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Knowledge About the Common Risk Factors Among Patients Presenting with Acute Stroke

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ABSTRACT

Background: Stroke is a leading cause of death and disability. Many survivors lack awareness of key stroke risk factors. **Objective:** To identify awareness gaps and assess understanding of stroke risk factors among acute stroke patients. **Methods:** Simple random sampling was used to select 100 consecutive patients (≥18 years old) with clinically diagnosed acute ischemic or hemorrhagic stroke for this qualitative, descriptive study. A semi-structured questionnaire covering seven major risk factors (hypertension, diabetes mellitus, smoking, high cholesterol, obesity, sedentary lifestyle, and family history), sources of prior information, and perceived cause of stroke was used to interview mentally competent patients who were able to participate. Responses were calculated as frequencies and percentages, and demographic and clinical data were documented. **Results:** With 56% of the cohort being male, the mean age distribution was 10% (18–30 years), 28% (31–50 years), 42% (51–70 years), and 20% (>70 years). The highest levels of awareness were for diabetes (66%) and hypertension (72%), while smoking (58%), high cholesterol (49%), obesity (41%), sedentary lifestyle (38%), and family history (45%) were less common. 84% of respondents said they had at least one modifiable risk factor, 36% said they had non-modifiable risks, 29% said they had both, and 8% said they had no discernible hazards. Of those who had no prior information, 25% cited media (24%), family/friends (28%), and healthcare professionals (33%). 42% of respondents named hypertension as the primary cause of their stroke, followed by stress (18%), diabetes (14%), smoking (9%), and uncertainty (17%). **Conclusion:** Knowledge gaps persist on key stroke risk factors. Structured, multimodal educational efforts are crucial for effective secondary prevention.

INTRODUCTION

In fact, even now, strokes are still a huge issue in a global scale and it will only get worse in the future, given the ageing population. Strokes impose a heavy financial burden on everyone, including patients and their families, the healthcare system, and the society. Although among adults, they are one of the major causes for death, dependence, and disability. (2020 Raul et al, 2020)

Stroke is an potentially lethal condition, and about 85% of the total occurrences of stroke are ischemic. Worldwide, about 6 million individuals die of strokes every year. Those who survive are quite likely to have another sooner or later. According to the study conducted by Wang et. al in 2018, you have the possibility of having the recurrence in the proportion of 39.2 within ten years. If the stroke occurs again the patient's disability may worsen or even lead to death. Following a balanced diet and taking medicine as advised can make stroke survivors less likely to suffer future complications. The leading cause of adult disability globally is stroke. It causes more than 250,000 deaths a year, the third highest cause of death in Thailand. If a stroke returns you have 25 percent more risk of death or severe disability to develop within 5 years. While one of the consequences of strokes is disabilities, it isn't the only one. In the words of Saengsuwan et al. (2017)

Stroke is one of the most lethal and prevalent cause worldwide especially in South Asia and is a major cause of death and disability (Shravani, et. al; 2015). The rate of stroke is approximately 40 to 270 per 100,000 population in various regions of India and, the sufferer is mostly less than 40 years old as mentioned in the Indian Council of Research study of 2006."The stroke is a rapidly developed therapeutic sign of focal loss of

cerebral activity with presumed vascular origin that persists more than 24 hours," is the way the World Health Assembly defines a stroke.

According to Lloyd-Jones et al. (2009), a stroke is a tragic event which transforms an individual's life beyond imagination. It also affects the loved ones and carers of stroke sufferers. However, the number of fatalities caused by stroke has also been decreasing. Although the importance of preventive measures in reducing the stroke burden continues unabated by alternative intervention therapies to the tissue-type plasminogen activating chore of an exclusive treatment for some patients with acute strokes within the window of opportunity for therapy, and the introduction of intravenous tissue-type plasminogen activating chore, other concomitant prevention and treatment actions are recommended for the care of specific high risk patients (Adams et al. 2007).

Indeed, acute stroke is nothing like an accident; something that has to be remembered. Thus, it is better to describe this as a brain attack rather than a heart attack. Stroke can start off in many different ways, unlike heart disease. The most common types are ischemic and hemorrhagic strokes (Forshing Lui and Prasanna Tadi, 2023). Secondary types of hemorrhagic strokes include spontaneous (non traumatic) bleeding of the brain (ICH) and a spontaneous (non traumatic) subarachnoid hemorrhage (SAH).

