

# The Sufficiency of Assistant and Intern Doctors' Knowledge About Basic and Advanced Life Support: A Survey Study

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## ABSTRACT

**Objective:** We aimed to evaluate the level of assistant and intern doctors' knowledge about basic and advanced life support.

**Material and Methods:** In this study, the current knowledge of 357 assistant and intern doctors at the hospital of Cumhuriyet University was reviewed via a questionnaire of 40 questions about basic and advanced life support. The participants' consent was received before administering the questionnaire. The findings were reported in figures and percentages. While the Kruskal-Wallis Variance analysis test was used for statistical calculations, the chi-square test was used for statistical comparisons.  $p < 0.05$  was accepted as significant. This study consists of questions prepared about the recent changes in the guide for cardiopulmonary resuscitation by the American Heart Association (AHA) released in 2010.

**Results:** This study weights the answers from both of the participant groups equally even though the practical experience of assistant doctors is greater than the interns'. The ratio of right answers to the questions about general knowledge of basic and advanced life support is found to be low in this particular study. However, assistant doctors aged between 20-30 achieve a higher rate of true answers compared to the other participant doctors.

**Conclusions:** This study has concluded that the knowledge level of assistant and intern doctors is insufficient and not up-to-date. It has also shown that insufficient knowledge may cause danger, given the fact that basic and advanced life support cannot be applied effectively without correct and accurate information.

**Keywords:** life, resuscitation, support

## ÖZET

Bir anket çalışması: asistan ve intörn doktorların temel ve ileri yaşam desteği konusundaki bilgi yeterliliği

**Amaç:** Asistan ve intörn doktorların temel ve ileri yaşam desteği konusunda bilgi düzeyini inceledik.

**Yöntem:** Bu çalışmada, Cumhuriyet Üniversitesi Hastanesi'nde çalışan 357 asistan ve stajyer doktorun temel ve ileri yaşam desteği ile ilgili güncel bilgileri 40 sorudan oluşan bir anket uygulanarak incelendi. Katılımcıların onayı anketten önce alındı. Bulgular rakamlarla ve yüzdelerde rapor edildi. İstatistiksel hesaplamalarda Kruskal Wallis Varyans analizi testi, istatistiksel karşılaştırmalarda ki-kare kullanıldı.  $p < 0.05$  önemli kabul edildi. Söz konusu çalışma, 2010 yılında yayınlanan Amerikan Kalp Derneği (AHA) tarafından kardiyo pulmoner resüsitasyon rehberindeki son değişiklikler üzerine hazırlandı.

**Bulgular:** Asistan doktorların pratiği daha çok olmasına rağmen hem asistan hem de stajyer doktorların cevapları eşit derecede değerlendirildi. Temel ve ileri yaşam desteği hakkındaki genel bilgilere ilişkin doğru cevapların oranı, bu çalışmada düşük olarak kabul edilmektedir. Bununla birlikte, 20-30 yaş arasındaki asistan doktorlar daha yüksek doğru cevaplar vermektedir.

**Sonuç:** Bu çalışma, asistan ve stajyer doktorların bilgi düzeyinin yetersiz olduğu ve güncel olmadığı sonucuna varmıştır. Ayrıca temel ve ileri yaşam desteğinin yeterli bilgi olmadan doğru şekilde uygulanamayacağı ve tehlikeli olduğunu göstermiştir.

**Anahtar kelimeler:** yaşam, resusitasyon, destek

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## Introduction

Basic Life Support is an emergency intervention keeping the airway open for continuing respiration artificially and applying chest compressions. It can be done by members of the public as well as by health officials and trained life savers. Advanced Life Support, on the other hand, is a special procedure that has to be administered exclusively by health care providers.

As a medical intervention, cardiopulmonary resuscitation aims to reverse situation of cardiac and/or pulmonary arrest in a simple or advanced way. At this point, health care personnel need to be sufficiently trained and medically able to apply the necessary treatments.

The literature includes numerous studies about the most effective ways like in a Peter Safar book. The modern order of resuscitation A-B-C (1,2) and “mouth-to-mouth breathing” in 1958 developed by Peter Safar. The closed-chest massage was re-introduced by Kouwenhoven, Jude, and Knickerbocker in 1960 (3-5). In 1960, the same authors reported 14 surviving patients after using this method (6).

