

## Postprint: A Study on the Current Status and Influencing Factors of Intention for High-Risk Stroke Screening Among Community Residents in Guangdong Province

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### Abstract

**Background** The stroke high-risk population screening program is a national health project vigorously promoted in China, but low participation rates among residents have been found in practice, seriously affecting screening efficacy. Screening intention is an important predictor of screening behavior, yet research on the current status of residents' intention for stroke high-risk screening and its influencing factors is scarce. **Objective** To understand the current status of community residents' intention for stroke high-risk screening and explore the factors influencing residents' intention for stroke high-risk screening. **Methods** From March to May 2022, 648 residents of Guangdong Province were conveniently sampled as survey subjects and investigated using a self-designed questionnaire (including a general information survey form, Stroke High-Risk Screening Intention Scale, Stroke Health Knowledge Scale, Community Medical Service Trust Scale, and Perceived Social Support Scale). Scores on the Stroke High-Risk Screening Intention Scale were compared among residents with different characteristics, and multiple linear regression was used to analyze factors influencing residents' intention for stroke high-risk screening. **Results** A total of 600 valid questionnaires were recovered, with an effective response rate of 92.6%. The average total score on the Stroke High-Risk Screening Intention Scale was  $(101.30 \pm 14.98)$  points, among which 352 (58.7%) residents had high screening intention, and 248 (41.3%) residents had moderate or low screening intention. Statistically significant differences in Stroke High-Risk Screening Intention Scale scores were found among residents with different characteristics in terms of gender, living status, hypertension status, hyperlipidemia status, smoking status, awareness of stroke high-risk screening, previous implementation of stroke high-risk screening in their community, previous acceptance of

stroke high-risk screening, perceived lifetime risk of stroke, and perceived risk of stroke within one year ( $P < 0.05$ ). Residents' Stroke High-Risk Screening Intention Scale scores were positively correlated with their Stroke Health Knowledge Scale scores, Community Medical Service Trust Scale scores, and Perceived Social Support Scale scores ( $P < 0.05$ ). Multiple linear regression analysis showed that gender, hypertension status, hyperlipidemia status, whether the community had previously implemented stroke high-risk screening, perceived lifetime risk of stroke, Perceived Social Support Scale score, Community Medical Service Trust Scale score, and Stroke Health Knowledge Scale score were influencing factors of residents' Stroke High-Risk Screening Intention Scale scores ( $P < 0.05$ ). Conclusion The intention for stroke high-risk screening among community residents in Guangdong Province is generally at a high level, but the screening intention level of some residents remains to be improved. Communities should focus on male residents with weaker screening intention, strengthen the popularization of stroke health knowledge, especially regarding risk factors, and help residents scientifically understand their personal risk of stroke and the importance of high-risk screening. At the national level, investment in screening equipment and medical facilities for community health service institutions should be increased, community medical talent team building should be emphasized, and the stroke high-risk population screening capacity of community health service institutions should be effectively improved to enhance residents' trust in community medical services. Simultaneously, attention should be paid to the positive influence of social support level on residents' intention for stroke high-risk screening, and through increased social publicity efforts, an atmosphere of universal participation in screening should be created to effectively improve residents' intention level to participate in stroke high-risk screening.

## Full Text

### Current Status and Influencing Factors of the Intention to Screen for High-risk Stroke among Community Residents in Guangdong

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## Abstract

**Background:** The stroke high-risk population screening project is a national health initiative being vigorously promoted in China. However, low resident

participation rates have been observed in practice, seriously affecting screening efficacy. Screening intention is an important predictor of screening behavior, yet few studies have examined the current status and influencing factors of residents' intention to screen for high-risk stroke.

**Objective:** To understand the current status of intention to screen for high-risk stroke among community residents and explore its influencing factors.

**Methods:** From March to May 2022, 648 residents of Guangdong Province were selected through convenience sampling and surveyed using a self-designed questionnaire (including General Data Questionnaire, Stroke High-Risk Screening Intention Scale, Stroke Health Knowledge Scale, Community Medical Service Trust Scale, and Perceived Social Support Scale). Scores on the Stroke High-Risk Screening Intention Scale were compared across residents with different characteristics, and multiple linear regression was used to analyze factors influencing screening intention.

