the special Emergency units during my study period	54 16.6%	12 3.7%	1 0.3%	117 35.9%	40 12.3%	2 0.6%	69 21.2%	30 9.2%	1 0.3%	3.509 ^a - 0.444
The Demonstration taught during diploma/degree course	49 15.0%	17 5.2%	1 0.3%	114 35.0%	33 10.1%	12 3.7%	71 21.8%	22 6.7%	7 2.1%	3.679 - 0.452
Period of clinical practice during my study period	45 13.8%	15 4.6%	7 2.1%	103 31.6%	44 13.5%	12 3.7%	62 19.0%	31 9.5%	7 2.1%	1.920 ^a 4 0.750
The knowledge gained during diploma/degree program	46 14.1%	16 4.9%	5 1.5%	114 35.0%	35 10.7%	10 3.1%	64 19.6%	27 8.3%	9 2.8%	1.912 - 0.756

Table 8. Distribution of hospital related factors of nurses in relation to levels of practice on ALS

Hospital related Factors	Good Practice			Average Practice			Poor Practice			Statistical Tests
	Most Influence	Less Influence	No Influence	Most Influence	Less Influence	No Influence	Most Influence	Less Influence	No Influence	
	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	f(n) P%	X ² Df P value
Ethical barriers	17 5.2%	36 11.0%	14 4.3%	28 8.6%	67 20.6%	64 19.6%	23 7.1%	25 7.7%	52 16.0%	20.512 ^a 4 <0.001
Insufficient emergency equipment and resources	36 11.0%	22 6.7%	9 2.8%	64 19.6%	32 9.8%	63 19.3%	26 8.0%	22 6.7%	52 16.0%	27.456 ^a 4 <0.001
Lack of job satisfaction	15 4.6%	34 10.4%	18 5.5%	37 11.3%	55 16.9%	67 20.6%	14 4.3%	31 9.5%	55 16.9%	14.904 ^a 4 0.005
Higher Workload	42 12.9%	21 6.4%	4 1.2%	76 23.3%	62 19.0%	21 6.4%	34 10.4%	49 15.0%	17 5.2%	14.247 ^a 4 0.007
Long working hours	42 12.9%	22 6.7%	3 0.9%	79 24.2%	65 19.9%	15 4.6%	37 11.3%	53 16.3%	10 3.1%	11.346 ^a 4 0.023
Higher concern on critical situation and ALS procedures	32 9.8%	30 9.2%	5 1.5%	55 16.9%	85 26.1%	19 5.8%	25 7.7%	59 18.1%	16 4.9%	9.985 ^a 4 0.041
Improper ward setup to perform ALS procedure	25 7.7%	29 8.9%	13 4.0%	90 27.6%	50 15.3%	19 5.8%	57 17.5%	29 8.9%	14 4.3%	8.409 ^a 4 0.078
Lack of nursing staff	32 9.8%	34 10.4%	1 0.3%	70 21.5%	80 24.5%	9 2.8%	34 10.4%	64 19.6%	2 0.6%	7.224 - 0.114

Table 8 illustrate the distribution of hospital related factors in relation to the levels of practice of the nurses; Ethical barriers (p < 0.001), Insufficient emergency equipment and resources (p < 0.001), Lack of job

satisfaction (p = 0.005), Higher Workload (p = 0.007) have a solid statistical significant difference.

IV. DISSCUSSION AND CONCLUSION

According to this study, only 20.4% nurses had Good practice, approximately half of the nurses (48.5%) had Average practice and the practice score was inadequate among 30.5% of the total study population (n=326). The mean marks of the nurses regarding the practice on adult ALS was 19.60 (Standard Deviation was 7.183) out of 38. Improper practice and knowledge deficit in several aspect of adult ALS among the nurses were found. In contrast a study by Tsegaye et al. among clinical year medical students in Jimma University, Ethiopia also reported that the clinical year medical students had a better practice score towards CPR. Overall, however, the majority of students' practices toward to CPR were not sufficient, favourable and safe enough (Tsegaye and Tesfaye, 2015).

Several questions were asked to assess the practice level among nurses and the result shows that the area of good practice (>50%) were; early recognition of deteriorating patient, cardiopulmonary resuscitation and practice on emergency trolley. The area of (<50%) poor practice were; communication and leadership, assessment and management of airway, breathing, circulation, level of consciousness and exposure, defibrillation, practice on non-shockable rhythm, post resuscitation care. However, Tsegayes' findings doesn't support ours as in their study 80.7% students were not practicing CPR (Tsegaye and Tesfaye, 2015). Furthermore, according to the study done by Suzuki et al. (Suzuki et al., 2001) among the Japanese medical students showed that about 20% of them could perform standard CPR and other close studies also confirmed this, too (Farah et al., 2007; Khan et al., 2010).

The study shows the statistical significance of various socio demographics, personal, educational and hospital related factors in relation to the practice on ALS of the nurses: educational level, present working place, attended the formal teaching or simulation training, number of attempts to provide ALS, leadership skills, psychological issues, effective communication, self-confidence, previous experiences in ALS procedures, motivation of the practitioner who taught ALS/CPR, learned or practiced with the help of college/co-worker, the training programmes attended during service, self-learning regarding ALS, ethical barriers, insufficient emergency equipment and resources, lack of job satisfaction, higher workload had statistically significant difference in the practice on ALS. Meanwhile, the study by Tsegaye et al. revealed a total of 98.7% of students with lack of training as major factors affecting practice of CPR, followed by

poor exposure (93.56%). Nearly 84% participants state that lack of confidence is one factor affecting practice of CPR. There is significant association between lack of training, inadequate information, lack of confidence, Poor exposure and practice of CPR as p value is less than 0.05 (Tsegaye and Tesfaye, 2015).

