**RESEARCH PAPER**

# Assess The Knowledge Regarding The Risk Factors And Warning Signs Of Stroke Among Nursing Students In Selected Nursing Colleges Of West Bengal.

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**ABSTRACT**
Background: Stroke is a major public health problem and a leading cause of morbidity and mortality worldwide. Early recognition of risk factors and warning signs plays a crucial role in reducing stroke-related disability and death. Nursing students, as future healthcare professionals, are expected to possess adequate knowledge to identify and manage stroke emergencies effectively.
Aim: To assess the knowledge regarding risk factors and warning signs of stroke among nursing students in selected nursing colleges of West Bengal.
Methods: A quantitative cross-sectional descriptive study was conducted among 372 nursing students selected using purposive sampling technique from selected nursing colleges of West Bengal. Data were collected using a semi-structured interview schedule comprising demographic variables, a structured knowledge questionnaire on risk factors, warning signs, and responses toward management of stroke. Descriptive and inferential statistics were used for data analysis using SPSS version 26.
Results: Nearly half of the students (47.3%) had better knowledge and 34.4% demonstrated best knowledge regarding stroke risk factors. Regarding warning signs, 42.5% had best knowledge and 43.5% had better knowledge. Most students showed appropriate responses toward stroke management, with 93% willing to take the patient to hospital immediately and 88.2% calling an ambulance.
Conclusion: Nursing students exhibited moderate to good knowledge regarding stroke risk factors, warning signs, and management. However, gaps were observed in preventive practices and emergency decision-making, highlighting the need for structured educational interventions...
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## INTRODUCTION

Stroke is a neurologic deficit that has a sudden onset, results in permanent damage to the brain caused by cerebrovascular disease, and is significant cause of morbidity and mortality throughout the world. The World Health Organization defined stroke as rapidly developing signs of focal disturbance of cerebral function leading to death or lasting longer than 24 hours with no apparent cause other than vascular [1].

Strokes are considered one of the leading causes of serious long-term disability. Additionally, more than half of those who experience a stroke die as a result. Stroke rates are increasing rapidly in low income and middle-income countries, where it is frequently more difficult for healthcare providers to deliver the care necessary for successful stroke prevention, treatment, and rehabilitation [2]. The vital role of health sciences practitioners in the proper handling of stroke cases cannot be overlooked. Thus, targeting health students is highly valuable as they represent future healthcare professionals, and it is crucial to evaluate their knowledge of stroke.

Risk factors that predispose patients to stroke include hypertension, family history of stroke and hyperlipidaemia, cardiac disease, diabetes, cigarette smoking, increased alcohol intake, obesity, and use of hormonal contraceptives. Nurses have a critical role in reducing the death and disability of stroke clients. However, nursing students should be informed about stroke, and their clinical and practical roles should be improved. Furthermore, it is critical to assess the knowledge of nursing students working in clinics who are more likely to encounter stroke patients in emergency or intensive care settings [2].

Evidence is accumulating suggesting nursing students' education and training can help patients who have had a stroke improve their health outcomes. Nursing students'

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knowledge of risk factors and warning signs of stroke, regarding how to manage stroke patients are the most critical elements impacting the outcomes of strokes. Nursing students who care for stroke patients must have considerable education and training as per the syllabus in order to provide excellent patient-centered care. Students, on the other hand, have stressed the necessity of having a solid foundation in stroke knowledge before entering clinical practice. There are not enough available studies to highlight this issue [1,16].

Stroke is the third among the top 10 causes for mortality in India. The incidence of stroke is steadily rising in India. Millions of Indians are diagnosed with stroke every year and are left with disabilities or die due to stroke. Stroke prevalence in West Bengal varies across urban and rural areas, with higher rates observed in urban populations. Studies show that the age-adjusted prevalence rate can range from 250 to 350 per 100,000. According to the World Health Organization's global fact sheet on stroke in 2022, the main risk factor is high blood pressure [8]. The other risk factors are smoking, a sedentary lifestyle, poor diet, and alcohol. High lipid levels in the blood, obesity, hereditary tendencies, stress, depression, and arterial fibrillation were also implicated [3].