**Results:** A total of 600 valid questionnaires were collected (valid response rate: 92.6%). The average total score on the Stroke High-Risk Screening Intention Scale was  $(101.30 \pm 14.98)$ . Among respondents, 352 (58.7%) had high screening intention, while 248 (41.3%) had moderate or low intention. Statistically significant differences in screening intention scores were found across groups differing in gender, residential status, hypertension, hyperlipidemia, smoking status, awareness of high-risk stroke screening, previous implementation of screening in their community, previous participation in screening, self-perceived lifetime stroke risk, and self-perceived 1-year stroke risk ( $P < 0.05$ ). Screening intention scores were positively correlated with scores on the Stroke Health Knowledge Scale, Community Medical Service Trust Scale, and Perceived Social Support Scale ( $P < 0.05$ ). Multiple linear regression analysis showed that gender, hypertension, hyperlipidemia, community implementation of stroke high-risk screening, self-perceived lifetime stroke risk, Perceived Social Support Scale score, Community Medical Service Trust Scale score, and Stroke Health Knowledge Scale score were influencing factors ( $P < 0.05$ ).

**Conclusion:** While overall intention for high-risk stroke screening among community residents in Guangdong is relatively high, the intention level of some residents needs improvement. Communities should focus on male residents with weaker screening intention, strengthen health education on stroke knowledge (especially risk factors), and help residents scientifically understand their stroke risk and the importance of high-risk screening. At the national level, investment in screening equipment and medical facilities for community health service institutions should be increased, with greater emphasis on building community medical and nursing talent teams to effectively improve screening capacity and enhance residents' trust in community medical services. Additionally, the positive impact of social support on screening intention should be emphasized. By increasing publicity and creating an atmosphere of universal participation, residents' intention to participate in high-risk stroke screening can be effectively improved.

**Keywords:** Stroke; High-risk screening; Intention; Root cause analysis; Community health services; Guangdong

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## 1. Methods

**1.1 Study Participants** From March to May 2022, community residents aged  $\geq 35$  years in Guangdong Province were selected through convenience sampling. The age threshold of  $\geq 35$  years was chosen considering the younger onset trend of stroke in China and proactive efforts to advance stroke prevention to earlier stages in some regions. Inclusion criteria were: (1) basic reading and comprehension ability; (2) ability to communicate effectively with investigators or complete the questionnaire independently using a smartphone. Exclusion criteria were: (1) history of mental illness or intellectual disability; (2) previous diagnosis of malignant tumors or severe cardiac, hepatic, pulmonary, or renal dysfunction. All participants provided informed consent and voluntarily completed the survey.

Based on literature review, the research team identified 28 variables (including dependent and candidate independent variables). Considering that sample size should be 5-10 times the number of variables and accounting for a 5-10% invalid questionnaire rate, the minimum required sample size was determined to be 147-308. During sampling, more community-dwelling older adults were included while ensuring the minimum sample size was met.

**1.2 Survey Instruments**

**1.2.1 General Data Questionnaire:** Self-designed by the researchers, covering four domains: (1) Demographics: gender, age, education, marital status, residence location, living situation, monthly household income per capita, medical insurance status, and physical examination frequency; (2) Personal health status: hypertension, diabetes, hyperlipidemia, family history of stroke, atrial fibrillation or other heart disease, smoking, overweight/obesity, physical inactivity, and history of stroke or transient ischemic attack; (3) Awareness of high-risk stroke screening: knowledge of screening, whether their community had previously implemented screening, and personal screening history; (4) Perceived stroke risk: self-perceived lifetime stroke risk, self-perceived 1-year stroke risk, and self-perceived relative risk compared with peers.

