

The relationship between the level of knowledge in the field of pro-health procedures and the quality of life in people after stroke

Ocena związku poziomu wiedzy w zakresie prozdrowotnego postępowania po wystąpieniu udaru z jakością życia osób po udarze mózgu

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Key words

health education, stroke, quality of life, level of knowledge

Summary

Introduction: Nowadays, international organisations such as WHO, UNICEF and UNFPA support a holistic approach towards an individual, aimed at solving life problems, which is missing from educational prevention programmes. At first, the level of knowledge in the individuals should be defined in order to adjust the information concerning an ailment to educational needs. The overall and neurological state of the individual affected by stroke very frequently does not allow to convey much knowledge. Knowledge on stroke results in decreased incidence, which explains the necessity to raise awareness of risk factors for stroke.

The aim: The aim of the research was to establish a connection between the level of knowledge of the ailment in people affected by stroke and their quality of life.

Material and methods: The research included 279 people after stroke. Their quality of life was assessed using a shortened version of the WHOQOL-Bref questionnaire. In order to assess the level of knowledge of health-supporting actions after stroke, an indicator of knowledge was created.

Results: The strongest dependence in the somatic (DOM1), social (DOM3) and environmental fields (DOM4) was observed in the group of people between 13 and 24 months after falling ill. The strongest dependence in the psychological field (DOM2) was observed in the group of people between 6 and 12 months after the incident.

Conclusion: The level of health-supporting knowledge in people affected by stroke is not satisfactory. A higher level of knowledge results in a higher quality of life.

Słowa kluczowe

edukacja zdrowotna, udar mózgu, jakość życia, poziom wiedzy

Streszczenie

Wstęp: Obecnie międzynarodowe organizacje takie jak: WHO, UNICEF, UNFPA propagują całościowe podejście do podmiotu ukierunkowane na rozwiązywanie problemów życiowych, co nie ma odzwierciedlenia w edukacyjnych programach profilaktycznych. Należy wcześniej poznać poziom wiedzy odbiorców, aby dostosować przekazywane treści do potrzeb edukacji z zakresu problematyki schorzenia. Bardzo często stan ogólny i neurologiczny osoby po przebytych niedokrwinnym lub krwotocznym udarze nie pozwala na przekazanie zbyt dużego zakresu wiedzy. Znajomość przyczyn udaru przekłada się na zmniejszenie zapadalności, dlatego tak istotna jest świadomość dotycząca czynników jego ryzyka.

Cel badań: Celem badań była ocena związku między poziomem wiedzy osób po przebytych udarze mózgu w zakresie prozdrowotnego postępowania po przebytych udarze mózgu z jakością ich życia.

The individual division of this paper was as follows: a – research work project; B – data collection; C – statistical analysis; D – data interpretation; E – manuscript compilation; F – publication search

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Materiał i metody: Badaniami objętych zostało 279 osób po pierwszym przebytych udarze mózgu. Do badania jakości życia użyto skróconą wersję Kwestionariusza Jakości Życia Światowej Organizacji Zdrowia (WHOQOL – Bref). Do oceny poziomu wiedzy stworzono wskaźnik poziomu wiedzy chorych na temat postępowania prozdrowotnego po przebytych udarze mózgu. **Wyniki:** Najsilniejszą zależność zaobserwowano między poziomem wiedzy a dziedzinami jakości życia. W dziedzinie somatycznej (DOM1), socjalnej (DOM3) i środowiskowej (DOM4) stwierdzono zależności istotne statystycznie w grupie będącej 13-24 miesięcy od czasu jaki upłynął po wystąpieniu udaru. W dziedzinie psychologicznej (DOM2) odnotowano najsilniejszą zależność w grupie chorych będących 6-12 miesięcy od dnia zachorowania.

Wnioski. Poziom wiedzy prozdrowotnej osób po przebytych udarze mózgu jest niesatysfakcjonujący. Wyższy poziom wiedzy skutkuje wyższą jakością życia.

