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The Medical Education and Rehabilitation of Patients with Ischaemic Stroke

Paul LUCACI[1], Marius NECULAES[2], Aurora CONSTANTINESCU[3], Danisia HABA[4]

Abstract

According to statistics, the incidence of ischaemic stroke is rising worldwide and it represents one of the main causes of infirmity and disability. Studies conducted in recent years argue that due to the evolution of the health system, the reorientation of medical education towards community health represents an alignment of the medical training centres with the needs of the general population. This type of education for health should be part of the cultural life in each country. Besides the functional deficit, patients with a stroke face depression and cognitive deficit, and this leads to the increase in the burden associated with this disorder. The questionnaire was applied on a sample of 153 subjects (73 female and 80 male) with ischaemic stroke, who were on their second admission at the Clinical Recovery Hospital Iași. From among them, 73 had an urban background and 80 had a rural background, each of them in the first 6 months from the stroke and all of them patients also diagnosed with primary arterial hypertension. The study highlights the informational shortcomings of patients with ischaemic stroke regarding the rehabilitation possibilities, the specific symptomatology and need to conduct personalized physical therapy programs. Lifestyle change, regular medical check-ups and blood pressure monitoring represent other aspects of which patients with a stroke are not very aware.

Keywords: medical rehabilitation, community health, medical culture, social factors, community-based education.

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Introduction

Stroke represents one of the main causes of death and invalidity worldwide, and the incidence and economic burden of this disease are rising (Eunice Ho., *et al.*, 2018). The therapies specific to stroke are the most effective when they are initiated immediately after the onset of symptoms, which involves the rapid clinical evaluation and the imagistic examination (Kobayashi *et al.*, 2018). Imaging for diagnosing is the most important test conducted; computer imagining, computerized tomography makes the difference between a haemorrhage and an ischaemia of a brain region. Magnetic resonance imaging exam may also be used, in order to determine the size of the brain lesion (Smith & Rowland Hill, 2018).

A significant number of patients die during hospitalization, and the risk of death varies by the type of stroke; the rate of mortality is much higher in case of haemorrhagic strokes and of subarachnoid haemorrhages, compared to the ischaemic stroke (Sun *et al.*, 2018; Mozaffarian *et al.*, 2015). After the hospital stay, up to 80% of the patients who suffered an ischaemic stroke are transferred home, where they receive critical care and support from the family (McCarthy *et al.,* 2018; Quinn, Murray, & Malone, 2014). The risk of dementia onset is 50 higher in the first year following the stroke, compared to the general population, according to a study conducted on a sample of 92,728 subjects of Oxfordshire, UK, the risk of dementia decreasing substantially in case of transient ischaemic attacks or minor cerebral ischemia (Pendlebury & Rothwell, 2019). Depression and cognitive deficit represent another perturbing factor for patients with a stroke, and it leads to an increase in the burden associated with the handicap generated by this disease (Baccaro A., *et al.*, 2019; Feigin *et al.*, 2017; Mirza *et al.*, 2016; Almeida *et al.*, 2007).

The medical education of patients with ischaemic stroke is not a well-defined and represented concept in Romania. There are no studies to attest the information level of these patients. The need to accomplish this desideratum may be reflected in the increase of neuromotor rehabilitation performance. Furthermore, medical education may lead to increased autonomy, treatment compliance and early action in case of a stroke. This process leads an understanding of the disease and its management by making the right choices and by taking concrete and responsible actions.

According to the Emergency Ordinance no. 162/2008, on the transfer of all attributions and competences exercised by the Ministry of Health towards the authorities of the public administration, Article 2 comprises a series of activities, among which education for health and disease prophylaxis, by promoting a healthy lifestyle and environment. In addition, according to point “f” under Article 5, the county public health directorates are also in charge with identifying, developing and proposing specific programs of education for health and with adopting a healthy lifestyle at the level of the different communities.

Community-based education was described as "medical education that is based outside a tertiary or large secondary level hospital (and which) is focused on the care provided to patients both before the decision to refer to a tertiary hospital and after the decision to discharge the patient from such care" (Dent, 2016). The studies conducted argue that, as the health system evolves, the reorientation of medical education towards community health represents a strategy of aligning the priorities of academic medical centres with those of the general population (Hunt, Bonham, & Jones, 2011; Prislin, Saultz & Geyman, 2010).

