



# World Scientific News

An International Scientific Journal

WSN 104 (2018) 202-214

EISSN 2392-2192

---

---

## First aid in the workplace and employee awareness about it

**Natalia Jędrzejak\*, Krzysztof Sobala**

Faculty of Management, Czestochowa University of Technology, Czestochowa, Poland

\*E-mail address: [natalia.jedrzejak@o2.pl](mailto:natalia.jedrzejak@o2.pl)

### ABSTRACT

The ability to provide first aid should be available to every person. Chances of surviving the victim depend among others on the early diagnosis of the cause of life-threatening condition, the effectiveness of the activities carried out, as well as the awareness of outsiders. The willingness to help is an inseparable part of our lives, but only the proper implementation of the above-mentioned elements has a significant impact on improving the activities carried out in order to save human life.

**Keywords:** accident, first aid, first aid kits, training

### 1. INTRODUCTION

An accident at work is a sudden event arising from activity, caused by an external cause and causing injury or death. The employer is responsible for the health and safety at work in the workplace by preventing accidents at work and occupational diseases. He is obliged to comply with health and safety regulations and to provide first aid points, first aid kits and people responsible for first aid to the injured in the workplace. The first aid in the workplace should be adapted to the type and scope of activity, the number of employed people and, above all, to the type of hazards that may occur. The Central Statistical Office each year presents the number of accidents at work in Poland. Despite numerous preventive programs, training at workplaces, the problem of accidents at work does not disappear, but grows. In

2017, the number of injured in accidents at work, reported on the Z-KW form Statist accident card, totaled 88330 people and was 0.5% higher than last year. 874,700 employees were injured at work with a light effect, 661 employees - accidents with severe injuries and fatal accidents - 269 employees.

## **2. FIRST AID KITS IN THE WORKPLACE**

First-aid kit is a container used to store materials and resources intended for first aid, it is an extremely important element which is often associated with safety. Despite the obligation of equipping work establishments with pharmacies, there is a lack of legal regulations precisely specifying their composition. In Poland, as in most EU countries, the composition of first aid kits has been adopted on the basis of German DIN standards, but it is a voluntary decision on people equipping the workplace with first aid means. German DIN standards precisely define the composition of first aid kits and the requirements for their equipment for four groups: motorcyclists (DIN 13167), passenger cars (DIN 13164), workplaces (DIN 13157) and for more people (DIN 13169). The basic requirement to remember when purchasing first-aid kits meeting the DIN standards is not only the entry on the packaging specifying the standard number, but an additional description on the packaging of the dressing materials. The composition of the first aid kit acc. DIN 13157 standards for workplaces should contain.

**Table 1.** The composition of the first aid kit acc. DIN 13157 standards

<b>Elements of first aid kit</b>	<b>Number of elements</b>
Adhesive strip DIN 13019 - A (5 m × 2,5 cm)	1
Plaster DIN 13019 - E (10 × 6 cm)	8
Fingertip dressing	4
Finger dressing (12 × 2 cm)	4
Plaster with dressing (1.9 × 7.2 cm)	4
Plaster with dressing (2.5 × 7.2 cm)	8
Individual dressing DIN 13151 - K (6 × 8 cm)	1
Individual dressing DIN 13151 - M (8 × 10 cm)	3
Individual dressing DIN 13151 - G (10 × 12 cm)	1
Plaid dressing DIN 13152 - A (60 × 80 cm)	1
Compress (10 × 10 cm)	6
Eye compress (min 5 × 7 cm)	2

Cold compress (minimum 200 cm <sup>2</sup> )	1
Rescue blanket 160 × 210 cm	1
Elastic band DIN 61634 - FB 6 (4 m × 6 cm)	2
Elastic band DIN 61634 - FB 8 (4 m × 8 cm)	2
Triangular shawl DIN 13168 - D	2
Scissors DIN 58279 - B (19 cm)	1
Plastic bag (minimum 30 × 40 cm)	2
Non-woven slash (min 20 × 30 cm)	5
Disposable gloves EN 455	4
Instructions for first aid	1

Source: own study based on: DIN 13157 standards.

In Poland, the number of first-aid kits and the type of dressing means should be determined in consultation with the physician administering preventive health care over employees in accordance with art. 44 ust. 2 of the Labor Code (Journal of Laws of 2016, item 1666). The German DIN standard recommends the number of first aid kit cartridges for the type of activity and the number of people.

**Table 2.** The number of first aid kit cartridges for the type of activity and the number of people

Type of activity	Contribution
Production facility	one in 20 people
Construction site	one to 10 people
Trade, administration	one in 50 people
Other workplaces, schools	one

Source: own study based on: DIN 13157 standards.

