



DEMOGRAPHIC FACTORS ASSOCIATED WITH PUBLIC KNOWLEDGE OF STROKE SYMPTOMS AMONG ASIAN POPULATIONS: A NARRATIVE REVIEW

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ABSTRACT

Public knowledge of stroke symptoms plays an important role in early recognition and timely treatment, particularly in the pre-hospital phase. In Asian populations, demographic characteristics may influence the level of awareness, but findings across studies have not always been consistent. This article aimed to review the relationship between demographic factors and knowledge of stroke symptoms through a narrative review of previous studies. Ten cross-sectional studies published between 2020 and 2025 were identified through database searches in PubMed and Google Scholar with predefined inclusion criteria. The included studies involved heterogeneous populations, including community-based samples, older adults, healthcare professionals, and outpatients with recurrent stroke or transient ischemic attack. Overall, the findings showed that education was the most consistent factor associated with better stroke knowledge. In contrast, associations with age, information sources, place of residence and socioeconomic status varied across studies and settings. Recognition of core stroke symptoms, particularly those reflected in the FAST concept, tended to be better than knowledge of less consistently identified symptoms and appropriate response patterns. Several studies also showed persistent gaps in prevention knowledge, symptom recognition and emergency response. These findings suggest that stroke awareness in Asian populations remains heterogeneous. Community-based education and improved access to context-appropriate health information are therefore needed to strengthen public understanding of stroke symptoms and support early recognition and response.

Keywords: Asian population; demographic factors; early detection; stroke knowledge

1. INTRODUCTION

Stroke is the third leading cause of death and the fourth leading cause of disability worldwide with a steadily increasing trend (Feigin et al., 2024; World Health Organization, 2024). Across Asia, the burden of stroke remains considerable, particularly in East Asia and Southeast Asia, where incidence, prevalence, mortality, and disability have shown increasing patterns in recent years. In contrast, trends in other parts of Asia appear to be more stable or variable over the same period (Feigin et al., 2024).

One of the main causes of the high stroke burden is the low level of awareness among Asian populations regarding stroke symptoms. Many individuals are unable to recognize stroke symptoms using the FAST (Face, Arm, Speech, Time) scale (Rioux et al., 2022). This contributes to high rates of delay in seeking medical attention. Although most patients are eligible for thrombolysis, only a small proportion actually receive it due to delays in hospitalization (Zhao et al., 2024). Campaigns using the FAST approach have been shown to increase awareness of the core symptoms of stroke although their effectiveness remains limited because they do not reach populations with low education levels or those living in high-risk rural areas (Zhang et al., 2020; Kleinig et al., 2024). These campaigns have also been successful in reducing delays in hospitalization (Heuschmann et al., 2021).

Furthermore, participation in education among at-risk groups such as stroke survivors and caregivers remains low (Widjaja et al., 2021; Lobo et al., 2025). Community-based interventions are also rarely comprehensively evaluated (Zhong et al., 2020; Abbasian et al., 2024). The dominance of social media as a source of information without guidance from healthcare professionals also presents a challenge (Sakr et al., 2023; Abbasian et al., 2024).

This review addresses a gap in the literature by specifically synthesizing the influence of demographic factors, such as education, age, socioeconomic status, and place of residence, on public knowledge in diverse Asian populations. Asia's heterogeneity in culture, education, urbanization, and healthcare access may contribute to significant variations in stroke awareness. By focusing on demographic determinants, this review provides a targeted understanding of factors influencing stroke knowledge, which can inform more effective, context-sensitive educational strategies.

2. METHODS

2.1. Data Sources

This literature review was based on searches in the PubMed and Google Scholar databases. The searches were conducted using predetermined keywords.

2.2. Research Flow

A literature search was conducted to identify relevant studies of public knowledge of stroke. The search strategy combined the Medical Subject Headings (MeSH) and the free-text terms by using the Boolean operators, including (“Stroke” [MeSH] OR stroke) AND (awareness OR knowledge OR “symptom recognition”) AND (Asia OR Indonesia OR China). Such geographic terms as Asia, Indonesia, and China were included to capture studies of Asian populations.