Education for health should be an integral part of the cultural life of each country, and public establishments, health and educational units should set an example within this process, (Graziano, Hanson, & Ridker, 2001). Physical therapy represents a standard part of medical recovery after a stroke, but scientific literature comprises few studies that describe precise activities that physical therapists must perform with the patients (Latham *et al.*, 2005). It has been proven that exercise can stimulate neurogenesis, synaptogenesis and angiogenesis (Xie *et al.*, 2019).

Methodology

In order to conduct this research, we have used in this study a questionnaire that we have developed, which comprised a series of questions regarding the information regarding ischaemic stroke and the possibilities of conducting medical rehabilitation programs.

The sample included 153 subjects (73 female and 80 male) with ischaemic stroke, who were on their second admission at the Clinical Recovery Hospital Iași. From among them, 73 had an urban background and 80 had a rural background, each of them in the first 6 months from the stroke, being patients also diagnosed with primary arterial hypertension. The instruction level of the subjects was different: 68 of them graduated from middle school, 20 persons graduated from high school, 11 graduated from post-secondary school, 28 graduated from secondary school, while 26 graduated from college. All the subjects benefited from medical rehabilitation programs during hospital admission and each of them were recommended long-tern physical therapy post-discharge.

The questionnaire comprised a series of items with the purpose of collecting information related to the continuity of physical therapy after discharge, the knowledge about the places where rehabilitation programs may be conducted, the impediments in conducting the medical recovery, the information channels regarding the occurrence of a stroke, specific symptoms, the physical activity recommended after the stroke, information related to diet and the prevention of this disease.

Upon reviewing the scientific literature, we have concluded that few studies have been conducted by applying a questionnaire regarding the information held

by a patient with ischaemic stroke. Hence, our aim was to conduct a descriptive study of this phenomenon, concerning our sample of subjects. The analysis and graphic interpretation were carried out using Microsoft Office Excel, through which images and data were generated, by analyzing the information provided by the 153 subjects and by including them within certain categories of answers. Based on the relative frequencies of the answers obtained from or sample of subjects, we have developed the descriptive statistics of the medical education of patients with ischaemic stroke.

Results

In *Figure 1*, we represented graphically the relative frequencies of the answers regarding the knowledge of the subjects related to the places where they may conduct medical rehabilitation after an ischaemic stroke.

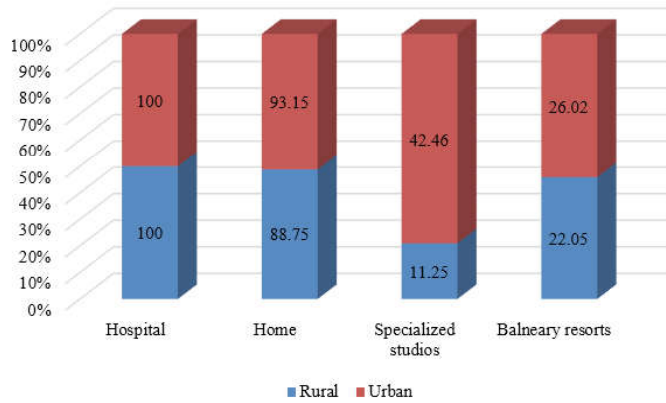

Figure 1. Places for physical therapy

According to *Figure 1*, all the subjects questioned reported that physical therapy could be done in the hospital, because they were already admitted to the hospital when the questionnaire was applied. Moreover, a great number of answers referred to the possibility of conducting the rehabilitation post stroke at home, too (88.75% had a rural background, 93.15% had an urban background) under the supervision of a physical therapist. A significant difference regarding the possible places to conduct rehabilitation emerged in case of the answers about specialized medical practices. It has been concluded that a small number in the category of the subjects had a rural background (11.25%) regarding the possibility of conducting medical gymnastics in the specialized practices. A significant difference was observed in case of the urban subjects, where 42.46% of the answers referred to the specialized practices. In case of balneary resorts, the percentage of the answers was relatively

small, 22.05% of the subjects with a rural background mentioned this possibility, while 26.02% of the urban respondents.

