RISK FACTOR ASSOCIATED WITH CEREBROVASCULAR ACCIDENTS (BRAIN STROKE): DESCRIPTIVE STUDY

ANI, I. A.[1*] – ALKHAQANI, A. L.[2]

[1] *Adult Nursing Department, University of Al Qadisiyan, Qadisiyyah Province, Iraq.*

[2] *Al-Sadder Medical Hospital, Ministry of Health, Al-Najaf, Iraq.*

**Corresponding author*
e-mail: alkhaqani50[at]gmail.com

(Received 13th January 2025; revised 11th April 2025; accepted 21st April 2025)

Abstract. Cerebrovascular accidents (CVAs), commonly referred to as strokes, represent a significant global health challenge, accounting for a substantial burden of morbidity and mortality. In addition to these well-established risk factors, emerging research points to the importance of psychological factors in stroke risk. To analyze risk factors associated with cerebrovascular accidents in a cohort of patients admitted to a tertiary care hospital over two years. This study employed a descriptive, cross-sectional design to investigate the demographic characteristics, prevalence of hypertension, diabetes, cardiovascular conditions, and associated psychological factors. Data were collected from clinical records, which provided detailed information on each patient's medical history, including pre-existing conditions, medications, and previous hospitalizations. Data were analyzed using statistical software (SPSS) to identify associations between various risk factors and the incidence of stroke. A total of 150 patients were included in the study, comprising 85 males and 65 females. The prevalence of angina pectoris (16.5%) and myocardial infarction (7.1%) was higher than that of females, who reported 9.2% and 6.2%, respectively. The study's findings reveal notable gender disparities in health indicators, which align with existing literature and provide insights into the unique health challenges faced by males or females regarding cardiovascular health. Gender disparities are associated with a higher prevalence of cardiovascular diseases, which underscores the need for targeted interventions and further research that explores the underlying mechanisms driving gender disparity in chronic diseases. Moreover, the study highlights the importance of psychological factors and the predominant types of strokes diagnosed in the sample population.
Keywords: *patients, risk factors, cerebrovascular accidents, brain stroke*

Introduction

Cerebrovascular accidents (CVAs), commonly referred to as strokes, represent a significant global health challenge, accounting for a substantial burden of morbidity and mortality. The World Health Organization (WHO) estimates that stroke is the second leading cause of death worldwide, with approximately 11 million fatalities annually (Jackova et al., 2020). Furthermore, strokes are a leading cause of long-term disability, impacting patients' quality of life and placing considerable strain on healthcare systems. Understanding the risk factors associated with CVAs is critical for developing effective prevention strategies and interventions to reduce the incidence and impact of this debilitating condition (Song et al., 2005). The etiology of stroke is multifactorial, encompassing a range of demographic, physiological, and psychological factors. Among these, hypertension, diabetes mellitus, and cardiovascular diseases are frequently cited as primary contributors to stroke risk. Hypertension, in particular, is recognized as the most significant modifiable risk factor, with studies indicating that individuals with high blood pressure are up to six times more likely to experience a stroke compared to those with normal levels (Madubuko, 2018). Similarly, diabetes

mellitus is associated with a two to fourfold increase in stroke risk, as it promotes atherosclerosis and other vascular complications. Cardiovascular conditions, including coronary artery disease and heart failure, further exacerbate the likelihood of stroke occurrence, highlighting the interconnectedness of these health issues.

In addition to these well-established risk factors, emerging research points to the importance of psychological factors in stroke risk. Psychological stress, anxiety, and depression have been implicated in the pathogenesis of cardiovascular diseases and may contribute to the onset of stroke through various mechanisms, including the dysregulation of the autonomic nervous system and the promotion of unhealthy lifestyle choices. As such, understanding the psychological dimensions of stroke risk is essential for a comprehensive approach to prevention and management (Kim and Choi-Kwon, 1999). Gender differences in stroke risk have garnered increasing attention in recent years, with evidence suggesting that men and women may experience distinct risk profiles and outcomes. Previous studies have shown that men are more likely to suffer from strokes at a younger age, while women tend to have higher rates of stroke-related mortality and disability (Liu et al., 2006). These disparities may be attributable to biological factors, such as hormonal influences and sociocultural factors that affect health behaviors and access to care. Investigating these gender-specific differences is crucial for tailoring interventions and improving health outcomes for both sexes. The present study aims to analyze the risk factors associated with cerebrovascular accidents among patients admitted to a tertiary care hospital over a two-year period (Shitandi, 2019).

