Evaluating nurses' knowledge in assisting stroke patients in emergency situations: a survey

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ABSTRACT

Introduction: in Italy, stroke is the second leading cause of death after ischemic heart disease, accounting for 9-10% of all deaths and being the primary cause of disability. Globally, the World Health Organization recognizes ischemic stroke as one of the leading causes of death. European statistics indicate that stroke is the second leading cause of death, with significant mortality rates among both men and women. Ensuring high-quality care in the acute phase following a stroke is crucial for patient clinical outcomes. This study aims to assess the knowledge of nurses in Emergency/Intensive Care Units regarding the management of stroke patients, identifying potential educational gaps and the need for updates among these healthcare professionals.

Materials and Methods: a survey was conducted targeting nurses in the Emergency/Intensive Care departments in the regions of Puglia, Marche, and Piemonte. A specifically designed questionnaire based on the latest SPREAD guidelines was utilized. The survey included three sections: socio-demographic data, multiple-choice questions on the theory regarding stroke management, and qualitative questions regarding professional experience and training needs. Data were collected anonymously from February to March 2022 and analyzed using Microsoft Excel® and Google Sheets.

Results: the survey was completed by 172 nurses. No participant answered all theoretical questions correctly. Only half scored 60% or higher on the theoretical questions, and only 36 achieved more than 85%. The average number of correct answers was 5 out of 10. The highest percentages of correct answers were related to questions on anticoagulant therapy, stroke treatment, and stroke assessment scales. However, significant gaps were identified in the understanding of stroke symptoms and appropriate diagnostic tools. The qualitative section revealed that, although 68% had experience with stroke patients, only 23% had attended specific training courses on stroke management. Notably, the majority expressed interest in additional training courses.

Discussion: the study highlights a significant gap in knowledge among nurses in Emergency/Intensive Care Units regarding stroke management, emphasizing the need for dedicated training programs. Although some elements of stroke management education are included in Italian university curricula, there is a clear demand for post-graduate training. Continuing education is essential for healthcare professionals to stay updated on best practices and emerging technologies, ensuring high-quality patient care.

Conclusions: there is a significant gap in the knowledge of nurses regarding the management of stroke patients in Emergency/Urgency departments across Italy. This highlights the urgent need for investment in targeted training programs and the promotion of uniform standards nationwide. Enhancing nurses' knowledge in intensive care and addressing regional disparities is crucial for improving the quality of care and clinical outcomes for stroke patients.

Key words: emergency nurse, emergency department, specific training, stroke, stroke knowledge.

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Introduction

In Italy, stroke is the second leading cause of death after ischemic heart disease, responsible for 9-10% of all deaths and is the primary cause of disability. The WHO recognizes that ischemic stroke is one of the leading causes of death worldwide. The fifth edition of the European Statistics on Cardiovascular Diseases highlights that in Europe, stroke is the second leading cause of death, with 405,000 deaths (9%) among men and 583,000 (13%) among women. In 2019, it is estimated that stroke caused 6.55 million deaths globally (with an incidence of 84.2 per 100,000 people), ranking as the second leading cause of death after ischemic heart disease. According to the Ministry of Health (2022), stroke recorded an incidence of 12.2 million cases (with an incidence of 150.8 per 100,000 people) and a prevalence of 101 million cases (with a prevalence of 1240.3 per 100,000 people). The ischemic form of stroke is the most common, causing 3.29 million deaths (with an incidence of 43.5 per 100,000 people), with an incidence of 7.63 million cases (94.5 per 100,000 people) and a prevalence of 77.2 million cases (951 per 100,000 people). This is followed by intracerebral hemorrhage, which caused 2.89 million deaths (with an incidence of 36 per 100,000 people), with an incidence of 3.41 million cases (41.8 per 100,000 people) and a prevalence of 20.7 million cases (248.8 per 100,000 people), and subarachnoid hemorrhage, responsible for approximately 373,000 deaths (with an incidence of 4.7 per 100,000 people), with an incidence of 1.98 million cases (14.5 per 100,000 people) and a prevalence of 8.4 million cases (101.6 per 100,000 people). Ensuring high-quality care in the early stages following the event is a fundamental aspect that significantly affects the final outcomes. Recognizing conditions that may endanger the patient's life and promptly identifying possible complications, both immediate and delayed, are crucial for ensuring effective treatment. The care needs in these particular situations require adequate training from the early stages of the educational pathway. However, these topics are only briefly mentioned in specific study programs, implying a probable need for additional postgraduate training to fill knowledge gaps and acquire the necessary skills to address complex and critical situations in clinical settings. Continuous education is essential to ensure that healthcare professionals can provide high-quality care and respond appropriately to patient needs. The aim of this study is to evaluate the knowledge of nurses working in Emergency/Trauma departments regarding the management of stroke patients, in order to identify possible educational gaps and update needs among nurses in this sector.