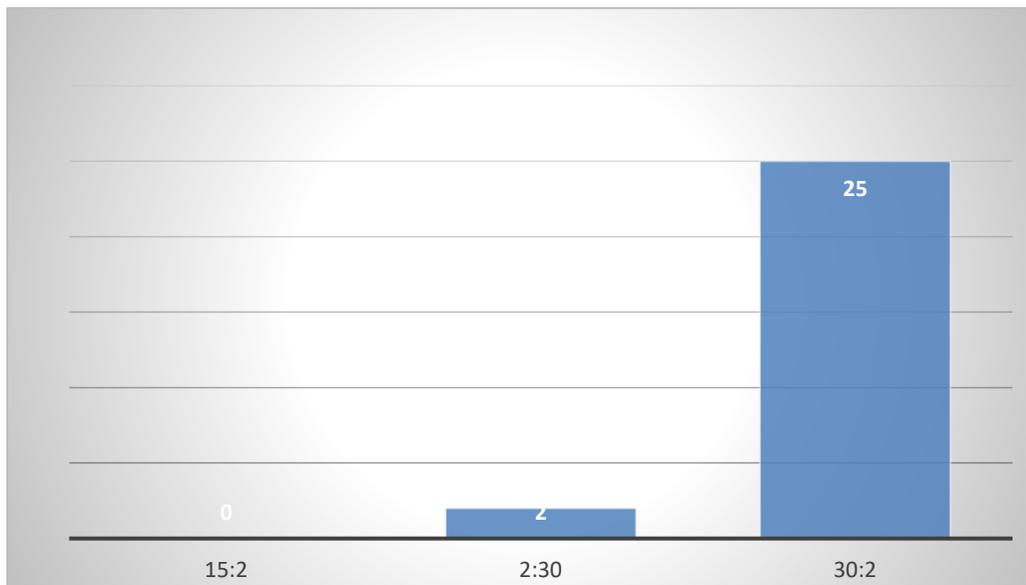
First aid points and first aid kits should be located in visible, easily accessible places and appropriately marked in accordance with the Polish Standard. In these places there should also be an instruction for first aid with a list of employees designated to provide it. The ability to provide first aid can be purchased already during initial and periodic health and safety training which the employer is obliged to provide to employees. A properly adapted training program will allow to acquire relevant skills, however, their scope and method of acquisition

should be reviewed by a physician who carries out health care over employees. The number of people who should be responsible for first aid should depend on the degree of risk that occurs in the workplace because no regulations define them. An employee who voluntarily accepts such an obligation should be aware of the duties that lie on him.

### 3. AWARENESS AND KNOWLEDGE OF EMPLOYEES ABOUT FIRST AID

Employee awareness is one of the security elements that can be built through a priority approach to safety at the workplace. Health and safety training and first aid courses should provide adequate awareness and knowledge to employees about first aid to victims. However, it often happens that they do not give sufficient results as evidenced by the conducted surveys in two surveyed enterprises. The first company provides specialized power services in the field of: operation, service, design and assembly of power devices. The second of the production of cellulose sponge blocks. Employees of companies answered questions about first aid. The first question concerned cardiopulmonary resuscitation (CPR) aimed at maintaining and restoring basic life functions.

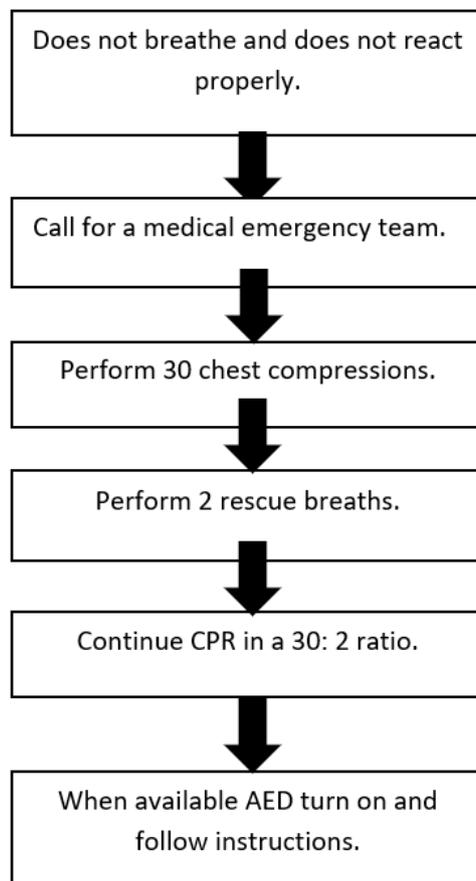
**Figure 1.** What is the correct ratio of chest compressions and rescue breaths in a person unconscious without breathing?



Source: own study based

Properly performed cardiopulmonary resuscitation in an adult should consist in opening the airways, thirty chest compressions, and then on performing two rescue breaths. Published data performed on animal models indicate the best benefits of the sequence of compressions provided by ventilation above 15:2. [16] The 2010 ERC guidelines recommend that a single rescuer perform an adult relationship of 30:2 compressions resulting in less breaks in chest compressions by reducing time without blood [4] flow as well as reducing time without hyperventilation. [5]

