

# What nursing students know about resuscitation? A survey study

Łukasz Szarpak

Department of Cardiosurgery and Transplantology, Institute of Cardiology, Warsaw, Poland

**Author's address:**

Łukasz Szarpak, ul. Modlińska 201A/11, 03-122 Warszawa, phone: +48 500 186 225, Poland;  
e-mail: lukasz.szarpak@gmail.com

**Received:** 2013.07.28 • **Accepted:** 2013.12.13 • **Published:** 2013.12.20

## Summary

**Background.** Cardiac arrest requires urgent action associated with cardiopulmonary resuscitation – respiratory and implementation of defibrillation if required by the patient's condition. The aim of the study was to assess the knowledge of nursing students in basic life support.

**Methods.** Randomized study using a questionnaire survey was conducted from October to November 2013. The study included students of the third year of the nursing program. The control group consisted of students of third year medical emergency.

**Results.** The analysis showed statistically significant differences in students' knowledge of nursing to students of medical rescue in all analysed areas of knowledge. The lowest level of knowledge of nursing students in the care post-resuscitation and CPR.

**Conclusions.** Level of resuscitation knowledge among nursing students is low. It is necessary to introduce mandatory CPR training among medical students.

**Key words:** resuscitation, knowledge, students, defibrillation.

## Introduction

Today, we live in times when the continuous progress of medicine creates opportunities for people who are saving lives even in the case of sudden cardiac arrest (SCA). Over the last decade can be seen considerable emphasis on making CPR – breathing by bystanders and medical personnel. The effectiveness of activities performed by them has a huge impact on the survival of victims after an episode SCA [1]. Knowledge of the standards of conduct in the above situations is acquired at numerous courses and training, as well as classes in the vocational studies.

Standards of Conduct cardiac arrest – that relating to resuscitation are based on Evidence

Based Medicine and published by the European Resuscitation Council at five years [2]. The current resuscitation guidelines were published in 2010 year [3]. It is important, however, that apart from knowledge gleaned from books successively repeat and practice issues related to resuscitation, because as emphasized by many researchers – no contact even with resuscitation in a simulated environment results in a reduction manual skills [4,5,6]. Especially doctors, nurses and paramedics due to the nature of work, frequent contact with patients in life-threatening conditions must be proficient knowledge and skills in the field of both basic and advanced life support.

The aim of this study was to determine the level of knowledge of nursing students in basic life support.

## Material and methods

The study was conducted among students of nursing and emergency medical services from October to November 2013. The survey was distributed to 350 people, the level of returns correctly filled surveys was 82.8%. The study included 290 people. For the purposes of research developed a special questionnaire. The first part of the survey contained data: age, gender, place of residence, field of study. The second part of the questionnaire contained 17 statements. For each of these questions it was possible to check answer: "Correct", "Incorrect" or "do not know". Each correct answer was scored 1 point, while incorrect answers or answers "do not know" awarded "0" points. Finally, the knowledge of the respondents were classified as low (0-33.3%), intermediate (33.4-66.6%) and high (66.7-100%). In the third part of the questionnaire contained questions about attitudes towards resuscitation.

Group I consisted of 240 third-year students of nursing (GN), and 50 third-year students toward medical emergency the control group (KG).

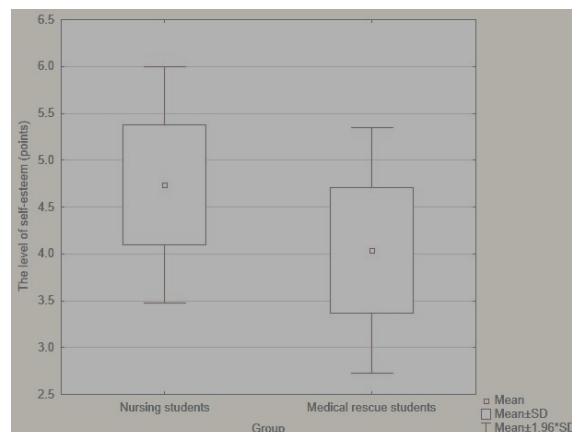
Respondents were aged 21-42 years (mean: 26 years), and their professional experience ranged from 1 to 32 years (mean 6.3 years). 83 % of the respondents were women (n=242), while men accounted for 17% of all respondents.