In *Figure 2,* we represented graphically the relative frequencies of the answers regarding the performing of physical therapy constantly, under supervision.

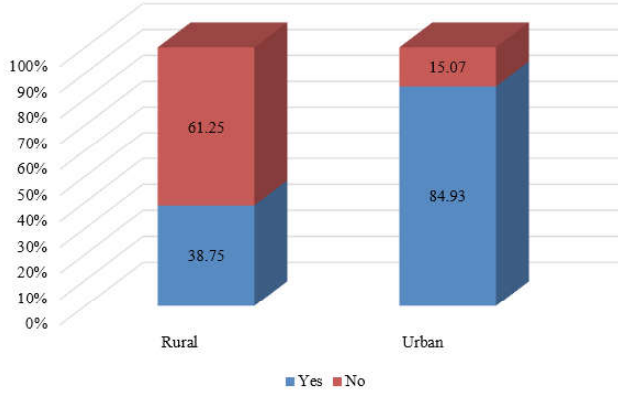

Figure 2. The patients who underwent physical therapy

As shown in *Figure 2*, a significant percentage of answers provided by the subjects with a rural background (61.25%) were negative concerning the performing of long-term physical therapy post-discharge. A low percentage of 38.75% of the answers was affirmative in case of respondents with a rural background. Concerning the rural environment, major differences were recorded, a percentage of 84.93% of the answers being positive, the negative ones accounting for 15.07%.

In *Figure 3*, we represented graphically the relative frequencies of the answers regarding the obstacles that the subjects had to overcome in order to conduct physical therapy post-discharge.

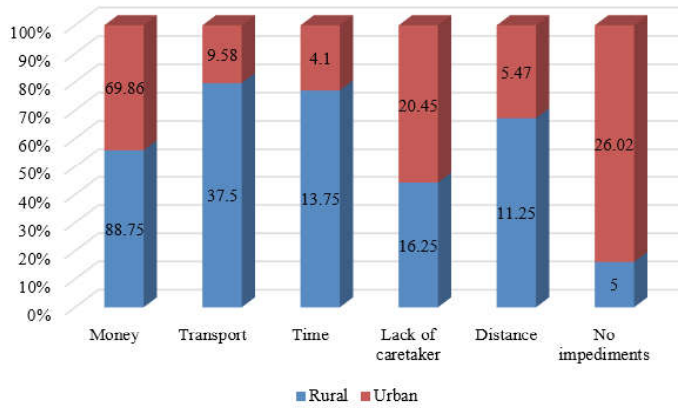

Figure 3. Obstacles in the performing of physical therapy

According to *Figure 3*, the main impediment in the performing of long-term physical therapy was represented by the lack of money according to the answers provided by the subjects. 88.75% of the answers by respondents with a rural background referred to this impediment, while a significant percentage from the rural environment pointed out the same impediment (69.86%). A significant impediment for the subjects with a rural background is also represented by the transportation possibilities (37.5%), the same impediment being much less representative for subjects from the rural environment (9.58%). Other impediments identified by the subjects were the lack of time (13.75% of the answers by the subjects with a rural background and 4.1% by those from the rural environment). The lack of caretakers (16.25% rural, 20.45% urban) and distance (11.25% rural, 5.57% urban), represented other impediments that the subjects had to face. A small number of answers pointed out to the category "there are no impediments", (5% rural and 26.02% urban).

In *Figure 4*, we represented graphically the relative frequencies of the answers regarding the information means that the subjects prefer them regarding the information of the signs specific to a stroke.

