GENERAL AWARENESS OF STROKE IN THE CZECH REPUBLIC

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SUMMARY

Objective: The main goal of the study was to find out the general public's awareness of stroke, the relations between the awareness of stroke and socio-demographic factors, and awareness of stroke and experience of stroke.

Methods: The combination of a non-standardized questionnaire on the stroke prevention and a standardized questionnaire on the identification of the general health literacy (HLSQ-16) was used. The sample was chosen using a quota choice. The sample structure corresponded with the composition of the Czech population with regard to regions, sex and age. These features were determined as representative. The sample consisted of 1,004 respondents.

Results: The general awareness of stroke is high in the Czech Republic. Most of the respondents (97.2%) stated that they had ever heard of stroke. This basic awareness is influenced by the sex and marital status of the respondents. Almost one half (42.2%) of the general public would welcome more information on stroke. Women showed significantly higher interest in the information than men. Significantly higher interest could be seen in elderly respondents while younger respondents said significantly more frequently that they were not interested in the information. Married respondents showed a significantly higher degree of awareness. Rural respondents expressed higher interest in the information. The interest in the information dropped with higher education. The interest was significantly influenced by the respondents' sex, place of residence, marital status, and education. Almost 1/4 (24.3%) of respondents mentioned stroke incidence in their families. Our study proved that this incidence significantly varied in dependence on the respondents' sex, age, marital status and education. Further questions were focused on the sources of information on stroke. The most important sources include internet, which was named by nearly one half (48.6%) of respondents, and it was found that women could use the sources of information more frequently than men. Women used all sources of information on stroke (internet, television, families, GPs) more than men.

Conclusion: The Czech respondents' interest in stroke is significantly influenced by their sex, age, place of residence, marital status, and the respondents' education. The findings play a role in the focus on preventive activities in this area. It is necessary to implement the general public education not only in general practitioners' offices but also in mass media in order to improve the awareness of stroke.

Key words: stroke, prevention, awareness, population education, multidisciplinary cooperation

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INTRODUCTION

Stroke is one of severe diseases representing medical and economic problems worldwide (1). Ischaemic vascular diseases represent the third main cause of death in the European population. According to the data from 2017, a higher mortality was registered in East European and North European countries (2). In the Czech Republic, the mortality relating to stroke has been dropping since 1994 (3). However, the prevalence data are inaccurate since the existing registers do not deal with non-fatal strokes (4). As a result of increasing life expectancy and accumulation of stroke risk factors, the incidence will also tend to increase in younger age categories (5).

Stroke is defined as a sudden loss of the cerebral function caused by a sudden necrosis of cerebral cells (6). This is a neurological disease, which has a significant social and economic impact. In individuals affected by stroke, significant health changes occur. Stroke patients often become dependent on other persons. Stroke changes both the patient's life and the life of the patient's significant ones, who often take the role of care providers. The stroke patients frequently need a permanent contact with another person. Stroke is the main reason of a health handicap and the treatment requires a long-term hospitalization associated with a financial burden (7). The quality of life is severely affected since stroke is a disease causing disabilities, which fundamentally change human lives and make patients highly dependent.

Unquestionably, morbidity and mortality can be significantly reduced by an effective care organization, emergent diagnostics, treatment, and appropriate rehabilitation. The cost of a complex stroke treatment concerns not only the healthcare system but also the social system and includes a number of indirect expenses associated with the impact on families and the society (5).

The main goal of the study was to identify the general public's awareness of stroke in the Czech Republic, the awareness of stroke in association with socio-demographic factors and experience with stroke.

MATERIALS AND METHODS

The data were collected using the combination of a non-standardized questionnaire on the stroke prevention and a standardized questionnaire on the identification of the general health literacy (HLSQ-16).

The field study was performed using the face-to-face dialogue between the questioner and respondent. The final sounding of the questionnaire was determined in accordance with the results of preliminary study. The study was anonymous, and participation was voluntary. The survey itself did not contain any controversial ethical questions. The standardized questionnaire was provided by the Institute for Health Literacy in the Czech Republic, whose members of staff cooperate with J. Pelikan, one of the main investigators participating in an international comparative study (8, 9). This questionnaire is a short version of the HLS-EU-Q47 questionnaire containing 47 questions. The shortened version was chosen on the basis of a pilot study which was performed to find out the most suitable questionnaire for Czech respondents (10). The standardized questionnaire was complemented by questions concerning the respondents' awareness of stroke; the level and sources of the awareness, stroke incidence among the respondents' relatives, experience of care for the significant ones, and things which are missed most in the care for person affected by stroke.

