Knowledge of Students of Medical and Non-medical Faculties on the Principles of Premedical First Aid in Stroke

Wiedza studentów kierunków medycznych i niemedycznych na temat zasad udzielania pierwszej pomocy przedmedycznej w udarze mózgu

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Abstract

Introduction. A stroke is a sudden, unexpected condition that can be life threatening and requires hospitalization. The time from the onset of stroke symptoms to the provision of medical attention is very important. The later help is provided, the chances of recovery decrease, and the possibility of permanent disability increases.
Aim. The aim of the study was to assess the level of knowledge of students of medical and non-medical faculties on the principles of pre-medical first aid in stroke and to determine the state of general knowledge about stroke.
Material and Methods. The study was conducted among students of the Academy of Applied Sciences of Stanisław Staszic in Piła in the academic year 2020/2021. 186 students participated in the study, including 77 students of non-medical faculties and 109 students of medical faculties. The study used the diagnostic survey method using the author's questionnaire. Each data is described in terms of quantity and percentage. The distribution of features in groups of students of non-medical and medical faculties was checked with the chi-square test. The level of significance was $p<0.05$.
Results. The level of students' knowledge depended on the field of study. Students of non-medical faculties definitely more often answered "I don't know" to the questions asked, they had less knowledge about recognizing the symptoms or risk factors of stroke. The average level of knowledge of non-medical students was 2.88 ± 0.79 and was significantly lower ($t=-5.73$, $p<0.0001$) than the average level of knowledge of medical students of 3.60 ± 0.97.
Conclusions. Weaker knowledge of the issues related to stroke among students of non-medical faculties indicates the need for urgent education of students in the field of stroke, so that they can recognize a stroke and take appropriate action quickly, thanks to which the patient will have a chance to quickly reach the right hospital, and thus receive the best possible treatment according to current recommendations. Students of both medical and non-medical studies should be able to participate in additional classes developing knowledge and practical skills in the field of stroke management. **(JNNN 2022;11(4):154–161)**
Key Words: first aid in stroke, stroke, students' knowledge

Streszczenie

Wstęp. Udar mózgu jest to nagły, niespodziewany stan, który może zagrażać życiu i konieczna jest hospitalizacja. Bardzo ważny jest czas od momentu pojawienia się objawów udaru do udzielenia pomocy medycznej. Im później zostanie udzielona pomoc tym szanse na odzyskanie sprawności maleją, a wzrasta możliwość wystąpienia trwałej niesprawności.
Cel. Celem pracy była ocena poziomu wiedzy studentów kierunków medycznych i niemedycznych na temat zasad udzielania pierwszej pomocy przedmedycznej w udarze mózgu oraz określenie stanu ogólnej wiedzy na temat udaru mózgu.

Materiał i metody. Badanie przeprowadzono wśród studentów Akademii Nauk Stosowanych im. Stanisława Staszica w Pile w roku akademickim 2020/2021. W badaniu wzięło udział 186 studentów, w tym 77 studentów kierunków niemedycznych i 109 studentów kierunków medycznych. W pracy posłużono się metodą sondażu diagnostycznego posługując się autorską ankietą. Każdą daną opisano w ujęciu ilościowo-procentowym. Rozkład cech w grupach studentów kierunków niemedycznych i medycznych sprawdzono testem chi-kwadrat. Za poziom istotności przyjęto p<0,05.

Wyniki. Poziom wiedzy studentów uzależniony był od kierunku studiów. Studenci kierunków niemedycznych zdecydowanie częściej udzielali odpowiedzi „nie wiem" na zadawane pytania, mieli mniejszą wiedzę na temat rozpoznawania objawów czy czynników ryzyka udaru mózgu. Średni poziom wiedzy studentów kierunków niemedycznych wynosił 2,88±0,79 i był istotnie niższy (t=−5,73, p<0,0001) od średniego poziomu wiedzy studentów kierunków medycznych 3,60±0,97.