Resuscitation can be divided into two categories: basic and advanced life support. Basic life support means supporting respiration and circulation without administering any drugs, only using protective equipment. If the problem regards respiration, basic life support is of higher benefit for the patient with a chance to recover fully. Advanced cardiac life support includes airway management, ventilation support, bradycardia and tachycardia management, and drug treatments. A successful advanced life support uses high-quality CPR and defibrillation for VF (ventricular fibrillation)/pulseless ventricular tachycardia.

This particular study was carried out to measure the sufficiency of assistant and intern doctors' knowledge about basic and advanced life support. It aimed to investigate whether doctors keep abreast of the daily improvements to achieve an insight into their self-awareness regarding their own competence and to determine the existence of differences between the researched groups.

## Material and Methods

The research data was collected using a questionnaire prepared in accordance with the necessary literature. After the literature search, a 40-question survey, which was prepared on the basis of the AHA 2010 Resuscitation Guide, was distributed to 357 doctors at the Hospital of the Medicinal Faculty at Cumhuriyet

University. The participants consented that the data of this study could be used in any studies planned in the future. They were informed that their answers would be used only for scientific purposes and that their work life or social life would not be affected by it any way. The participants were required to answer fully and to state only the most appropriate answer if they felt that more than one answer could be chosen. The resulting data was uploaded to the software package SPSS14.0. During the evaluation of the answers, when the parametric test hypothesis was applied, a significance test between the two averages of the independent groups was carried. When the parametric test hypothesis was not applied, Kruskal-Wallis and Man-Whitney U tests were used. An error margin of  $p < 0.05$  was accepted as statistically significant.

**Table 1: Demographic distribution of participants**

	n	%
<b>Education</b>		
Assistant doctor	217	60.8
Intern doctor	140	39.2
Total	357	100.0
<b>Marital Status</b>		
Married	145	40.6
Single	212	59.4
Total	357	100.0
<b>Gender</b>		
Male	197	55.2
Female	160	44.8
Total	357	100.0
<b>Age</b>		
20-25	139	38.9
26-30	183	51.3
31-35	29	8.1
36-40	6	1.7
Total	357	100.0

## Results

If we compare the total score of the participants in terms of their education level, we will see that the difference is significant ( $p < 0.05$ ). The score of assistant doctors is higher than the interns' score.

If we compare the total score of the participants in terms of their marriage status, we will see that the difference is significant ( $p < 0.05$ ). The score of the married doctors is higher than the singles' score.

If we compare the total score of the participants in terms of their gender, the difference is not significant ( $p > 0.05$ ).