Materials and Methods

This study employed a descriptive, cross-sectional design to analyze risk factors associated with cerebrovascular accidents (CVAs) in a cohort of patients admitted to a tertiary care hospital over two years. The primary objective was to identify and categorize various demographic, clinical, lifestyle, and biochemical factors that contribute to stroke incidence. The study cohort consisted of 150 patients who were diagnosed with CVAs and admitted to the hospital during the study period. Inclusion criteria encompassed adults aged 18 years and older who consented to participate in the study. Patients with transient ischaemic attacks (TIAs) or other stroke mimics were excluded from the analysis to ensure a focus on confirmed stroke cases. This study was carried out at the fourth ward at Al-Najaf Teaching Hospital in Al-Najaf city; between (November 2023- April 2024). The diagnosis was established by data collected from patients' records from patients' sheet radiological assessment using a computerized tomography scan (CT scan).

Data were collected from clinical records, which provided detailed information on each patient's medical history, including pre-existing conditions, medications, and previous hospitalizations. The clinical history was reviewed for common stroke risk factors such as hypertension, diabetes mellitus, hyperlipidemia, atrial fibrillation, and a history of TIAs. Demographic data were gathered through a structured questionnaire administered to participants upon admission. This included age, sex, geographic location (urban vs. rural), and socioeconomic status. Age was categorized into specific groups (18-44, 45-54, 55-64, 65-74, 75-84, and 85+ years) to facilitate a more detailed analysis of age-related stroke incidence. Lifestyle factors were assessed through a self-reported questionnaire, which included questions regarding smoking status (current,

former, or never), alcohol consumption (categorized as non-drinker, moderate drinker, or heavy drinker), dietary habits (intake of fruits, vegetables, and processed foods), and physical activity levels (sedentary, moderately active, or active). The questionnaire was designed to provide insights into participants' daily habits and lifestyle choices that may contribute to stroke risk.

Biochemical assessments were conducted on blood samples collected from participants during their hospital stay. Key biomarkers evaluated included serum cholesterol levels, C-reactive protein (CRP), homocysteine levels, and coagulation profiles (prothrombin time and activated partial thromboplastin time). These markers were analyzed using standard laboratory techniques, and the results were interpreted in the context of established reference ranges. Data were analyzed using statistical software (SPSS) to identify associations between various risk factors and the incidence of stroke. Descriptive statistics were calculated for demographic characteristics, clinical history, lifestyle factors, and biochemical markers. Continuous variables were summarized using means and standard deviations, while categorical variables were presented as frequencies and percentages. Univariate logistic regression analyses were conducted to assess the association between individual risk factors and stroke incidence. Odds ratios (OR) with 95% confidence intervals (CI) were calculated for each risk factor. A p-value of less than 0.05 was considered statistically significant. A multivariate logistic regression model was employed to evaluate the independent contributions of various risk factors to stroke incidence. The model included age, sex, hypertension, diabetes, hyperlipidemia, atrial fibrillation, smoking status, alcohol consumption, physical activity, and biochemical markers as independent variables. The results were reported as adjusted odds ratios (AOR) with 95% CI, providing insights into the relative importance of each risk factor while controlling for potential confounders.