Sample

The sample of respondents was constructed using quota choice to correspond with the composition of all citizens of the Czech Republic by region, sex and age. These features were determined as representative. The sample consisted of 1,004 respondents.

The sample was constructed using a data sample containing election districts from which the districts were randomly selected. The data sample was classified according to the regions and the number of voters in a rising way. Using the Complex Samples module, a successive selection was performed containing a step calculated according to the number of authorized voters in the district (the number of authorized voters is the "measure of size" in the method of choice of PPS Systematic), which enabled the same probability for each voter to be included. The successive choice was performed for each region independently (a region represented a stratification variable) – this enables the representation of all regions. The required number of selected districts in individual regions was calculated proportionally depending on the number of voters. Subsequently, quota regulations (source of the data on sex and age – the Czech Statistical Agency, 2018) were developed.

During the field survey, 1,137 randomly chosen individuals were asked for an interview on particular topic; 133 respondents (11.7%) of all addressed individuals refused the interview. A higher proportion of refusals was prevented thanks to a special training of the questioners for the way of establishing a contact, arousing the respondent's trust, and the way of communication aimed at recruiting participants in the study.

The data were processed statistically using the SASD 1. 4. 12 (Statistical Analysis of Social Data) and SPSS software. The classification degree 1 and contingence tables of selected indicators of the classification degree 2 were processed. Tests of normality were performed using the Kolmogorov-Smirnov a Shapiro-Wilk Tests. According to the distribution and character of the features, parametric and non-parametric tests (Chi-Square Tests, Mann-Whitney Test, Kruskal-Wallis Test) were used for the calculations of significance. In justified cases, the value for Phi/Cramer's V, which also represents the effect size (coefficient r) of statistical significance (11), and Cohen's d were calculated. Based on this analysis, data were interpreted, and relevant tables were processed.

RESULTS

Socio-demographic Features

The sample consisted of 489 (48.7%) men and 515 (51.3%) women, which corresponds with the analogous composition of CR citizens aged 18 years and more. In comparison with relative frequencies, there is the deviation of 0.1% from the sample of general population. As for gender, the study is representative for CR citizens.

The age groups in combination with the sex groups are presented in percentage in the selected sample in Table 1.

Compared with the age distribution of the general population, the deviation does not exceed 0.1%. It can be stated that the study results are representative for individual age groups of Czech citizens aged 18 years and more.

Table 1. *Composition of selected sample of respondents by sex and age (N = 1,004)*

Age	Men			Women		
	n	%	Deviation	n	%	Deviation
18–24 years	41	4.1	+0.1	39	3.9	+0.1
25–34 years	83	8.3	0.0	78	7.8	0.0
35–44 years	103	10.3	0.0	96	9.6	0.0
45–54 years	87	8.7	0.0	84	8.4	+0.1
55–64 years	74	7.4	0.0	77	7.7	0.0
65 and more	101	10.1	0.0	141	14.0	0.0

Data source: Age composition of CR citizens in 2018. Situation on 31 December, 2018. Prague, Czech Statistical Office, 2019.

For the territorial or regional classification of the respondents, the division into regions, in force since 2001, was used. Compared with the regional division of the general population, the maximum deviation is 0.1%. The results are representative for Czech citizens with regard to sex, age, and region.

Other characteristics of the sample do not meet the requirements for representativeness. However, they enable the sample description using other features comprising education, marital status, size of the place of residence and occupation.

From the point of view of education, the largest groups involved individuals with a secondary education (39.9%) and apprenticeship (29.8%). Basic education was reported by 3.8% of respondents, a higher professional education by 6.8%, and an academic education by 19.7% of respondents.

As far as the marital status is concerned, the largest group consisted of married respondents (49.0%). Unmarried respondents accounted for 14.3%, divorced for 10.5%, widowed respondents for 9.6%, and unmarried couples for 16.6% of the total number of respondents. The distribution by the place of residence shows the highest representation by city/town dwellers.

As far as the occupation is concerned, respondents employed fulltime were the most numerous group in the sample (48.5%) followed by old-age pensioners (24.7%).