If we compare the total score of the participants in terms of

**Table 2: Questions and answers**

Question	Yes (%)	No (%)	Expected answer
1. Heart rate should be at least 100 per minute in cardiopulmonary resuscitation	278 (77.8%)	79 (22.2%)	yes
2. For adults, 5 cm depth of pressure is enough for resuscitation	322 (90.2%)	35 (9.8%)	no
3. Basic life support includes circulatory support, airway management, and respiration	276 (77.3%)	81 (22.7%)	yes
4. During cardiac arrest, cricoid pressure must be performed during intubation	74 (20.7%)	283 (79.3%)	no
5. Need to use manual defibrillator during resuscitation in infants under the age of 5.	165 (46.2%)	192 (53.8%)	no
6. There are 4 kinds of pad positioning positions during defibrillation	256 (71.7%)	101 (28.3%)	yes
7. The biphasic dose for cardioversion in the atrial fibrillation is 200 joules	278 (77.9%)	79 (22.1%)	yes
8. Biphasic cardioversion in monomorphic ventricular tachycardia is not feasible	164 (45.9%)	193 (54.1%)	yes
9. Precordial shootan also be used for ventricular tachycardia	224 (62.7%)	133 (37.3%)	no
10. Capnography is used to confirm placement of the endotracheal tube	308 (86.3%)	47 (13.7%)	no
11. Limited cardiac life support is shaped like a linear algorithm	315 (88.2%)	42 (11.1%)	no
12. Atropine has been removed from the cardiopulmonary resuscitation scheme	298 (83.5%)	59 (16.5%)	yes
13. Beginning of resuscitation with air instead of 100% oxygen in infants born at term is more appropriate	272 (76.2%)	85 (23.8%)	yes
14. Pressure/artificial respiration rate is 3/1 in neonatal resuscitation	295 (83.4%)	62 (16.6%)	yes
15. Whole extremity must be immobile with bandage when snake bite	299 (83.7%)	58 (16.3%)	yes
16. Everyone with a chest pain should be given 1 adult aspirin	285 (79.8%)	72 (20.2%)	yes
17. Wound location must be washed with acetic acid at least 30 seconds when jellyfish bite	296 (82.9%)	61 (17.1%)	yes
18. I can apply basic life support	276 (77.3%)	81 (22.7%)	yes
19. Rescuers of non-respiratory patients must only compress	316 (88.5%)	41 (11.5%)	yes
20. Look-listen-feel is removed from basic life support algorithm	200 (56.0%)	157 (44.0%)	yes
21. Defibrillation is not applied for ventricular fibrillation	100 (28.0%)	257 (72.0%)	no
22. Automatic external defibrillator use is part of basic life support	247 (69.2%)	110 (30.8%)	yes
23. Without using medical equipment and all non-drug interventions that can be done by you are called basic life support	316 (88.5%)	41 (11.5%)	yes
24. In pediatric patients, initial defibrillation is 2-4 joules/kg	317 (88.8%)	40 (11.2%)	yes
25. In patients with implanted pacemaker or defibrillator, defibrillation is performed directly on the implanted device	223 (62.5%)	134 (37.5%)	no
26. Adrenaline is administered every 3-5 minutes during cardiopulmonary resuscitation	327 (91.6%)	30 (8.4%)	yes
27. In cardiopulmonary resuscitation, personnel performing cardiac massage should be replaced at a 10-minute interval	173 (48.5%)	184 (51.5%)	no
28. There is no need waiting for full retract thoracic cavity in cardiopulmonary resuscitation	96 (26.9%)	261 (73.1%)	no
29. Pressure amplitude should be at least 5 cm during heart massage in children and infants	85 (23.8%)	272 (76.2%)	no
30. In pediatric cardiac arrest, use of calcium is recommended	153 (42.9%)	204 (57.1%)	no
31. When you open the airway in a patient who is not traumatized, apply head back chin up maneuver	326 (91.3%)	31 (8.7%)	no
32. Continuation of CPR after first defibrillation (shock) in ventricular fibrillation is more useful than the second shock	308 (86.3%)	191 (3.7%)	yes
33. Defibrillation is applied to asystole	89 (24.9%)	268 (75.1%)	no
34. Defibrillation during resuscitation requires 360 monophasic defibrillator	281 (7.7%)	76 (21.3%)	no
35. Heart massage is 30/2 in adults	303 (84.9%)	54 (15.1%)	yes
36. Optional shock devices are 2 types	306 (85.7%)	49 (14.3%)	yes
37. Increase chest press pauses as much as possible in the office	95 (26.6%)	262 (73.4%)	no
38. If the pulse is not present within 10 seconds in patients who do not have spontaneous breathing, resuscitation should be initiated	316 (88.5%)	41 (11.5%)	yes
39. The most effective drug in case of anaphylaxis is adrenaline	341 (95.5%)	16 (4.5%)	yes
40. Cervical trauma does not require neck stabilization in patients	69 (19.3%)	288 (80.7%)	no

their ages, we will see that the difference is significant ( $p < 0.05$ ). There is an important difference between the doctors aged between 20-25 and those aged 26-30. The other aged groups are found to be insignificant.

## Discussion

Resuscitation has been applied for a long time ago. This procedure can be divided into basic life support and advanced life support has always changed and renovated.

North American Emergency Service aims to transport the patients to the doctors and thus to the hospital, while European countries base their healthcare strategy on taking the doctors and -if necessary- the intensive care service to the patients (7). The European medical system is based on expert doctors, though this can differ between countries. Basic life support (BLS) is the basis for saving lives after cardiac arrest. In general terms, basic life support is provided by members of the public and carried out outside the hospital. Health care personnel may need to apply basic life support outside their workplace.

Studies have shown that people witnessing cases of cardiac arrest are two to three times more likely to rescue sufferer if they apply basic life support immediately than if they not. Deaths from cardiac arrest make it necessary for both healthcare personnel and other people to take basic life support lessons (8).

In our study, we aimed to assess assistant and intern doctors' knowledge level and ability of catching up with innovations. We tried to reach a conclusion by comparing the answers of the different groups.