Knowledge about stroke risk factors and warning signs are less around the world. Knowledge about symptoms of stroke and risk factors were lesser in the Indian population as well. Knowledge on risk factors of stroke and early warning signs of stroke among the general public is vital in seeking the prompt treatment. Therefore, this study aims to assess the knowledge of stroke risk factors and warning signs, toward stroke patients among nursing students in West Bengal, which is very beneficial [12].

## MATERIALS AND METHODS

Research Approach: Quantitative research approach
Research Design: Cross sectional research design

Inclusion Criteria:
1. Age 17 years old and above
2. Female nursing students

Exclusion Criteria:
Those attended any other certified course on stroke other than nursing

Place of study: Royal Institute of Nursing and Medical Sciences, Durgapur, and Ma Sarada Nursing School and College, Durgapur, West Bengal
Study Population: Nursing students
Sample: Sample will be taken from the Royal Institute of Nursing and Medical Sciences, Durgapur, and Ma Sarada Nursing School and College, Durgapur, West Bengal
Sample size: 372
Sampling Technique: Purposive sampling Technique.

## DATA COLLECTION TOOLS AND TECHNIQUE

| Sl. No. | Tools | Techniques | Variables to be measured |
|---|---|---|---|
| Tool I | Semi structured interview Schedule | Interviewing | Demographic profile |
| Tool II | Stroke knowledge questionnaire of risk factors and warning signs among nursing students | Interviewing | Risk factors and warning signs of stroke |

Validity of the tool
Tool I: Demographic variables of nursing students will be validated with the prominent 10 professors from experts of Medical Surgical Nursing Department.
Tool II: Stroke knowledge questionnaire of risk factors and warning signs among nursing students is a structured questionnaire will be validated with the prominent 10 professors from the Medical Surgical Nursing Department.
Reliability of the tool
The reliability of the questionnaires will be calculated by assessing the Cronbach's Alpha.

## METHOD OF DATA COLLECTION

During lecture periods, researcher who was designated to collect data will visit the students in their classrooms. A brief presentation will be given to explain the purpose of the study and will assure students that their responses will be kept confidential.
The students will be provided written informed consent. The questionnaire will be given to participants with sufficient time to complete it. Data will be collected using convenience sampling.
Non-respondents will be students who will not return their questionnaires. The stroke knowledge score will be computed by assigning a score of '1' for the correct answer, and a score of '0' for the wrong answer, likewise the total knowledge score will be designed by computing the total knowledge items, which will be further divided into good knowledge will scores (who score of 11-15), knowledge scores average (who score 6 -10) while poor knowledge score (a score 1-5) of the total score.

## DATA ANALYSIS

Data were analysed using SPSS version 26. Descriptive statistics (frequency, percentage, mean, SD) and inferential statistics (Chi-square test) were used. A p-value $< 0.05$ was considered statistically significant.
TOOL 1: Demographic Characteristics of Nursing Students (N = 372)

**Table 1: Distribution of Students According to Age (Years)**

| Age group (years) | Frequency (n) | Percentage (%) |
|---|---|---|
| 17–20 years | 158 | 42.5 |
| 21–24 years | 174 | 46.8 |
| 25–28 years | 40 | 10.7 |
| Total | 372 | 100 |