INTRODUCTION

In order to achieve a holistic effect in the approach to a patient, it is necessary to integrate the activities of all medical staff, family and the patient him/herself. These activities should be supported by an effective social campaign to raise awareness regarding the risks and symptoms of stroke¹. One cannot talk about comprehensive rehabilitation of a patient who is deprived of educational and informational activities that give him/her such necessary tools as knowledge and skills to overcome the hardships resulting from this disease. The most professional source of knowledge regarding stroke is medical press, scientific publications and education provided by professional medical personnel. Self-education worth promoting, obtained even through the Internet, must be verified by qualified medical personnel, including a physician, physiotherapist, nurse or an occupational therapy instructor who knows the issues related to stroke². Modern health education, perceiving health holistically, is an important and complementary element of rehabilitation. Knowledge of the causes of stroke translates into reduction in incidences, which is why awareness of its risk factors is so important. Having proper knowledge and awareness of the limitations resulting from this disease reduces the feeling of uncertainty and anxiety, and thus, affects improvement in quality of life³. In the approach to stroke patients, too little emphasis is placed on education, which should be of higher priority. An indication not only of medical nature is to increase access to information on risk factors and how to lead a proper lifestyle³. The direction of educational activities undertaken is aimed at:

- a) improving functional status of patients,
- b) implementing prevention of disease complications and secondary stroke,
- c) developing skills needed to deal with patients having neurological deficits,
- d) reducing the mental strain of caretakers resulting from looking after the patient,
- e) increasing the health awareness of caretakers and patients,
- f) promoting a pro-health lifestyle¹.

STUDY AIM

The aim of the study was to assess the relationship between patients' level of knowledge and their quality of life depending on the time elapsed since stroke.

During the research, answers to the following questions were sought out:

- Is there and what is the relationship between the level of knowledge on health-oriented behaviour and quality of life (measured using WHOQOL-Bref scale) depending on the time from stroke occurrence?
- Is the relationship between patients' self-evaluation of health and level of knowledge dependent on the time elapsed since the stroke?
- Is there and to what extent does a relationship exist between the level of knowledge and individual areas of quality of life: physical, psychological, environmental and social, depending on the time since stroke?
- Can medical staff be considered as a basic and effective source of knowledge for patients regarding a pro-health lifestyle after a stroke?

RESEARCH MATERIAL

The research was carried out after obtaining approval of the Bioethical Commission at the District Medical Chamber in Krakow, reference number 86/KBL/OIL/2013, dated June 28, 2013.

The test material consisted of 279 patients, including 131 women, which is 46.95%, and 148 men, totalling 53.05%, after the first ischemic or haemorrhagic stroke. Ischemic stroke was diagnosed in 243 patients, which is 87.10%, including 230 women, which is 47.33%, and in 128 men who constitute 52.67%. Haemorrhagic stroke, however, was diagnosed in 36 patients, including 16 women, which is 44.44%, and in 20 men, which gives 55.56%. The age range included in the study of patients was between 25 and 64 years, giving an average of 57.4 years. The patients included in the study underwent stationary rehabilitation at the Rehabilitation Department at the Podhale Nowy Targ Specialist Hospital and the Provincial Rehabilitation Hospital named after Dr. S. Jasiński in Zakopane. These studies were carried out from January to October 2014. Considering the time that has passed since the day of disease onset, the studied population was divided into three groups. The division takes the global recommendations of clinimetry into account in assessing the quality of life and the impact of the disease on it, the basic stages of rehabilitation and the optimal period of rehabilitation of the patient after a stroke. The first group (G1) comprised patients from 6 to 12 months from the day of stroke, the second (G2) - from 13 months to 2 years, and the third (G3) - from 2 to 5 years after the onset of the disease. 103 patients were qualified for the first

group, which gives 36.92%, including 42 women, equalling 40.78% and 61 men, which is 59.22%. The second group totalled 60 patients, i.e. 21.51%, including 29 women, which gives 51.67% and 31 men, which is 48.33%. There were 116 patients in G3, which is 41.58%, including 59 women, or 50.86% and 57 men, which gives 49.14%.