Wnioski. Słabsza znajomość problematyki związanej z udarem mózgu wśród studentów kierunków niemedycznych wskazuje na konieczność pilnej edukacji studentów w zakresie udaru, aby umieli rozpoznać udar mózgu i podjęli szybko właściwe działania, dzięki którym pacjent będzie miał szanse na szybkie dotarcie do właściwego szpitala, a tym samym otrzyma jak najlepsze leczenie według obowiązujących zaleceń. Studenci studiów zarówno medycznych, jak i niemedycznych powinni mieć możliwość uczestnictwa w dodatkowych zajęciach kształcących wiedzę oraz umiejętności praktyczne z zakresu postępowania w udarze mózgu. **(PNN 2022;11(4):154–161)**

Słowa kluczowe: pierwsza pomoc w udarze, udar mózgu, wiedza studentów

Introduction

Ischemic stroke (IS), according to the World Health Organization (WHO), is a clinical syndrome characterized by the sudden onset of focal or global cerebral dysfunction, which, if not fatal earlier, persists for a period of time longer than 24 hours and have no cause other than vascular [1–3]. It is the most common cause of disability among adults and is also one of the leading causes of death [1]. Ischemic stroke is a life-threatening condition and whether a patient will be fit after a stroke depends on the speed of reaction of his family and people around him at the time of stroke [3,4].

Cerebral ischemia caused by arterial thrombosis or cardiac embolism or other cause often leads to speech disorders and paresis of the limbs. The patient's sudden paresis should raise the suspicion of a stroke, and this is a clear indication to call the emergency medical team (EMS). The symptom of a stroke may also be dizziness occurring together with balance disorders, visual disturbances, articulation disorders, headaches. The time from the onset of stroke symptoms to the provision of medical attention is very important. The later help is provided, the chances of recovery decrease and the possibility of permanent health consequences increases [1,2,4]. Therefore, knowledge of the symptoms of IS by the public is crucial in early detection of the disease and initiation of appropriate treatment. Additional and basic methods for diagnosing a stroke include a short test with the FAS acronym (Face, Arm, Speech), which has been recommended by the American Heart Association (AHA) and the American Stroke Association (ASA). In order to facilitate the diagnosis of stroke, doctors from the Cincinnati hospital created the FAST test, which in English means "fast/quickly". The words in the FAST scheme come from English words that mean: face, arm,

speech, time. To confirm the symptoms of a stroke, ask the patient to:

— "show" the teeth F (face) — a stroke will be indicated by the drooping of the corner of the mouth, and the inability to grin on the side opposite to the stroke focus,
— stretch both upper limbs forward at the same time and one of the limb drops A (arm) — the limb on the side opposite to the stroke focus drops,
— say his/her name and surname S (speech) and if the patient says their name in a unclear or completely slurred manner, this suggests a stroke.

It is important to react quickly and call for help immediately if any of the above symptoms appear suddenly — T (time) [5–7].

Anyone who is familiar with the test can perform the FAST test. The test should only take a few seconds to complete. After this time, if the examiner suspects a stroke, first aid should be provided, which should include:

— calling the emergency medical team (EMS) by calling 112 or 999 and informing about the patient's ailments and symptoms that suggest a stroke,
— do not give a person with a suspected stroke anything to drink or eat,
— place the sick person in a comfortable position and provide psychological support,
— before the arrival of EMS, prepare medical documentation and a list of medications taken by the patient,
— in case of loss of consciousness of the patient, put him in a safe position. Check if the person is breathing. If unconsciousness and respiratory arrest occur, begin cardiopulmonary resuscitation,
— determine as precisely as possible the time of the appearance of the first symptoms of stroke, loss of consciousness and pass it on to the paramedics.

Taking action quickly and hospitalizing the patient gives a very good chance of curing or mitigating the effects of stroke and preventing deaths [2,3].

The aim of the study was to assess the level of knowledge of students of medical and non-medical faculties on the principles of pre-medical first aid in stroke and to determine the state of general knowledge about stroke.

Material and Methods

The research was conducted among students of the Academy of Applies Sciences of Stanisław Staszic in Piła in the academic year 2020/2021. The study used the method of diagnostic survey with the use of the questionnaire technique. The author's questionnaire consists of two parts, where the first part concerns demographic data: gender, age, place of residence, field of study and year of study. The remaining questions were to determine the level of students' knowledge about stroke: symptoms and principles of first aid to a person with a suspected stroke.