The research material was coded in MS Excel 2010 and developed using the Statistica 8.0. The results are presented in the form of numbers, percentages or percentage of the median. For the analyses used Student's t-test and Wilcoxon test. Results were considered statistically significant at  $p < 0.05$ .

## Results

At the outset, the survey asked respondents to indicate the level of self-esteem in the field of basic life support (BLS). Respondents had to choose a scale from 1 to 5, with one meant a lack of knowledge, and 5 – full knowledge. The mean value obtained by a group of nursing students was 4.59 points (SD 0.23), and was higher by more than

half a point compared to the control group (students of emergency medical services), where this result was 4.02 points (0.41) (Figure 1). These differences were statistically significant ( $p < 0.001$ ).



**Figure 1:** The level of self-esteem in the field of basic life support in the examined group.

Detailed distribution Mean and Standard Deviation answers given by the respondents to questions put to them are presented in Table 1.

**Table 1:** The mean and standard deviation of percentage of obtained knowledge scores about resuscitation by participants

Period Areas of knowledge	Group GN		Group CG		Wilcoxon statistical test
	Mean	SD	Mean	SD	
Personal safety (3 questions)	16.74	14.22	92.46	2.46	P=0.001
ABC valuation (3 questions)	22.44	6.82	96.24	8.64	P=0.001
Resuscitation (6 questions)	10.26	9.4	92.48	12.42	P=0.001
AED (2 questions)	26.52	12.48	98.52	8.46	P=0.001
Post-resuscitation care (3 questions)	8.86	12.68	84.68	14.62	P=0.001

Table 2 shows the correlations between selected sociodemographic parameters such as gender, age, field of study and place of residence and the issues raised in the survey research.

The analysis of Table 1, the group GN (Nurses Group) showed a significantly lower knowledge of all areas related to basic life support – compared

to the control group, which included students of the third year of studies in the field of emergency medical services. Differences in the knowledge discussed in each of the zones were statistically significant. The lowest level of knowledge of nursing students in the after resuscitation care and the same resuscitation.

**Table 2:** Correlation between sociodemographic variables and areas of knowledge

Period Areas of knowledge	Gen- der	Age	Field of study	Place of residence
CPR function- ing	0.23*	0.19	0.29*	0.21*
Knowledge of self security	0.22*	-0.21*	0.26*	0.11
Awareness of 4H & 4T	0.11	0.08	0.29*	0.08
Knowledge of ventilation	0.08	0.22*	0.25*	0.16
Knowledge of heart press	0.19	-0.054	0.13	0.8
Knowledge of AED use	0.07	-0.21*	0.21*	0.45
* p<0.05				

Shakeable sex correlates with the attitude towards the provision of CPR and an evaluation of your safety. Men more often declared to the activities of resuscitation to both the bystander as well as a family member who required resuscitation. Also, the male sex positively correlated own safety assessment prior emergency action.

With variable “age” of correlated factors such as their own safety assessment, knowledge of the use of the AED and knowledge of patient ventilation, and the elderly showed greater knowledge of the proper ventilation of the patient than younger people. Conversely, the situation was in the case of these first two factors. Younger people are more likely to declare their own safety assessment and showed a greater knowledge of the use of an automatic external defibrillator.

With variable “field of study” correlate all listed in Table 2 factors: attitude towards the provision of first aid, personal safety assessment, knowledge of reversible causes, knowledge of the conduct of ventilation and chest compressions patient and knowledge of the use of an AED. All the factors

correlated positively with those studying in the direction of a medical emergency.

With variable “place of residence” correlated only factor – “attitude towards the provision of first aid”. People living in rural area more frequently declared its willingness to CPR than urban dwellers.

## Discussion

Medical personnel, including prospective student nurses and emergency medical services due to the course of study and work are often in contact with people in a state of sudden health threat, the concept of which in accordance with the Law on State Emergency Medical Services to be understood “condition involving sudden or anticipated in the short during the onset of symptoms worsening health, which may be a direct consequence of serious damage to bodily functions or personal injury or loss of life, demanding for immediate rescue operations and medical treatment” [7].