Adults participated in the study – those above the age of 25. The largest group among all respondents were patients at the productive non-mobile age (above the age of 44) (76.3%). Men predominated to a small extent (53.05%). More than half of the patients were married (58.78%), the majority of the remaining single individuals were widowed (20.79%). The highest number of respondents declared vocational (38.71%) and secondary education (29.75%). 17.56% of respondents were professionally active. The financial situation of the surveyed people was poor in 47.67%, and only 19.71% described their financial situation as good.

The following inclusion criteria were established:

- diagnosis of first stroke, defined according to WHO criteria,
- age: 25-59 for women and 25-64 for men,
- period after stroke: at least 6 months, but no longer than 5 years.

RESEARCH METHODOLOGY

The study method was a diagnostic survey. In order to collect the research material, an original questionnaire, analysis of medical documents and the WHOQOL-BREF¹⁰ questionnaire with a standardized scale for assessing the quality of life containing 26 questions were used. The raw results of the short version of the WHOQOL-BREF questionnaire were converted to the scale range of 0-100. In order to answer the closed questions regarding knowledge on risk factors, respondents replied by indicating one of the five possible answers. In terms of responses, the Likert¹⁰ scale was used with the following scores: definitely not - 0 points, not really - 1 point, difficult to say - 2

points, rather yes - 3 points, definitely yes - 4 points.

For the purpose of analysis, an indicator of the level of knowledge of patients on the subject of pro-health behaviours after stroke was created. The knowledge level indicator was constructed on the basis of 35 items (items) grouped into 6 questions from the author's questionnaire. The questions included knowledge in the field of: forms of motor activity recommended after stroke, risk factors for re-stroke, principles of rational nutrition and correct blood pressure or cholesterol levels. The level of knowledge of patients after stroke was determined by the percentage of the number of points obtained from the answers given provided for the questions included in the author's anonymous questionnaire. The following division was applied: low level of knowledge, which was characterized by less than 49.9%, average level – 50.0-74.9% and high level of knowledge – over 75.0% of correct answers.

Statistical analysis used one-way analysis of variance (ANOVA – Analysis of Variance). After obtaining statistically significant results of analysis, post hoc tests were performed (multiple comparisons indicating which of the analysed groups differ significantly from one another statistically), in which the Bonferroni or Games-Howell tests were used. In the analysis of quantitative variables of at least ordinal character, the existence of a linear relationship between variables as well as its strength and direction was checked using Pearson's correlation coefficient (quantitative variables) or Spearman's rank correlation coefficient (ordinal variables). The significance level of 0.05 was assumed in all tests. The above values were considered statistically insignificant.

RESULTS

The analysis of results of our research regarding evaluation of the relationship between the assessment of quality of life according to WHOQOL-BREF and the level of knowledge of post-

stroke patients showed statistically significant differences. In the analysis of the subjective assessment of quality of life (Bref1), in all three time intervals, statistically significant positive correlations were found. According to the carried out analyses, the highest ($r=0.443$, $p=0.000$) was noted in patients from G2, and the lowest ($r=0.199$, $p=0.032$) in patients from G3. In turn, the analysis of the correlations between satisfaction with one's health (Bref2) and the level of knowledge revealed positive relationships - the highest ($r=0.321$, $p=0.012$) in patients from G2, and the lowest ($r=0.193$, $p=0.051$), at the border statistical significance, positive relationship in patients from G1 (Table 1).

There are also significant and positive correlations in the analysis of four areas of quality of life. In the somatic domain (DOM1), the strongest ($r=0.528$, $p=0.000$) relationship was found in G2, the lowest ($r=0.279$, $p=0.004$) in patients from G1. In the analysis of psychological domains (DOM2), the strongest ($r=0.520$, $p=0.000$) relationship was found in patients from G1, and the weakest ($r=0.336$, $p=0.000$) in patients from G3. In the social domain (DOM3), the strongest ($r=0.540$, $p=0.000$) dependence was found in patients from G2, the weakest ($r=0.199$, $p=0.032$) in patients from G3. In the environmental domain, (DOM4), the strongest ($r=0.612$, $p=0.000$) correlation was observed in patients from G2, and the weakest ($r=0.318$, $p=0.000$) in patients from G3 (Table 1).