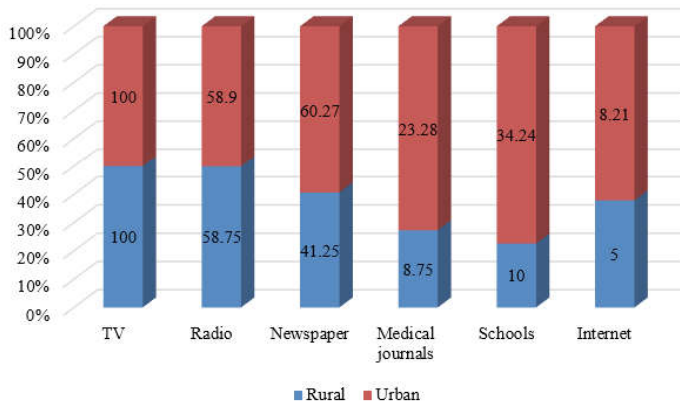

Figure 4. The information means – signs specific to a stroke

As shown in *Figure 4*, the most important information source regarding the signs of a stroke is the TV (100% rural, 100% urban). In addition, a significant percentage of the answers pointed to the radio (58.75% rural, 58.9% urban) and newspaper (41.25% rural, 60.27% urban) as sources of information. A smaller number of answers were provided for medical journals (8.75% rural, 23.28% urban), schools (10% rural, 34.24% urban) and the Internet (5% rural, 8.21% urban).

In *Figure 5*, we represented graphically the relative frequencies of the answers regarding the knowledge of the subjects related to the symptomatology of a stroke.

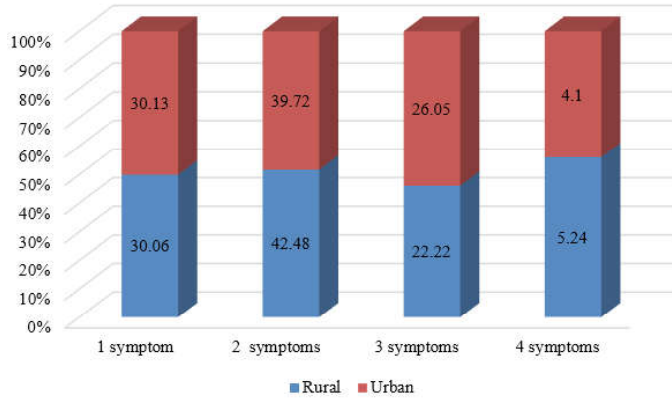

Figure 5. Symptoms of a stroke

According to *Figure 5*, the highest percentage of answers pertained to the acknowledgment of two symptoms of a stroke (42.48% rural, 39.72% urban) and of a single symptom (30.06% rural, 30.13% urban). The percentages of the answers dropped significantly concerning the acknowledgement of three and four symptoms of a stroke (22.22% rural, 26.05% urban), respectively (5.24% rural, 4.1% urban).

In *Figure 6*, we represented graphically the relative frequencies of the answers regarding the information of the subjects related to physical activity post-stroke.

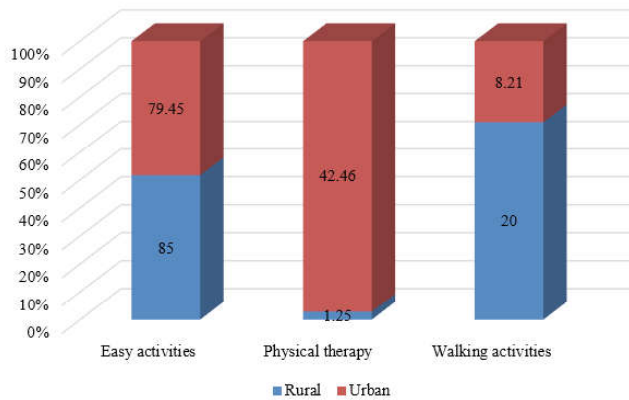

Figure 6. Physical activities post-stroke

Figure 6 highlights that 85% of the answers by the subjects with a rural background and 79.45% from the rural environment, concerned easy activities. A very small number of answers concerned physical therapy among respondents with a rural background (1.25%). A relatively high percentage of answers was oriented

towards physical therapy in case of respondents from the rural environment (42.46%) compared to those from the rural environment. Concerning walking activities, they were mentioned by 20% of the answers by subjects with a rural background and by 8.21% in case of respondents from the rural environment.

In *Figure 7*, we represented graphically the relative frequencies of the answers regarding the information of the subjects related to the diet post-stroke.