**1.2.2 Stroke High-Risk Screening Intention Scale:** Developed by our research team based on the Theory of Planned Behavior and psychometric principles, this 25-item scale measures intention to participate in high-risk stroke screening across four dimensions: positive attitude, negative attitude, subjective norm, and perceived behavioral control. Using a 5-point Likert scale (“disagree” to “agree” scored 1-5), total scores range from 25-125, with the negative attitude dimension reverse-scored. Following previous studies, scores  $\geq 80\%$  of the maximum indicate high intention, 40%- $<80\%$  moderate intention, and  $<40\%$

low intention. Thus, scores  $\geq 100$  indicate high intention, 50- $<100$  moderate, and  $<50$  low. Dimension scores are calculated as the mean of items within each dimension. The scale demonstrates good validity (I-CVI: 0.8-1.0; S-CVI: 0.99) and reliability (overall Cronbach' s  $\alpha$ : 0.904; test-retest reliability: 0.810), with four dimensions explaining 61.945% of cumulative variance and factor loadings of 0.482-0.828.

**1.2.3 Stroke Health Knowledge Scale:** Developed by Yao Weiyu, this 35-item scale measures stroke knowledge across five dimensions: basic knowledge, lifestyle, risk factors, medication knowledge, and warning signs. Using a 3-point scoring system ( "know" =2, "unclear" =1, "don' t know" =0), total scores range from 0-70, with higher scores indicating better knowledge. In this study, Cronbach' s  $\alpha$  was 0.949.

**1.2.4 Community Medical Service Trust Scale:** Adapted from the Patient Trust Behavior and Attitude Scale (DAGGER et al.), which was translated and revised by Dong Enhong et al. The original 5-item scale assessing patient trust in physicians was modified by replacing "physician" with "community medical staff" and "hospital" with "community hospital." An additional item ( "I trust nurses to provide my care" ) was added based on expert review, given nurses' involvement in screening, follow-up, and intervention. The final 6-item scale uses a 5-point Likert scale ( "very difficult to agree" to "very easy to agree" scored 1-5), with items 3-4 reverse-scored. Total scores range from 6-30, with higher scores indicating greater trust. Cronbach' s  $\alpha$  was 0.653 in this study.

**1.2.5 Perceived Social Support Scale:** Translated and revised by Jiang Qianjin, this 12-item scale measures perceived social support across three dimensions: family support, friend support, and other support. Using a 7-point Likert scale ( "strongly disagree" to "strongly agree" scored 1-7), total scores range from 12-84, with 12-36 indicating low, 37-60 moderate, and 61-84 high perceived support. Cronbach' s  $\alpha$  was 0.88 and test-retest reliability was 0.85.

**1.3 Data Collection and Quality Control** Eight community health service institutions in Guangzhou, Shenzhen, Jiangmen, Shunde, and Yunfu were selected as survey sites. Data collection used both online and offline methods. Before the survey, eight investigators received unified training on the background and knowledge of stroke high-risk population screening, study objectives, and questionnaire completion instructions. During the survey, standardized instructions were used to introduce the study purpose and screening program to reduce information bias, and participants were assured of confidentiality. Questionnaires were self-administered and collected on-site. Investigators provided guidance using standardized responses for any questions or confusion without leading participants. Completed questionnaires were carefully reviewed, and those with obviously unreasonable responses were excluded to ensure data accuracy and completeness.

**1.4 Statistical Analysis** SPSS 25.0 was used for statistical analysis. Categorical data were described using frequency and percentage. Normally distributed continuous data were expressed as (mean $\pm$ SD) and compared between two groups using independent samples t-test and among multiple groups using one-way ANOVA. Non-normally distributed continuous data were expressed as median and interquartile range [M(QR)] and compared between two groups using Mann-Whitney U test and among multiple groups using Kruskal-Wallis H test. Pearson correlation analysis examined relationships between Stroke High-Risk Screening Intention Scale scores and scores on the Stroke Health Knowledge Scale, Community Medical Service Trust Scale, and Perceived Social Support Scale. Multiple linear regression analyzed factors influencing screening intention.  $P < 0.05$  was considered statistically significant.