The search was limited to articles published between 2020 and 2025, written in English, and available as a full text. The search strategy was designed to support a narrative synthesis rather than a systematic review, allowing flexibility in the study selection based on relevance to the research objectives.

2.2.1. Rationale for Study Selection

Only 10 articles were included to focus on studies specifically addressing demographic factors affecting stroke knowledge in Asia. This limitation was necessary to maintain relevance and allow a detailed narrative synthesis.

2.2.2. Literature Search Strategy

The search was carried out from May 1 to July 16, 2025, by using the following keywords: “stroke knowledge”, “stroke awareness”, “onset stroke”, and “Asian populations”.

2.2.3. Inclusion Criteria

The articles were included if they met the following requirements:

1. Original research articles with a cross-sectional design
2. Research using survey methods (questionnaire/interview) involving the general population, patients, or healthcare professionals
3. Articles focusing on assessments of stroke symptom knowledge
4. Studies conducted in Asia
5. Articles written in English, available in a full-text version, and published between 2020 until 2025.

2.2.4. Exclusion Criteria

The articles were excluded if they were:

1. Reviews, systematic reviews, scoping reviews, or meta-analyses
2. Studies conducted on special populations (e.g., healthcare students)
3. Studies involving non - Asian populations
4. Articles not available in a full-text format.

2.2.5. Selection and Data Extraction Process

The retrieved articles were screened based on titles and abstracts. The eligible articles were then read in full, and information was extracted, including the first author and year of publication, country, participant population, identified stroke symptoms, and related demographic factors.

2.2.6. Quality Assessment

A formal quality assessment was not conducted, as this is a narrative review focusing on descriptive synthesis of the findings rather than quantitative comparison or meta-analysis.

2.2.7. Data Analysis

The data were analyzed descriptively and comparatively by comparing the results across the studies to identify patterns or trends. The analysis results were presented in tables and narrative descriptions.

3. RESULTS AND DISCUSSION

3.1. Levels of Stroke Symptom Knowledge among Asian Populations

This review includes 10 studies conducted in Asian countries such as China, Indonesia, Thailand, Jordan, Lebanon, Sri Lanka, Saudi Arabia, United Arab Emirates (UAE), and Syria. The analysis shows that the levels of knowledge of stroke symptoms among the Asian populations vary considerably. Knowledge levels varied considerably across settings. Jordan showed relatively stronger recognition of core stroke symptoms, whereas findings from Lebanon and Syria remained heterogeneous and indicated incomplete awareness in several domains ([Barakat et al., 2021](#); [Saade et al., 2022](#); [Kharaba et al., 2024](#)). For example, [Barakat et al. \(2021\)](#) reported that 92.3% of the participants in Jordan recognized difficulty speaking or understanding speech as a stroke symptom, while 88.0% recognized unilateral body weakness.

A comparable pattern of moderate and uneven knowledge was observed in China. [Zhong et al. \(2020\)](#) reported that among community residents in Chengdu, awareness of stroke risk before receiving health education was only 11.4%, while recognition of specific warning signs ranged from 29.8% to 59.5%; major signs such as limb weakness, language disturbance, and imbalance were recognized by more than half of the participants. These findings were consistent with a broader systematic review and meta-analysis by [Zhao et al. \(2024\)](#), which estimated that prehospital care-seeking delay occurred in 68% of acute ischemic stroke patients across the included studies and identified limited public awareness of stroke symptoms as one of the

contributing factors. Taken together, these findings suggest that although some core stroke symptoms are moderately recognized among Chinese populations, overall symptom knowledge remains insufficient to support timely treatment-seeking behavior.