Awareness of Stroke and Association with Socio-demographic Features

The respondents' basic awareness of stroke was identified using closed dichotomous questions asking whether they had heard about a disease called stroke. The goal was to identify general awareness without exploring the depth and range. The results are completely unambiguous; 97.2% of the respondents had ever heard of this disease, only 2.8% said that they had never heard of stroke. It means that the general awareness of the Czech citizens is high and is a good starting point for preventive activities in this area since it is not necessary to explain within the preventive activities what stroke means.

The determination of basic starting points and targeting preventive activities in this area requires to know the fact whether the general awareness of stroke varies in individual respondents' groups divided according to age, sex, education and other socio-demographic features.

The distribution of basic awareness with regard to sex can be seen in Table 2.

Significant differences in the awareness of stroke were identified between men and women ($p < 0.05$). Women are better informed on stroke than men. Subsequently, the effect size (dependence) of the correlation of identified differences between men and women was performed. The value of $r = 0.077$ is very weak.

As far as socio-demographic features are concerned, statistically significant differences were identified in the awareness of stroke with regard to the marital status. The highest awareness was identified in married respondents ($p < 0.05$). Subsequently, the effect size (dependence) of identified differences in the awareness of stroke with regard to marital status showed that this dependence was very low ($r = 0.100$).

It can be observed that the basic awareness of stroke is very high in Czech citizens, and the proportion of those who have not heard of this disease is negligible. Though subsequent analyses of the individual socio-demographic features identified significant differences in case of sex and marital status (higher awareness in women and married individuals), the significance of these differences is very low. Nevertheless, these differences can be taken into consideration while planning basic strategies in this area. The other socio-demographic features (age, place of residence, education, occupation) do not significantly influence the degree of awareness of stroke.

Interest in Information on Stroke and Association with Socio-demographic Features

The citizens' interest in information on stroke is an important indicator of the motivation for preventive activities in this area. Therefore, more detailed analyses were performed to show correlations between this interest and socio-demographic features so that it can be determined more exactly which groups of individuals need to be particularly motivated for preventive activities concerning this dangerous disease, and in which groups the interest should be just supported by providing more information.

Taking into account this goal, respondents were asked whether they would welcome more information on stroke. The greatest part (42.2%) of respondents answered that they would welcome such information, another part (30.6%) meant that they had enough information. Approximately one tenth (10.9%) of respondents were not interested in this topic, and the remaining 16.3% of respondents were not sure or did not know how to answer. These respondents were removed from further testing.

Significant differences in the interest in information on stroke were identified between men and women ($p < 0.001$). Women showed higher interest in the information than men. Men answered significantly more frequently that they were not interested in the topic (Table 3). Subsequently, the effect size of identified differences between men and women in the interest in information on stroke was tested. This dependence was proven to be low ($r = 0.222$).

Table 2. *Awareness of stroke with regard to sex*

Sex	Awareness of stroke		Total
	Yes n (%)	No n (%)	
Men	469 (48.1)	20 (71.4)	489 (48.7)
Women	507 (51.9)	8 (28.6)	515 (51.3)
Total	976 (100.0)	28 (100.0)	1,004 (100.0)

Table 3. *Interest in information on stroke according to sex*

Sex	Interest in information on stroke			Total
	Yes n (%)	No, I have enough information n (%)	I am not interested n (%)	
Men	173 (40.8)	141 (45.9)	82 (75.2)	396 (47.1)
Women	251 (59.2)	166 (54.1)	27 (24.8)	444 (52.9)
Total	424 (100.0)	307 (100.0)	109 (100.0)	840 (100.0)

Subsequent analyses of correlations between the interest in information on stroke and socio-demographic features showed that the interest in this information was, except for occupation, influenced by all other socio-demographic features, i.e., age, education, marital status, and place of residence.

Elderly respondents showed higher interest in information on stroke. Younger respondents answered significantly more frequently that they were not interested in the information ($p < 0.001$). However, the effect size (dependence) of identified differences was low ($r = 0.139$).

The interest in the information was also significantly influenced by education ($p < 0.01$). It can be observed that the higher the respondent's education was, the lower interest was shown in information on this topic, which was explained by having enough information. However, the effect size (dependence) between these features was low ($r = 0.112$).