**Figure 2.** An algorithm of basic resuscitation procedures and automatic external defibrillation.



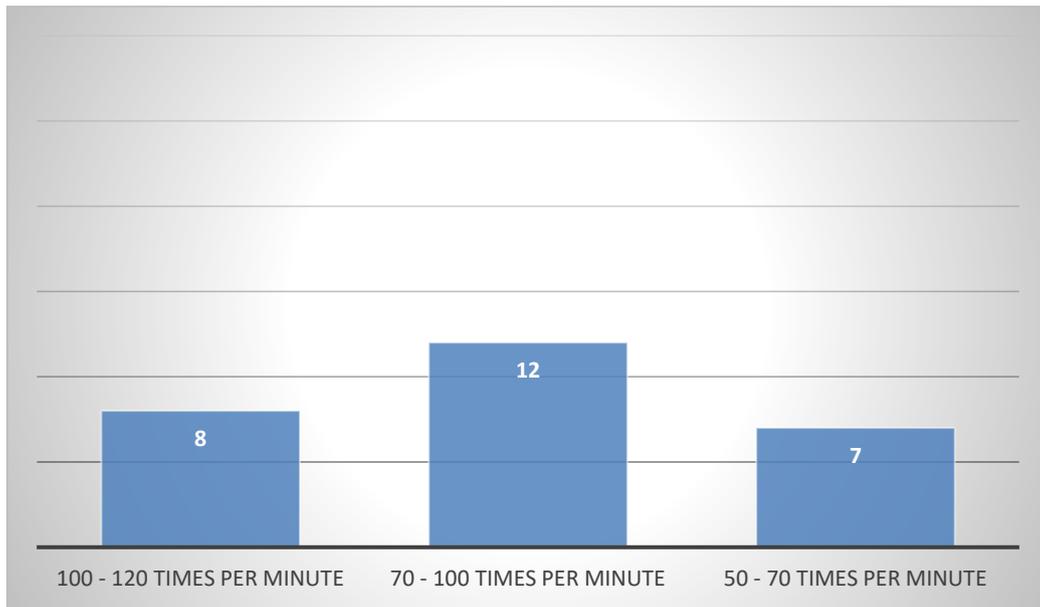
Source: own study based on: European Resuscitation Council Guidelines for Resuscitation 2015 [8]

Observational studies, considered as very poor evidence of cardiac arrest in adults with suspected cardiac etiology, suggest CPR with compression of the chest only and CPR combined to perform chest compressions and rescue breaths. The ERC supports the ILCOR recommendation that all CPR users should apply chest compressions to any person with cardiac arrest. [8-10]

The second question concerned the most important issue affecting the improvement of survival, and related to the frequency of chest compressions during cardiopulmonary resuscitation. Only 30% of respondents gave a correct answer indicating that the frequency with which chest compressions should be carried out is at least 100 / min (max 120 / min).

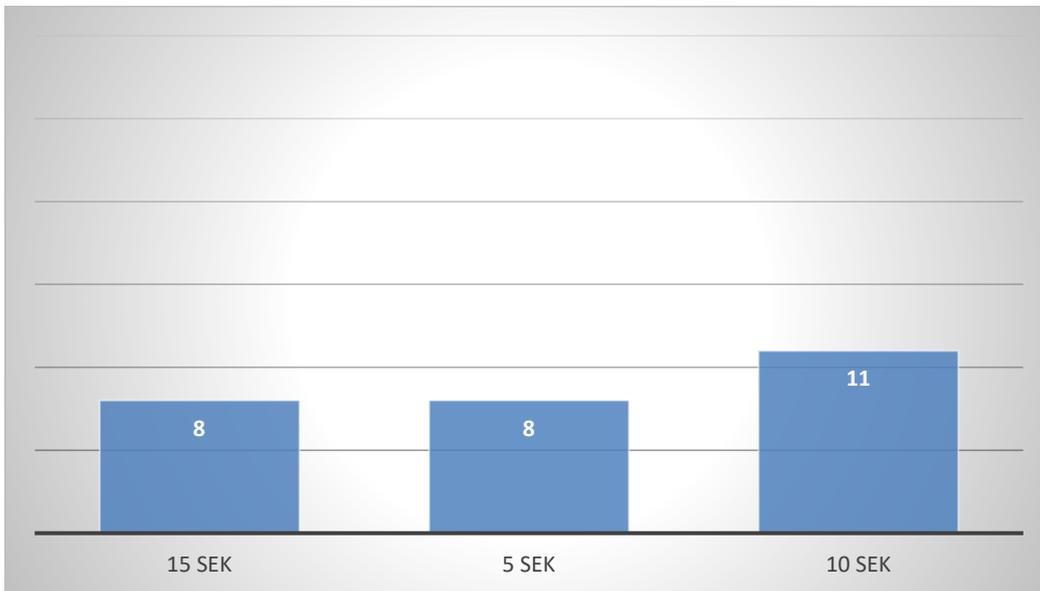
The essence is also the fact that after each compression, without taking your hands off, relieving the pressure on the chest, it should allow chest to return to its previous shape. However, the compression time should be equal to the time of releasing the pressure of the sternum. The third question that was asked to the respondents concerned the time of breath assessment in an unconscious person. A quick assessment of the condition of the victim should determine whether the victim reacts and breathes. It should not take more than 10 seconds to look, listen and feel the breath of the victim. [6]

**Figure 3.** At what frequency should you compress your chest when doing cardiopulmonary resuscitation?



Source: own study based.