A similar gap between general stroke awareness and specific symptom knowledge was found in South Asian and Gulf populations. [Chang et al. \(2020\)](#) reported that more than 90% of participants in Sri Lanka were aware of stroke risk factors in general; however, specific risk factors such as hypertension and diabetes were less well recognized, and male sex, lower education, and limited access to media were identified as barriers to adequate knowledge. A comparable discrepancy was observed in Saudi Arabia, where [Mubaraki et al. \(2021\)](#) found that 61.7% of participants in Taif city were aware of stroke, yet only 57.5% correctly identified slurred speech as a stroke symptom and just 36.2% recognized dizziness, the least identified symptom. Despite this limited symptom-specific knowledge, 86.6% of participants agreed that stroke was a medical emergency, indicating a discrepancy between the perceived urgency of stroke and the actual ability to recognize its symptoms.

In contrast, a study conducted in a rural community in southern Thailand reported comparatively lower levels of stroke knowledge ([Wanichanon et al., 2024](#)). Among 247 participants, the median score for recognition of stroke warning symptoms was only 6 out of a possible 10, and approximately half of the participants were unable to correctly identify several risk factors and warning symptoms. Participants who had previously been exposed to the Face, Arm, Speech, Time (FAST) campaign showed a significantly higher proportion of correct answers on FAST-related symptoms, underscoring the importance of targeted health education in strengthening symptom recognition in rural settings. In Indonesia, the data from [Widjaja et al. \(2021\)](#) showed that only 23.3% of stroke survivors demonstrated moderate to good knowledge of stroke in general (including symptoms, risk factors, and prevention strategies). Although the study did not specifically separate symptom knowledge, the generally low level of awareness among survivors indicated a potential gap in early recognition of stroke ([Widjaja et al., 2021](#)).

3.2. The Most and Least Recognized Symptoms

The most frequently recognized symptoms across the studies were weakness on one side of the body, slurred speech or difficulty speaking, and balance disturbances. These symptoms are consistent with the FAST protocol (Face, Arm, Speech, Time), which has often been used in stroke education campaigns in Asian populations. For instance, [Kharaba et al. \(2024\)](#) found that more than 70% of the participants in Syria identified these core symptoms.

On the other hand, non-FAST symptoms and several less consistently identified items were recognized less often across studies. Some studies also showed misidentification of non-stroke symptoms, indicating gaps in public understanding beyond the core FAST signs. In a study by [Ramadan et al. \(2023\)](#) in the UAE, only 21.2% of the participants recognized vomiting as a stroke symptom, and only 10.6% recognized fever. These findings highlight the need to strengthen public understanding beyond the core FAST signs while also reducing misidentification of non-stroke symptoms.

This pattern of a most-versus-least recognized symptom gap was also evident within individual country studies. Barakat et al. (2021) found that in Jordan, 92.3% of participants recognized difficulty speaking as a stroke symptom, while less common signs were identified far less consistently. A similar pattern was reported by Zhong et al. (2020) in China, where limb weakness, language disturbance, and imbalance were each recognized by more than half of the participants, indicating that FAST-related signs were comparatively easier to identify than other warning symptoms. In Saudi Arabia, [Mubaraki et al. \(2021\)](#) reported that slurred speech was the most identified symptom (57.5%), whereas dizziness was the least identified (36.2%), a pattern broadly consistent with the low recognition of non-FAST symptoms such as vomiting and fever observed in the UAE.

Taken together, these findings reinforce that public education campaigns emphasizing the FAST protocol have been comparatively successful in embedding recognition of its core signs, but have left a persistent gap in recognition of less typical, non-FAST stroke symptoms across Asian populations.

3.3. Influence of Education, Age, and Place of Residence

Education emerged as the most consistent demographic factor associated with better stroke symptom knowledge. Findings related to age and place of residence were more mixed across studies, suggesting that these factors may operate differently depending on population and setting. The participants with secondary or higher education consistently demonstrated greater ability to recognize stroke symptoms. This pattern was evident in studies conducted in Lebanon (Saade et al., 2022).

The findings related to age were more varied. Younger individuals (<40 years), particularly students, showed good knowledge in some studies (Mubarak et al., 2021; Ramadan et al., 2023). Nevertheless, patterns related to age and place of residence were not uniform across studies, indicating that these demographic influences may differ by setting and population characteristics (Zhong et al., 2020). A study in Thailand highlighted high rates of misidentification of stroke symptoms among rural populations (Wanichanon et al., 2024).