The study was conducted in accordance with the Declaration of Helsinki and was approved by the institutional review board (IRB) of the participating hospital. Informed consent was obtained from all participants prior to their inclusion in the study, ensuring that they were aware of the study's purpose and their right to withdraw at any time without affecting their medical care. While the study provides valuable insights into stroke risk factors, several limitations should be acknowledged. The cross-sectional design limits the ability to establish causal relationships between risk factors and stroke incidence. Additionally, self-reported data may be subject to recall bias, particularly regarding lifestyle factors such as smoking and alcohol consumption. Future longitudinal studies are recommended to further explore the temporal relationships between these risk factors and stroke outcomes.

Results and Discussion

This section presents the study's results on a sample of 150 participants, comprising 85 males and 65 females, to investigate the demographic characteristics, prevalence of hypertension, diabetes, cardiovascular conditions, and associated psychological factors. The findings are organized into several subsections, each addressing specific aspects of the data collected. The demographic data of the study sample are summarized in *Table 1*. The mean age of male participants was 62.4 years (±14.3), while female participants had a higher mean age of 65.3 years (±9.7). The age range for males spanned from 40 to 80 years, whereas females ranged from 50 to 80 years, indicating a younger

demographic in the male sample. The educational status of participants revealed significant gender disparities. Among males, 23.5% were illiterate, and 35.3% had completed primary education. In contrast, a staggering 80.0% of female participants were illiterate, with only 4.6% having completed primary education. Notably, no females with intermediate, secondary, or higher education highlighted a considerable educational gap between genders. Marital status also exhibited stark differences between the genders. A significant majority of males (88.2%) were married, while only 46.2% of females reported being married. The prevalence of widowhood was markedly higher among females (47.7%) compared to males (8.2%). Additionally, 6.2% of females were single, whereas no males reported being single. Smoking behavior varied between males and females. Among males, 35.3% were current smokers, while 28.2% were ex-smokers. In contrast, only 12.3% of females were smokers, with 21.5% being ex-smokers. The majority of females (66.2%) identified as non-smokers, indicating a significant difference in smoking prevalence between genders. The mean BMI for males was 30.2 kg/m² (±4.6), while for females, it was slightly higher at 30.6 kg/m² (±4.9), suggesting a comparable level of obesity in both groups. Blood sugar levels were also assessed, revealing a mean of 120.3 mg/dL (±25.4) for males and 125.7 mg/dL (±22.6) for females, indicating a trend towards higher blood sugar levels in females.

Table 1. *Descriptive demographics data of study sample (N=150).*

Variable	Male (N=85)	Female (N=65)
Age (years)	62.4±14.3	65.3±9.7
Age Range	40-80	50-80
Status of Educational		
Illiterate	20 (23.5%)	52 (80.0%)
Primary	30 (35.3%)	3 (4.6%)
Intermediate	10 (11.8%)	2 (3.1%)
Secondary	5 (5.9%)	3 (4.6%)
Institution	10 (11.8%)	1 (1.5%)
College	5 (5.9%)	2 (3.1%)
Higher Education	5 (5.9%)	2 (3.1%)
Status of Marital		
Married	75 (88.2%)	30 (46.2%)
Single	3 (3.5%)	4 (6.2%)
Widow	7 (8.2%)	31 (47.7%)
Status of Smoking		
Smoker	30 (35.3%)	8 (12.3%)
Non-smoker	24 (28.2%)	43 (66.2%)
Ex-smoker	41 (48.2%)	14 (21.5%)
BMI (kg/m²)	30.2±4.6	30.6±4.9
Blood Sugar (mg/dL)	120.3±25.4	125.7±22.6

Table 2 illustrates the association between hypertension and gender. Among male participants, 61.2% were hypertensive, while 38.8% were non-hypertensive. In comparison, a higher proportion of female participants (73.8%) were hypertensive, with only 26.2% being non-hypertensive. The Fisher's Exact Probability test yielded a significant result (p=0.035) for males, while for females, the result was highly significant (p=0.000), indicating a stronger association between hypertension and female gender. The duration of hypertension also differed between genders, with males having an average duration of 99.8 months (range: 6-336 months) compared to 91.6

months (range: 24-240 months) for females. This suggests that while females had a higher prevalence of hypertension, males had a longer duration of the condition. Diabetes was assessed in conjunction with hypertension, revealing significant differences between genders. Among males, only 10.6% were diabetic, while a substantial 89.4% were non-diabetic. Conversely, the prevalence of diabetes among females was notably higher, with 46.2% being diabetic and 53.8% non-diabetic. Fisher's Exact Probability test indicated a highly significant association between males (p=0.000), while the association between females was not statistically significant (p=0.057).