A common cause of sudden death is VF (ventricular fibrillation) and the definite treatment is defibrillation, which is one of the most important aspects of advanced cardiac life support. In their study, Bilir et al., a percentage of 77.8 correctly stated that defibrillation must be applied in the case of VF patients (11). In addition, 45.35% of participant doctors in the study by Kimaz et al. knew this particular detail, which is very low if we consider that defibrillation is vital (9).

In the study by Kaan et al., 73.6% of the participants were exactly able to perform defibrillation steps. However, they appeared to make mistakes in placing defibrillation pads on the true chest areas (10).

Callahan and Madsen pointed out that defibrillation increases survival of the VF patient nine times if carried out by a first-aid life-saver, whereas artificial respiration and cardiac

massage increase the survival four times if made by a member of the public (12).

We can conclude that resuscitation must be given more importance in medicine faculties both during the education and training practice.

In the AHA guide of 2010, it is recommended to apply chest compression at least 100 times per minute with an amplitude of 5 cm. However, many other studies state that although they apply the ratio of 30/2, they could not reach the target of 100 chest compressions per minute.

In our particular study, 90.2% of the participants ( $n=322$ ) answered yes whereas 9.8% said no when asked if "5-cm depth of pressure is enough in adult cases". However, the expected answer is "no".

The AHA guide of 2000 recommended 15/2 compressions/respiration for adults with one or two rescuers, while the AHA guide of 2005 had proposed a ratio of 30/2.

In the research by Babacan, 77.2% and 64.7% of the participants, respectively responded positively to the questions about adult and pediatric pressure/respiration ratios (15). Of the same group, 84.9% said yes and 15.1% ( $n=54$ ) no to the statement "heart massage for adults is 30.2." The expected answer was yes. The results are in parallel with the literature.

In the study by Babacan, the question about the pulse control was answered in the affirmative by 48.1% (15). There is no related research in the literature. After the study in 1992, the reliability rate-of-pulse control has been determined at 65.0%. Our study shows that the participants who said yes was 88.5% and of those who said no 11.5% for the statement "resuscitation is needed if the pulse does not appear in 10 seconds with the patients who do not have spontaneous respiration". The expected answer was yes. These results are in parallel with the ones in Babacan's research.

In Babacan's study, the participants seem to need to know that applying other maneuvers may cause spinal cord injuries. The 91.3% of the participants in this study of Babacan said yes to the statement: "During the opening the airway of traumatic patients, the head needs to be back and the chin to be up.", where as 8.7% of the participants said no. The expected answer is no. These results are in parallel with the literature about the before-training period. The doctors are insufficient in their approach to the traumatic patients.

In our study, when the total scores of the individuals were compared according to age groups, the difference was significant

( $p < 0.05$ ). The difference between the ages of 20-25 years and 26-30 years was significant ( $p < 0.05$ ) and the difference between the other age groups was not significant ( $p > 0.05$ ). This study differs from the literature. This may be explained by the fact that the interns are concentrated in the age group of 20 to 25 and the assistants in the age group of 26 to 30. According to marital status, marriage is 28.43 times more successful than average. This can be explained by the fact that many of the assistants are married. Clinical practice guidelines aim to improve quality of care, reduce variation of practice, and provide evidence-based health care (13-16). The American Heart Association (AHA) guidelines for cardiopulmonary resuscitation (CPR) are nowadays recognized as the world's most authoritative resuscitation guidelines (13-16). As a result, the scientific community has proposed new resuscitation strategies relying on information technologies and devices aiming at improving and ensuring adherence to AHA guidelines (16-20).

## Conclusion

Although most of the participants see themselves as successful about the basic life support, the rate found is much lower than the expected. The true answers about the adult basic life support, general knowledge, circulation, defibrillation dose and

the rhythms and application places during the defibrillation is low. The participants prove to be insufficient at this point.

The knowledge must accompany the application skill about basic life support. If all the stages and details are taken into consideration and applied carefully, success is inevitable.

However, this study finds out that the knowledge level is insufficient. The application skills are not related in this survey. If we reference 2010 AHA guide, there is an important failure in keeping up with the novelties and updating the basic life support knowledge.

Contribution Categories	Name of Author
Development of study idea	S.H.E., B.A.
Methodological design of the study	S.H.E., B.A.
Data acquisition and processing	S.H.E., B.A.
Data analysis and interpretation	S.K., S.H.E., B.A.
Literature review	S.K., S.H.E., B.A.
Manuscript write-up	S.K., S.H.E., B.A.
Manuscript review and revision	S.K., S.H.E., B.A.

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