The influence of marital status on the interest in information on stroke was also identified as significant ($p < 0.01$). Widowed and married respondents were interested in the information significantly more than single respondents. The effect size (dependence) was also low ($r = 0.128$).

The last of the studied socio-demographic features in which a significant influence on the interest intensity was observed was the place of residence ($p < 0.001$). Rural respondents showed significantly higher interest in information on stroke. City/town dwellers, on the other hand, answered significantly more frequently that they had enough information. The effect size was identified as low ($r = 0.152$).

It follows from testing correlations between the respondents' interest in information and individual socio-demographic features that this interest significantly varies in dependence on respondents' sex, age, place of residence, and education. The occupation has no significant influence on the interest in information on stroke. These findings are important for preventive activities in this area, which should be focused particularly on men, younger and single individuals, and town/city dwellers. On the other hand, preventive activities could extend the interest of women, elderly citizens, widowed or married individuals, and individuals living in rural areas.

Stroke Experience

In any prevention of any disease, one of the preconditions of the success is the fact whether the prevention object has any experience of particular disease. Therefore, one of the goals of the study was to find out Czech citizens' experience of stroke. The questions were focused on the stroke incidence in close relatives and the experience of care of close persons affected by stroke.

Almost 1/4 (24.3%) of respondents answered that stroke had occurred in their close relatives. A majority (62.1%) answered this question negatively, and the remaining 13.6% of respondents stated that they had not known about the incidence of stroke in their close relatives.

The tests for statistical significance identified significance between the stroke incidence in close relatives and sex, age and marital status.

A significant correlation was proven between the experience of stroke and sex ($p < 0.01$). Women mentioned significantly more frequently the stroke incidence in their close relatives. The effect size (dependence) is, however, very low in this case ($r = 0{,}095$). However, if the answers "I do not know" had not been removed from the analysis, it could have been observed that men chose this answer significantly more frequently.

The significant correlation between age and experience of stroke ($p < 0.001$) is explainable. Younger respondents answered significantly more frequently that stroke had not occurred in their close relatives. Older respondents admitted the stroke incidence in their close relatives significantly more frequently. The effect size was again very low (Cohen's d was 0.311).

The experience of stroke is significantly influenced by the marital status ($p < 0.01$). Widowed respondents mentioned stroke incidence in their relatives significantly more frequently. In this case, the respondent's age can indirectly play a role.

No significant correlation was identified for the correlations between the experience of stroke and education and place of residence.

The respondents who had mentioned stroke incidence in their close relatives ($n = 244$) were subsequently asked whether they had been informed by their doctors on the possibilities of stroke prevention. More than one half (52.1%) answered that they had been informed on this topic, further 38.1% answered negatively, and the remaining 9.8% chose the answer "I do not know".

The fact that almost 1/4 of respondents have experience of stroke suggests that they can provide support in the case of outlining preventive programmes, and, in addition, be used for the spread of information on stroke prevention among other citizens who do not have this experience. Women and elderly individuals can be expected to be more helpful. Reserves in preventive activities can be expected in GPs since a considerable part had not provided any information on stroke prevention, not even in the case of stroke incidence in respondents' close relatives.

Sources of Information on Stroke

The sources from which information had been drawn played an essential role for the respondents' knowledge of stroke. This fact was studied using semi-open questions containing a number of possible sources and the option of another source than mentioned in the offer. There was even a possibility to name more than one source of information (Table 4).

Table 4. *Sources of information on stroke according to sex – accumulated*

Sex	Healthcare professionals n (%)	Family n (%)	Digital n (%)	Press n (%)	Education n (%)
Men	176 (46.9)	164 (46.2)	322 (48.3)	162 (44.8)	26 (26.5)
Women	199 (53.1)	191 (53.8)	344 (51.7)	200 (55.2)	72 (73.5)
Total	375 (100.0)	355 (100.0)	666 (100.0)	362 (100.0)	98 (100.0)

The assessment showed that the most important source was the Internet mentioned by almost one half (48.6%) of respondents. Other important sources of information included television (37.2%), family (35.3%), and general practitioners (28.0%). Other sources were mentioned less frequently; 4.8% of respondents had no information on stroke.

Women prevail for all sources of information. They are also better educated on stroke. From the point of view of the goal of the study, women will be better at preventive activities, not only as an object but also as a subject. Since respondents had the opportunity to name more sources, which were subsequently accumulated, no additional analyses were performed with regard to individual socio-demographic features.