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## 2. Results

**2.1 General Characteristics of Participants** A total of 648 questionnaires were distributed, and 600 valid questionnaires were collected (valid response rate: 92.6%). Among the 600 residents, 328 (54.7%) were female; 264 (44.0%) were aged 35- $<$ 45 years; 225 (37.5%) had undergraduate/college education; 527 (87.8%) were married; 262 (43.7%) lived in urban areas; 539 (89.8%) lived with family; 152 (25.3%) had monthly household income per capita of 2,000-3,999 yuan; 577 (96.2%) had medical insurance; 321 (53.5%) had at least one physical examination within the past year; 97 (16.2%) had hypertension; 60 (10.0%) had diabetes; 59 (9.8%) had hyperlipidemia; 69 (11.5%) had family history of stroke; 26 (4.3%) had atrial fibrillation or other heart disease; 15 (2.5%) had experienced stroke or transient ischemic attack; 125 (20.8%) smoked; 95 (15.8%) were overweight/obese; 159 (26.5%) lacked physical activity; 183 (30.5%) knew about high-risk stroke screening; 312 (52.0%) were unclear whether their community had previously implemented screening; 484 (80.7%) had never received high-risk stroke screening; 256 (42.7%) perceived their lifetime stroke risk as low; 477 (79.5%) perceived their 1-year stroke risk as low; and 381 (63.5%) perceived their relative stroke risk as low compared with peers.

### 2.2 Scale Scores for Screening Intention, Health Knowledge, Trust, and Social Support

**2.2.1 Stroke High-Risk Screening Intention Scale:** The average total score was (101.30 $\pm$ 14.98). Specifically, 352(58.7 $\pm$ 5.15), negative attitude(18.65 $\pm$ 5.39), positive attitude[(4.20 $\pm$ 0.74)points], subjectivenorm[(4.14 $\pm$ 0.78)points], perceivedbehavioralcontrol[(4.07 $\pm$ 0.74)points], scoring items were: (1)"Results from community high-risk stroke screening are untrustworthy"[(3.76 $\pm$ 1.18)points], (2)"Stroke screening because it's unlucky"[(3.62 $\pm$ 1.33)points].

**2.2.2 Stroke Health Knowledge Scale:** The average total score was (50.11 $\pm$ 13.76). Dimensions scores were: basic knowledge(11.62 $\pm$ 3.86), lifestyle(7.90 $\pm$ 2.35), risk factors(15.61 $\pm$ 4.55).

**2.2.3 Community Medical Service Trust Scale:** The average score was (22.59 $\pm$ 3.44).

**2.2.4 Perceived Social Support Scale:** The average score was (64.20±10.24), *withmostresidents*( $n = 539, 89.8 \pm 3.83$ ), *friendsupport*(20.89±4.04), *and othersupport*(20.27±

**2.3 Comparison of Screening Intention Scores Across Resident Characteristics** Significant differences in Stroke High-Risk Screening Intention Scale scores were found across groups differing in gender, residential status, hypertension, hyperlipidemia, smoking status, awareness of high-risk stroke screening, previous community screening implementation, previous personal screening participation, self-perceived lifetime stroke risk, and self-perceived 1-year stroke risk ( $P < 0.05$ ). No significant differences were found for age, education, marital status, residence location, monthly household income per capita, physical examination frequency, medical insurance status, diabetes, atrial fibrillation/other heart disease, family history of stroke, previous stroke/TIA, overweight/obesity, physical inactivity, or self-perceived relative stroke risk ( $P > 0.05$ ).

Screening intention scores were positively correlated with Stroke Health Knowledge Scale scores, Community Medical Service Trust Scale scores, and Perceived Social Support Scale scores ( $P < 0.05$ ).

**2.4 Multiple Linear Regression Analysis of Influencing Factors** Using variables showing significant differences in Table 1 plus Perceived Social Support Scale score, Community Medical Service Trust Scale score, and Stroke Health Knowledge Scale score as independent variables, and Stroke High-Risk Screening Intention Scale score as the dependent variable (entered as original values), multiple linear regression analysis showed that gender, hypertension, hyperlipidemia, community implementation of stroke high-risk screening, self-perceived lifetime stroke risk, Perceived Social Support Scale score, Community Medical Service Trust Scale score, and Stroke Health Knowledge Scale score were influencing factors ( $P < 0.05$ ).

