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ORIGINAL RESEARCH

Knowledge, Attitudes, and Practices Among Middle-Aged and Elderly Population Towards Ultrasound Screening for Strokes

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Purpose: This study aimed to assess the knowledge, attitudes and practices (KAP) among middle-aged and elderly population towards ultrasound screening for strokes.

Patients and Methods: This web-based cross-sectional study was conducted between March, 2023, and May, 2023 at Shanghai Eighth People's Hospital. A self-designed questionnaire was developed to collect demographic information of middle-aged and elderly population and assess their knowledge, attitudes and practices toward ultrasound screening for strokes.

Results: A total of 552 participants enrolled in this study, among them 151 (27.36%) aged above 60 years old, 306 (55.43%) resided in rural area, 239 (43.30%) possessed educational attainment at the level of junior college, college or above. The mean knowledge, attitudes and practice scores were 5.53 ± 2.56, 40.22 ± 5.60 and 38.30 ± 7.38, respectively. Pearson's analysis was performed to assess the relationship between knowledge, attitudes, and practices. It was shown that knowledge and attitudes were positively correlated ($r = 0.544$, $P < 0.001$), and knowledge and practices were also positively correlated ($r = 0.404$, $P < 0.001$). Additionally, there was a positive correlation between attitude and practice scores ($r = 0.566$, $P < 0.001$).

Conclusion: The results of this study demonstrate that the middle-aged and elderly population exhibited insufficient knowledge, positive attitudes, and moderate practices towards ultrasound screening for strokes. There is a need to improve the understanding of stroke risk factors, symptoms, and emergency measures among this population.

Keywords: knowledge, attitudes, practice, stroke, ultrasound imaging, middle-aged, elderly

Introduction

Stroke constitutes a cerebrovascular event characterized by the abrupt interruption of cerebral blood supply, culminating in neurological dysfunction.[1,2] In China, stroke holds a significant position within the continuum of mortality and disability. According to findings derived from the Global Burden of Disease Study 2019, China witnessed 3.94 million incident cases of stroke, alongside 28.76 million cases that were prevalent. Moreover, the year 2019 recorded 2.19 million fatalities attributable to stroke in the nation. Noteworthy, strokes are frequently entwined with a spectrum of deleterious consequences encompassing enduring disability, cognitive impairment, and heightened susceptibility to subsequent cardiovascular events. These ramifications collectively impose a substantial encumbrance upon healthcare infrastructures, inducing pronounced financial ramifications stemming from medical expenditure and a decrement in workforce productivity.[3,4]

In congruence with the advancing demographic shift, the onus of stroke impact intensifies. Older adults substantiate a considerable segment of stroke victims, amplifying the urgency for effective preemptive strategies.[4,5] Amid these countermeasures, ultrasound screening has surged to prominence attributed to its non-invasive, expeditious, and

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precision-laden diagnostic prowess.[6,7] Timely detection affords opportune interventions that serve to alleviate the gravity of stroke sequelae and enhance patient prognoses.[8]

Nevertheless, notwithstanding the manifest merits of ultrasound screening, an appreciable cognition void persists among the middle-aged and elderly demographic pertaining to its pivotal role in stroke prevention.[6,9] Constrained awareness coupled with incomplete discernment of ultrasound's functional significance engenders suboptimal utility of this diagnostic modality. This informational dearth impedes proactive embracement of preemptive practices, thereby thwarting efficacious stroke risk abatement within this susceptible cohort.

The Knowledge, Attitudes, and Practices (KAP) paradigm furnishes a methodical apparatus to fathom the intricate interplay between knowledge assimilation, attitudes, and pragmatic behaviors.[10,11] Within the medical milieu, KAP investigations elucidate determinants that sway health-related decision-making and conduct. By scrutinizing participants' comprehension of ultrasound's pivotal role in stroke preemption, their predispositions towards preventative protocols, and their tangible adherence to screening regimens, this framework yields insights into the obstacles and catalysts governing the incorporation of ultrasound screening within the middle-aged and elderly population.

The present investigation aspires to bridge this extant hiatus via a comprehensive exploration of KAP factors that bear upon the integration of ultrasound screening for stroke prevention amidst the middle-aged and elderly populace. Through the identification of misconceptions, hurdles, and potential incentivizing agents, this study endeavors to furnish discernment that informs precisely targeted pedagogic interventions, thereby fomenting cognizance and fostering the embrace of ultrasound screenings.