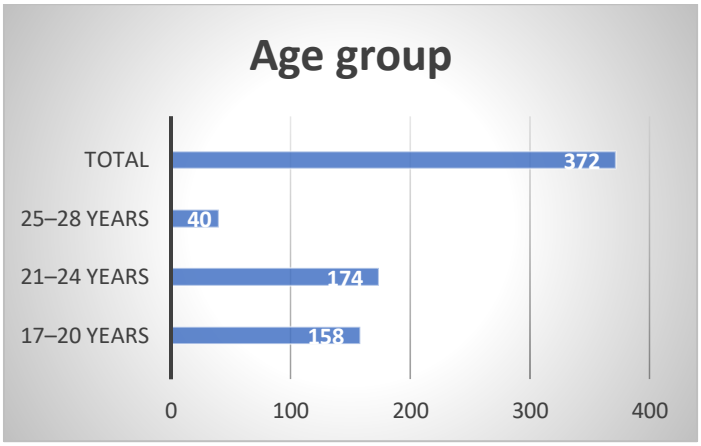


**Table 2: Distribution According to Course Enrolled**

| Course | Frequency (n) | Percentage (%) |
|---|---|---|
| B.Sc. Nursing | 242 | 65.1 |
| GNM | 130 | 34.9 |
| Total | 372 | 100 |

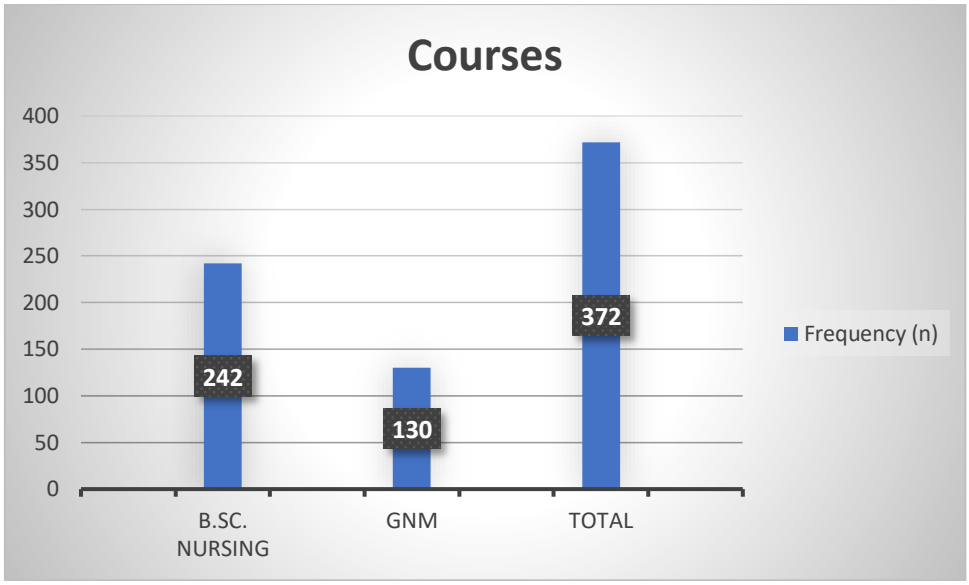


**Table 3: Distribution According to Level of Education**

| Level of Education | Frequency (n) | Percentage (%) |
|---|---|---|
| Second Year | 124 | 33.3 |
| Third Year | 138 | 37.1 |
| Fourth Year | 110 | 29.6 |
| Total | 372 | 100 |