Additional evidence from individual studies further supported the role of education. Barakat et al. (2021) found that in Jordan, educational level was significantly associated with the ability to identify at least one early stroke symptom and to respond appropriately. A similar association was reported by Sakr et al. (2023) among elderly participants in Lebanon, where holding a university degree was significantly associated with better knowledge of stroke risks, and by Saade et al. (2022), who found that a university degree was linked to a higher stroke knowledge score among Lebanese adults. Regarding place of residence, Saade et al. (2022) reported that participants living in Mount Lebanon had significantly lower knowledge scores than those in Beirut, indicating that geographic disparities in stroke knowledge could exist even within a single country. Meanwhile, being a student was associated with better stroke knowledge among younger participants in the UAE, further supporting the link between formal education and symptom awareness (Ramadan et al., 2023).

3.4. Sources of Information about Stroke

The common sources of information about stroke included social media, television, as well as family and friends. Meanwhile, only a few participants mentioned healthcare professionals. Although healthcare professionals were identified as important potential sources of stroke information, their role in knowledge dissemination appeared to vary across settings (Sakr et al., 2023).

However, Abbasian et al. (2024) noted that although media campaigns were effective in reaching large audiences, such approach alone was insufficient to create a long-term behavioral change. Combining media exposure with face-to-face education could yield more sustainable outcomes. More detailed data on information sources were available from individual studies. In Jordan, Barakat et al. (2021) found that the internet and social media were the most frequently used source of stroke information (24.4%), followed by healthcare professionals (20.9%) and family or relatives (15.2%), suggesting that informal and unregulated channels dominated over professional ones. However, relying on the internet did not necessarily translate into better practical knowledge: Saade et al. (2022) reported that Lebanese adults who obtained stroke information from the internet had significantly lower scores on a validated measure of appropriate response to stroke symptoms. This was further corroborated by Sakr et al. (2023), who found that seeking stroke information from pharmacists, physicians, or the internet was not significantly associated with better knowledge among elderly participants in Lebanon. Together, these findings suggest that the volume of exposure to stroke

information does not guarantee accurate or actionable knowledge, reinforcing the need for structured, professionally guided health education rather than passive media exposure alone

3.5. Role of Personal Experience and Caregivers

Prior exposure to stroke, including knowing someone with stroke or being familiar with stroke-related information, appeared to support awareness in some studies. However, this pattern was not universal (Barakat et al., 2021; Chang et al., 2020). Interestingly, Widjaja et al. (2021) found that personal experience of stroke did not always correlate with higher knowledge; only 23.3% survivors demonstrated moderate or good understanding. Although this study measured overall stroke knowledge (including risk factors and treatment adherence), the findings indicated that post-stroke education remained inadequate (Widjaja et al., 2021).

Lobo et al. (2025) highlighted the role of informal caregivers who were usually family members providing daily care for 4-13 hours. Many caregivers lacked formal training, which negatively affected patient outcomes and increased the risk of recurrent stroke. This finding emphasizes the importance of stroke education focusing on caregivers. In addition, the review by Lobo et al. (2025) also stressed the mismatch between caregiver information needs and the educational materials available. Personalized, context-based education delivered by healthcare professionals was recommended as a more effective approach.

The inconsistency of this relationship was further illustrated by Sakr et al. (2023), who found that Lebanese elderly participants with a history of a previous ischemic attack showed significantly lower knowledge of stroke alarming signs and prevention measures compared with those without such history. This unexpected finding suggests that personal illness experience alone, without accompanying structured education at the time of the event, may not translate into improved symptom knowledge, and in some cases may even coincide with persistent knowledge gaps among those most at risk of recurrence. To provide a consolidated overview of these demographic patterns, Table 1 summarizes the sample characteristics, demographic factors, and corresponding levels of stroke symptom knowledge reported across the included studies.