An ischemic stroke occurs when blood artery that goes to the brain becomes blocked. The blood supply is diminished. A hemorrhagic stroke occurs when a blood artery bursts, which draws blood into the brain cavity. (Forshing Lui and Prasanna Tadi, 2023))

Brain hemorrhage caused after bursting of a blood artery is the situation referred as 'é hemorrhagic stroke. There are two types of stroke with hemorrhage that may be differentiated further; subarachnoid hemorrhages (SAH) and intravenous hemorrhage (ICH). Both SAH and ICH leaks are being received by the subarachnoid space and the brain parenchyma. Hemorrhagic stroke is highly morbid and a potentially fatal condition (Unnithan et al., 2023). Development of hemorrhagic stroke is associated with poor outcomes. Because as is normal, bleeding gets worse quickly so that a sudden loss of consciousness and neurological impairment will occur, it is critical to recognize and treat the condition early.

The American Cardiovascular Association and the American Stroke Association defined stroke in detail. Basically, a stroke is a sudden onset of a defect in focal neurological functioning lasting for more than 24 hours. Stroke is one of the main causes of disability and the second main cause of death worldwide. A significant financial burden could be related to prehospital, hospital, and posthospital treatment costs to patients suffering from stroke.

Good understanding of stroke is important as stroke survivors need to comply to the preventive treatment and practice healthy habits which are supposed to reduce or delay the risk of stroke recurrence and improve prognosis. Yet, most stroke survivors do not clearly understand this information. According to a study made by Wang et. al in 2018, More than 50% of stroke survivors in previous study were unaware of the risk and chances of the occurrence of recurrence because they could not identify even one warning sign or risk factor. For nearly one third of those people, they did not know what to do if they came down with the flu symptoms. Over 30% of patients no longer had the need to take their secondary preventative drug when they were discharged because they were no longer needed to take their oral prescription. (The 2018 study by Wang et al.)

Stroke is a major killer and a major cause of long-term disability on people who have survived it. Stroke incidence is decreasing in wealthy countries hugely over the last 40 years, but the disease has become more burdensome in low- and middle-income countries. Stroke incidence is on Due to a plurality of circumstance such as shifting demographics and epidemiology, lack of resource to perform thrombolysis in instances of ischemic stroke as well as inefficient treatment for both primary and secondary prevention. Reference: Wahab et al. (2015) This developing country's health indicators are expected to decline as a result of untreated stroke. The rising rates of cardiovascular illnesses like stroke alongside other cardiovascular problems, as well as the fact that we have not yet succeeded in eliminating infectious diseases like HIV/AIDS, TB, and malaria that is resistant to several drugs, pose serious threats to these countries. Although the rate of prevalence has fallen than that of better income nations, a recent systematic study found that the overall yearly incidence of attack is 29 every 100,000 individuals (95% confidence range) in Saudi Arabia. For instance, the yearly incidence of stroke is around 76 per 100,000 for Australia and around 119 per 100,000 for New Zealand respectively (Alkhotani, et, et; 2023). Even then, stroke occurrence in Saudi Arabia differs among regions. Most diseases of venereal significance occurred in the Aseer area (57.64 per 100,000 people per year, 95% CI: 57.57–57.70) and least in Al Madinah (13.89 per 100,000 people).

There are many causes of stroke, and they can develop over a number of years before the stroke occurs. And people who are at extremely susceptible of having stroke may be identified and treated by using the right measures. To decrease the risk factors, these traits must be identified and changed. Some of the risk factors that may be changed are high blood pressure, diabetes, heart disease, smoking, high cholesterol, drinking too much alcohol, a history of TIA, central nervous system infections, oral contraceptives, anomalies of blood clotting and migraines. Age, sex, ethnicity and genetics are some of the risk factors that cannot be changed.

Research Objective

The purpose of this study is to determine how well-informed people who are having an acute stroke are about common risk factors for stroke. The reason for the study is to detect the areas where there are knowledge and comprehension gaps about risk factors, whether modifiable or non-modifiable such as: family history, smoking, obesity, diabetes mellitus, hypertension and sedentary lifestyle. The purpose of the study is to generate evidence for targeted health education and preventive strategies against incidence of stroke through risk factor modification, at the time of presentation, by measuring the patient awareness.