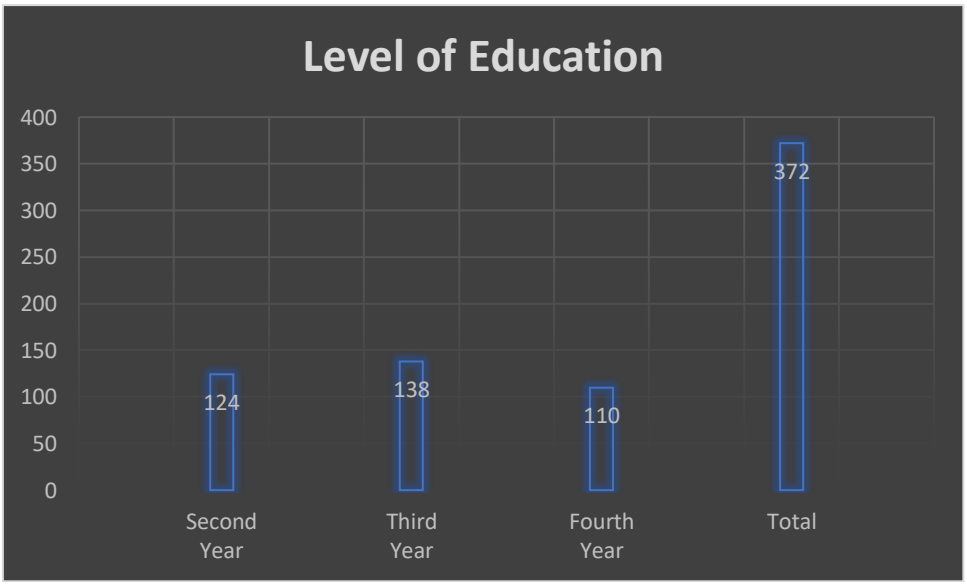


Table 4: Distribution According to Parents Working in Healthcare Setting

| Parents working in healthcare | Frequency (n) | Percentage (%) |
|---|---|---|
| Yes | 148 | 39.8 |
| No | 224 | 60.2 |

| | | |
|---|---|---|
| Total | 372 | 100 |

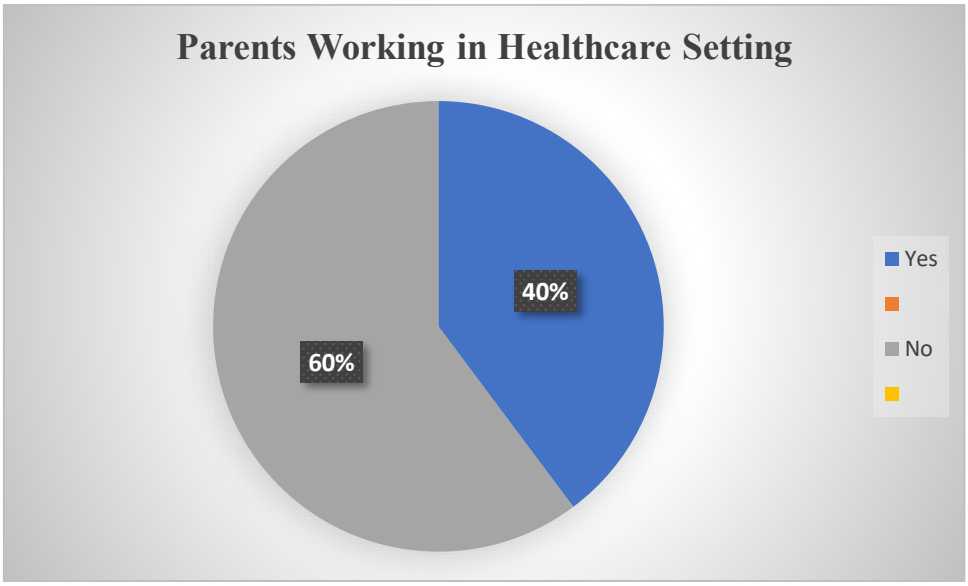


**Table 5: Distribution According to Source of Information Regarding Stroke**

| Source of Information | Frequency (n) | Percentage (%) |
|---|---|---|
| Physicians | 62 | 16.7 |
| Textbooks | 98 | 26.3 |
| Lectures & presentations | 124 | 33.3 |
| Newspapers & magazines | 38 | 10.2 |
| Nurses | 32 | 8.6 |
| Relatives/Friends | 18 | 4.9 |
| Total | 372 | 100 |

TOOL 2: a. Knowledge questionnaire of risk factors of stroke among nursing students

**Table 6: Item-wise Distribution of Correct Responses on Knowledge of Risk Factors of Stroke (N = 372)**

| Q. No | Knowledge Item (Risk Factors) | Correct response (n) |
|---|---|---|
| 1 | Age group at more risk of stroke | 286 |
| 2 | Commonest risk factor of ischaemic stroke | 312 |
| 3 | Non-modifiable risk factor | 298 |
| 4 | Lifestyle factor increasing stroke risk in young adults | 254 |
| 5 | Risk factor of subarachnoid haemorrhage | 240 |
| 6 | Smoking quantity increasing stroke risk | 218 |

| | | |
|---|---|---|
| 7 | Frequency of BP screening | 196 |
| 8 | Highest risk period for recurrent stroke | 264 |
| 9 | Risk factor for thromboembolism | 288 |
| 10 | Patient at most risk for haemorrhagic stroke | 226 |
| 11 | Stroke related to uncontrolled hypertension | 304 |
| 12 | Cardiovascular condition increasing stroke risk | 292 |
| 13 | Family history and stroke risk | 270 |
| 14 | Most beneficial lifestyle modification | 320 |
| 15 | Headache combined risk factor for stroke | 212 |