***Table 2**. Association between chronic disease and gender relation to CVA.*

Gender	Male	Female
Hypertensive	52 (61.2%)*	48 (73.8%)**
Non-hypertensive	33 (38.8%)	17 (26.2%)
Fisher's exact probabiltiy	0.035	0.000
Duration (months)	99.8 (6-336)	91.6 (24-240)
Diabetic	9 (10.6%)**	30 (46.2%)
Non-diabetic	76 (89.4%)	35 (53.8%)
Fisher's exact probabiltiy	0.000	0.057 (NS)
Duration (years)	2.5 (1-3)	6.8 (2-20)

*Note: *Significant at P≤0.05; **Significant at P≤0.01.*

Table 3 presents the prevalence of various cardiovascular conditions among study participants. The data indicate that males exhibited a higher prevalence of angina pectoris (16.5%) and myocardial infarction (7.1%) compared to females, who reported 9.2% and 6.2%, respectively. Both conditions showed significant associations (p=0.000) for males. Peripheral vascular disease was prevalent in 29.4% of males and 27.7% of females, with a significant association (p=0.001) noted for both genders. Atrial fibrillation was more common among females (50.8%) than males (24.7%), but the association for females was not statistically significant (p=0.056). This suggests that while females may experience a higher prevalence of atrial fibrillation, the data do not provide strong statistical support for this observation. The types of medications used by participants were also analyzed, revealing significant differences in drug usage patterns between genders. Anticoagulation therapy was utilized by 16.5% of males and 15.4% of females, with both groups showing a significant association (p=0.000). Antiplatelet therapy was more commonly reported among males (38.8%) than females (30.8%), with a significant association for males (p=0.035) and a highly significant association for females (p=0.000).

***Table 3**. Association between cardiovascular and medication use relation to CVA.*

Category	Male (N=85)	Probability	Female (N=65)	Probability
Angina Pectoris	14 (16.5%)**	0.000	6 (9.2%)**	0.000
Myocardial Infarction	6 (7.1%)**	0.000	4 (6.2%)**	0.000
Peripheral Vascular Disease	25 (29.4%)**	0.001	18 (27.7%)**	0.001
Atrial Fibrillation	21 (24.7%)**	0.000	33 (50.8%)	0.056 (NS)
Received drug				
Anticoagulation	14 (16.5%)**	0.000	10 (15.4%)**	0.000
Antiplatelets	33 (38.8%)*	0.035	20 (30.8%)**	0.000

Table 4 summarizes the accident history and psychological trauma experienced by participants. The data indicate that 5.9% of males had a history of accidents, while 4.6% of females reported similar experiences. Psychological trauma was reported by 21.2% of males and 18.5% of females, suggesting a relatively comparable level of psychological distress between genders. The types of cerebrovascular accidents (CVA) diagnosed in participants were categorized as ischemic stroke, transient ischemic attack, and hemorrhagic stroke. The majority of participants (69.3%) were diagnosed with ischemic stroke, followed by hemorrhagic stroke (27.4%) and transient ischemic attack (3.3%). These findings highlight the predominance of ischemic strokes in the study population. The diagnostic imaging techniques employed in the study, specifically CT scans and MRIs, were utilized to confirm the diagnoses of CVA. The percentage of diagnoses made via these imaging modalities underscores the critical role of advanced imaging techniques in detecting and managing cerebrovascular events (*Figure 1*).