Table 1. Relationship between demographic factors and stroke knowledge

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No	Author, Year	Country	Sample Size	Sample Category	Methods	Demographic Factors				Knowledge of Stroke Symptoms		Level of Significance	
						Education *	Information source*	Socioeconomic*	Age*	Stroke Symptom Recognition*	Less Recognized Symptoms **		
1.	Zhong et al., 2020	China	1685	Community, ≥ 18 years old	Cross sectional, survey approach, and health education intervention	Primary/unspecified (35.4%); high school (35.3%); university (29.3%)	Print media (38.6%), social media (36.7%), TV (28.4%)	Urban/sub-urban communities (69.2%); rural communities (30.8%)	18-36 years (23.7%); 37-55 years (35.1%); 56-74 years (34.1%)	Limb weakness (59.5%), balance disorders (56.7%), speech difficulties (56.6%)	Chest pain/panic (31.6%), blurred vision (29.8%), shortness of breath (27.9%)	Knowledge of stroke symptoms improved after stroke health education intervention (p<0.001).	
2.	Chang et al., 2020)	Sri Lanka	840 general public, 98 physician s/general practitioners	Relatives of non-stroke patients and physician s	Cross sectional, survey approach	Secondary school (31%), high school (30.1%), university (3.8%)	Friends/family of stroke survivors (45.6%), TV (36.4), newspaper (29.8%)	Urban participants (36.3%); professional and administrative (15.4%); technical medium-to-high income (60.6%), low income (39.4%)	18-24 years; 25-44 years; 45-64 years	Weakness of face/arm/leg on side (95.8%), speech difficulties (83.3%); numbness (79.5%)	Chest pain (35%)	Low income was associated with lower knowledge of stroke symptoms, adjusted OR = 95% CI: 2.0 (1.4-2.9); 1.0.	
3.	Mubarki et al., 2021	Saudi Arabia	3456	Community, ≥ 18 years old	Cross sectional, online questionnaire survey	University (69.2%), primary/secondary education (30.8%)	TV or social media (41.4%), family/friends (26.1%), healthcare professionals (22.2%)	students (49%), employed (30.5%), unemployed (20.6%)	15-39 years (71.7%), 40-59 years (19.6%), ≥ 60 years (8.7%)	Slurred speech (57.5%), balance disturbance (49.2%), confusion (45.7%)	Dizziness (36.2%), visual disturbance (38.8%), facial weakness (38.4%)	Good knowledge was significantly associated with marital status (unmarried), higher education, and occupation (student) (p < 0.001). Age of 15-39 years was also significant (p= 0.002).	

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4.	Barakat et al., 2021	Jordan	573	Community > 18 years	Cross sectional, online questionnaire approach	University (93.4%), primary education (6.6%)	Internet/social media (24.4%), healthcare professionals (20.9%), family/relatives (15.2%)	Urban (85.9%), rural (14.1%); middle income (52.7%), high income (21.3%); employed full-/part time (60.4%); others including student, homemakers, retirees, unemployed (39.6%).	<30 years (31.9%), 30-49 years (47.1%), > 50 years (21%)	Difficulty speaking or understanding (92.3%), unilateral body weakness (88%), facial droop (85.7%)	Not reported	University-level education was significantly associated with better recognition of stroke symptoms (β = 1.2; OR (95% CI) = 3.4 (1.1 - 9.8); p = 0.023).	
5.	Widjaja et al., 2021	Indonesia	215	Outpatients (ischemic stroke recurrence or Transient Ischemic Attack (TIA))	Cross sectional, survey approach	Secondary school or lower (85.6%), higher education (14.4%)	Not analyzed	Not analyzed	47-65 years (mean 56.3 $\pm$ 8.7 years)	Unilateral paralysis (79%), headache (52%)	Visual disturbance (2.33%)	No demographic factors were significant in the multivariate model.	
6.	Saade et al., 2022)	Lebanon	410	Community >18 years	Cross sectional, online survey	Higher education (89%), secondary education (35%), primary education (2.2%)	Family (99%), friends (96.6%)	Urban/suburban (68.2%), rural (31.8%). Single (48.3%), married (48%), divorced (3.7%). Employed (62.7%), Unemployed (37%). With social insurance (62%), without social insurance (38%)	18-44 years, 45-64 years, $\geq$ 65 years	Sudden weakness (57.6%), speech difficulty on one side of the body (49.8%)	unilateral (65.8%), difficulty numbness (24.6%), sudden loss of coordination (0.7%)	Sudden dizziness (25.1%), sudden confusion (24.6%), sudden loss of coordination (0.7%)	Good stroke knowledge was significantly associated with university education (β = 7.217; 95% CI = 2.123 -12.311; p = 0.006). Poor knowledge was significantly associated with rural (Mount Lebanon) (β