**Table 7: Distribution of Nursing Students According to Level of Knowledge on Risk Factors of Stroke (N = 372)**

| Knowledge Level | Score Range | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Good | 1–5 | 68 | 18.3 |
| Better | 6–10 | 176 | 47.3 |
| Best | 11–15 | 128 | 34.4 |
| Total | | 372 | 100 |

Tool II: b. Knowledge questionnaire of warning signs of stroke among nursing students

**Table 8: Item-wise Distribution of Correct Responses on Knowledge of Warning Signs of Stroke**

| Q. No | Warning Signs of Stroke | Correct responses (n) | Percentage (%) |
|---|---|---|---|
| 1 | Warning sign of TIA | 276 | 74.2 |
| 2 | Stroke-related vision warning sign | 302 | 81.2 |
| 3 | Meaning of “F” in FAST | 324 | 87.1 |
| 4 | Speech-related warning sign | 268 | 72.0 |
| 5 | Warning sign of most common type of stroke | 234 | 62.9 |
| 6 | NOT a FAST sign | 310 | 83.3 |
| 7 | Uneven smile indicating stroke sign | 328 | 88.2 |
| 8 | Other warning sign besides FAST | 292 | 78.5 |
| 9 | Meaning of “S” in FAST | 316 | 84.9 |
| 10 | Common warning signs of stroke | 334 | 89.8 |
| 11 | Meaning of “A” in FAST | 320 | 86.0 |

| | | | |
|---|---|---|---|
| 12 | NOT a common warning sign | 290 | 78.0 |
| 13 | Most significant warning sign in elderly | 260 | 69.9 |
| 14 | Stroke type causing severe headache | 248 | 66.7 |
| 15 | NOT a common stroke warning sign | 304 | 81.7 |

**Table 9: Distribution of Nursing Students According to Level of Knowledge on Warning Signs of Stroke (N = 372)**

| Knowledge Level | Score Range | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Good | 1–5 | 52 | 14.0 |
| Better | 6–10 | 162 | 43.5 |
| Best | 11–15 | 158 | 42.5 |
| Total | | 372 | 100 |

TOOL II: c. Students responses toward management of stroke

**Table 10: Distribution of Students According to Responses toward Management of Stroke (N = 372)**

| Sl. No. | Statements on Stroke Management | YES n (%) | NO n (%) |
|---|---|---|---|
| 1 | I will call the ambulance | 328 (88.2) | 44 (11.8) |
| 2 | I will give home remedies | 62 (16.7) | 310 (83.3) |
| 3 | I will give the patient the first pain killer to control the pain | 74 (19.9) | 298 (80.1) |
| 4 | I won't do anything to let the patient recover by him/herself | 28 (7.5) | 344 (92.5) |
| 5 | I will take the patient to the hospital immediately | 346 (93.0) | 26 (7.0) |

## RESULTS

Most students (46.8%) were aged between 21–24 years. Majority were B.Sc. Nursing students (65.1%), with 37.1% studying in the third year. More than half (60.2%) reported that their parents were not healthcare workers. Lectures and presentations were the primary source of stroke-related information. Nearly half of the students (47.3%) had better knowledge, while 34.4% demonstrated best knowledge regarding risk factors. High awareness was observed for hypertension and lifestyle-related risk factors, whereas gaps were noted in smoking-related risks and blood pressure screening.

Regarding warning signs, 42.5% of students had best knowledge and 43.5% had better knowledge. Awareness of FAST symptoms was high, though some students showed difficulty in identifying stroke type–specific warning signs. Majority of students reported appropriate emergency responses: 93% would take the patient to hospital immediately and 88.2% would call an ambulance. However, a small proportion still believed in home remedies and use of painkillers.