**Figure 4.** How long should the breathing rate last for an unconscious person?



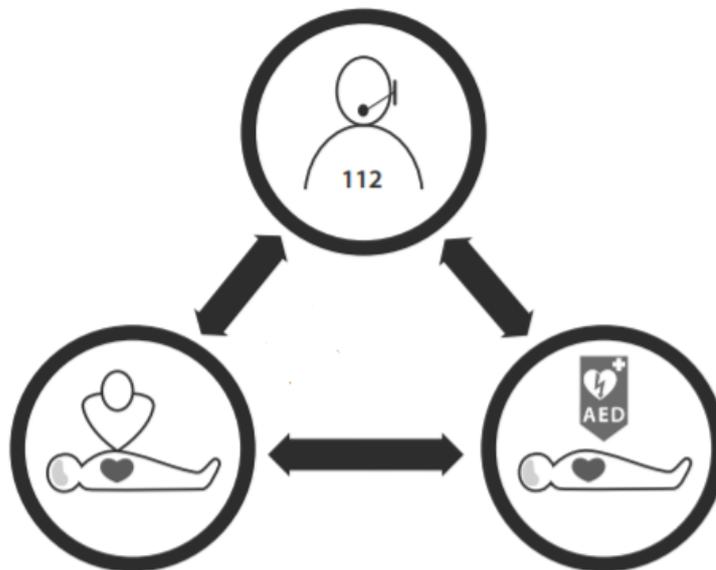
Source: own study based.

Only 41% of employees gave the correct answer. Another important issue investigated in the questionnaire was the use of an automatic electric defibrillator, which can restore the correct heart rhythm with electrical impulses.

The basic action to be taken at the scene of the incident is a proper assessment by the witnesses of the victims condition, which will allow to assess if he is conscious and if he is breathing properly. An injured person who has been found to lack vital functions requires cardiopulmonary resuscitation and the use of a defibrillator. Properly performed cardiopulmonary resuscitation remains the most important element affecting the improvement of survival.

The AED defibrillator is used as soon as possible in the event of a sudden cardiac arrest.

**Figure 5.** Correct interaction between the medical dispatcher, the witness of the CPR event and the rapid use of AED.



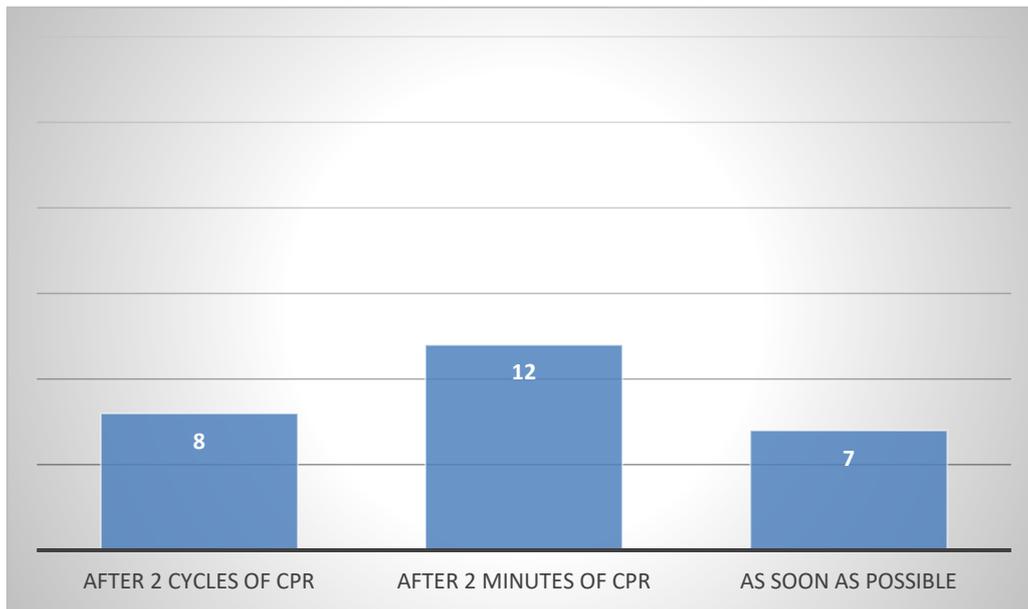
Source: European Resuscitation Council Guidelines for Resuscitation 2015. [8]

Its quick use increases the chances of a person's health and, above all, life, because every minute of waiting for emergency services reduces the chance of survival by 10%. Defibrillation performed within 3 - 5 minutes of unconsciousness may result in survival of the victim in 50-70%. [6]

Only 25.92% of respondents answered correctly, indicating the use of the AED defibrillator as soon as possible. The remaining 74% of the respondents were not sure about the proper behavior in the situation described in the question.