Table 4. *Association of accident history, psychological and stroke diagnosis.*

Gender	Accident history	Psychological trauma
Male	5 (5.9%)	18 (21.2%)
Female	3 (4.6%)	12 (18.5%)
Diagnosis Type		
Ischemic Stroke	104	69.3%
Transient Ischemic Attack	5	3.3%
Hemorrhagic Stroke	41	27.4%

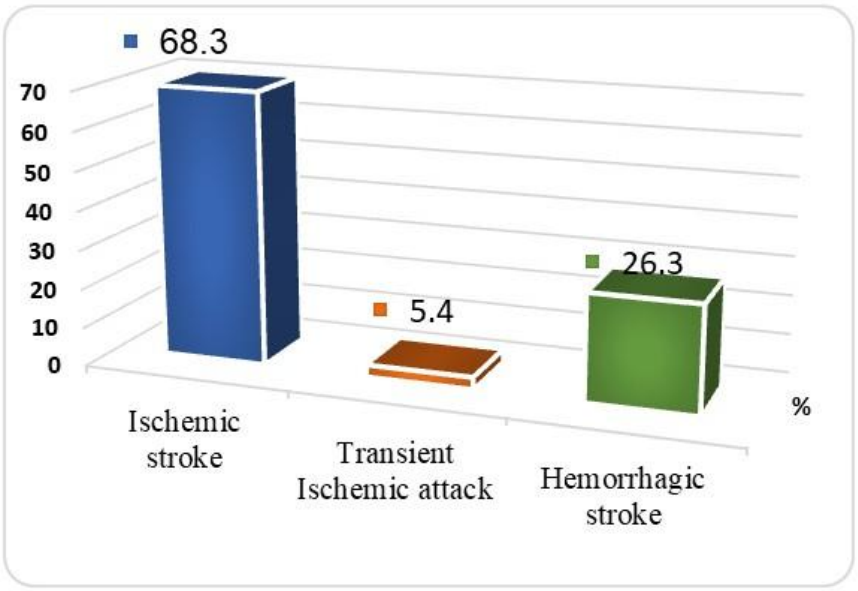

Figure 1. *Percentage of diagnosis of CVA via CT scan or MRI.*

The results of this study reveal significant demographic differences between male and female participants, particularly in educational status and marital status. The prevalence of hypertension and diabetes also exhibited notable gender disparities, with females demonstrating a higher prevalence of hypertension and a significant proportion of diabetes (Jaffre et al., 2014). Cardiovascular conditions were prevalent among both genders, with distinct patterns of medication usage observed. Furthermore, the study highlights the importance of psychological factors and the predominant types of strokes

diagnosed in the sample population. The findings underscore the need for targeted interventions and further research to address the unique health challenges faced by different genders concerning cardiovascular health (Jackova et al., 2020). The demographic analysis indicates a significant age difference between male and female participants, with males being younger on average. This finding is consistent with previous studies that have reported similar age disparities in various populations. The older age profile of female participants may reflect longer life expectancy among women, but it also poses a higher risk for age-related chronic conditions such as hypertension and cardiovascular diseases (WHO, 2020). Educational status highlights a concerning gender gap, with a significantly higher percentage of illiteracy among females. This aligns with findings from other studies that underscore the impact of educational attainment on health outcomes, particularly among women in low- and middle-income countries. The lack of educational opportunities for women can exacerbate health disparities, as lower education levels are associated with reduced health literacy and poorer health outcomes (Baker et al., 2007). Addressing educational inequities is crucial for improving health outcomes in this population.