186 students participated in the study, including 77 (41%) students of non-medical faculties such as: construction, electrical engineering, mechanical engineering, transport, economics, philology, forensics, cosmetology and social work and 109 (59%) students
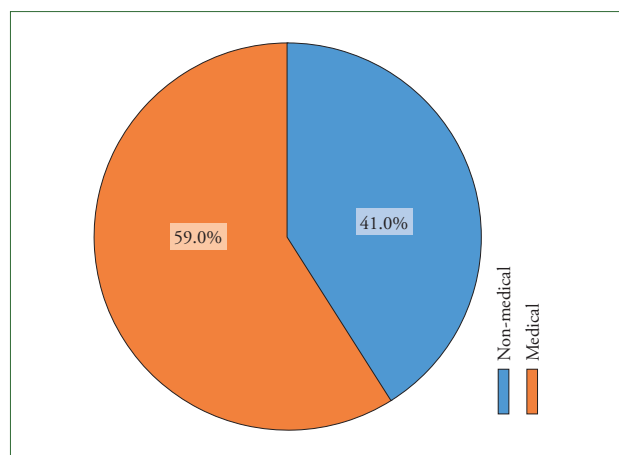
Figure 1. Characteristics of the fields of study of students in the study group

of medical faculties such as: nursing, emergency medical services and physiotherapy (Figure 1).

The questionnaire was sent to students of the Academy of Applied Sciences of Stanisław Staszic in Piła electronically via e-mail and MS Teams. The survey was fully anonymous. Participation in the study was tantamount to consent to complete the questionnaire. At any time, regardless of the stage of the study, the respondent had the right to withdraw from participation.

The respondents were informed about this at the beginning of the survey.

In the study, the data was described in terms of quantity and percentage. The distribution of features in groups of students of non-medical and medical faculties was checked with the chi-square test. The level of assessment of knowledge about stroke in the group of students of medical and non-medical faculties was checked with the student's test. The level of significance was $p < 0.05$.

Results

Conducting on original survey made it possible to assess the knowledge of students of medical and non-medical faculties about the symptoms and rules of conduct in stroke. The surveyed group of students comprised 73% of women and 27% of men. Women were more likely to provide answers both in medical and non-medical faculties.

In the study group, 83% were people aged 18–25. 10% of respondents were aged 26–34, 35–39 — 3%, and over 40 — 4% of respondents. The age distribution in the study group of non-medical and medical fields of study was similar.

In the surveyed group, 53% were people living in the city from 10,000 up to 50,000 inhabitants. 31% lived in the countryside, and 16% were students living in cities with up to 19,000 inhabitants. The distribution of place of residence in the study group of non-medical and medical fields of study was similar.

In the second stage of the survey, respondents were asked, among other things, whether they had encountered the need to provide first aid to a person with a suspected stroke and whether they would like to take part in a training on stroke. They were also asked to mark those risk factors and stroke symptoms that they thought were normal.

Table 1. Characteristics of first aid situations during stroke among students in the study group

Have you encountered a situation where it was necessary to provide first aid to a person with suspected stroke?	Non-medical		Medical		Total	
	N	%	N	%	N	%
Yes	12	16	19	17	31	17
No	65	84	89	82	154	83
I don't know	0	0	1	1	1	1
Total	77	100	109	100	186	100

$\chi^2 = 1.20$, $p = 0.54$

The question „Have you encountered a situation where it was necessary to provide first aid to a person with a suspected stroke?" was answered affirmatively by 17% of students. The distribution of answers in the surveyed group of non-medical and medical fields of study was similar (Table 1).

Table 2 presents students' answers about stroke symptoms.

Table 2. Characteristics of knowledge about stroke symptoms among students in the study group

What symptoms do you think are characteristic of a stroke?	Non-medical		Medical		Total	
	N	%	N	%	N	%
Slurred speech, loss of ability to say words, difficulty understanding speech	71	38	102	55	173	93
Worse vision in one eye	18	10	41	22	59	32
Dizziness with balance disorders and sudden falls	42	23	64	34	106	57
Sensory loss on one side of the body or numbness in one half of the body, weakness of a limb or limbs on one side of the body	65	35	97	52	162	87
Contortion of the face on one side — the lowering of the corner of the mouth is especially visible	67	36	99	53	166	89
Severe headache and abdominal pain	11	6	30	16	41	22
Swallowing disorders	7	4	51	27	58	31
Increase in body temperature	4	2	19	10	23	12

