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Research Article

Areas of Difficulty in Basic Life Support Practical with Chiropractic Students

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Abstract

Introduction: The purpose of this retrospective study is to determine areas of difficulty in basic life support (BLS) procedures based upon the details of OSCE grades as part of a chiropractic course in the United States.

Methods: Author performed retrospective analysis of BLS OSCE grade details by percent of total students and percent total missed points.

Results: The three most missed areas of the OSCE included the following in order of most difficult to least (% of students missed item,% of total missed points): Resuscitation mask usage (18.0,10.1); Checking breathing and pulse at the same time (17.0, 10.1); Timing of recheck (17,10).

Discussion: Difficulty in resuscitation mask usage mainly included: 1. not being able to perform jaw thrust and 2. not tilting chin for those without neck injury. Timing of recheck included: 1. Not knowing how many cycles or minutes to perform before re-check or 2. Not performing recheck. Limitations were as follows: retrospective design, retakes, mentions of most missed items to students in the past and collapsed line items.

Conclusion: The most missed areas of the BLS OSCE should be communicated to students to provide feedback to prevent students from making the same mistakes. Attention to the details of the most missed areas should be communicated as well. These conclusions must be balanced with limitations.

Keywords: *BLS; Basic Life Support; CPR; Cardiopulmonary Resuscitation; Education; OSCE*

Introduction

BLS is taught in many chiropractic colleges at the healthcare provider level and includes rescue breathing, conscious choking, unconscious choking, CPR 1 rescuer, CPR 2 rescuer and AED. In addition, the initial assessment is assessed which is a general approach to scenario management. The initial assessment is delineated in table 1 and is significantly modified from the American Red Cross's teaching protocols [1]. These skills are modified depending upon whether the victim is an adult, child or infant. These skills and victim types result in 18 possible scenarios. Learning these critical skills by healthcare providers improves the recovery from cardiac arrest; among other maladies [2]. Compared to the burden that cardiac arrest imposes; there has only been modest gains in survivability attributed to system optimization rather than improvements in treatment that require skill training [2].

Step	Sub Step	Mneumonic	Description
1	A	A - Ok	Survey the scene
	B	Be sure to put on gloves	Put on gloves
	C	Consciousness check	Shout, tap, shout
	C	Consent	
	C	Calm down	
	C	Check Bracelet	Check for med alert information
	D	Drowning	2 breaths for them if drowning, HNSI?
2	1	Emergency number	Call 911
	2	First Aid kit and AED	Get First Aid Kit and AED
	3	HNSI (3 areas of concern)	Head, neck, spinal injury evidence
	4	Firm, Flat surface	Put victim on a firm, flat surface
3		SOL (notice 3 letters)	Breathing and pulse
4		Go FOUR the fix	Treatment

Table 1: *Initial Assessment Steps.*

Teaching methods

Many teaching methods have been investigated in the past. Nord., *et al.* found that web based CPR training had no significant effect on practical CPR skills; although, this was on 13-years-old and thus cannot be applied to the target population of this study (25-30 year-old graduate students) [3]. Bylow gave evidence that web-based training improved adults' ability to perform BLS skills [4]. Systematic reviews comparing different methods of training were limited by low methodological quality studies and low n numbers: n=5 [5] and n=11 [6]. An RCT by Moon and Hyun suggested that a blended (in class and online) approach seemed to improve knowledge using a 20-point practical performance rubric [7]. The blended approach with virtual patients was studied with pediatric life support as well with positive results in skill performance [8]; Garcia-Suarez's systematic review supports this generally [6]. This information should be taken into consideration as ways to improve the teaching methods to provide better results in the future.

Assessment

Assessment of these skills are often performed by objective structured clinical examinations (OSCE) [9] where a rubric is scored while the student performs procedures in a simulated clinical scenario. The rubric is delineated in table 2 for this OSCE. This OSCE was part of a BLS course which was in quarter 9 of 13. The OSCE was out of 25 points. Others have used a 20-point rubric [7].

Category	Step	SubStep	Mneumonic	Details
1	1	A	A - Ok	Survey the scene
2		B	Be sure to put on gloves	Put on gloves
3		C	Consciousness check	Shout, tap, shout
4		C	Consent	
5		C	Calm down	
6		C	Check Bracelet	Check for med alert information
7		D	Drowning	2 breaths for them if drowning, HNSI?
8	2	1	Emergency number	Call 911, auto-fail if not done before treatment (except con choking)
9		2	First Aid kit and AED	Get First Aid Kit and AED
10		3	HNSI (3 areas of concern)	Head, neck, spinal injury evidence
11		4	Firm, Flat surface	Put victim on a firm, flat surface
12	3		SOL (notice 3 letters)	Breathing and pulse
13			Same time	Check breathing and pulse same time
14			Tilt/mask	Opened airway, used mask appropriately
15			Mask Available	Especially infant mask

	4		Go FOUR the fix … Treatments	
16			Rescue breaths	Ratio
17			Conscious choking	Ratio
18			Unconscious choking	Ratio
19			CPR 1 Rescuer	Ratio, form
20			CPR 2 Rescuers	Ratio, form, switch, 2 thumbs for infants
21			AED Turn on	Done first
22			AED Other	Pads before plug in
23			2 min or when to check signs of life	
24			Other	Other areas not represented in rubric that would affect quality of patient care
25			3 Stoppers	Know what would stop specific care being performed: EMS takes over, too Exhausted to continue, Monster (danger at the scene), Signs of life return

Table 2: *BLS OSCE Rubric with Steps and Details.*

Primary aim

The primary aim of this study was to determine which items students had difficulties performing during assessment by rubric guided OSCE. Also, the author investigates some of the subitems missed within the main categories.