MATERIALS AND METHODS

This qualitative, descriptive, hospital-based study described the awareness of patients about the usual risk factors for acute stroke. The study was carried out in a Quetta tertiary care hospital, being one of the important regional referral centers for neurological diseases and stroke. Therefore, a study is based on a random sample of the 100 patients hospitalized during the study period and who were at least 18 years old and had acute stroke symptoms. Patients with a clinical diagnosis of acute ischemic or hemorrhagic stroke and mentally competent, were able to participate in an interview, constituted the study. Participants were excluded for refusing to participate, for being unconscious, or having a very significant cognitive deficit. Semi structured questionnaires and structured interviews were used to assess patients' knowledge of a number of a stroke risk factors, such as high blood pressure, diabetes, smoking, high cholesterol, obesity, sedentary lifestyle and family history. This was also documented as clinical and demographic information.

The main aim of the study was to assess patients' knowledge of risk factor and identify proportion of modifiable and nonmodifiable risks in the sample. Data was examined and presented in frequency tables to show trends and knowledge gaps in the risk variables.

RESULTS

A total of 100 patients were included in the study. The findings are presented in the following tables and figures, summarizing the socio-demographic characteristics, awareness of stroke risk factors, self-reported risk factor distribution, sources of information, and patients' perceived causes of their stroke episodes.

This table summarizes the socio-demographic characteristics of the patients in the study, including age distribution and gender. The majority of patients fall within the 51–70 years age group (42%), followed by 31–50 years (28%). A slightly higher number of male patients (56%) were included in the study compared to female patients (44%).

Table 1

Socio-Demographic Characteristics of Patients (n=100)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
18–30	10	10%
31–50	28	28%
51–70	42	42%
Above 70	20	20%
Gender		
Male	56	56
Female	44	44

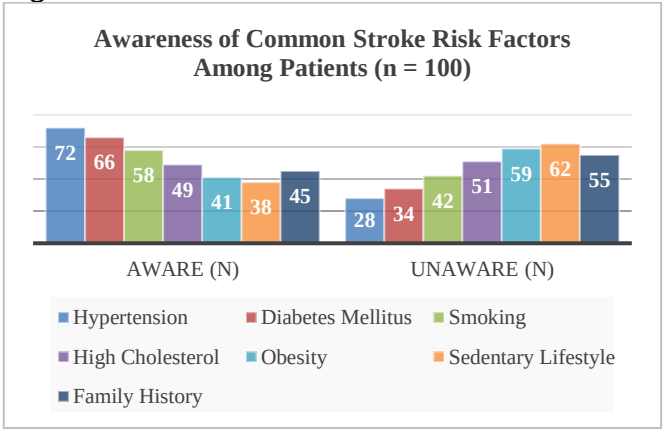
This table presents the awareness of common stroke risk factors among the study participants. Hypertension is the most recognized risk factor, with 72% of patients aware of it. In contrast, obesity and sedentary lifestyle were less known, with 59% and 62% of patients being unaware, respectively.

Table 2

Awareness of Common Stroke Risk Factors Among Patients (n = 100)

Risk Factor	Aware (n)	Unaware (n)
Hypertension	72	28
Diabetes Mellitus	66	34
Smoking	58	42
High Cholesterol	49	51
Obesity	41	59
Sedentary Lifestyle	38	62
Family History	45	55

Figure 1



The table compares the distribution of modifiable and non-modifiable stroke risk factors reported by patients. A substantial proportion of patients (84%) identified at least one modifiable risk factor, while 36% identified non-modifiable factors. Interestingly, 29% of patients reported both modifiable and non-modifiable risk factors, and 8% did not identify any risk factors.

Table 3

Distribution of Modifiable vs Non-Modifiable Risk Factors (Self-Reported) (n = 100)

Risk Factor Type	Patients with Risk Factor (n)	%age
Modifiable (any)	84	84%
Non-Modifiable (any)	36	36%
Both	29	29%
No Identified Risk	8	8%

This table outlines the various sources of information regarding stroke risk factors that patients relied on. Healthcare professionals were the most common source of information (33%), followed by family and friends (28%). Television/media also played a significant role, with 24% of patients citing it as their source of information.