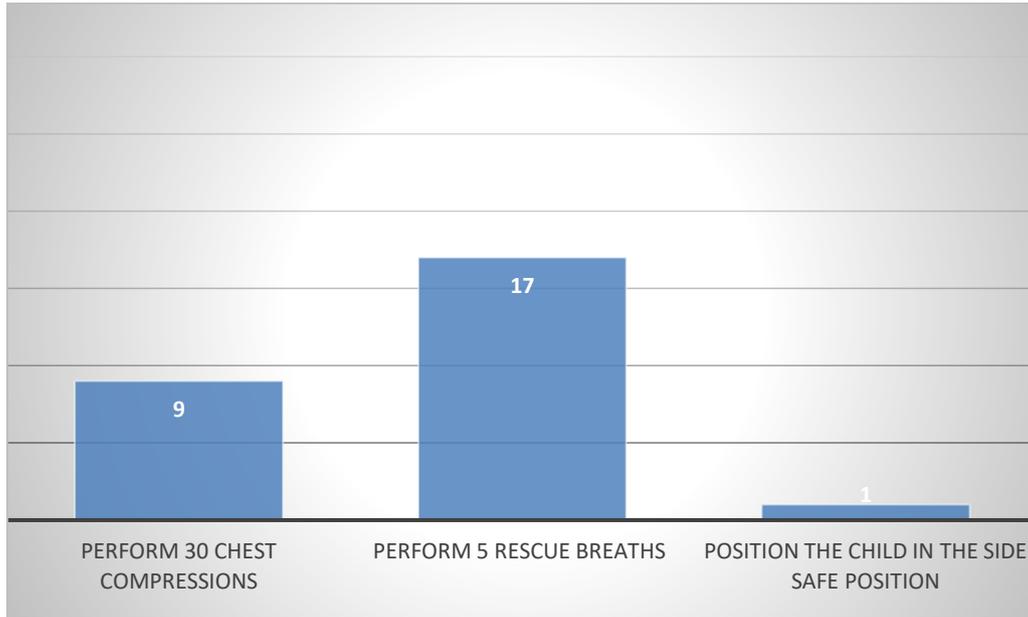
Knowledge about using the AED defibrillator among employees is small, however, thanks to numerous preventive programs, it is growing every day. Placing the AED defibrillator in public access programs for defibrillation is one of the main goals to be achieved. Access to this information will help the dispatchers direct the person calling the nearest defibrillator who can improve the frequency of CPR performed by witnesses of the incident before the arrival of the medical team. [11]

**Figure 6.** When should we use an AED during cardiopulmonary resuscitation (CPR)?



Source: own study based.

**Figure 7.** If you find a lack of breath in your child should you?



Source: own study based.

Question No. 5 concerned the management of a child's lack of breath. Only 68% of the respondents indicated a correct answer - indicating that 5 child's rescue breaths should be performed.

The basic algorithm in the case of lack of breath in children should be to remove visible foreign bodies that may cause airway obstruction, 5 rescue breaths and in the absence of signs of life on 15 compressions and 2 rescue breaths to a depth of 4 cm in an infant and 5 cm in a child.

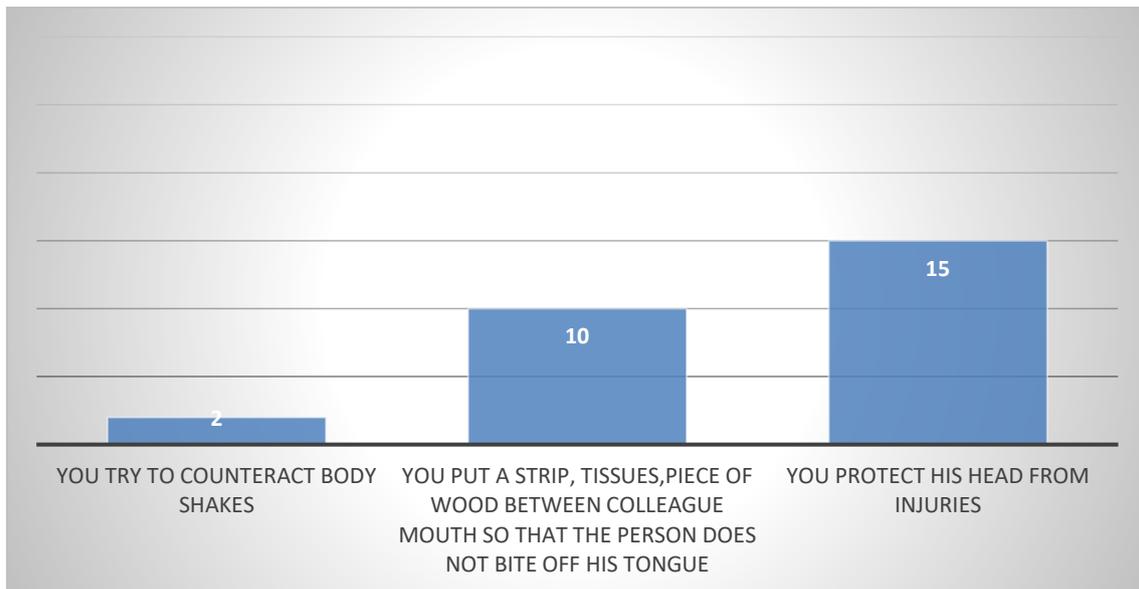
The next question in questionnaire turned out to be very important because a large group of respondents could not answer them correctly. The question was about dealing with a seizure situation. Epilepsy is a chronic disease of the brain that is affected by morphological changes, damage or metabolic disorders. It affects from 0.5% to 5% of people in the world (approximately 400,000 people in Poland suffer from it).