Methods

Teaching methods included mainly lecture, limited video, PowerPoint (Microsoft Corp) and guided training. One quarter of students learned by online instruction due to the Covid-19 Pandemic and the OSCEs where online. BLS OSCEs are practical exams where the student performs a scripted protocol on a scenario that develops, and the student is expected to respond appropriately. Scenarios were randomized by Microsoft Excel function as follows: = rand (between,1,18). Students began the OSCE not knowing their assigned scenario and discovered what their scenario was as it developed. Students were graded using the rubric in table 1.

Retrospective analysis of anonymized BLS OSCE grade details were performed on each step to determine what percentage of the students missed an item and what percentage of the missed items involve that item. This analysis was performed using Excel (Microsoft Corp).

Background literature acquisition methods included the following searches in Pubmed: CPR online; cardiopulmonary resuscitation web (filtered for free-full text). Eight articles were identified. One reference was from author's personal collection [1].

Results

Descriptive statistics are represented in table 3.

	A OK Scene	Gloves	Cons-sciou-ness	Consent	Calm	Bracelet Check	If drowning, 2 Breath	911	First Aid kit	AED	HNSI	SOL	Same Time	Tilt/mask	Mask Other	Rescue Breaths	Con Choke	Un Choke	CPR1	CPR2	AED Turn on	AED Other	2 min and SOL recheck	Other	3 Stoppers
# missed	1	13	30	41	0	1	5	33	63	37	14	44	89	94	14	18	46	46	40	27	24	27	89	66	20
% students	0.2	2.5	5.7	7.9	0.0	0.2	1.0	6.3	12.1	7.1	2.7	8.4	17.0	18.0	2.7	3.4	8.8	8.8	7.7	5.2	4.6	5.2	17.0	12.6	3.8
% of total missed	0.1	1.5	3.4	4.6	0.0	0.1	0.6	3.7	7.1	4.2	1.6	5.0	10.1	10.7	1.6	2.0	5.2	5.2	4.5	3.1	2.7	3.1	10.1	7.5	2.3

Table 3: *Descriptions of the phases, teaching style and results, n=522, 8 quarters total.*

Discussion

Overview

Areas of difficulty by chiropractic students performing a BLS OSCE is represented in table 1. This discussion will review and interpret the results and delineate the limitations of this study.

Interpretation of results

The three most missed areas of the OSCE included the following in order of most difficult to least (% of students missed item,% of total missed points): Resuscitation mask usage (18.0,10.1); Checking breathing and pulse at the same time (17.0, 10.1); Timing of recheck (17,10). Difficulty in resuscitation mask usage mainly included: 1. not being able to perform jaw thrust and 2. not tilting chin for those without neck injury. Timing of recheck included: 1. Not knowing how many cycles or minutes to perform before re-check or 2. Not performing recheck.

Limitations

Limitations were as follows: retrospective design, retakes, mentions of most missed items to students in the past and collapsed line items. This study was performed by retrospective design and therefore was not optimal. Other influencers such as stress were not able to be determined retrospectively. Retakes decreased the magnitude of the percentages of results since the students had to retake any OSCE with a grade less than eighty percent. Mentions of the most missed items in the past could have skewed the data. Collapsing different specifics into large categories may hide areas of difficulty that did not involve collapsing of data. Difficulty in resuscitation mask usage mainly included the following subitems: 1. not being able to perform jaw thrust and 2. not tilting chin for those without neck injury. This combination of subitems 1 and 2 may have inflated the percentage for this large category. Perhaps a single item in another category may have proven to me more difficult if the subitems where detached. Another concern is sometime student do things that should be reported yet are not necessarily in the OSCE rubric. A few students had times of uncomfortable stalling which would not be appropriate in an emergency. Often the proctor would say "Everyone is staring at you" during these instances. These limitations should be considered in further studies.

Further Study

Further studies avoiding the limitations of this study is recommended. The instructor has mentioned areas of difficulty in the past and that effect should be explored.

Declarations

Conflicts of Interest

No conflicts known. No sources of funding.

IRB Determinations

This study did not constitute human subjects research pursuant to 45 CFR 46.

Conclusion

The three most missed areas of the OSCE included the following in order of most difficult to least (% of students missed item,% of total missed points): Resuscitation mask usage (18.0,10.1); Checking breathing and pulse at the same time (17.0, 10.1); Timing of recheck (17,10). Difficulty in resuscitation mask usage mainly included: 1. not being able to perform jaw thrust and 2. not tilting chin for those without neck injury. Timing of recheck included: 1. Not knowing how many cycles or minutes to perform before re-check or 2. Not performing recheck. Alternate teaching methods including virtual patients should be considered based upon the literature to improve results as well.

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