DISCUSSION

The general awareness of stroke is very high in the Czech Republic (97.2%), the proportion of those who have never heard of it is negligible. The analysis showed a significant correlation between the general awareness and sex and marital status. Women are better informed than men. Married respondents also showed better awareness. These differences need to be taken into account when developing the basic strategy for preventive activities in the area of stroke. This study can be a good starting point for preventive activities in this area since it is not necessary to explain, within the prevention, what stroke means.

The citizens' interest in information on stroke is an important indicator for the motivation of preventive activities in this area. Furthermore, respondents were asked whether they would welcome more information on stroke. The largest part (42.2%) of respondents answered that they would welcome such information, further 30.6% meant that they had enough information on this topic. Women showed higher interest in the information than men. Men stated significantly more frequently that they were not interested in the prevention of stroke. The respondents' age is another important factor influencing the state of prevention of stroke. Elderly respondents were significantly more interested in information on stroke. Younger respondents answered significantly more frequently that they were not interested in the information. The marital status also influences the differences in the interest in information on stroke. Married respondents showed significantly higher awareness of stroke. Rural respondents expressed higher interest in the information while the city/town dwellers meant that they had enough information. Respondents with an academic education answered significantly more frequently that they had enough information on this topic. Apprenticed respondents and respondents with secondary education finished by school leaving exam (A level) expressed the interest to a significantly higher degree.

The analysed results show that the general public's awareness and interest in stroke prevention significantly varies in dependence on respondents' sex, age, place of residence, marital status, and education. The findings are of importance to the development of further preventive activities in this area. The goal is to increase the interest in this information particularly in men, younger, single individuals, in individuals with a lower education living in towns and cities. On the other hand, in preventive activities higher interest on the part of women, elderly individuals, widowed or married individuals, and rural dwellers can be utilized.

In any prevention of any diseases, the success presupposes some experience of the disease. Almost 1/4 of respondents answered that stroke had occurred in their close relatives. This suggests that these individuals can offer support and can be used for spreading the information on stroke prevention among other persons who do not have such experience. Women mentioned the incidence of stroke in their close relatives significantly more frequently. Elderly and widowed respondents admitted the occurrence of stroke in their close relatives significantly more frequently.

Therefore, higher helpfulness can be expected in women and elderly individuals. Reserves in preventive activities can be observed in doctors since a considerable proportion (38.1%) did not provide, according to the respondents, any information on stroke prevention, not even in the case of stroke incidence in the respondents' close relatives.

Sources of information on stroke play an essential role for the respondents' knowledge. The most important sources include the Internet, which was named by almost one half (48.6%) of respondents, followed by television (37.2%), family (35.3%), and general practitioners (28.0%). Other sources are mentioned less frequently. The choice of the information source is influenced by sex, age, place of residence, marital status, occupation, and education – i.e. all studied socio-demographic factors.

Women prevail for all sources of information. They are also better educated on stroke. Therefore, women will be better at preventive activities, not only as an object but also as a subject.

It can be observed that the information campaign called "30 Days for the Stroke Prevention and Treatment", which was held in 2009–2011, made the mass media aware of the problem. However, no influence on the interest of the general public, particularly on part of elderly men and younger age categories, could be proven (12).

Studies performed in other countries show that school educational programmes focused on stroke seem to be effective with regard to the improvement of the knowledge of stroke. However, further studies are needed in order to identify whether children taking part in these programmes are able to recognize a stroke and to react properly. In addition, further studies are needed to identify the transfer of the knowledge of stroke from children to parents (13–15).

It is necessary to implement the general public education not only in general practitioners' offices but also in mass media in order to improve the awareness of stroke, which can be confirmed by some studies (16–18), where the data analyses show that an increased impact of the campaign could improve the public awareness of stroke, and, as a result, adequate reactions to the symptoms of acute stroke.

CONCLUSIONS

The study shows that the Czech citizens' interest in information on stroke is significantly influenced by respondents' sex, age, place of residence, marital status, and education. It is supposed that the above-mentioned findings are of importance to the focus on preventive activities in this area. The above-mentioned socio-

demographic features need to be focused on, and education needs to be provided not only by GPs but also by mass media in order to increase the awareness of stroke.

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Conflicts of Interests

None declared

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