The main factors which can cause seizure include:

- fever and neuroinfections,
- trauma, cancer or developmental disorders of the central nervous system,
- irregular lifestyle accompanied by fatigue, lack of sleep,
- hormone fluctuations,
- emotional stress,
- excessive physical effort,
- discontinuation of treatment or lack of regularity in taking medication.

Despite its universality, there is a problem providing first aid to a person who suffer from it.

**Figure 8.** What will you do when you witness a seizure at your colleague at the workplace?

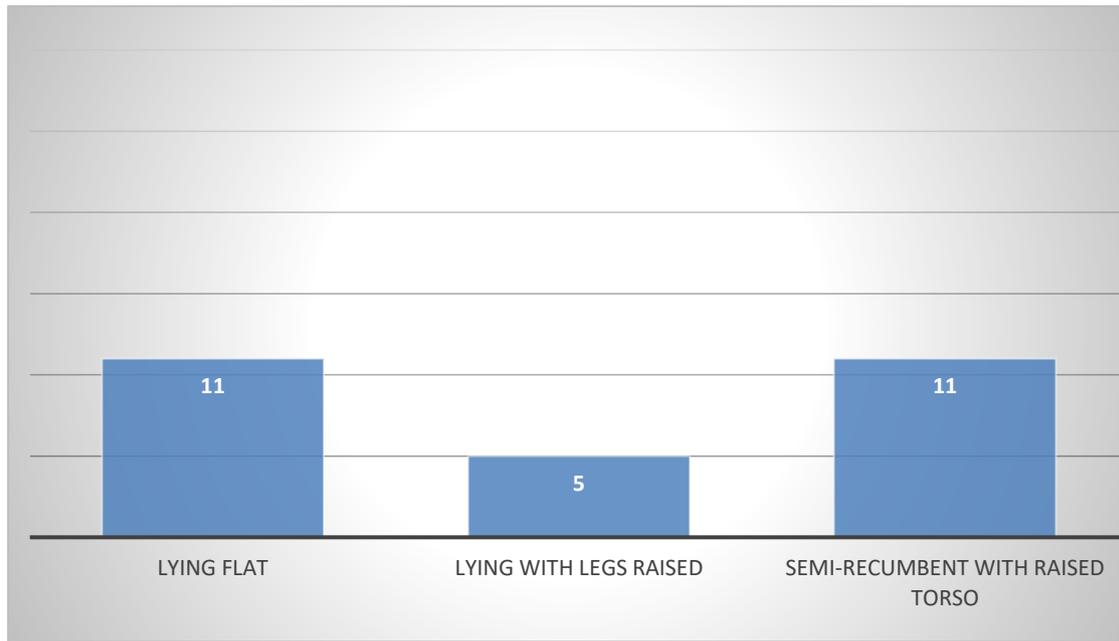


Source: own study based.

Only 55% of researched employees indicated the correct answer. In the situation of being a witness to a seizure, they will protect the injured person's head against injuries.

Question no. 10 concerned the position of the victim in the event of a suspicion of a heart attack. 40% of employees answered correctly indicating a semi-recumbent position with a raised torso.

**Figure 9.** In what position do you put a person who you suspect of having a heart attack?



Source: own study based.

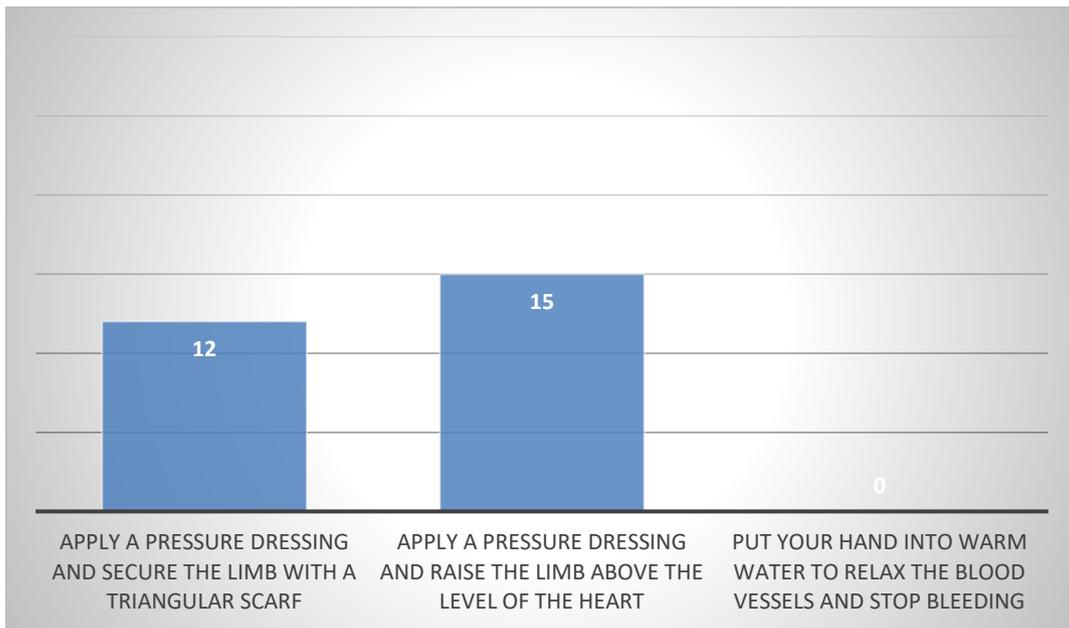
This is the safest position for a person who is suspected of having a heart attack because it reduces the pressure on the heart. It is also necessary to have deep and regular breathing, which should be provided to the victim by pulling or loosening clothes.