Table 4

Sources of Information About Stroke Risk Factors (n=100)

Source of Information	Frequency (n)	Percentage
Television/Media	24	24%
Healthcare Professionals	33	33%
Family/Friends	28	28%
No Prior Information	25	25%

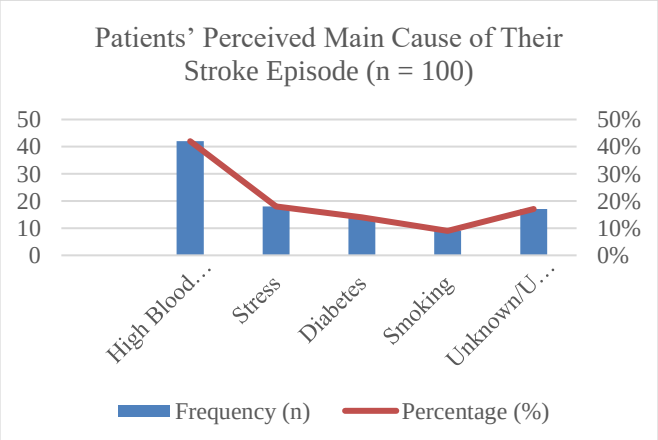
The table displays the patients' perceptions of the main cause of their stroke episode. High blood pressure was considered the leading cause by 42% of patients, while stress was also a significant factor for 18% of participants. A notable 17% of patients were unsure or did not know the cause of their stroke.

Table 5

Patients' Perceived Main Cause of Their Stroke Episode (n=100)

Perceived Cause	Frequency (n)	Percentage (%)
High Blood Pressure	42	42%
Stress	18	18%
Diabetes	14	14%
Smoking	9	9%
Unknown/Unsure	17	17%

Figure 2



DISCUSSION

A total of 100 adult acute stroke patients presenting in a Quetta tertiary care hospital were asked to state their knowledge of the common stroke risk factors. The trends in awareness, views and demographics are significant and can be used in preventative and educational initiatives that are targeted.

Fifty one percent of the patients are 51 years of age or older (45 % 51–70 years old, 6 % older than 70). This is indicative of the fact that only 10% were under 30 as there is a known rise in stroke incidence with age. Consistent with global stroke data for the incidence to be higher in men because of higher exposure to behavioral risk factors like alcohol and tobacco use, there is a small male preponderance (56%). In line with earlier area studies, educational attainment, although not reported explicitly, should be expected to have an effect on these variables' influence on awareness levels.

Reassuringly, the most frequently identified risk factors were diabetes mellitus (66%) and hypertension (72%), since they are very frequent and modifiable. Conversely, awareness of obesity (41%), sedentary lifestyle (38%) and dyslipidemia (49%) fell greatly. Piquantly, more than half of the patients were unaware of the fact that Physical inactivity and high cholesterol are main causes of thrombotic stroke and atherosclerosis. Although non-modifiable risks are not taken seriously, only 45% of respondents knew family history was a risk factor.

The that the proportion of at least one modifiable risk factor was high (84%) points towards the potential influence of lifestyle or medical intervention. Close to one third (29%) held both of these risks, and more than one third (36%) also had non modifiable hazards (such as age or family... Although just 8% had no identifiable risk factors, risk-reduction efforts targeted at them could be beneficial for almost all patients.

Between friends and family (28%), healthcare providers (33%) and media/television (24%) healthcare providers were the most popular information source. Incredibly, 25 percent of patients claimed not to have heard of the risk factors for stroke. This disparity highlights the large loss of teaching opportunities offered during normal care and suggests that community outreach, mass media campaigns to decrease children's exposure to RIN are not fully utilized in this context.

When asked, 42% of respondents said high blood pressure was its primary cause; a comparatively good understanding of the impact of hypertension. Although clear epidemiological data indicate a risk for stroke related to smoking, only 9% of respondents attributed their stroke to smoking, 17% were unable or not able to indicate the cause, and 18% mentioned stress, which could be a physician's perception rather than epidemiological data, and with which there may be a need to correct the misunderstandings.