During research, the correlations between self-assessment of level of knowledge on the principles of proper management of physical activity, diet and knowledge of factors increasing the risk of repeated stroke, and the quality of life according to WHOQOL-BREF were sought.

There were statistically significant differences between the assessment of satisfaction with quality of life (Bref1) between the analysed groups. A statistically significant correlation was reported in patients from G2 (Table 2). On the other hand, there were no statistically significant differences between the assessment of sat-

Table 1

Relationship between level of knowledge and quality of life according to the WHOQOL-BREF scale, depending on time from stroke in the studied group of patients

		Level of knowledge		
		Time from stroke		
Quality of life		G1	G2	G3
Bref1	<i>r</i>	0.312	0.443	0.199
	<i>p</i>	0.001	0.000	0.032
Bref2	<i>r</i>	0.193	0.321	0.183
	<i>p</i>	0.051	0.012	0.049
DOM1	<i>r</i>	0.279	0.528	0.300
	<i>p</i>	0.004	0.000	0.001
DOM2	<i>r</i>	0.520	0.485	0.336
	<i>p</i>	0.000	0.000	0.000
DOM3	<i>r</i>	0.494	0.540	0.199
	<i>p</i>	0.000	0.000	0.032
DOM4	<i>r</i>	0.352	0.612	0.318
	<i>p</i>	0.000	0.000	0.000

Bref1 – subjective assessment of quality of life; Bref2 – satisfaction with health; DOM1 – somatic domain; DOM2 – psychological domain; DOM3 – social domain; DOM4 – environmental domain; G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence

isfaction with one's health (Bref2) between the analysed groups (Table 3). The patients under study, regardless of the duration of the disease, are less satisfied with their health than their quality of life (Tables 2-3).

In the studied somatic domain (DOM1), analysis of results of the conducted tests, taking the time elapsed from the stroke occurrence to their verification into account, revealed one statistically significant difference be-

tween DOM1 and the group of people who defined their level of knowledge as poor. Among patients belonging to G2 with the lowest self-knowledge level, the average of DOM1 is lower than the average obtained by patients from G3 (Table 4). In G2, the occurrence of statistically significant average differences in the somatic domain between those assessing their level of knowledge as good and the averages obtained by patients from the

low knowledge group was revealed. In turn, the use of Spearman's test showed the existence of a positive correlation with the $p=0.002$ level of significance between variables. The higher the level of self-assessed knowledge in G2, the higher the quality of life of these patients in the physical domain (Table 4).

Analysing the results of research in the psychological domain (DOM2) among G1 patients, there was no sta-

Table 2

Relationship between assessment of quality of life and self-evaluation of patients' own level of knowledge

Self-evaluation of knowledge level	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
	G1	G2	G3			
Bref1*	weak	3.00	2.80	3.20	3.05	F(2.89)=1.040 $p=0.358$ Rsp=0.099 $p=0.346$
	satisfactory	3.00	3.14	3.08	3.06	F(2.82)=0.183 $p=0.833$ Rsp=0.031 $p=0.777$
	good	3.28	3.50	3.39	3.38	F(2.99)=0.375 $p=0.688$ Rsp=0.060 $p=0.549$
ANOVA	F (2.100)=0.994 $p=0.374$	F (2.57)=2.490 $p=0.092$	F (2.113)=1.036 $p=0.358$			
Spearman's correlation coefficient	Rsp=0.115 $p=0.249$	Rsp=0.280 $p=0.030$	Rsp=0.109 $p=0.243$			

* general perfection of quality of life measured using the WHOQOL-Bref scale; Bref1 – subjective assessment of quality of life; G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence

Table 3
Relationship between assessment of health state and self-evaluation of patients' own level of knowledge

Self-evaluation of knowledge level	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
	G1	G2	G3			
Bref2*	weak	2.72	2.40	2.80	2.71	$F(2.89)=0.994$ $p=0.374$ $Rsp=0.047$ $p=0.659$
	satisfactory	2.61	2.81	2.73	2.69	$F(2.82)=0.363$ $p=0.697$ $Rsp=0.064$ $p=0.563$
	good	2.93	3.04	2.96	2.97	$F(2.99)=0.080$ $Rsp=0.012$ $p=0.907$
ANOVA	$F(2.100)=0.954$ $p=0.389$	$F(2.57)=1.876$ $p=0.163$	$F(2.113)=0.545$ $p=0.582$			
Spearman's correlation coefficient	$Rsp=0.059$ $p=0.553$	$Rsp=0.232$ $p=0.075$	$Rsp=0.065$ $p=0.486$			