Materials and Methods

A cross-sectional survey was conducted among nurses in Emergency/Trauma departments operating throughout the national territory, specifically in the regions of Puglia (identified in the text as South), Marche (identified as Central), and Piemonte (identified as North). To thoroughly address the research question, a specifically designed questionnaire was developed, based on the recent publication of the SPREAD – Stroke Prevention and Educational Awareness Diffusion guidelines, "Cerebral Stroke: Italian Guidelines for Prevention and Treatment." Before reaching the final version, the survey instrument was reviewed by a group of critical care nurses working within the same contexts examined in the study. This targeted approach ensured the validity and relevance of the questionnaire, adapting it to the specific needs of the ongoing investigation. The questionnaire is divided into three distinct parts:

the first section gathers socio-demographic data (such as gender, age, workplace, service province, years of experience, and both basic and advanced training); the second section includes a total of 10 multiple-choice questions aimed at thoroughly exploring nurses' knowledge and understanding of various aspects related to the management and care of stroke patients; while the third section, consisting of 5 questions, is dedicated to a qualitative inquiry regarding professional experience and specific training needs. The theoretical questions start from broader topics and then focus on specific details, ensuring coherence between the subjects covered and the work contexts considered in the investigation. Data collection in an anonymous format took place between February and March 2022, involving a representative sample of nurses working in Emergency/Trauma departments across various regions of the country. Subsequently, the collected data were analyzed using Microsoft Excel® software and the "Sheets" application on Google Drive to ensure a comprehensive analysis and an accurate representation of the results obtained.

Results

The survey was completed by 172 nurses, whose sociodemographic details are shown in Table 1. The responses provided reflect the significant and representative involvement of the nursing sample in the study context. No participant answered all theoretical questions correctly. Among the respondents, only half achieved a correct response rate of 60% or higher, while only 36

Table 1. Sociodemographic characteristics of study participants.

	%	Number
Gender		
Male	82.00	141
Female	18.00	31
Unit of employment		
Emergency Room	34.40	59
Intensive Care	4.70	8
Territorial Emergency	40.10	69
Emergency Neurology	14.50	25
Stroke Unit	6.40	11
Age of respondent		
<25	6.40	11
26-30	34.30	59
31-35	40.10	69
36-40	11.00	19
>40	8.10	14
Years of service		
<5	7.60	13
5-10	34.90	60
11-20	37.80	65
21-30	8.70	15
> 31	11.00	19
Region of service		
Northern Italy	27.30	47
Central Italy	55.80	96
Southern Italy	16.90	29
Qualification		
Nursing Diploma	1.70	3
Bachelor's Degree	61.00	105
First-Level Master	26.20	45
Master's Degree	9.90	17
Second-Level Master	1.20	2