There were some limitations of this study. A self-administered questionnaire was used to examine nurses' practice. In ALS, practice assessment only by questioner doesn't provide a greater insight to conclude. Assessment of practical skills through simulated practical tests also equally important aspect. Though, the simulated practice level was not assessed due to the time factor. Thus, responses might not indicate actual nursing practices. Lack of time as well as willingness of nurses questions the sensitivity and the specificity of the questionnaire. This study was conducted only in one teaching hospital; thus, these findings may not be generalized to other settings.

This exploration of the current situation of nurses' practice on ALS provides baseline data for the further improvement of nursing care in this field. ALS should be included in the nursing curriculum of both diploma and degree programs. In-service formal teaching, simulation training on ALS with evidence based guidelines should be given to all the nurses in a continuous manner to improve their knowledge and skills as well as expected to transmit their knowledge to the nursing students.

Hospital policies and guidelines are necessary to improve nurses' knowledge and practice on ALS with the frequent re-evaluation. Further research to investigate the relationship between the level of knowledge and practices on ALS needed to identify the shortages of the care.

ACKNOWLEDGMENT

It's my obligation and honour to express my thankfulness and appreciation to all who have helped me to complete this study successfully as I wished.

I would like to express my deepest gratitude to my supervisors for their valuable guidance, encouragement and unreserved support throughout the study.

I extend my warm appreciation and gratitude to the contribution of all the nurses who took part in this study.

I acknowledge the International Research Conference, General Sir John Kotelawala Defense University for giving this opportunity to present my study in the conference.

REFERENCES

About Cardiac Arrest | American Heart Association (2017) *heart.org*. Available at: [https://www.heart.org/en/health-](https://www.heart.org/en/health-topics/cardiopulmonary-resuscitation/about-cardiac-arrest)

[topics/cardiopulmonary-resuscitation/about-cardiac-arrest](https://www.heart.org/en/health-topics/cardiopulmonary-resuscitation/about-cardiac-arrest) (Accessed: 18 January 2018).

Association, A. H. (2010) '2010 American Heart Association Guidelines for CPR and ECC', *Resuscitation*, 276, pp. 410–528. doi: 10.1161/CIR.0b013e3181fdf7aa.

Cardiovascular diseases (2018) *who.int*. Available at: https://www.who.int/health-topics/cardiovascular-diseases/#tab=tab_1 (Accessed: 1 May 2018).

Cardiovascular diseases (CVDs) (2018) *who.int*. Available at: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)) (Accessed: 12 March 2018).

ERC (2017) *cprguidelines.eu/*. Available at: <https://www.erc.edu/courses> (Accessed: 6 January 2018).

ERC Guidelines | ERC Guidelines 2015 (2018) *cprguidelines.eu/*. Available at: <https://cprguidelines.eu/> (Accessed: 11 February 2018).

Farah, R. *et al.* (2007) 'Cardiopulmonary resuscitation surprise drills for assessing, improving and maintaining cardiopulmonary resuscitation skills of hospital personnel', *European Journal of Emergency Medicine*, 14(6), pp. 332–336. doi: 10.1097/MEJ.0b013e328285d6d6.

Fuzzard, K. *et al.* (2016) '(ALS) EDUCATION PACKAGE Including : Basic Life Support Advanced Life Support Peri-arrest patient management', (April).

GeoHazards International (2015) 'About Us: Our Mission', (March). Available at: <http://geohaz.org/about/index.html>.

Guidelines (2016) *resus.org.au*. Available at: <https://resus.org.au/guidelines/> (Accessed: 17 February 2018).

Khan, A. *et al.* (2010) 'Knowledge attitude and practices of undergraduate students regarding first aid measures', *Journal of the Pakistan Medical Association*, 60(1), pp. 68–72.

RESUSCITATION SRI LANKA (2015) <https://resuslanka.org>. Available at: <https://resuslanka.org/about-us/> (Accessed: 25 December 2017).

Soar, J. *et al.* (2015) 'Part 4: Advanced life support. 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations', *Resuscitation*, 95, pp. e71–e120. doi: 10.1016/j.resuscitation.2015.07.042.

Sudden Cardiac Death, Cardiac Arrest, and Heart Disease (2018) *WebMD.com*. Available at: <https://www.webmd.com/heart-disease/guide/sudden-cardiac-death#1> (Accessed: 8 March 2018).

Suzuki, A. *et al.* (2001) '[A survey of 3,303 6th-year medical students from 36 universities concerning knowledge of resuscitation--more than 80% of medical students can not perform standard cardiopulmonary resuscitation?]', *Masui. The Japanese journal of anesthesiology*, 50(3), pp. 316–22. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/11296450> (Accessed: 3 December 2019).

Tsegaye, W. and Tesfaye, M. (2015) 'Knowledge, Attitude and Practice of Cardiopulmonary Resuscitation and Associated Factors in Ethiopian University Medical Students', *Journal of*

General Practice, 03(04). doi: 10.4172/2329-9126.1000206.

'World Health Organization - Noncommunicable Diseases (NCD) Country Profiles, 2014.' (2014) *World Health Organization - Noncommunicable Diseases (NCD) Country Profiles, 2014*.