Question No. 11 concerned the issue of forearm haemorrhage. In a light bleeding situation, a sterile dressing should be used, and the bleeding will disappear spontaneously. Strong bleeding, however, requires compressing the wound, lifting the limb up (above the heart), thanks to which the blood flow will be reduced.

55% of asked employees indicated a correct answer during the study.

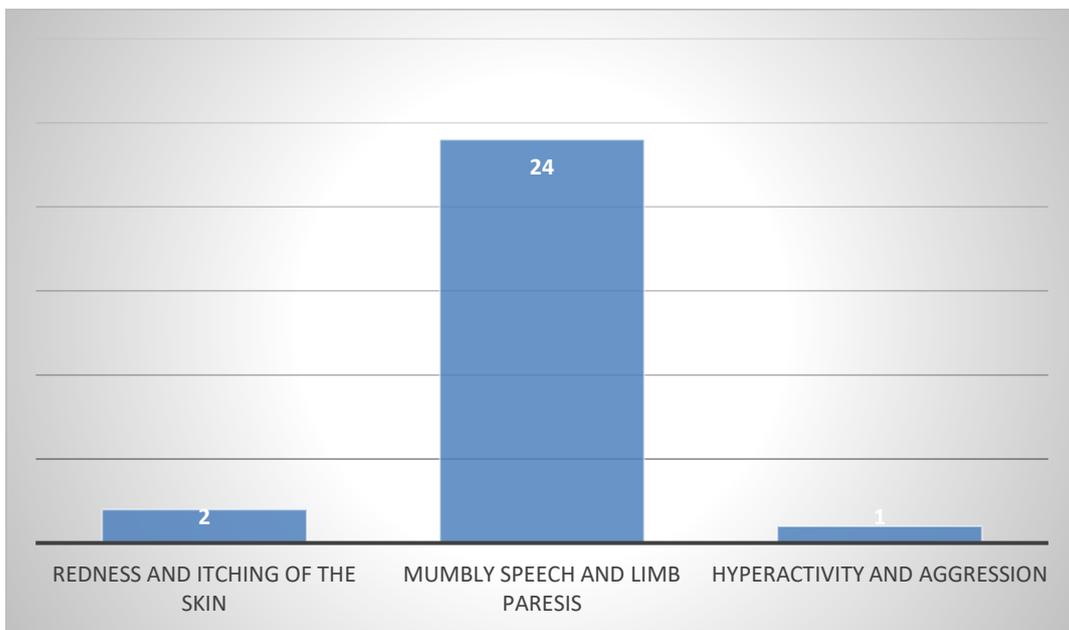
Next question in the survey concerned the symptoms of stroke, which affects 15 million people each year in the world, 6 million of them die, and another 5 million suffer permanently. [5] A quick diagnosis of stroke and first aid increases the chance of curing the victim. The rapid start of therapy significantly improves the treatment results by quickly identifying the symptoms of stroke by first aid users. [12, 13] Research has shown that the use of regimens confirming the occurrence of stroke shortens the time of final treatment. [14, 15] First-aid educators should use stroke assessment scales in people suspected of having a stroke for early diagnosis and treatment. Trained people should have knowledge of simple patterns confirming the occurrence of stroke, such as FAST (Face, Arm, Speech Tool) [1-3] or CPSS (Cincinnati Prehospital Stroke Scale). However, not every person could recognize the stroke symptom unequivocally and this problem was met by 11% of the asked employees who indicated a wrong answer.

**Figure 10.** How should you deal with a severe forearm haemorrhage?



Source: own study based.

**Figure 11.** One of the symptoms of a stroke can be?



Source: own study based.

Despite the existence of obvious threats in researched companies, one can conclude that a large group of employees have no knowledge about proper first aid. The questions that arose in the questionnaire concerned the basic situations causing life threatening with which each of

us can meet every day. Often, professional medical assistance reaches the victim with a long delay, and the time devoted to waiting for it may be limited to the passive attitude of the company's employees.

#### **4. CONCLUSION**

Polish law precisely defines the obligation to appoint a person who will be responsible for possible first aid in the workplace. However, the designation of such a person is just one of the many elements that the first aid consists of, it is also the security of the accident site, the assessment of the injured person's condition or the call for professional help. Skills related to saving human life should be well known and everyone should acquire them. Awareness of how important first aid should be to building employers through numerous trainings, because no man saving lives and other human health should have any concerns about the activities to be performed.