individuals exceeded 85%. The average number of correct answers was 5. No participant provided correct answers to all theoretical questions. Among the multiple-choice questions, only three recorded a correct response rate higher than 80%. Specifically, one of these questions concerned the goal of administering anticoagulant drugs to stroke patients, with 82% of correct responses. Another question related to the appropriate treatment for stroke, achieving a correct response rate of 87%, while the third focused on the choice of stroke assessment scale, with 84% accuracy. Sixty-six percent of participants correctly identified "sudden difficulty in speaking or understanding language" as a symptom of stroke (Figure 1). Meanwhile, 59% answered correctly that "hypoglycemia can mimic stroke symptoms" to the question about why it is important to evaluate blood glucose (Figure 2). Only 45% correctly answered the question regarding the classic symptom of ischemic stroke involving the left hemisphere of the brain (Figure 3), which may manifest as an inability to speak properly or difficulty understanding spoken language. The correct response rate regarding the part of the body that may be affected by weakness or paralysis in the case of a stroke in the right hemisphere of the brain was 59% (Figure 4). Regarding the distinction between ischemic and hemorrhagic stroke in the assessment, the instrumental examinations used were cited correctly in only 34% of cases (Figure 5), while only 54% of responses regarding the instruments for assessing the extent of a stroke, in reference to the tools used (Figure 6), were correct. The third section of the questionnaire addresses qualitative aspects. Sixty-eight percent of respondents reported having assisted at least once during their working life with a person affected by a stroke. Of these, 48% assisted between 1 and 10 patients, 39% assisted more than 10 patients, and 13% assisted fewer than 5 patients. Additionally, 48% of the sample reported having dedicated protocols available in their operational unit (Figure 7). Subsequently, responses to the question regarding the presence of dedicated protocols were analyzed, considering the provinces in which professionals operate, in order to assess possible significant differences between the geographical areas of Northern, Central, and Southern Italy. After dividing the Italian territory into these three areas and analyzing the data, it emerges that the "NO" response prevails in Central-Southern Italy (Figure 8). Seventy-four percent of the respondents reported that they have never attended training courses on the subject. However, among the 85% of those who have not had training experience, they expressed interest in participating in such courses in the future. In contrast, only 23% of professionals had the opportunity to attend training courses on the subject.
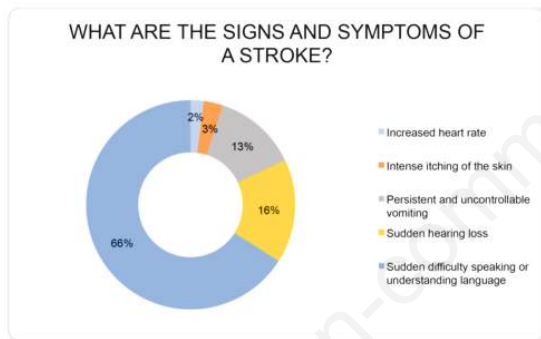

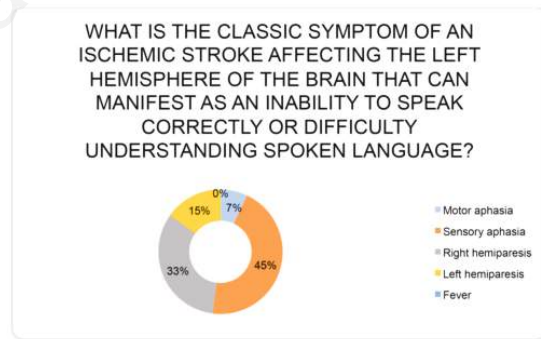**Figure 1.** Percentages of recognition of stroke signs and symptoms among participants.

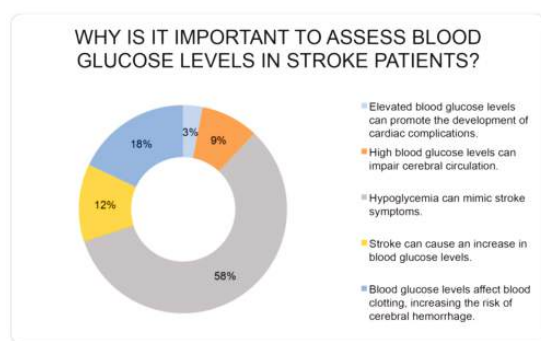**Figure 3.** Percentages of recognition of the classic symptom of left-hemisphere ischemic stroke.