Materials and Methods

Study Design and Subjects

This cross-sectional study was conducted between March, 2023, and May, 2023 at Shanghai Eighth People's Hospital. The study participants were middle-aged and elderly population. The study was approved by the Ethics Committee of Shanghai Eighth People's Hospital (approval No. 2023–043-003), and all participants provided informed consent.

The inclusion criteria were as follows:1) age above 45years 2) fluent in Chinese 3) willing to provide informed consent to participate in the study.

The exclusion criteria were as follows: 1) diagnosed cognitive impairments (eg, dementia, severe memory deficits) that could affect their ability to respond accurately. 2) individuals with severe medical conditions that may hinder their ability to participate (eg, terminal illnesses, critical care).

Questionnaire

The questionnaire was developed with guidance from 2021 Guideline for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack[12] and relevant literatures.[9,13] The first draft was revised with input from senior experts in stroke prevention and treatment and then pilot tested on a small scale (n=53), resulting in a Cronbach's alpha coefficient value of 0.902, indicating good internal consistency.

The final questionnaire was presented in Chinese and encompassed four dimensions: demographic details, knowledge, attitudes, and practices. The demographic section encompassed 13 items, while the knowledge, attitude, and practice segments comprised 10 items each. The knowledge items were scored 1 point for a correct answer and 0 points for incorrect answers, resulting in a possible score range of 0–10. The attitude items scored on a five-point Likert scale ranging from very positive (5 points) to very negative (1 point), with a possible score range of 10 to 50. The practice items also scored on a five-point Likert scale, ranging from always (5 points) to never (1 point), with a possible score range of 10 to 50.

Data collection was facilitated through an online questionnaire deployed on the Sojump platform (http://www.sojump.com). Dissemination of the online survey transpired through diverse social media conduits, comprising WeChat, online forums, and web links. In order to forestall redundancy, a mechanism employing IP restrictions was enacted, thereby warranting singular survey completion per unique IP address.

Statistical Analysis

STATA 17.0 (Stata Corporation, College Station, TX, USA) was used for statistical analysis. The continuous variables was expressed as mean±SD, and the categorical variables was expressed as n (%). The continuous variables conformed to a normal distribution were tested by the *t*-test or ANOVA. The structural equation model (SEM) of knowledge, attitudes and practices among middle-aged and elderly population towards ultrasound screening for strokes was constructed with AMOS 24.0 (IBM, NY, United States). The model fitting was evaluated with CMIN/DF (Chi-square fit statistics/degree of freedom), RMSEA (root mean square error of approximation), IFI (incremental fix index), TLI (Tucker-Lewis index) and CFI (comparative fix index). Two-sided $p<0.05$ were considered statistically significant.

Results

A total of 552 participants enrolled in this study, among them 151 (27.36%) aged above 60 years old, 306 (55.43%) resided in rural area, 239 (43.30%) possessed educational attainment at the level of junior college, college or above. The mean knowledge, attitudes and practice scores were 5.53 ± 2.56, 40.22 ± 5.60 and 38.30 ± 7.38, respectively (Table 1).

The three knowledge items with the highest correctness rates were as follows: "The rehabilitation programs for stroke victims include training in limb function, language skills, cognitive functions, and psychological recovery". (K6) with a correctness rate of 79.71%, "The optimal timing for administering thrombolysis after a stroke" (K5) with a correctness rate of 77.54%, "The ultrasound screening method uses echo reflection imaging of ultrasound in human tissues". (K8) with a correctness rate of 74.28%. The three items with the lowest

Table 1 Sociodemographic Characteristics and KAP Scores

	N	%	Knowledge		Attitudes		Practices	
			Mean ± SD	P	Mean ± SD	P	Mean ± SD	P
Total	552		5.53 ± 2.558		40.22 ± 5.604		38.30 ± 7.377	
Gender				0.575		0.291		0.422
Male	208	37.68	5.61 ± 2.405		40.54 ± 5.630		38.63 ± 7.077	
Female	344	62.32	5.48 ± 2.648		40.02 ± 5.587		38.10 ± 7.556	
Age (years)				0.286		0.239		0.893
45–59	401	72.64	5.60 ± 2.531		40.39 ± 5.480		38.33 ± 7.317	
≥ 60	151	27.36	5.34 ± 2.628		39.76 ± 5.916		38.23 ± 7.559	
Residency				0.177		0.511		0.302
Rural	306	55.43	5.40 ± 2.556		40.08 ± 5.663		38.59 ± 7.309	
Urban	246	44.57	5.69 ± 2.556		40.39 ± 5.536		37.94 ± 7.460	
Marital status				0.012		0.064		0.085
Married	497	90.04	5.62 ± 2.538		40.37 ± 5.519		38.48 ± 7.137	
Unmarried	55	9.96	4.71 ± 2.615		38.89 ± 6.220		36.67 ± 9.185	
Education				0.472		0.108		0.197
Middle school and lower	165	29.89	5.53 ± 2.441		40.05 ± 5.582		37.56 ± 7.628	
High school or secondary school	148	26.81	5.32 ± 2.668		39.55 ± 5.626		38.18 ± 7.241	
Junior college, college, and above	239	43.30	5.65 ± 2.570		40.75 ± 5.577		38.89 ± 7.264	