= -8.189; CI = -12.843 to -4.795); $p < 0.001$).

Table 1. Relationship between demographic factors and stroke knowledge

7.	Sakr et al., 2023	Lebanon	513	Community ≥ 65 years	Cross sectional, online survey	Primary (56%), secondary/higher (44%)	Physicians (74%), pharmacist (57%), internet (41%)	Urban (42%), non-urban (58%). Single/widowed/divorced (34%) married (66%). With social insurance (56%), without social insurance (44%)	65-78 years (mean=71.74 $\pm$ 6.41 years)	Unilateral weakness (88%), speech difficulties (87%), dizziness/loss balance (85%)	Not reported	No demographic factors were significantly associated with stroke symptom knowledge in the multivariable analysis.
8.	Ramadan et al., 2023	United Arab Emirates	500	Community >18 years	Cross sectional, online survey	Bachelor/diploma (45.2%), postgraduate (36.5%), High school or lower (18.3%)	Electronic media friends (40.4%), healthcare professionals (30%),	Urban; marital status: single (59.4%), married (37%), divorced (1.8%). Employment: students (48.4%), employed (31.4%), housewife (15%). Monthly income: low (57.4%), medium (15.2%), high (1.6%)	18-25 years (53.4%), 26-35 years (18.6%), 36-45 years (18.4%)	Confusion (64.6%), numbness (64.4%), difficulty walking (58.8%)	Vomiting (21.2%), fever (10.6%)	Good knowledge was significantly associated with student status (parameter estimate = 2.45; standard error = 1.20; $p = 0.04$).
9.	Wanichanon et al., 2024	Thailand	247	Community >18 years	Cross sectional, survey approach	Middle/primary school (52.5%), high school and higher education (47.5%)	Not analyzed	Rural community. Marital status: single/widowed (27.5%), married (72.5%). Occupation: agriculture (42.2%), self-employed (16.4%), employee (9.4%). Majority had low income	≥ 18 years	Correct responses: Sudden speech difficulty (59.9%), sudden difficulty walking or loss of balance (57.9%), sudden unilateral weakness of face, arm, or hand (57.1%)	Incorrect responses: Sudden chest pain (68%), sudden muscle pain in both arms or legs (64%), sudden numbness in arms and legs (44.9%)	Marital status (married) was significantly associated with stroke symptom knowledge ($\beta = 0.51$; 95% CI = 0.02-1.01; $p = 0.042$).

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10.	Kharab a et al., 2024	Syria	1013	Community , ≥ 15 years, primary healthcare users (without medical diagnosis)	<i>Cross sectional, online survey</i>	Higher/uni versity (65%), primary (35%)	Internet/so cial media (20.2%), family/frie nds (17.8%), healthcare profession als (16.9%)	Urban (78.8%), rural (21.2%); marital status: single (42.2%), married (27.8%). Employment: employed (55.6%), unemployed (44.4%). Income: low (62.3%), medium (22.3%)	18-24 years (41.2%), 25-34 years (29.3%), 35-44 years (15.5%).	Unilateral weakness (71.9%), speech disturbance (68.7%), difficulty walking (65.7%).	Fainting (40.7%), seizures (30.7%)	University level of education was significantly associated with better recognition of stroke symptoms ($\beta = 1.165$; OR = 3.207; 95% CI = 1.304-7.888; $p =$ 0.011)
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Notes:

