HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

SCREENING-BASED ASSESSMENT OF CEREBROVASCULAR DISEASE RISK FACTORS IN ADULTS AGED OVER 40 YEARS IN ANDIJAN REGION: A CROSS-SECTIONAL STUDY

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doi:https://doi.org/10.5281/zenodo.23377877

Abstract. **Background.** Cerebrovascular diseases represent a significant medical and social problem. Early identification of arterial hypertension, disorders of glucose and lipid metabolism, excess body weight, and behavioral risk factors is important for stroke prevention.
Objective. To assess the prevalence of major risk factors for cerebrovascular diseases among adults aged over 40 years in Andijan region using a comprehensive screening approach.
Materials and Methods. A model dataset of 181 individuals aged over 40 years was used as an illustrative example. The screening program included medical history collection, blood pressure measurement in both arms, body mass index assessment, carotid artery auscultation, measurement of blood glucose and total cholesterol, symptom assessment using the Fedin scale, and cognitive screening using the Mini-Cog test.
Results. In the illustrative dataset, arterial hypertension was identified in 91 participants (50.3%), overweight in 70 (38.7%), obesity in 45 (24.9%), elevated total cholesterol in 83 (45.9%), and elevated blood glucose in 31 (17.1%). Three or more risk factors were present in 62 participants (34.3%). Abnormal cognitive screening results were observed in 27 participants (14.9%). These figures are illustrative only and were not obtained from an actual patient dataset.
Conclusion. Comprehensive screening provides a structured approach to assessing major vascular risk factors and identifying individuals who require further examination. Analysis of actual clinical data is necessary to establish the regional prevalence of these risk factors.
Keywords: cerebrovascular diseases; stroke; risk factors; screening; arterial hypertension; cognitive impairment; primary health care.

Introduction. Cerebrovascular diseases remain among the leading causes of mortality and persistent disability in adults. Their development is associated with a combination of non-modifiable factors, including age and genetic predisposition, and modifiable factors, particularly arterial hypertension, diabetes mellitus, dyslipidemia, obesity, smoking, and physical inactivity.
According to the World Health Organization (WHO), national surveys of noncommunicable disease risk factors have been conducted in Uzbekistan using the WHO STEPwise approach to noncommunicable disease risk factor surveillance (STEPS), which incorporates interviews, physical measurements, and laboratory assessments [1, 2]. According to the WHO hypertension profile, the age-standardized prevalence of hypertension among the population of Uzbekistan aged 30–79 years was approximately 46–47% in 2019 [3].
Despite the availability of national epidemiological data, assessing the coexistence of risk factors among adults aged over 40 years attending outpatient facilities is important for organizing preventive healthcare at the regional level.

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A comprehensive screening approach enables simultaneous assessment of blood pressure, anthropometric parameters, laboratory indicators, and selected clinical findings that may warrant further investigation.

The aim of this study was to assess the prevalence of major risk factors for cerebrovascular diseases among adults aged over 40 years in Andijan region and to evaluate the potential application of a comprehensive screening approach in outpatient practice.

Materials and Methods. A cross-sectional observational design was selected as the basis for the study. The planned sample size was 181 individuals aged over 40 years attending outpatient healthcare facilities in Andijan region, Uzbekistan.

The numerical findings presented below constitute an illustrative model and are not actual results from patient examinations. For publication, these values must be replaced with data from the original research database.

The screening program included the following components:

Medical history collection using a standardized questionnaire.

Blood pressure measurement in both arms.

Measurement of height and body weight and calculation of body mass index (BMI).

Carotid artery auscultation.

Measurement of blood glucose and total cholesterol.

Assessment of clinical symptoms using the Fedin scale.

Cognitive screening using the Mini-Cog test.

For the illustrative analysis, arterial hypertension was defined by a previously established diagnosis or elevated blood pressure at the time of examination. Overweight was defined as a BMI of 25.0–29.9 kg/m², while obesity was defined as a BMI of at least 30.0 kg/m².

Elevated total cholesterol was defined in the illustrative dataset as a value of at least 5.0 mmol/L. Elevated blood glucose was determined using a predefined laboratory threshold. In the actual study, these criteria must be aligned with the measurement methods, applicable clinical guidelines, and conditions under which biological samples were collected.

Statistical Analysis. Categorical variables are presented as absolute numbers and percentages. The percentage was calculated by dividing the number of participants with the respective characteristic by the total number of participants and multiplying the result by 100.

In the actual study, 95% confidence intervals should be calculated to estimate the prevalence of risk factors. Comparisons between age and sex groups should be conducted after assessing data distributions and selecting appropriate statistical tests. Statistical significance values and odds ratios are not reported in this illustrative example because they require a separate analysis of the original dataset.

Results. General Characteristics of the Study Population

The illustrative study population consisted of 181 adults aged over 40 years. For the purpose of demonstrating the structure of the results, the sample was assumed to include 76 men (42.0%) and 105 women (58.0%).

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Table 1.
Illustrative sociodemographic characteristics of the study population

Characteristic	Number	Percentage (%)
Total participants	181	100.0
Men	76	42.0
Women	105	58.0
Age 41–50 years	58	32.0
Age 51–60 years	67	37.0
Age over 60 years	56	30.9

Note: The values in this table are illustrative. The age distribution and sex composition must be verified against the actual research database.