(*Continued*)

Table 1 (Continued).

	N	%	Knowledge		Attitudes		Practices	
			Mean ± SD	P	Mean ± SD	P	Mean ± SD	P
Monthly income per capita, CNY				0.170		0.083		0.036
< 2000	74	13.41	4.99 ± 2.697		38.69 ± 6.088		36.12 ± 8.304	
2000–5000	211	38.22	5.66 ± 2.522		40.43 ± 5.500		38.93 ± 6.932	
5000–10000	169	30.62	5.45 ± 2.573		40.34 ± 5.279		38.17 ± 7.100	
> 10,000	98	17.75	5.79 ± 2.476		40.71 ± 5.882		38.82 ± 7.817	
Health insurance				0.005		0.131		0.375
No	8	1.45	3.00 ± 2.828		37.25 ± 7.440		36.00 ± 10.637	
Yes	544	98.55	5.56 ± 2.538		40.26 ± 5.570		38.33 ± 7.327	
Smoking or passive smoking				0.098		0.005		0.814
No	209	37.86	5.30 ± 2.853		39.37 ± 6.106		38.21 ± 7.750	
Yes	343	62.14	5.67 ± 2.353		40.74 ± 5.216		38.36 ± 7.151	
Alcohol consumption				0.268		0.648		0.515
No	367	66.49	5.44 ± 2.708		40.14 ± 5.802		38.16 ± 7.824	
Yes	185	33.51	5.70 ± 2.228		40.37 ± 5.202		38.59 ± 6.409	
Preference for salty foods				0.418		0.317		0.444
No	249	45.11	5.43 ± 2.802		39.96 ± 5.794		38.57 ± 7.503	
Yes	303	54.89	5.61 ± 2.340		40.44 ± 5.443		38.08 ± 7.277	
Preference for fried or fatty foods				0.582		0.406		0.684
No	295	53.44	5.47 ± 2.682		40.03 ± 6.106		38.42 ± 7.975	
Yes	257	46.56	5.59 ± 2.411		40.43 ± 4.970		38.16 ± 6.638	
Frequency of physical exercise				0.384		0.111		< 0.001
Once daily	110	19.93	5.27 ± 2.736		39.62 ± 6.582		40.12 ± 8.181	
3–6 times per week	93	16.85	5.33 ± 2.651		39.56 ± 5.474		38.59 ± 6.878	
1–2 times per week	164	29.71	5.76 ± 2.370		41.03 ± 5.198		39.09 ± 6.635	
0 times per week	185	33.51	5.57 ± 2.562		40.19 ± 5.333		36.38 ± 7.374	
Number of stroke-related comorbidities				0.385		0.800		0.750
0	259	46.92	5.38 ± 2.699		40.15 ± 5.498		38.55 ± 8.229	
1 or 2	234	42.39	5.61 ± 2.513		40.18 ± 5.955		38.06 ± 6.612	
≥ 3	59	10.69	5.83 ± 2.044		40.68 ± 4.603		38.17 ± 6.292	

correctness rates were "The risk factors for stroke". (K2) with a correctness rate of 5.98%, "The emergency measures in the event of a stroke". (K3) with a correctness rate of 12.50%, "The symptoms of a stroke". (K1) with a correctness rate of 30.62% (Table 2).