Marital status further emphasizes gender differences, particularly the high prevalence of widowhood among females. This finding is consistent with demographic trends observed in various studies, which indicate that women typically outlive men and often face significant health challenges in later life, particularly in the absence of spousal support. The implications of marital status on health are profound, as social support is a critical factor in managing chronic diseases (Callaghan and Morrissey, 1993). The study's findings reveal a higher prevalence of hypertension among females (73.8%) compared to males (61.2%). This aligns with existing literature that suggests women often experience higher rates of hypertension, particularly post-menopause, due to hormonal changes and other risk factors. The significant association between gender and hypertension observed in this study ($p=0.000$) supports the need for gender-specific interventions in hypertension management. In terms of diabetes prevalence, the results indicate that 46.2% of female participants were diabetic, a figure that is notably higher than the 10.6% prevalence among males. This finding is corroborated by other studies that report a rising trend of diabetes among women, particularly in regions with limited access to healthcare and education. The lack of statistical significance in the association for females ($p=0.057$) suggests that while the prevalence is high, further research is needed to explore the underlying factors contributing to diabetes among women. The interplay between hypertension and diabetes is critical, as both conditions are major risk factors for cardiovascular diseases. The co-occurrence of these conditions among females may explain the observed gender disparities in cardiovascular morbidity and mortality (Eckel et al., 2005). Public health initiatives should focus on integrated management strategies for these comorbidities, particularly targeting disproportionately affected women.

The analysis of cardiovascular conditions reveals that males exhibit a higher prevalence of angina pectoris and myocardial infarction, while atrial fibrillation is more common among females. These findings are consistent with previous research that indicates gender differences in cardiovascular disease presentations, with men often experiencing more severe forms of coronary artery disease (Kannel et al., 1979). The higher prevalence of atrial fibrillation among females, although not statistically significant, aligns with studies suggesting that women may be at greater risk for this condition, particularly at older ages. The differences in medication usage patterns

between genders are noteworthy. The higher prevalence of antiplatelet therapy among males may reflect a more aggressive approach to managing cardiovascular risk in this demographic, while the significant use of anticoagulation therapy among both genders highlights the importance of preventing thromboembolic events (Go et al., 2003). These findings underscore the need for tailored pharmacological interventions that consider gender-specific risk profiles and treatment responses. The study highlights a relatively comparable level of psychological trauma reported by both genders, with 21.2% of males and 18.5% of females indicating psychological distress. The prevalence of psychological trauma is concerning, as it is well-established that mental health significantly impacts physical health outcomes, particularly in individuals with chronic diseases. The relationship between psychological factors and cardiovascular health is complex, with stress and depression being linked to increased morbidity and mortality. Future research should explore the causal pathways between psychological trauma and chronic health conditions, particularly in the context of gender differences.

The predominance of ischemic strokes (69.3%) in the study population aligns with national and global trends, where ischemic strokes are the most common type of cerebrovascular accident (Feigin et al., 2014). The use of advanced imaging techniques, such as CT scans and MRIs, is critical for accurate diagnosis and management of strokes, as highlighted in the findings. The reliance on these modalities underscores the importance of access to quality healthcare services and the need for continued investment in diagnostic technologies. The findings of this study have significant implications for public health initiatives aimed at addressing gender disparities in health outcomes. Targeted interventions that consider the unique demographic, psychological, and health profiles of males and females are essential for improving health equity. Educational programs that promote health literacy, particularly among women, could empower individuals to take control of their health and make informed decisions regarding lifestyle and medical care (Nutbeam, 2000). Moreover, the study highlights the need for further research that explores the underlying mechanisms driving gender disparities in chronic diseases. Longitudinal studies that track health outcomes over time could provide valuable insights into the interplay between gender, psychosocial factors, and chronic disease progression. Additionally, qualitative research exploring the lived experiences of individuals with chronic conditions may illuminate the social determinants of health that contribute to these disparities (Khan and Vohra, 2007). The findings of this study contribute significantly to the understanding of the demographic characteristics, prevalence of hypertension, diabetes, cardiovascular conditions, and associated psychological factors among participants. The results reveal notable gender disparities in health indicators, which align with existing literature and provide insights into the unique health challenges faced by males and females. This discussion will contextualize the findings within the broader body of research, highlighting implications for public health and future studies.