CONCLUSION

This study indicates that acute stroke patients in Quetta are relatively knowing about the contribution to risk of stroke of hypertension (72%) and diabetes (66%), and that there is a considerable deficit in their perception of other major contributors, especially high cholesterol (49%), obesity (41%), sedentary lifestyle (38%), and family history (45%). Almost all patients (84%) were aware of at least one modifiable risk factor for stroke, yet one quarter had never been told that they were at risk of

stroke before their event. Moreover, reliance on medical experts (33%), or so-called unofficial sources, e.g., friends, family, or the media, corroborates irregular patient education as well as missed opportunity for systematic risk factor counseling. As nearly one third of patients had both modifiable and non-modifiable risks, comprehensive and tailored preventative intervention is needed despite the preponderance of age >51 years (62%) and moderate male preponderance (56) consistent with demographic tendencies. We find that there are misconceptions such as the over attribution of stress to stroke (18%) and under recognition of smoking (9%) to reflect, evidence based, unambiguous messaging.

REFERENCES

1. Adams HP Jr, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, et al. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups. Stroke. 2007;38:1655–711. https://doi.org/10.1161/strokeaha.107.181486
2. Alkhotani, A. M., Almasoudi, A., Alzahrani, J., Alkhotani, E., Kalkatawi, M., & Alkhotani, A. (2022). Factors associated with delayed hospital presentation for patients with acute stroke in Makkah: a cross-sectional study. *Medicine*, *101*(34). https://doi.org/10.1097/md.0000000000030075
3. Asplund K, Karvanen J, Giampaoli S, et al; MORGAM Project. Relative risks for stroke by age, sex, and population based on follow-up of 18 European populations in the MORGAM Project. **Stroke**. 2009; *40*:2319–2326. https://doi.org/10.1161/STROKEAHA.109.547869.
4. Corsi DJ, Subramanian SV, Chow CK, McKee M, Chifamba J, Dagenais G, et al. Prospective Urban Rural Epidemiology (PURE) study: Baseline characteristics of the household sample and comparative analyses with national data in 17 countries. Am Heart J. 2013;166(4):636–46.e4. Epub 2013/10/08. https://doi.org/10.1016/j.ahj.2013.04.019 pmid:24093842.
5. Corsi DJ, Subramanian SV, Chow CK, McKee M, Chifamba J, Dagenais G, et al. Prospective Urban Rural Epidemiology (PURE) study: Baseline characteristics of the household sample and comparative analyses with national data in 17 countries. Am Heart J. 2013;166(4):636–46.e4. Epub 2013/10/08. pmid:24093842. https://doi.org/10.1016/j.ahj.2013.04.019
6. Forouzanfar MH, Liu P, Roth GA, Ng M, Biryukov S, Marczak L, et al. Global Burden of Hypertension and Systolic Blood Pressure of at Least 110 to 115 mm Hg, 1990–2015. Jama. 2017;317(2):165–82. Epub 2017/01/18. pmid:28097354. https://doi.org/10.1001/jama.2016.19043
7. Howard VJ, Kleindorfer DO, Judd SE, McClure LA, Safford MM, Rhodes JD, Cushman M, Moy CS, Soliman EZ, Kissela BM, Howard G. Disparities in stroke incidence contributing to disparities in stroke mortality. Ann Neurol**.** 2011; *69*:619–627. https://doi.org/10.1002/ana.22385.
8. Lloyd-Jones D, Adams R, Carnethon M, De Simone G, Ferguson TB, et al. Heart disease and stroke statistics—2009 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee [published correction appears in circulation. 2009; 119:e182]. Circulation. 2009;119:480–6. https://doi.org/10.1161/circulationaha.108.191259
9. Misra A, Tandon N, Ebrahim S, Sattar N, Alam D, Shrivastava U, et al. Diabetes, cardiovascular disease, and chronic kidney disease in South Asia: current status and future directions. Bmj. 2017;357:j1420. Epub 2017/04/13. pmid:28400361. https://doi.org/10.1136/bmj.j1420
10. Maimaris W, Paty J, Perel P, Legido-Quigley H, Balabanova D, Nieuwlaat R, et al. The influence of health systems on hypertension awareness, treatment, and control: a systematic literature review. PLoS Med. 2013;10(7):e1001490 https://doi.org/10.1371/journal.pmed.1001490
11. Neal B, MacMahons S, Chapman N. Effects of ACE Inhibitors, Calcium antagonists and other blood pressure lowering drugs: results of prospectively designed overviews of randomized trials. Blood pressure lowering treatment trialists collaboration. Lancet 2005; 356: 1955-64
12. Olsen MH, Angell SY, Asma S, Boutouyrie P, Burger D, Chirinos JA, et al. A call to action and a lifecourse strategy to address the global burden of raised blood pressure on current and future generations: the Lancet Commission on hypertension. Lancet. 2016;388(10060):2665–712. Epub 2016/09/28. pmid:27671667. https://doi.org/10.1016/S0140-6736(16)31134-5