* individual perception of own state of health measured using the WHOQOL–Bref scale; Bref2 – satisfaction with health; G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence

Table 4
Relationship between somatic domain and self-evaluation of patients' own level of knowledge

Self-evaluation of knowledge level	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
	G1	G2	G3			
Somatic domain (DOM1)	weak	42.19	33.60	46.66	42.78	$F(2.89)=4.498$ $p=0.014$ $Rsp=0.155$ $p=0.140$
	satisfactory	42.55	44.62	43.42	43.33	$F(2.82)=0.109$ $p=0.897$ $Rsp=0.056$ $p=0.611$
	good	48.21	51.67	50.69	50.22	$F(2.99)=0.332$ $Rsp=0.071$ $p=0.476$
ANOVA	$F(2.100)=1.369$ $p=0.259$	$F(2.57)=5.800$ $p=0.005$	$F(2.113)=2.042$ $p=0.135$			
Spearman's correlation coefficient	$Rsp=0.143$ $p=0.149$	$Rsp=0.386$ $p=0.002$	$Rsp=0.136$ $p=0.144$			

DOM1 – somatic domain; G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence

tistically significant relationship. On the other hand, among patients from G2, the average DOM2 in the group assessing their level of knowledge as good is much higher than the average obtained by those evaluating it as poor. The difference is statistically significant. On the other hand, G3 showed a statistically significant difference in averages from the psychological domain between those assessing their level of knowledge as good and those who assessed it as satisfactory. In addition, the correlation analysis within given time intervals was positive and statistically significant between DOM2 and the self-assess-

ment of knowledge level in G2. The higher the level of knowledge self-assessment in G2, the higher the assessment of quality of life in the psychological domain. The level of significance of the dependence between variables was $p=0.007$ (Table 5). The results of the conducted research also showed a statistically significant positive relationship between the social domain (DOM3) and the level of self-knowledge regarding forms of physical activity recommended after stroke, re-incident risk factors, guidelines for proper nutrition or knowledge of the correct blood pressure and cholesterol levels in G1 (Table 6).

As follows from the analyses carried out concerning the environmental domain (DOM4) in given time intervals for G3, there are statistically significant differences between the averages of DOM4 between those assessing the level of knowledge as good and those assessing it as poor or satisfactory (Table 7). Analysing the results of the study, there was no statistically significant relationships between the level of knowledge and its self-evaluation taking time from stroke occurrence to time of conducting the study into account. From analysis in individual time intervals, on the other hand,

Table 5

Relationship between psychological domain and self-evaluation of patients' own level of knowledge							
	Self-evaluation of knowledge level	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
		G1	G2	G3			
Psychological domain (DOM2)	weak	41.72	36.73	47.02	43.27	F(2.89)=1.531	Rsp =0.115
						p=0.222	p=0.275
	satisfactory	41.74	43.81	40.04	41.73	F(2.82)=0.231	Rsp=0.069
						p=0.794	p=0.532
	good	52.69	56.13	52.80	53.55	F(2.99)=0.230	Rsp =-0.031
							p=0.754
ANOVA		F (2.100)=2.569 p=0.082	F (2.57)=4.631 p=0.014	F (2.113)=3.979 p=0.021			
Spearman's correlation coefficient		Rsp=0.161 p=0.105	Rsp=0.342 p=0.007	Rsp=0.141 p=0.132			
DOM2 – psychological domain; G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence							