Extreme example of this is the state of cardiac arrest requiring immediate adoption of advanced life support [8,9]. Therefore, more and more emphasis is put on the promotion of resuscitation knowledge among the public and among medical personnel. Nurses and paramedics are authorized for use during cardiopulmonary resuscitation both manual defibrillation, as well as pharmacological agents. Global studies have shown that emergency medical personnel the knowledge about CPR and first aid often determines the chances of survival of the victim. It should be remembered that every minute of delay in taking CPR patient’s chance of survival decreases by 10-12% [10,11,12,13].

The study examined the knowledge of issues related to the provision of basic life support among third-year nursing students from different areas of competence rescue. The control group consisted of students of third year medical emergency direction. How to be expected, the number of errors committed by the future adepts of nursing was compared with students of the medical rescue much greater.

A key factor contributing to the survival of the patient with cardiac arrest is the “Chain of Survival”. This string is nothing but a sequence of activities that should occur when each order to en-

sure a comprehensive approach to patient [14,15]. The elements which we took in this study is an early take CPR – respiratory and early defibrillation using automated defibrillation. Provisions of the organism sufficient oxygen for about 4 minutes – this means that in spite of the organs are still arrest oxygen nutrition for 4 minutes after the end of working of the heart [16,17]. Therefore, as soon as possible to take CPR is so crucial.

The very knowledge of CPR is one thing, the other side of the coin is the attitude of potential witnesses to the incident to assist a person in a position of sudden cardiac arrest. In this study, emergency medical students more frequently declared their willingness to provide assistance both to people with immediate family as well as strangers. In a study on attitudes towards Szarpak first aid by the residents of Świętokrzyskie Voivodeship much as 82 % said that it would grant the first aid person this requires [18].

Cardiac arrest can have a different etiology. Whether defibrillator is recommended discharge, or heart rhythm vote belongs to the rhythms of “no pads” should be kept in mind and thus correct reversible causes of cardiac arrest are known in the form of “4H & 4T”. By developing a shortcut mnemotechnic above should be borne in mind: hypoxia, hypovolemia, hypo-/hyperkalaemia/metabolic disorders, hypothermia, thromboembolic disorders – thrombophlebitis, pericardial tamponade, pneumothorax poisoning or course, most of these reasons, we can correct in the context of advanced life support, but hypovolemia (by anti-shock position) hypoxia and hypothermia can no longer adjust the level of basic life support. As shown in this study the level of knowledge of the 4H&4T was almost four times higher in the group of students of medical rescue.

To efficiently perform cardiopulmonary resuscitation – respiratory as the name suggests should ensure proper ventilation of the patient and the correct pressure thorax cage [21,22]. Clearing the

airway and perform rescue breaths using a bag AMBU contrary to appearances, is not easy. In order to ensure patency respiratory track at the level of the BLS used Guedel’s tube, which prevent the collapse of the tang [23]. Another key issue is properly selected tidal volume because the volume is not too small oxygenation of the patient correctly, and may result in too much air filling of the stomach and thereby increases the risk of regurgitation. Appropriate adult tidal volume is 6-7ml/kg. In this respect, more knowledge, students also showed a medical emergency rather than nursing.

In order to maintain blood flow to vital organs during cardiac arrest plays an important role proper chest compression [24]. It is not enough just to put your hands in the middle of the chest, it is also important compression depth, as well as the frequency of compressions and the ratio of compressions to the relaxation of the chest. As in the case of proper ventilation as well as in the case of knowledge regarding chest compressions – students were chief medical emergency.

In terms of basic life support is also used AEDs [25]. The program of public access to defibrillation (PAD) allows you to use the AED by any contingent witness the event – not just people with medical training. Due to propagate automatic defibrillation would seem that all students of medical faculties will have full knowledge of the use of an AED. Nothing could be further from the truth, according to the study, the level of knowledge of the AED among nursing students is insufficient, similarly shall also knowledge of post-resuscitation care.

## Conclusions

- 1) It is necessary to introduction of mandatory CPR training among medical students.
- 2) Maintenance Level of resuscitation knowledge among nursing students is low.