13. Olsen MH, Angell SY, Asma S, Boutouyrie P, Burger D, Chirinos JA, et al. A call to action and a lifecourse strategy to address the global burden of raised blood pressure on current and future generations: the Lancet Commission on hypertension. Lancet. 2016;388(10060):2665–712. Epub 2016/09/28. pmid:27671667. https://doi.org/10.1016/S0140-6736(16)31134-5
14. Saengsuwan, J., Suangpho, P., & Tiamkao, S. (2017). Knowledge of stroke risk factors and warning signs in patients with recurrent stroke or recurrent transient ischaemic attack in Thailand. *Neurology research international*, *2017*. https://doi.org/10.1155/2017/8215726
15. Shravani, K., Parmar, M. Y., Macharla, R., Mateti, U. V., & Martha, S. (2015). Risk factor assessment of stroke and its awareness among stroke survivors: A prospective study. *Advanced biomedical research*, *4*. https://doi.org/10.4103/2277-9175.164011
16. Soto-Cámara, R., González-Bernal, J. J., González-Santos, J., Aguilar-Parra, J. M., Trigueros, R., & López-Liria, R. (2020). Knowledge on signs and risk factors in stroke patients. *Journal of clinical medicine*, *9*(8), 2557. https://doi.org/10.3390/jcm9082557
17. Tadi P, Lui F. Acute Stroke. [Updated 2023 Aug 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK535369/
18. Tang, J. L., Morris, J. K., Wald, N. J., Hole, D., Shipley, M., & Tunstall-Pedoe, H. (1995). Mortality in relation to tar yield of cigarettes: a prospective study of four cohorts. *BMJ*, *311*(7019), 1530-1533. https://doi.org/10.1136/bmj.311.7019.1530
19. Ueshima, H., Reza Choudhury, S., Okayama, A., Hayakawa, T., Kita, Y., Kadowaki, T., ... & Iimura, O. (2004). Cigarette smoking as a risk factor for stroke death in Japan: NIPPON DATA80. *Stroke*, *35*(8), 1836-1841. https://doi.org/10.1161/01.str.0000131747.84423.74
20. United States. Surgeon General's Advisory Committee on Smoking. (1964). *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service* (No. 1103). US Department of Health, Education, and Welfare, Public Health Service.
21. Unnithan AKA, M Das J, Mehta P. Hemorrhagic Stroke. [Updated 2023 May 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK559173/
22. van Asch CJ, Luitse MJ, Rinkel GJ, van der Tweel I, Algra A, Klijn CJ. Incidence, case fatality, and functional outcome of intracerebral haemorrhage over time, according to age, sex, and ethnic origin: a systematic review and meta-analysis. Lancet Neurol. 2010; *9*:167–176. https://doi.org/10.1016/S1474-4422(09)70340-0.
23. Wahab, K. W., Kayode, O. O., & Musa, O. I. (2015). Knowledge of stroke risk factors among Nigerians at high risk. *Journal of Stroke and Cerebrovascular Diseases*, *24*(1), 125-129. https://doi.org/10.1016/j.jstrokecerebrovasdis.2014.07.053
24. Wang, M. D., Wang, Y., Mao, L., Xia, Y. P., He, Q. W., Lu, Z. X., ... & Hu, B. (2018). Acute stroke patients' knowledge of stroke at discharge in China: a cross-sectional study. *Tropical Medicine & International Health*, *23*(11), 1200-1206. https://doi.org/10.1111/tmi.13148
25. WHO. A global brief on hypertension: Silent killer, global public health crisis. Geneva, Switzerland: 2013. https://doi.org/10.5005/ijopmr-24-1-2