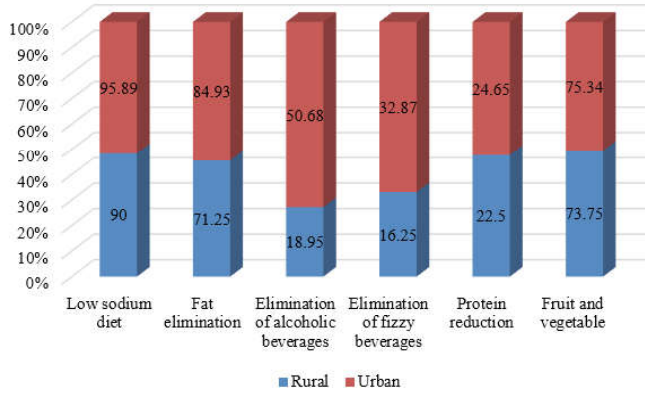

Figure 7. The diet post stroke

As shown in *Figure 7*, 90% of the answers by the subjects with a rural background and 95.89% of the rural environment focused on low sodium diet. A high percentage of answers focused on eliminating fat from their diet (71.25% rural, 84.93% urban). Regarding the elimination of alcoholic and fizzy beverages, we have recorded 18.95% of the answers for the rural environment, 50.68% for the rural environment and 16.25% for the rural environment, respectively, as well as 32.87% for the rural environment. Actually, 22.5% of the answers provided by those with a rural background concerned the reduction of protein intake, a similar percentage also being recorded by the answers of the urban subjects (24.65%). A very high percentage of answers focused on the fruit and vegetable intake (73.75% rural, 75.34% urban).

In *Figure 8*, we represented graphically the relative frequencies of the answers regarding the information of the subjects related to stroke prevention.

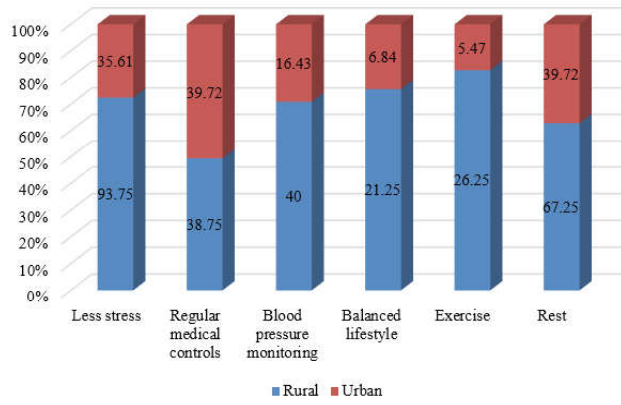

Figure 8. Stroke prevention

According to *Figure 8*, a great number of answers focused on the level of stress (93.75% for the respondents with a rural background). A percentage of 35.61 answers were given for the same category by the respondents from the rural environment, too. Concerning regular medical controls, a relatively small number of subjects believed it was important to prevent a stroke (38.75% rural, 39.72% urban). A small number of answers were also given for blood pressure monitoring (40% rural, 16.43% urban). Moreover, 21.25% of the answers of the subjects with a rural background and 6.48% of those from the rural environment referred to a balanced lifestyle as important for stroke prevention. Concerning exercise, 26.25% of the answers of rural subjects and 5.47% of the answers of the urban subjects focused around this necessity. A high percentage of answers of the respondents with a rural background concerned rest (67.25%), while only a percentage of 39.72% of the answers provided by the subjects from the rural environment regarded this aspect.

Discussion

The questionnaire applied had the purpose of identifying the informational level of patients with ischaemic stroke, referring to their rehabilitation possibilities, and to the level of knowledge related to physical activity, diet, symptomatology and prevention of this disease. As shown by Figure 1, patients are aware that medical rehabilitation can mainly be conducted in the hospital (100% rural, 100% urban) and at home (88.76% rural, 93.15% urban). It is worth mentioning that very few of the patients with a rural background (11.25%) and 42.46% from the rural environment know that medical rehabilitation can be conducted in specialized practices. Patients with a rural background are less likely to benefit from medical rehabilitation programs compared to their counterparts from the rural environment

(Jia *et al,* 2011). *Figure 2* illustrates that only 38.75% of the patients with a rural background underwent physical therapy after their hospital stay. A considerably higher percentage of patients from the rural environment underwent physical therapy programs post-discharge (84.93%), compared to a study in India reporting that only 45.5% of the patients with a stroke from the rural background undergo physical therapy programs versus 81.2% of the patients from the rural environment (Mahak *et al.*, 2018).