#### **References**

- [1] Fothergill R.T., Watson L.R., Chamberlain D., Viridi G.K., Moore F.P., Whitbread M., Increases in survival from out-of-hospital cardiac arrest: a five year study. *Resuscitation*. 2013; 84: 1089-1092.
- [2] Svensson L., M.D., Ph.D., Katarina Bohm, R.N., Ph.D., Maaret Castrèn, M.D., Ph.D., Hans Pettersson, Lars Engerström, Johan Herlitz, M.D., , Mårten Rosenqvist, M.D., Compression-Only CPR or Standard CPR in Out-of-Hospital Cardiac Arrest. *New England Journal of Medicine*. 2010; 363: 434-442.
- [3] Ringh M., Rosenqvist M., Hollenberg J., Jonsson M., Fredman D., Nordberg P., Järnbert-Pettersson H., Hasselqvist-Ax I., Riva G., Svensson L., Mobile-phone dispatch of laypersons for CPR in out-of-hospital cardiac arrest. *The New England Journal of Medicine* 2015; 372: 2316-25
- [4] Sayre M.R., Cantrell S.A., White L.J., Hiestand B.C., Keseg D.P., Koser S., Impact of the 2005 American Heart Association cardiopulmonary resuscitation and emergency cardiovascular care guidelines on out-of-hospital cardiac arrest survival. *Prehosp Emerg Care*. 2009; 13(4): 469-477
- [5] Aufderheide T.P., Sigurdsson G., Pirrallo R.G., Yannopoulos D., McKnite S., von Briesen C., Sparks C.W., Conrad C.J., Provo T.A., Lurie K.G., Hyperventilation-induced hypotension during cardiopulmonary resuscitation. *Circulation*. 2004 Apr 27; 109(16): 1960-1965
- [6] Marieke T. Blom, Stefanie G. Beesems, Petronella C.M. Homma, Jolande A. Zijlstra, Hulleman M., Daniel A. van Hoeijen, Abdennasser Bardai, Jan G.P. Tijssen, Hanno L. Tan, Rudolph W Koster, Improved Survival After Out-of-Hospital Cardiac Arrest and Use of Automated External Defibrillators. *Circulation*. 2014; 130: 1868-1875.
- [7] Koenraad G. Monsieursa, Jerry P. Nolanc, Leo L. Bossaerte, Greif R., Ian K. Maconochieh, Nikolaos I. Nikolaoui , Gavin D. Perkinsj, Soark J., Truhlářl A., Jonathan

- W., Zideman D. A., *European Resuscitation Council Guidelines for Resuscitation 2015*, 2015; 6-39.
- [8] Holmberg M., Holmberg S., Herlitz J., Factors modifying the effect of bystander cardiopulmonary resuscitation on survival in out-of-hospital cardiac arrest patients in Sweden. *European Heart Journal*, Volume 22, Issue 6, 2001, 511–519.
- [9] Panchal A.R, Bobrow B.J., Spaite D.W., Berg RA, Stolz U, Vadeboncoeur TF, Sanders AB, Kern KB, Ewy GA, Chest compression-only cardiopulmonary resuscitation performed by lay rescuers for adult out-of-hospital cardiac arrest due to non-cardiac aetiologies. *Resuscitation*. 2013; 84(4): 435-439
- [10] Kitamura T., Iwami T., Kawamura T., Nagao K., Tanaka H., Berg R.A., Hiraide A.; Implementation Working Group for All-Japan Utstein Registry of the Fire and Disaster Management Agency. Time-dependent effectiveness of chest compression-only and conventional cardiopulmonary resuscitation for out-of-hospital cardiac arrest of cardiac origin. *Resuscitation*. 2011; 82(1): 3-9.
- [11] Zijlstra J.A., Stieglis R., Riedijk F., Smeeke M., van der Worp W.E., Koster R.W. Local lay rescuers with AEDs, alerted by text messages, contribute to early defibrillation in a Dutch out-of-hospital cardiac arrest dispatch system. *Resuscitation*. 2014; 85: 1444-1449
- [12] Fonarow G .C., Cox M., ; Smith E., Saver J. L, Reeves M. J, Bhatt D. L., Suter R., Schulte P. J., Xian Y., Hernandez A. F., Peterson E. D., Schwamm L.H., : Improving Door-to-Needle Times in Acute Ischemic Stroke. *Stroke* 2011; 42: 2983-2989.
- [13] Lin C.B., Peterson E.D, Smith E.E., Saver J.L., Liang L., Xian Y., Olson D.M., Shah B.R., Hernandez A.F., Schwamm L.H., Fonarow G.C., Emergency medical service hospital prenotification is associated with improved evaluation and treatment of acute ischemic stroke. *Circ Cardiovasc Qual Outcomes*. 2012; 5: 514-522.
- [14] Nazliel B., Starkman S., Liebeskind D.S., et al. A brief prehospital stroke severity scale identifies ischemic stroke patients harboring persisting large arterial occlusions. *Stroke*. 2008; 39: 2264–2267
- [15] O'Brien W., Crimmins D., Donaldson W., Risti R., Clarke TA., Whyte S., Sturm J., FASTER (Face, Arm, Speech, Time, Emergency Response): experience of Central Coast Stroke Services implementation of a pre-hospital notification system for expedient management of acute stroke. *J Clin Neurosci*. 2012; 19: 241-245
- [16] Dorph E., Wik L., Strømme T.A., Eriksen M., Steen P.A., Oxygen delivery and return of spontaneous circulation with ventilation:compression ratio 2:30 versus chest compressions only CPR in pigs. *Resuscitation* 2004 Mar; 60(3): 309-18