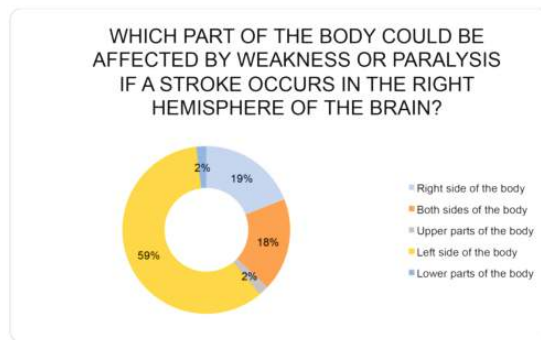**Figure 2.** Assessment of the importance of blood glucose in stroke.

Figure 4. Percentages of recognition of the affected body part in right-hemisphere stroke.

Discussion

To ensure adequate diagnostic, therapeutic, and care treatment, a high level of preparation is necessary, combining knowledge, discernment, skills, and experience to guarantee high-quality standards. Regardless of the disparities present in high-income countries, this study aims to assess the knowledge level of nursing staff employed in Emergency/Urgent care departments in the management of stroke patients, with the purpose of identifying the potential need to develop dedicated training programs and specific operational tools. Timely and adequate initial treatment of stroke patients is crucial, as it irreversibly influences the progression of the disease. The management of the acute phase begins with an integrated pathway that starts with recognizing the acute event and activating the Territorial Emergency-Urgency Service, followed by hospitalization in a competent and qualified dedicated area (Stroke Unit).

Only 68% of the population involved had experience with stroke patients, of which 23% had attended specific training courses, yet no participant answered all theoretical-practical knowledge questions correctly. Despite a brief discussion of stroke patient management in Italian university programs, established at the ministerial level, and the heterogeneity of northern, central, and southern Italian regions determined by the presence/absence of specific protocols, our study almost unanimously highlights a request for post-basic training on the subject. The analysis of data

obtained from our research compared with international literature revealed a significant diversity in both methods used and results obtained regarding nurses' knowledge of intervention procedures in case of stroke.

A 2016 pilot study conducted on 20 nurses from some emergency departments in the Mid-Atlantic regions shows a correlation between years of experience in emergency nursing and test scores, observing that only professionals with more experience in the field scored higher on tests with statistically significant values ($p=0.02$); moreover, most nurses did not participate in specific continuous training. According to the authors, variations in the working conditions of healthcare operators, particularly professional seniority, can be identified as the main cause of such disparities.

Our survey only analyzes knowledge, preventing us from extrapolating a relationship between years of service and practical skills. However, it emerges that despite a willingness to participate, the majority of nurses in our study have never attended specific training courses on the subject. A recent literature review described by the American Heart Association, which summarized and updated best practices regarding the management and nursing care of adult patients with acute and hyperacute stroke, highlights significant gaps in knowledge, emphasizing the urgent need to deepen nurse-led research in this area.

Considering the results of this survey, it appears that only in a few contexts are specific protocols active, despite the presence of regulations regarding them. Although databases contain studies analyzing the heterogeneous behaviors and knowledge of nurses in
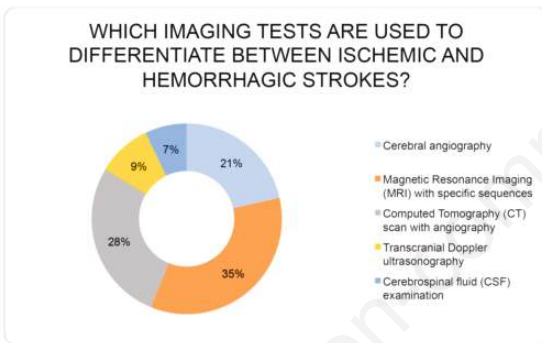