Some patients face financial problems when it comes to accessing healthcare services after stroke (Ganesh *et al.,* 2017). *Figure 3* shows very clearly that the main impediment in the performing of physical therapy post-discharge of patients is represented by the lack of money. A high percentage (88.75%) of answers came from the subjects with a rural background. Furthermore, 69.86% of the answers by the urban subjects concerned the same impediment. Some studies refer to two very important social aspects: the instruction level and the monthly or annual income. Generally, persons with low income and little education are more likely to develop high blood pressure and diabetes (Min, Chang & Balkrishnan, 2010; Vrijkotte, Van Doornen & Geus, 2000).

According to *Figure 4*, the main sources of information preferred by patients are represented by TV (100% for the respondents with a rural and an urban background) and radio (58.75% rural, 58.9% urban), followed by newspapers (41.25% rural, 60.27% urban). In a study conducted on 532 respondents in Bavaria found that the sources of information on the stroke were represented by the personal experiences of other patients (30.1%), TV/radio (22.1%), newspapers (18.4%), relatives and friends (17.2%). The subjects who had heard the information from the personal experiences of other patients and from newspapers were able to mention more symptoms than those who got their information from the TV or the radio (Handschu *et al.*, 2005). *Figure 5* highlights that most patients within our study acknowledged only two symptoms specific to stroke (42.48% rural, 39.72% urban) and only 5.24% from the rural environment and 4.10% from the rural environment were able to mention four symptoms specific to stroke. The latest studies have pointed out the lack of information regarding the impaired organ and the signs of a stroke. The same findings were highlighted in case of the respondents within a study conducted on a sample of 350 patients in Saudi Arabia (Alrefaei *et al.,* 2019). Consistent with the information we obtained, according to a questionnaire that 1,531 patients with ischaemic stroke filled out upon discharge from a hospital in the province of Hubei, China, the information related to the illness they are battling is scarce (Wang *et al.*, 2018).

Concerning the physical activity of patients with a stroke (Figure 6), most respondents mentioned easy physical activities, (85% rural and 79.45% urban). According to research, easy to moderate physical activity may represent a prevention factor for other strokes and a means to improve the motor functions (Ushio *et al.*, 2018; Vanroy *et al.*, 2019; Xie *et al.*, 2018). A very small number of answers concerned physical therapy (1.25% rural, 42.46% urban), even though it

represents the most important activity that a patient with a stroke should conduct, because it is standard procedure for rehabilitation (Latham *et al.*, 2005; Magdon-Ismail *et al.*, 2018; Ho *et al.*, 2018).

Concerning the diet of patients with ischaemic stroke, the answers of patients mentioned mainly a low sodium diet, a low fat diet, and more fruit and vegetable intake. I9t is well-known that diet may impact the evolution of a vascular pathology (Ayusto, Gonzalo-Gobernado, & Montaner, 2017). It has been proven that patients with a stroke do not have a healthy diet and they are not very likely to change their diet habits (Rodriguez-Campello *et al.*, 2014).

Concerning the prevention of ischaemic stroke (fig. 8), the subjects questioned focused mainly on mitigating stress levels, as they considered it the main cause of the stroke (93.75% rural, 35.61% urban), followed by lack of rest (67.25% rural, 39.72 urban). A relatively small number of answers focused on regular medical check-ups (38.75% rural, 39.72% urban) and on blood pressure monitoring (40% rural, 16.43% urban), which may account for the main means to prevent an ischaemic stroke. The historical approach based on prescribing drugs for the prevention of stroke is not sufficient. To mitigate the phenomenon, health literacy and improved lifestyle are necessary (Towfighi, 2017). The prevalence of high blood pressure is significant among the population, but alcohol consumption, smoking, stress-driven hormonal changes and unhealthy diet were not found to represented significant factors of this pathology (Dima-Cozma *et al.,* 2014).

Conclusion

The present study underlines the informational shortcomings of patients with ischaemic stroke regarding the rehabilitation possibilities, the symptomatology of stroke, the need to undergo a carefully developed and monitored physical therapy program. This paper also stands to show that the respondents lack information concerning lifestyle changes, regular medical check-ups and blood pressure monitoring. This study may represent a starting point for future research, aiming to point out the means to use for an efficient medical education of patients, thus preventing potential complications or even the onset of cardiovascular diseases.

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