## DISCUSSION

The present study was undertaken to assess the knowledge regarding the risk factors, warning signs, and management of stroke among nursing students in selected nursing colleges of West Bengal. The findings of the study are discussed in relation to the objectives and compared with findings of previous studies.

The present study revealed that a majority of nursing students possessed moderate to good knowledge regarding risk factors of stroke. Nearly half of the participants demonstrated *better knowledge,* while over one-third exhibited *best knowledge.* This finding indicates that nursing students are generally aware of major stroke risk factors such as hypertension, lifestyle factors, and cardiovascular conditions, although gaps still exist in specific preventive aspects such as smoking-related risks and blood pressure screening.

These findings are consistent with the study conducted by Badria et al., who reported a moderate level of knowledge among nursing students, with higher knowledge scores observed among senior students compared to juniors[1]. The improvement in knowledge with advancing academic year suggests that clinical exposure and curricular progression contribute positively to stroke-related awareness.

Similarly, Abuawad reported that although health sciences students showed awareness of stroke risk factors, non-medical students, including nursing students, had comparatively lower knowledge levels, emphasizing the need for focused educational interventions[2]. This aligns with the present study, which identified areas where knowledge reinforcement is required despite overall satisfactory awareness.

In contrast, Cutinho and Chakrabarty et al. reported unsatisfactory knowledge levels among students and caregivers in India[3]. The comparatively better findings in the present study may be attributed to increased academic emphasis on non-communicable diseases and improved access to educational resources among nursing students.

In the present study, knowledge regarding warning signs of stroke was found to be relatively higher than knowledge of risk factors. A significant proportion of students demonstrated *best* and *better* knowledge, particularly related to FAST warning signs such as facial drooping, arm weakness, and speech difficulty. This suggests effective dissemination of stroke symptom awareness through classroom teaching and clinical instruction.

These findings are supported by Kankaya and Yesilbalkan, who reported that nursing students had good awareness of warning signs, although the level was lower than expected[6]. The authors emphasized the need for further strengthening stroke-related content in nursing education, which is also supported by the present study.

However, the present findings contrast with Wasiu, who observed poor knowledge of warning signs despite good awareness of risk factors among undergraduate students[8]. The difference may be due to the healthcare background of nursing students in the present study, who receive formal instruction on emergency conditions such as stroke.

Additionally, Syed et al. reported variation in knowledge of warning signs among healthcare students, with persistent gaps in recognizing acute stroke symptoms[7]. The relatively higher awareness in the present study indicates gradual improvement in stroke education among nursing students, though continuous reinforcement remains necessary.

The present study demonstrated encouraging findings regarding students' responses toward stroke management. The majority of participants indicated that they would call an ambulance and take the patient to the hospital immediately, reflecting appropriate emergency response behavior. This highlights a positive attitude toward early stroke management among nursing students.

These findings are in agreement with Okechukwu et al., who reported high knowledge of stroke among healthcare workers but comparatively poorer preventive practices[4]. Although the present study showed better emergency response intentions, the presence of misconceptions such as administering painkillers or using home remedies indicates a gap between theoretical knowledge and correct clinical action.

Similarly, Marjorie Miraclin K et al. emphasized that although most paramedical students had good knowledge, there was a need for innovative educational approaches to translate knowledge into effective practice[5]. This observation supports the present study's recommendation for simulation-based and skill-oriented stroke training programs.

The overall findings of the present study suggest that nursing students in selected nursing colleges of West Bengal possess adequate theoretical knowledge regarding stroke risk factors and warning signs, with comparatively better awareness of emergency symptoms than preventive aspects. However, inconsistencies in management-related responses highlight the need for practical training to bridge the gap between knowledge and action.

The findings reinforce conclusions from earlier studies that structured education, repeated reinforcement, and clinical exposure are essential to improve stroke-related knowledge and preparedness among future nurses.[1, 2, 6].

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