Figure 5. Percentages of knowledge of diagnostic tools for differentiating ischemic from hemorrhagic stroke.
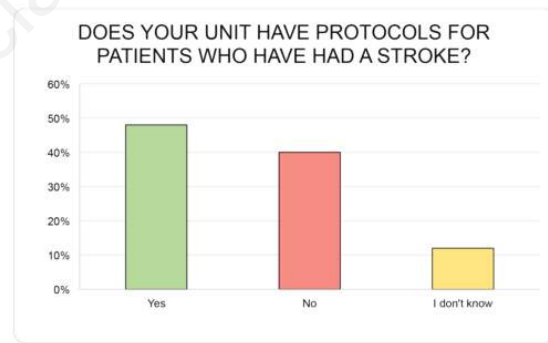

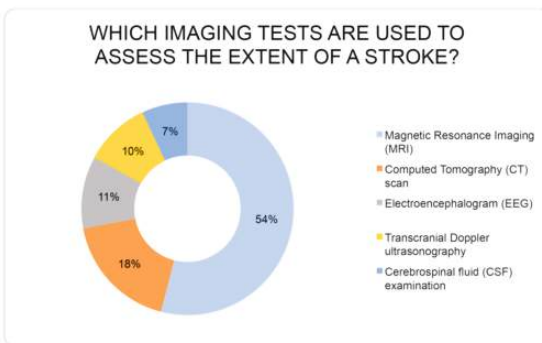**Figure 7.** Availability of protocols in respective departments.

Figure 6. Percentages of knowledge of diagnostic tools for assessing stroke extent.
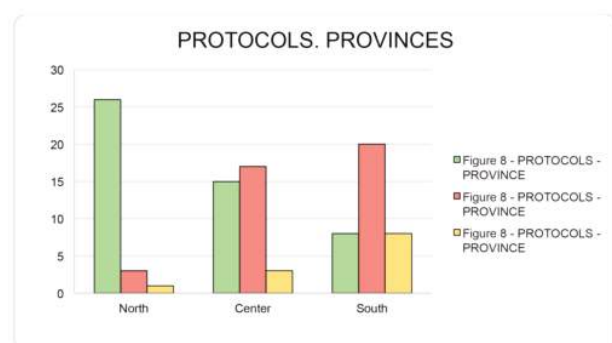

Figure 8. Distribution of protocol awareness by province: comparison between North, Center, and South.

terms of content and analysis methods, there is a unanimous need for training and updating. The literature also emphasizes the importance of defined protocols and accessible guidelines to support professionals in assisting stroke patients.

The crucial role of nurses within the multidisciplinary team emerges at every stage of stroke care. It is essential that nurses, in addition to physical aspects, also pay attention to psychological and educational aspects during care, considering physiological and psychological changes, alterations in body image, reduced autonomy, and potential emotional difficulties that the person may experience in relation to the severity and possible irreversible deficits caused by stroke.

Limitations

The predominant degree "Bachelor's Degree" may influence the performance reflected in the results, but it provides a clear view of the need to enhance their educational background.

Conclusions

Continuous education offers healthcare professionals the opportunity to refine their skills and expand their knowledge in the field. This study highlights the immediate need for intervention to improve nurses' knowledge in managing stroke patients in Emergency/Urgent departments. Planning for training pathways and continuous improvement in care quality would ensure the management of stroke patients based on the best scientific evidence and enable addressing complex situations with greater efficiency through informed decisions.

Investing in specific and continuous training programs accessible to all nurses, regardless of their geographical location, is fundamental. Through practical courses and workshops, professionals acquire new skills, strengthen their communication abilities, and provide high-quality care to patients.

Investing in the training of healthcare personnel is crucial to ensure safe and efficient care, meeting the evolving needs of patients and the community. Moreover, it is essential to promote standardized stroke management protocols to reduce regional disparities and ensure that all patients receive high-quality care. Improving nurses' preparedness not only contributes to better clinical outcomes for patients but also strengthens the entire healthcare system, enhancing the capacity to respond effectively to neurological emergencies. These combined efforts can lead to significant improvements in stroke management, yielding tangible benefits for public health.

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