In the surveyed group of students, both medical and non-medical students most often mentioned the following symptoms of stroke: speech disorders, paresis of the limbs and sensory disorders, as well as facial distortion and lowering of the corner of the mouth. The percentage of students from medical faculties mentioning these symptoms ranged from 52–55%, while from non-medical faculties it was 35–38%. Other symptoms, such as dizziness, balance disorders, were reported much less often as symptoms that could indicate a stroke. A small percentage of students from non-medical fields reported that swallowing disorders or headaches may indicate a stroke (respectively, 4% and 6%), while from medical fields the percentage was 27% and 16%. As the symptoms of a stroke, the students mentioned symptoms that are not characteristic of a stroke, such as abdominal pain and an increase in body temperature.

The question "According to your knowledge, does the time from the onset of stroke symptoms to the moment of admission of the patient to the hospital department affect the type of treatment undertaken?" was more often responded to as "no" by non-medical students (8%) than medical students (2%). In 98%, the students confirmed the influence of time on treatment.

The answers to the question whether a stroke is a life-threatening condition are presented in Table 3.

Table 3. Characteristics of knowledge among students about stroke as a life-threatening condition

According to your knowledge, is a stroke a life-threatening condition?	Non-medical		Medical		Total	
	N	%	N	%	N	%
Yes	75	97	109	100	184	99
No	2	3	0	0	2	1
Total	77	100	109	100	186	100

$\chi^2=3.55$, p=0.06

In the surveyed group of 187 students of medical and non-medical faculties, as many as 99% of students claimed that stroke is a life-threatening condition (Table 3).

Knowledge of the "FAST" acronym and knowledge of the meaning of the word "STROKE" is included in Table 4.

Table 4. Characteristics of students' knowledge about the word "STROKE" and the acronym "FAST"

Have you ever heard of a synonym for the word "FAST" or "STROKE"?	Non-medical		Medical		Total	
	N	%	N	%	N	%
Yes	34	44	76	70	110	59
No	29	38	20	18	49	26
I don't remember	14	18	13	12	27	15
Total	77	100	109	100	186	100

$\chi^2=12.61$, p<0.002

In the question "Have you ever heard of the acronym "FAST" or the term "STROKE?", students of medical faculties heard these terms significantly more often (70%), while non-medical ones only in 44% (Table 4).

In the next question, the respondents were asked what would the first thing they would do be if they suspected a stroke in themselves or a loved one (Table 5).

Table 5. Characteristics of knowledge on first aid of stroke by students in the study group

If you suspect a stroke in yourself or a loved one — the first action you should take is:	Non-medical		Medical		Total	
	N	%	N	%	N	%
I immediately call the ambulance team	67	87	103	94	170	91
I measure my blood pressure	4	5	4	4	8	4
I call for someone close to me and together we decide what to do next	2	3	2	2	4	2
I immediately go to my family doctor	2	3	0	0	2	1
I wait, but if the symptoms persist I go to the family doctor	1	1	0	0	1	1
I make an urgent appointment with a neurologist	1	1	0	0	1	1
Total	77	100	109	100	186	100

$\chi^2=7.69$, p<0.17

In the event of a suspicion of a stroke in oneself or a loved one, the first action that both medical and non-medical students would take was to "immediately call the ambulance team" (Table 5).

Figure 2 shows the relationship between the level of knowledge of the respondents and their profile of study. Medical students fared best compared to non-medical students.
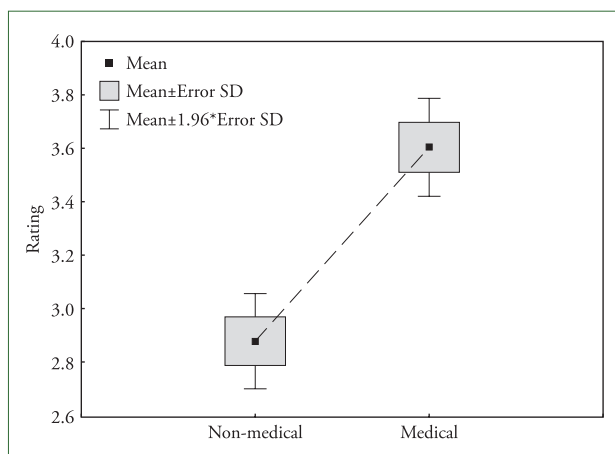
Figure 2. Comparison of the average level of knowledge of students

The average level of knowledge of non-medical students was 2.88±0.79 and was significantly lower (t=−5.73, p<0.0001) than the average level of knowledge of medical students of 3.60±0.97 (Figure 2).