1. * = data were taken from 1 to 3 highest percentage value
2. ** = data were taken from 1 to 3 lowest percentage value
3. β = regression coefficient
4. OR = odds ratio
5. CI = confidence interval
6. P = p-value

3.6. Effectiveness of Educational interventions

In China, the only intervention study that met the inclusion criteria of this review demonstrated that stroke education significantly improved knowledge and emergency responses (Zhong et al., 2020). This finding was consistent with Abbasian et al. (2024) who reported that multimedia-based, and culturally tailored interventions were effective in raising stroke awareness. Technology, such as mobile applications and telemedicine services, was also highlighted as a promising educational channel, particularly in areas with limited access to healthcare services (Abbasian et al., 2024).

The magnitude of improvement observed by Zhong et al. (2020) further illustrated the potential impact of structured intervention. After the intensive educational program, the proportion of participants who indicated they would make an emergency call upon recognizing stroke warning signs rose from 53.2% to 82.7%, alongside significant gains in the identification of stroke risk factors and warning signs. This magnitude of change suggests that even a single, well-designed community-based intervention can substantially narrow the gap between symptom awareness and appropriate emergency response, reinforcing the broader argument by Abbasian et al. (2024) that structured, sustained educational efforts are more effective than passive information exposure alone.

3.7. Study limitations

This review had several limitations that should be considered when interpreting its findings. In terms of geographical representation, although the studies reviewed covered several regions in Asia, some areas such as Central Asia and East Asia were still underrepresented. This might limit the generalizability of the findings across the entire continent.

In addition, there were methodological differences among the studies, both in the definitions and in the instruments used to assess the stroke knowledge. Such variation made direct comparisons less optimal. The scope of focus was also a limitation. Some studies did not clearly distinguish knowledge of stroke symptoms from general stroke knowledge, resulting in less specific findings. Furthermore, certain studies did not report key demographic information such as socioeconomic status or access to healthcare services, factors that could influence the level of knowledge in Asian populations.

Urban bias was also apparent as many studies were conducted in urban settings. This carried the risk of overlooking rural populations, who often had more limited access to health information. Despite these limitations, this review still provides a strong overview of the variations in stroke symptom knowledge across Asian populations and the demographic factors influencing them.

3.8. Implications

Stroke health promotion in Asia must be tailored to demographic, social, and geographic conditions. Based on the findings of this review, several important implications can be used as a reference. First, educational programs should focus on vulnerable groups at risk of low knowledge levels, such as Asian populations with lower educational attainment, limited access to health information, and those living in underserved settings. A more targeted approach to these groups is expected to reduce information gaps and raise awareness early.

Second, effective health promotion requires multi-sectoral collaboration. Health workers, mass media, schools, religious/community leaders, and local institutions need to be synergistically involved. This cross-sectoral integration not only expands the reach of interventions but also increases the credibility and trustworthiness of the educational messages delivered.

Third, the involvement of stroke survivors and caregivers holds significant potential as part of an educational strategy. By empowering them through basic training and mentoring, survivors and their families can act as educational agents, strengthening recurrence prevention efforts while improving the ability of Asian populations to recognize stroke symptoms early.

Finally, the use of digital technologies such as social media and health applications (apps) needs to be optimized. However, to be effective, the content disseminated must be validated by medical professionals to ensure the information received by Asian populations is accurate, relevant, and accountable.

4. CONCLUSION

Education was the most consistent factor associated with better stroke symptom knowledge across the included studies. In contrast, findings related to age, socioeconomic status, information sources, and place of residence were more variable across populations and settings. Overall, stroke awareness in Asian populations remains heterogeneous, suggesting the need for targeted, context-sensitive educational strategies and improved access to reliable health information.

5. ACKNOWLEDGMENTS

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6. CONFLICT OF INTEREST

All authors declared that there was no conflict of interest.

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