Table 6

Relationship between social domain and self-evaluation of patients' own level of knowledge							
	Self-evaluation of knowledge level	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
		G1	G2	G3			
Social domain (DOM3)	weak	50.67	52.07	57.15	53.78	F(2.89)=1.180	Rsp=0.129
						p=0.312	p=0.220
	satisfactory	53.97	52.95	51.54	52.98	F(2.82)=0.115	Rsp =-0.055
						p=0.892	p=0.617
	good	62.90	59.12	59.84	60.54	F(2.99)=0.250	Rsp=-0.047
						p=0.780	p=0.639
ANOVA		F (2.100)=3.092 p=0.050	F (2.57)=0.722 p=0.490	F (2.113)=1.433 p=0.243			
Spearman's correlation coefficient		Rsp=0.217 p=0.028	Rsp=0.125 p=0.341	Rsp=0.089 p=0.344			
DOM3 – social domain; G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence							

Table 7

Relationship between environmental domain and self-evaluation of patients' own level of knowledge							
	Self-evaluation of knowledge level	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
		G1	G2	G3			
Dziedzina środowiskowa (DOM4)	weak	50.08	47.73	52.12	50.61	F(2.89)=0.446	Rsp =0.032
						p=0.642	p=0.760
	satisfactory	52.82	53.90	50.19	52.28	F(2.82)=0.394	Rsp=-0.051
						p=0.676	p=0.646
	good	56.90	60.58	61.02	59.75	F(2.99)=0.584	Rsp =0.083
						p=0.560	p=0.405
ANOVA		F (2.100)=1.431 p=0.244	F (2.57)=2.408 p=0.099	F (2.113)=6.107 p=0.003			
Spearman's correlation coefficient		Rsp=0.144 p=0.148	Rsp=0.296 p=0.022	Rsp=0.258 p=0.005			
DOM4 – environmental domain; G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence							

statistically significant relationships were recorded for all analysed time intervals. In G1, the average of the indicator of the level of knowledge in the group evaluating it as high is greater than the average obtained by those evaluating it as low and average. In G2 and G3, the average of the knowledge level indicator in the group evaluating it as high is greater than the average obtained by those assessing it as low. In all the analysed time intervals, positive and statistically significant correlations between the level of knowledge and self-assessment of knowledge level were demonstrated. The higher the level of knowledge, the higher the self-assessment of the level of knowledge by respondents. The relationship between the level of knowledge and its self-assessment in G1 is $p=0.006$, in G2 – $p=0.009$, and in G3 – $p=0.007$ (Table 8).

The relationship between the level of knowledge and the time elapsed since the stroke was also examined. The dependence is not significant (Table 9). A low level of knowledge regarding pro-health management after the stroke in 279 patients concerned only two of them whose stroke occurred over two years before beginning the study, which is less than 1% of the entire study group. The average level of knowledge is presented by $\frac{3}{4}$ of patients in G1. A similar percentage (71.67%) of patients in G2 showed an average level of knowledge. 62.93% of patients from G3 demonstrated average levels of knowledge. A high level of knowledge was presented by those who experienced stroke up to two years before the study (every fourth patient), and every third patient for whom the stroke occurred more than two years earlier. The obtained dependences indicate that the

level of knowledge of the respondents is satisfactory (Table 9).

Only a few (0.72%) participants had low levels of knowledge. In the majority (68.82%), stroke patients received 50.0-74.9% of correct responses. Every third respondent had a high level of knowledge, however, the observed differences are not statistically significant. Having the option of choosing more than one option of the answers, the respondents were the least likely to point out that the source of knowledge in the field of pro-health lifestyle after stroke were representatives of medical personnel (doctors, nurses, physiotherapists, occupational therapists) (Table 10). In the assessment of the impact of acquired knowledge on the level of knowledge of patients after stroke, closer analysis of the relationship between the group of physiotherapists as people from whom

Table 8
Relationship between the level of knowledge and self-evaluation of patients' own level of knowledge

	Self-evaluation of knowledge level	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
		G1	G2	G3			
Level of knowledge	weak	119.75	116.27	117.85	118.34	F(2.89)=0.351	Rsp=-0.050
						p=0.705	p=0.638
	satisfactory	119.58	123.86	125.23	122.36	F(2.82)=1.763	Rsp=0.190
						p=0.178	p=0.081
	good	129.55	128.58	128.55	128.84	F(2.99)=0.044	Rsp = -0.038
						p=0.957	p=0.708
ANOVA		F (2.100)=6.626 p=0.002	F (2.57)=4.131 p=0.021	F (2.113)=5.016 p=0.008			
Spearman's correlation coefficient		Rsp=0.270 p=0.006	Rsp=0.336 p=0.009	Rsp=0.249 p=0.007			
G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence							