Table 2 Knowledge

	Correctness Rate	
	n	%
K1: The symptoms of a stroke.	169	30.62
K2: The risk factors for stroke.	33	5.98
K3: The emergency measures in the event of a stroke.	69	12.50
K4: Strokes are commonly treated with thrombectomy or thrombolysis.	330	59.78
K5: The optimal timing for administering thrombolysis after a stroke.	428	77.54
K6: The rehabilitation programs for stroke victims include training in limb function, language skills, cognitive functions, and psychological recovery.	440	79.71
K7: It is safe and repeatable to use ultrasound for stroke screening.	398	72.10
K8: The ultrasound screening method uses echo reflection imaging of ultrasound in human tissues.	410	74.28
K9: Ultrasound screening helps prevent and treat stroke, reducing its morbidity and mortality.	395	71.56
K10: Carotid artery ultrasound and transcranial color Doppler ultrasound are commonly used ultrasound screening methods.	379	68.66

Meanwhile, a significant majority of the participants (87.50%) strongly agreed/ agreed that they bear the responsibility of self-initiated stroke (A1). 84.96% of them strongly agreed/ agreed that disseminating information about stroke and ultrasound screening through public media and the community holds (A5). Moreover, 81.88% of them strongly agreed/ agreed that they have the willingness to acquire knowledge about stroke ultrasound screening through online resources (A2). However, in the previous study, still about a quarter of them (25.91%) mistakenly believe that ultrasound screening is harmful (A7) (Table 3).

Table 3 Attitudes

	Strongly Disagree N(%)		Somewhat Disagree N(%)		Neutral N(%)		Somewhat Agree N(%)		Strongly Agree N(%)	
A1. You bear the responsibility of self-initiated stroke prevention.	9	1.63	6	1.09	54	9.78	182	32.97	301	54.53
A2. You have the willingness to acquire knowledge about stroke ultrasound screening through online resources, television, and literature.	10	1.81	13	2.36	77	13.95	254	46.01	198	35.87
A3. You are interested in engaging in the hospital's ultrasound education program.	5	0.91	17	3.08	83	15.04	244	44.20	203	36.78
A4. You intend to discuss ultrasound screening for stroke with your medical practitioner.	4	0.72	9	1.63	82	14.86	249	45.11	208	37.68
A5. Disseminating information about stroke and ultrasound screening through public media and the community holds significance.	3	0.54	8	1.45	72	13.04	233	42.21	236	42.75
A6. Ultrasound screening plays a crucial role in stroke prevention and treatment.	4	0.72	11	1.99	79	14.31	241	43.66	217	39.31
A7. Ultrasound screening is harmful.	117	21.20	103	18.66	189	34.24	119	21.56	24	4.35
A8. Regular performance of ultrasound screenings is recommended.	4	0.72	10	1.81	98	17.75	239	43.30	201	36.41

(*Continued*)

Table 3 (Continued).

	Strongly Disagree N(%)		Somewhat Disagree N(%)		Neutral N(%)		Somewhat Agree N(%)		Strongly Agree N(%)	
A9. You aim to promote the adoption of routine ultrasound screenings among others for the purpose of stroke prevention.	0	0.00	14	2.54	125	22.64	234	42.39	179	32.43
A10. You aspire to contribute to establishing health records within the ultrasound department, maintain timely communication with experts, and proactively engage in stroke prevention and control.	2	0.36	8	1.45	100	18.12	257	46.56	185	33.51

Furthermore, 65.95% of the participants reported that they are very likely/likely to take proactive steps to acquire knowledge towards stroke prevention and treatment from diverse sources (P1). 71.56% of them reported that they purposefully undertake stroke prevention measures, which encompass dietary control, regular exercise, and lifestyle enhancement (P4). 57.42% claimed that they consciously seek understanding of emerging ultrasound screening technologies for stroke, such as ultra-microvascular imaging (P9) (Table 4).

Pearson's analysis was performed to assess the relationship between knowledge, attitudes, and practices. It was shown that the knowledge and the attitudes were positively correlated ($r = 0.544$, $P < 0.001$), and knowledge and practices were also positively correlated ($r = 0.404$, $P < 0.001$). Additionally, there was a positive correlation between attitude and practice scores ($r = 0.566$, $P < 0.001$) (Table 5).