Conclusion

Valuable insights into the demographic characteristics, prevalence of chronic conditions, and associated psychological factors among males and females. The significant gender disparities observed in educational status, hypertension, diabetes, and cardiovascular conditions underscore the need for targeted public health interventions. By addressing these disparities and promoting gender-sensitive approaches to

healthcare, we can work towards improving health outcomes for all individuals, regardless of gender. Future research should continue to explore the complexities of gender and health, ultimately contributing to a more equitable healthcare system.

Acknowledgement

This research is self-funded.

Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

REFERENCES

[1] Baker, D.W., Wolf, M.S., Feinglass, J., Thompson, J.A., Gazmararian, J.A., Huang, J. (2007): Health literacy and mortality among elderly persons. – Archives of Internal Medicine 167(14): 1503-1509.

[2] Callaghan, P., Morrissey, J. (1993): Social support and health: a review. – Journal of Advanced Nursing 18(2): 203-210.

[3] Eckel, R.H., Grundy, S.M., Zimmet, P.Z. (2005): The metabolic syndrome. – The Lancet 365(9468): 1415-1428.

[4] Feigin, V.L., Forouzanfar, M.H., Krishnamurthi, R., Mensah, G.A., Connor, M., Bennett, D.A., Moran, A.E., Sacco, R.L., Anderson, L., Truelsen, T., O'Donnell, M. (2014): Global and regional burden of stroke during 1990–2010: findings from the Global Burden of Disease Study 2010. – The Lancet 383(9913): 245-255.

[5] Go, A.S., Hylek, E.M., Chang, Y., Phillips, K.A., Henault, L.E., Capra, A.M., Jensvold, N.G., Selby, J.V., Singer, D.E. (2003): Anticoagulation therapy for stroke prevention in atrial fibrillation: how well do randomized trials translate into clinical practice? – Jama 290(20): 2685-2692.

[6] Jackova, J., Sedova, P., Brown Jr, R.D., Zvolsky, M., Volna, M., Baluchova, J., Belaskova, S., Bednarik, J., Mikulik, R. (2020): Risk factors in ischemic stroke subtypes: a community-based study in Brno, Czech republic. – Journal of Stroke and Cerebrovascular Diseases 29(2): 8p.

[7] Jaffre, A., Ruidavets, J.B., Calviere, L., Viguier, A., Ferrieres, J., Larrue, V. (2014): Risk factor profile by etiological subtype of ischemic stroke in the young. – Clinical Neurology and Neurosurgery 120: 78-83.

[8] Kannel, W.B., McGee, D.L. (1979): Diabetes and cardiovascular disease: the Framingham study. – JAMA 241(19): 2035-2038.

[9] Khan, S.N., Vohra, E.A. (2007): Risk factors for stroke: A hospital based study. – Pakistan Journal of Medical Sciences 23(1): 17-22.

[10] Kim, J.S., Choi-Kwon, S. (1999): Risk factors for stroke in different levels of cerebral arterial disease. – European Neurology 42(3): 150-156.

[11] Liu, L.S., Caguioa, E.S., Park, C.G., Quek, D.K.L., Saito, I., Venketasubramanian, N., Wong, K.S.L., Reid, J.L. (2006): Reducing stroke risk in hypertensive patients: Asian Consensus Conference recommendations. – International Journal of Stroke 1(3): 150-157.

[12] Madubuko, A.N. (2018): Stroke Risk Factor Knowledge, Attitude, Prevention Practices, and Stroke. – Walden University 164p.

[13] Nutbeam, D. (2000): Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. – Health Promotion International 15(3): 259-267.
[14] Shitandi, O.B. (2019): Pattern of stroke in a rural Kenyan hospital. – Malawi Medical Journal 31(1): 50-55.
[15] Song, Y.M., Kwon, S.U., Sung, J., Ebrahim, S., Smith, G.D., Sunwoo, S., Yun, Y.S. (2005): Different risk factor profiles between subtypes of ischemic stroke. A case-control study in Korean men. – European Journal of Epidemiology 20: 605-612.
[16] World Health Organization (WHO) (2020): Ageing and health. – WHO Web Portal 4p.