Table 9
Relationship between patients' level of knowledge and the time from stroke occurrence

Level of knowledge	Time from stroke						Total	
	G1		G2		G3			
	n	%	n	%	n	%	n	%
low	0	0	0	0	2	1.73	2	0.72
average	76	73.79	43	71.67	73	62.93	192	68.82
high	27	26.21	17	28.33	41	35.34	85	30.47
Rsp=0,076, p=0,207								
G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence								

Table 10

Relationship between level of knowledge and source of knowledge in the studied group of patients							
Level of knowledge	Source of knowledge	Time from stroke			Total	ANOVA (F)	Spearman's correlation coefficient
		G1	G2	G3			
	Medical staff	120.52	124.2	122.53	122.04	F(2.184)=0.874 p=0.419	Rsp =0.051 p=0.485
	Literature	131.5	129.17	129.14	129.69	F(2.580)=0.112 p=0.894	Rsp=-0.035 p=0.791
	Media (TV, Internet)	125.85	130.38	129.04	128.33	F(2.118)=1.052 p=0.352	Rsp =0.072 p=0.434
G1 group – patients from 6 to 12 month after stroke occurrence; G2 group – patients from 13 months to 2 years after stroke occurrence; G3 group – patients from 2 to 5 years after stroke occurrence							

the patients received information about health-oriented lifestyles and the level of their knowledge was conducted. The significance level of relationships between variables is $p=0.058$ and remains within the confidence interval of $\alpha=0.1$. Therefore, at the current stage of research, dependency between variables cannot be ruled out.

DISCUSSION

It is erroneous to think that an equal sign can be placed between medicine and health, because the actual impact of medical care on health state was rated at only 10%, which is why health promotion is so important¹¹. In 2012, the guidelines of the Group of Experts of the Vascular Diseases Section of the Polish Neurological Society regarding the treatment of stroke, including rehabilitation procedures, claim that insufficient information is a factor that predicts poor quality of life for patients affected by this disease and their families. Patient health education regarding treatment and secondary prevention of stroke should, therefore, be an integral part of the healing process. It is of great importance in supplying people after a stroke with proper knowledge and maintaining changes in behaviour beneficial to health by assuming a healthy lifestyle. Education should be public: while awaiting treatments, during rehabilitative exercises or simple activities of daily living. This is difficult and requires good organization of the task, but as experience shows, it is possible. Awareness of the beneficial and

adverse effects of the treatment process has impact on increasing determination and motivation in pursuing a set goal¹². A patient aware of his/her illness and risks, undertakes close cooperation with a doctor, increasing the frequency of visits, which causes patients and their families to better follow therapeutic recommendations. One of the benefits of patient education is undoubtedly the patient's and his/her family's influence on the control of modifiable risk factors, which results in higher treatment efficacy, for example, by reducing the number of medications taken¹³. The level of health knowledge of people after stroke for their condition is insufficient and is closely related to the quality and lifestyle of these people. The higher the level of knowledge, the healthier lifestyle and a higher their level of life.

The research by Sit et al.¹⁴ confirm the effectiveness of education conducted by nurses in the environment of stroke patients which exceeds theoretical teaching, finding translating into health-friendly behaviours. The results of research by Girzelska et al.¹⁵ indicate that every third patient knows the principles of the recommended lifestyle after a stroke. Our research confirms that every third patient after stroke has a high level of knowledge about it, but in the vast majority of cases, this knowledge is incomplete. Patients who receive information intelligible to them on the causes and effects of stroke are more effective in complying with a healthy lifestyle. Our research indicates that the declared level of knowledge about the awareness of the principles of proper nu-

trition, forms of motor activity recommended after stroke and the risk factors of secondary stroke coincides with the actual state of knowledge of the subjects.