The model statistics were:  $R = 0.520$ ,  $R^2 = 0.271$ , adjusted  $R^2 = 0.258$ ,  $F = 21.856$ ,  $P < 0.001$ .

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### 3. Discussion

**3.1 Focus on Residents with Low Screening Intention and Design Targeted Health Education Programs** Multiple linear regression analysis revealed that female gender, hypertension, hyperlipidemia, higher Stroke Health Knowledge Scale scores, and high self-perceived lifetime stroke risk were associated with stronger screening intention. Women showed stronger intention than men, consistent with research on cancer screening compliance and national stroke screening data showing higher participation rates among women. This may be because women have higher stroke knowledge levels and stronger health awareness. Residents with hypertension and hyperlipidemia showed stronger intention, likely because these well-known stroke risk factors increase awareness

of personal risk. Health knowledge level positively influenced screening intention, as residents with better health knowledge have stronger health beliefs and are more likely to develop healthy behaviors. Residents perceiving high lifetime stroke risk were more motivated to undergo early screening to mitigate potential risks. However, excessively high risk perception can cause psychological stress, while too low perception leads to unrealistic optimism. Strengthening education on stroke risk factors to help residents scientifically understand their risk is crucial. Communities should focus on male residents with low screening intention, enhancing their awareness of “early screening, early detection, early treatment.” Health education should emphasize stroke knowledge, particularly risk factors, to help residents—especially those with diabetes, atrial fibrillation, or other stroke-related conditions—accurately perceive their risk and understand screening importance.

**3.2 Strengthen Community Health Institutions’ Screening Capacity and Enhance Trust** Community medical service trust was the strongest influencing factor (largest  $|b|$ ), consistent with previous findings that unfamiliarity with and distrust of community medical staff hinder participation. Low trust may stem from inadequate screening capacity in community health institutions. Currently, China’s community health services are developing, with overall low service levels, professional competency, and medical facilities, leaving many residents with negative impressions. Therefore, national investment in screening equipment and medical facilities for community health institutions should increase, with greater emphasis on building medical and nursing teams, particularly in remote areas with insufficient human resources, funding, and equipment. Additionally, regional medical consortiums should be developed to establish an integrated network for stroke high-risk screening encompassing education, screening, follow-up, and management. This would facilitate referral pathways between community and higher-level institutions, enable seamless health data exchange, provide timely screening report interpretation, and deliver scientific management plans, thereby improving residents’ benefits and trust in community medical services.

**3.3 Emphasize Social Support and Create a Universal Participation Atmosphere** Residents in communities with previous screening implementation and those with higher perceived social support showed more positive screening intention. Strong social support systems enhance coping abilities and health behavior compliance, while family and friend support can alleviate fear and anxiety about screening. Previous studies show that lack of companionship is a barrier to cervical cancer screening. Communities with prior screening experience may benefit from positive word-of-mouth, creating group effects that enhance subsequent mobilization. Communities should leverage social support by encouraging screened individuals to share their experiences with family and neighbors, reducing concerns and negative emotions. Media campaigns through television, newspapers, bulletin boards, and online platforms should create an

atmosphere of universal participation, improving awareness of screening methods, procedures, and benefits to increase participation.

**3.4 Limitations** This study has limitations. The sampling regions had some bias, and the limited sample size may affect representativeness. Additionally, while screening intention predicts behavior, intention does not guarantee actual screening participation. Future longitudinal studies should examine the translation of intention into actual screening behavior.

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### Author Contributions

Qin Fengyin and Tan Yibing conceptualized and designed the study. Qin Fengyin, Zhang Qishan, Sun Xinglan, and Wang Fen conducted literature search and review. Qin Fengyin drafted and revised the manuscript. Zhang Qishan, Sun Xinglan, Wang Fen, Lai Jinjia, Huang Yimin, and Han Guoyin collected data. Qin Fengyin and Zhang Qishan organized data and performed statistical analysis. Qin Fengyin, Sun Xinglan, and Wang Fen analyzed and interpreted results. Tan Yibing provided overall supervision. The authors declare no conflicts of interest.

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