Table 6. Characteristics of willingness to participate in training on stroke in a group of students

Would you like to take part in a training on stroke?	Non-medical		Medical		Total	
	N	%	N	%	N	%
Yes	38	49	90	83	128	69
No	12	16	12	11	24	13
I am not interested in this topic	27	35	7	6	34	18
Total	77	100	109	100	186	100

$\chi^2=28.77$, p<0.0001

The group of students of medical faculties significantly more often (83%) expressed their willingness to participate in training on stroke than students of non medical faculties (49%) (Table 6). Most of the respondents declared their willingness to broaden their knowledge about stroke and ways to prevent it.

Discussion

Stroke is a serious health problem in Poland and in the world. There is a noticeable increase in the incidence of stroke, with a simultaneous decrease in the age of patients [3,8,9]. The lack of sufficient knowledge about stroke is related to the fact that people with stroke may end up in hospital too late, after the so-called time window for causative treatment of ischemic stroke [7, 9–11]. This translates into a worse prognosis in returning to full fitness from before the stroke [2].

Awareness of the society about the principles of first aid in case of a stroke gives the opportunity to proceed properly in the event of stroke symptoms.

The survey showed that students of medical faculties have much more knowledge about the symptoms of stroke, they can also indicate less specific symptoms of stroke, such as swallowing disorders or severe headaches. As the main symptom of stroke, the respondents considered various speech disorders, facial distortion on one side, sensory disturbances on one side of the body or numbness of one half of the body, weakness of a limb or limbs on one side of the body. The knowledge of stroke symptoms was higher among medical students than the knowledge of non-medical students.

Comparing with the research by Bartyzel-Lechforowicz et al. [12] conducted among teachers and students, 50.8% of teachers declared knowledge about stroke symptoms, while only 11.6% of students had knowledge about stroke symptoms. Both of them were able to name, on average, two symptoms heralding a stroke. It is positive, however, that almost all teachers and almost 90% of students were aware that stroke is a life-threatening disease and requires quick response [12]. On the other

hand, a study conducted by Krzystanek et al. [13] showed that respondents from the Silesia voivodeship had insufficient knowledge about the symptoms of stroke. 42.4% of the respondents did not know any specific stroke symptom [13]. The most frequently mentioned symptoms were disturbances of consciousness (33.4%), headaches (26.2%) and paresis (19.5%). The least frequently mentioned symptom was facial/mouth asymmetry (3.3%), while visual disturbances or vision loss were not mentioned at all [13].

In own research, the majority of the surveyed students from both medical and non-medical faculties (99%) knew that stroke is a life-threatening condition, which is presented in Table 3. Among the society, the ability to react quickly in a life-threatening situation is very important. The state of such a threat undoubtedly arises in patients in the acute phase of stroke.

In the research conducted by Cieślak, [14] 86.7% of the respondents (people after a stroke) considered stroke a life-threatening condition, and 11.7% of people (7 people) did not classify a stroke as a life-threatening condition [14].

Not recognizing the symptoms of a stroke and not calling the emergency medical team (EMS) to a patient with a stroke extends the time from the occurrence of a stroke to admission to the hospital and starting treatment. If a stroke patient is admitted to the hospital more than 4.5 hours after the onset of the stroke, he practically loses the chance of receiving thrombolytic therapy and has little chance of having a thrombectomy, because the standard time window for thrombolysis is 4.5 hours from the onset of stroke, and for thrombectomy — 6 hours [2].

Educated people, knowing the symptoms of a stroke, are able to react properly, provide first aid, call a medical rescue team to minimize the time from the stroke to the time when the patient is under specialist medical care.