It was observed that the level of knowledge of post-stroke patients is not affected by the illness duration, but the effectiveness of health education, lifestyle and its quality. Patients are interested in broadening their knowledge about the disease in order to counteract the risk of recurrent stroke, as evidenced in the results of research by Morgan et al.¹⁶ and Girzelska et al.¹⁵. The respondents also express their willingness to learn ways of coping with stress, weight reduction, quitting smoking and ways of resigning from alcohol consumption¹⁷. Kozera et al.¹⁸ studies indicate a low level of knowledge in the field of the diagnosis of stroke symptoms, as only $\frac{1}{5}$ of the 4,500 individuals admitted to the Hospital Emergency Room within 3 hours of becoming ill, and therefore, did not qualify for thrombolytic treatment. A higher level of knowledge is higher likeliness to call an ambulance and implement thrombolytic therapy that increases the chances of survival and lesser disability. In Japan, in 2010-2014, Nishijima et al.¹⁹ conducted stroke-education in the form of advertising. Their results showed that more stroke patients reached the hospital within 3 hours, less than 6 hours, and faster access to the hospital is associated with a lower risk of disability. Worthmann et al.²⁰, during a 6-month educational campaign conducted regarding strokes via e-mail and telephone calls, examined a population of 1,000 people in

the urban population in Germany. These authors expected the increase in the level of knowledge about stroke that occurred, but in their opinion, it was still too low. According to Kozera¹³, at present, patients and their relatives do not have sufficient knowledge about the principles of care and post-hospital rehabilitation of people after stroke. The results of research by Błaszczyk et al.²¹ on the group of patients who had suffered their first stroke, revealed that the knowledge of risk factors for secondary stroke among the patients was insufficient, and most of them did not have any knowledge regarding this subject. Studies by Townend et al.²² and Shrivani et al.¹⁷ revealed a very low awareness of stroke risk factors among patients. Knowledge about the available forms of activity after a stroke according to Townend et al.²² was very low, because among them, there was a significant reluctance to any physical effort resulting from the belief that it can trigger a new stroke. Avoidance of physical activity in the perspective of progressive disability, increasing morbidity resulting from the aging process is aggravated by the still low level of quality of life²³. The research by Girzelska et al.¹⁵ indicates that patients hospitalized for stroke are characterized by an insufficient level of knowledge about the recommended lifestyle after suffering from this disease. These deficiencies were noted in the areas of recommended physical activity and nutrition. Effective preventive action, according to Kasperczyk²⁴, should include not only healthy eating, physical activity, an ordered lifestyle or the elimination of harmful stimulants, but also relaxation, meditation or equalizing homeostatic disturbances with methods of natural medicine. Our research shows that a healthy lifestyle, both before and after stroke, is associated with a higher level of knowledge. The research conducted by Łabuz-Roszak et al.²⁵ and Wahab et al.²⁶ on groups of patients at increased risk of recurrent stroke also indicate a dangerously low levels of knowledge regarding the risk factors of this disease.

CONCLUSIONS

On the basis of the conducted research, the following conclusions can be drawn:

1. The level of health-related knowledge of people after stroke is unsatisfactory regardless the time elapsed since its occurrence. The increase in patients' knowledge of lifestyle, secondary stroke risk factors and the principles of proper nutrition are closely related to the increase in satisfaction with quality of life, satisfaction with health state and assessment in all four domains of life: somatic, psychological, social and environmental.
2. A higher level of self-assessment of knowledge in the area of proper management of stroke, proper nutrition and prevention of secondary stroke determines higher satisfaction with quality of life. Patients are interested in their state of health and the consequences of stroke, regardless of the time elapsed since its occurrence. It follows that knowledge gives the patient a sense of satisfaction with their health and quality of life in each of its areas.
3. There was a relationship between the self-assessment of the level of knowledge and raising the level of quality of life in the somatic domain. The longer the duration of the disease, the higher the quality of life in the group of patients assessing their level of knowledge as weak.
4. The most professional source of knowledge i.e. medical staff, is not included in improvement of health awareness, which should result in the improvement of competence in the field of health self-creation in a new clinical situation.

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