## References:

1. Szarpak Ł. Selected aspects of a survey on providing first aid among the population of Świętokrzyskie Voivodeship. *Military Pharmacy and Medicine* 2012; 3:37–42.
2. Holm C. Resuscitation in shock associated with burns. Tradition or evidence-based medicine? *Resuscitation*. 2000 May;44(3):157-64.
3. Nolan JP, Soar J, Zideman DA, Biarent D, Bossaert LL, Deakin C, Koster RW, Wyllie J, Böttiger B; ERC Guidelines Writing Group. European Resuscitation Council Guidelines for Resuscitation 2010 Section 1. Executive summary. *Resuscitation*. 2010 Oct;81(10):1219-76. doi: 10.1016/j.resuscitation.2010.08.021.
4. Pillow MT, Stader D, Nguyen M, Cao D, McArthur R, Hoxhaj S. Perceptions of Basic, Advanced, and Pediatric Life Support Training In a United States Medical School. *J Emerg Med*. 2013 Oct 22. pii: S0736-4679(13)01046-9. doi: 10.1016/j.jemermed.2013.08.055. [Epub ahead of print]
5. Ruesseler M, Weinlich M, Müller MP, Byhahn C, Marzi I, Walcher F. Republished: Simulation training improves ability to manage medical emergencies. *Postgrad Med J*. 2012 Jun;88(1040):312-6. doi: 10.1136/pgmj-2009-074518rep.
6. Spooner N, Hurst S, Khadra M. Medical simulation technology: educational overview, industry leaders, and what's missing. *Hosp Top*. 2012 Jul-Sep;90(3):57-64.
7. Szarpak Ł, Madziała M: Systems of medical segregation in mass casualty incidentse. *Military Pharmacy and Medicine* 2012, 1:82-86.
8. Ziembra R. Criteria of procedures in life-threatening states. *Military Pharmacy and Medicine* 2012; 2:62–68.
9. Bartczak M, Trendak W, Balcerzyk-Bardzo E, Timler D, Gaszyński T. Psychological aspects of decision-making in emergency rescue services. *Military Pharmacy and Medicine* 2012; 3:65–69.
10. Sandroni C, Nolan J: ERC 2010 guidelines for adult and pediatric resuscitation: summary of major changes. *Minerva Anestesiol* 2011; 77(2): 220-226.
11. Link MS, Atkins DL, Passman RS et al.: Part 6: electrical therapies: automated external defibrillators, defibrillation, cardioversion, and pacing: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation* 2010; 122 (suppl. 3): 706-719.
12. Kleinman ME, Chameides L, Schexnayder SM et al.: Part 14: pediatric advanced life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation* 2010; 122 (suppl. 3): 876-908.
13. Blewer AL, Abella BS. Incidence of Cardiopulmonary Resuscitation Training in the United States: Assessment of a Key Link in the “Chain of Survival”. *JAMA Intern Med*. 2013 Nov 18. doi: 10.1001/jamainternmed.2013.11470. [Epub ahead of print]
14. Kuo CW, See LC, Tu HT, Chen JC. Adult Out-of-Hospital Cardiac Arrest Based on Chain of Survival in Taoyuan County, Northern Taiwan. *J Emerg Med*. 2013 Oct 2. pii: S0736-4679(13)00936-0. doi: 10.1016/j.jemermed.2013.08.026. [Epub ahead of print]
15. McNally B, Robb R, Mehta M, Vellano K, Valderrama AL, Yoon PW, Sasson C, Crouch A, Perez AB, Merritt R, Kellermann A; Centers for Disease Control and Prevention. Out-of-hospital cardiac arrest surveillance – – – Cardiac Arrest Registry to Enhance Survival (CARES), United States, October 1, 2005--December 31, 2010. *MMWR Surveill Summ*. 2011 Jul 29;60(8):1-19.
16. Raghunathan K, Barbeito A, Macleod D. Goal-directed advanced cardiac life support: coronary perfusion pressure as a target during resuscitation. *Crit Care Med*. 2013 Dec;41(12):2817-8. doi: 10.1097/CCM.0b013e31829cb381.
17. Tucker KJ, Larson JL, Idris A, Curtis AB. Advanced cardiac life support: update on recent guidelines and a look at the future. *Clin Cardiol*. 1995 Sep;18(9):497-504.