Prevalence of Major Risk Factors

In the illustrative dataset, arterial hypertension was the most frequently recorded risk factor. Elevated total cholesterol was observed in 45.9% of participants, overweight in 38.7%, and obesity in 24.9%.

Table 2.
Illustrative prevalence of major risk factors for cerebrovascular diseases

Risk factor	Number of participants	Percentage (%)
Arterial hypertension	91	50.3
Elevated total cholesterol	83	45.9
Overweight	70	38.7
Obesity	45	24.9
Elevated blood glucose	31	17.1
Current smoking	29	16.0
Physical inactivity	76	42.0
Abnormal symptom screening using the Fedin scale	24	13.3
Abnormal cognitive screening using Mini-Cog	27	14.9

Note: These values are fictional and provided for illustrative purposes only. Risk-factor categories may overlap; therefore, the percentages do not add up to 100%. An abnormal screening result does not independently establish a clinical diagnosis.

This illustrative distribution demonstrates how the findings of a comprehensive screening assessment can be presented. In the final manuscript, the prevalence of each risk factor must be calculated using the actual study data, with confidence intervals reported where appropriate.

Coexistence of Risk Factors

To assess the cumulative vascular risk burden, the illustrative dataset was classified according to the number of risk factors present in each participant.

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Table 3.
Illustrative distribution of participants according to the number of risk factors

Number of risk factors	Number of participants	Percentage (%)
None	12	6.6
One risk factor	39	21.5
Two risk factors	68	37.6
Three or more risk factors	62	34.3
Total	181	100.0

According to the illustrative distribution, 62 participants (34.3%) had three or more concurrent risk factors. The coexistence of multiple adverse indicators warrants a comprehensive assessment of overall cardiovascular risk and the development of an individualized preventive management strategy.
In the actual study, the factors included in this calculation must be predefined, double-counting of overlapping categories must be avoided, and the number of risk factors must be calculated for each participant.
Findings of Comprehensive Screening
In the illustrative dataset, 24 participants (13.3%) were assumed to have abnormal findings on symptom screening using the Fedin scale, while 27 (14.9%) had abnormal Mini-Cog screening results. These figures may be used to demonstrate the structure of the final report but cannot establish the prevalence of cerebrovascular disease. Screening scales identify individuals who may require further clinical assessment; they do not independently establish a diagnosis.
Carotid artery auscultation should likewise be regarded as part of the clinical examination rather than an independent method for confirming carotid stenosis. When indicated, further investigations should be determined by the treating physician based on the medical history, examination findings, and relevant clinical guidelines.
Discussion. The principal value of a comprehensive screening approach lies in the simultaneous assessment of several groups of risk factors that are traditionally evaluated separately. Blood pressure measurement, anthropometric assessment, and laboratory testing provide a more complete picture of an individual's vascular risk profile.

National STEPS data confirm the importance of metabolic and behavioral risk factors among the population of Uzbekistan [1, 2]. However, national estimates cannot be directly extrapolated to patients attending outpatient facilities in Andijan region. Differences in age, sample composition, inclusion criteria, and measurement methods may substantially influence the findings.
In the illustrative dataset, arterial hypertension and elevated total cholesterol were the most frequently observed risk factors. If a similar pattern is confirmed by actual data, it would support the need for systematic blood pressure monitoring and lipid profile assessment among adults aged over 40 years.

The coexistence of multiple risk factors is particularly relevant to preventive clinical practice. When arterial hypertension occurs alongside obesity, hyperglycemia, or dyslipidemia, a

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comprehensive risk assessment is appropriate, together with verification of previously diagnosed conditions and determination of the need for further investigations.

The inclusion of Mini-Cog in the screening protocol may help identify individuals with possible cognitive impairment who require further evaluation. However, cognitive screening results must be interpreted in the context of age, educational background, language of testing, and other clinical circumstances. They cannot be considered direct evidence of cerebrovascular disease.

Potential strengths of the proposed study design include the comprehensive assessment of clinical, anthropometric, and laboratory parameters in an outpatient setting. Possible limitations include the cross-sectional design, relatively limited sample size, and inability to establish causal relationships. Following completion of the actual study, additional limitations relating to sampling methods, missing data, and measurement quality should be reported where applicable.

It should be emphasized that the illustrative results presented here cannot establish the actual prevalence of risk factors in Andijan region. Reliable regional estimates require analysis of the original patient data.

Conclusion. A comprehensive screening approach represents a promising method for systematically assessing risk factors for cerebrovascular diseases among adults aged over 40 years in outpatient practice.

Determining the regional prevalence of arterial hypertension, disorders of glucose and lipid metabolism, overweight, behavioral risk factors, and abnormalities detected by cognitive screening requires completion of the analysis using actual examination data.

The practical value of this approach depends on measurement accuracy, appropriate interpretation of screening findings, and the availability of an established pathway for further assessment and patient follow-up. Conclusions regarding the impact of screening on stroke incidence, clinical outcomes, or cost-effectiveness can only be drawn when the corresponding data are available.

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