The answers of the respondents of their own research on the knowledge of typical symptoms occurring in a stroke are similar to the results of the study by Szpunar et al. [11] on the knowledge of office workers about stroke. 68% of office workers showed knowledge of stroke symptoms [11]. It is a bit worse when it comes to knowing the rarer symptoms, which can also be the first symptoms of a serious stroke, such as headache, dizziness and balance disorders. Therefore, in trainings/ workshops, attention should be paid to trunk stroke, the symptoms of which are slightly different than typical hemisphere stroke.

As we know, the time of arrival of a patient with a stroke to the hospital, where he will be able to receive thrombolytic treatment, is important because if the patient goes after the so-called time window, causal treatment of the stroke is usually impossible.

According to the analysis of the results of own research, among all students of medical and non-medical faculties, the majority of people 178 (96%) know that the time from the onset of stroke symptoms to the admission of the patient to the hospital ward has an impact on the type of treatment undertaken.

Cichońska et al. [15] conducted research on the assessment of the time from the occurrence of a stroke incident to obtaining medical help in the population of the Holy Cross region. During the study, too long time was observed from the onset of a stroke to the admission of the patient to the hospital for diagnostic and treatment activities [15].

Our respondents knew (91%) that EMS should be called immediately when a stroke is suspected, and they would act accordingly. However, not all students of non-medical faculties would immediately call EMS to a patient with a suspected stroke. 3% said that they would call a loved one and decide together what to do with the patient or go immediately to the family doctor.

In the studies conducted by Cieślak [14], a total of 85% of respondents would first provide first aid and immediately call an ambulance [14].

The study showed significant differences in awareness of the synonym of the word "FAST" or "stroke" among students from both groups.

The results of own research indicate the need to conduct further research in the field of knowledge about stroke in the group of students, as well as the need to conduct intensive educational activities in this group.

Despite the general positive assessment of the knowledge of students of medical and non-medical faculties, there are areas in which knowledge should be supplemented.

In the studies by Gazdowicz [10] conducted among students of nursing at the Jan Grodek State University in Sanok, where their level of knowledge about strokes was examined, similar results were obtained to the results of the authors in the group of medical faculties [10].

A study conducted by Cwalina et al. [16] among 150 students of the Faculty of Health Sciences of the Medical University of Białystok in Białystok also showed a good and satisfactory level of knowledge about risk factors and basic principles of cardiovascular disease prevention in the majority of respondents [16].

Building awareness of the society about the usefulness of knowledge in the field of stroke management can be implemented by introducing these issues into various areas of life. Interest in training on stroke is significant among students of medical and non-medical faculties. 69% of respondents expressed their willingness to participate in training on stroke. In the opinion of the authors, workshops on both the symptoms and the principles of stroke management should be organized and conducted in a cyclical manner using the most modern

methods. It is important to introduce an educational and information project at universities, aimed at changing awareness and raising the level of knowledge of the general public, especially young people, on the management of stroke.

The knowledge of medical students was higher than that of non-medical students. Due to the specificity of the profession they will pursue in the future, students studying medicine should have the highest level of knowledge and skills to serve the health and life of another human being.

Conclusions

The conducted survey showed that:
1. The knowledge of students of medical faculties is much greater when it comes to first aid in strike than students of non-medical faculties.
2. The knowledge of actions to be taken in the event of a suspected stroke turned out to be quite good both among students of medical and non-medical faculties, but not sufficient.
3. It is advisable to organize cyclical trainings to improve knowledge among students of medical and non-medical studies in order to improve the knowledge of the symptoms of a stroke and the correct procedure in the event of a suspected stroke. Training should be organized at every level of academic education and should include theoretical and practical classes in the field of prevention and first aid in stroke.

Implications for Nursing Practice

The work raises issues related to the knowledge of students of medical and non-medical faculties on the principles of first aid in case of stroke. It should be remembered that the knowledge of young people about the first symptoms in patients with suspected stroke is very important, as it accelerates the implementation of the causative treatment of ischemic stroke (thrombolysis, thrombectomy). In order to make young people aware of the disease itself, special attention should be paid to the need to react quickly and call EMS after the first symptoms of stroke appear, which will translate into a reduction in disability.

The effectiveness of first aid in stroke can be increased by various educational programs among young people and this activity should be repeated.

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