Table 4 Practices

	Very Unlikely N(%)		Unlikely N(%)		Neutral N (%)		Likely N (%)		Very Likely N(%)	
P1. You take proactive steps to acquire knowledge towards stroke prevention and treatment from diverse sources, encompassing literature, online resources, and print media.	6	1.09	6	6.88	144	26.09	202	36.59	162	29.35
P2. You shall initiate communication with your physician to arrange an appointment for stroke ultrasound screening.	11	1.99	11	8.15	159	28.80	180	32.61	157	28.44
P3. Your engagement is envisioned in educational initiatives pertaining to stroke ultrasound screening, organized by entities like community health centers or the hospital's ultrasound department.	8	1.45	8	6.52	149	26.99	199	36.05	160	28.99
P4. You purposefully undertake stroke prevention measures, which encompass dietary control, regular exercise, and lifestyle enhancement.	5	0.91	5	3.80	131	23.73	225	40.76	170	30.80
P5. You consciously familiarize yourself with the local stroke thrombolysis geographical distribution or utilize the stroke thrombolysis area application to identify the nearest medical facility providing thrombolysis intervention.	0	0.00	0	10.87	157	28.44	227	41.12	108	19.57
P6. It is advised to contemplate the possibility of a stroke when encountering symptoms such as numbness, muscle weakness, and speech impediments.	11	1.99	11	6.16	146	26.45	226	40.94	135	24.46
P7. You actively engage in the initiation of stroke-related health records at the hospital and subsequent follow-up activities.	11	1.99	11	4.17	134	24.28	226	40.94	158	28.62

(*Continued*)

Table 4 (Continued).

	Very Unlikely N(%)		Unlikely N(%)		Neutral N (%)		Likely N (%)		Very Likely N(%)	
P8. You devote attention to indicators present in the ultrasound screening report, including features such as plaque presence and blood flow velocity.	10	1.81	10	3.26	147	26.63	217	39.31	160	28.99
P9. You consciously seek understanding of emerging ultrasound screening technologies for stroke, such as ultra-microvascular imaging.	16	2.90	16	9.78	165	29.89	176	31.88	141	25.54
P10. You express the desire to actively contribute to the establishment of health records within the ultrasound department, maintain timely communication with experts, and engage proactively in stroke prevention and management.	12	2.17	12	5.25	135	24.46	212	38.41	164	29.71

Table 5 Pearson's Analysis

	Knowledge	Attitudes	Practices
Knowledge	1		
Attitudes	0.544(P<0.001)	1	
Practices	0.404(P<0.001)	0.566(P<0.001)	1

Based on the results of the Pearson's analysis, the structural equation model was established to further investigate whether middle-aged and elderly population's knowledge and attitude toward ultrasound screening for strokes affect their practice, whether attitude plays an intermediary role between knowledge and practice, and whether knowledge can directly affect their practice according to the KAP theory. It also investigated the effect of other factors including "marital status", "physical exercise frequency", and "monthly income per capita" on the three dimensions mentioned above (Figure 1).

Hypothesis 1: The path coefficient from knowledge to attitudes is 1.193 ($P < 0.001$), which indicates that middle-aged and elderly population's knowledge level is positively and significantly associated with their attitudes.

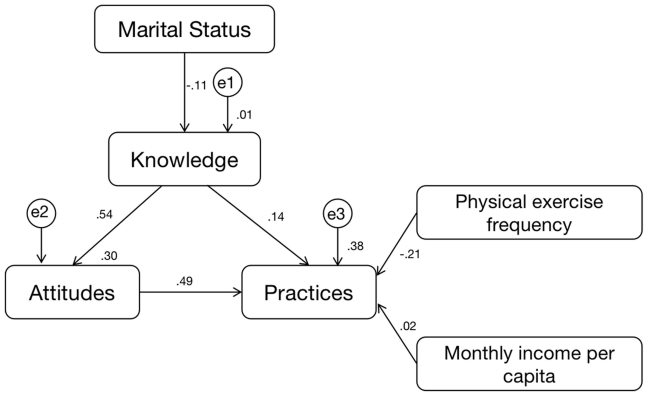

Figure 1 Structural equation modeling.

Table 6 Test Results of the Hypothesis

			Estimate	S.E.	C.R.	P
Knowledge	<—	Marital_status	−0.909	0.361	−2.514	0.012
Attitude	<—	Knowledge	1.193	0.078	15.234	<0.001
Practice	<—	Attitude	0.656	0.053	12.415	<0.001
Practice	<—	Knowledge	0.410	0.116	3.541	<0.001
Practice	<—	Physical_exercise_frequency	−1.368	0.222	−6.160	<0.001
Practice	<—	Monthly_income_per_capita	0.163	0.266	0.612	0.540

Table 7 Model Fitness Indices for the KAP Structural Equation Model

Goodness-of-Fit Indices	Ideal Standards	Measurement Value
CMIN/DF	1–3 excellent, 3–5 good	0.949
RMSEA	<0.08 good	<0.001
IFI	>0.8 good	1.001
TLI	>0.8 good	1.002
CFI	>0.8 good	1.000

Abbreviations: CMIN/DF, Chi-square fit statistics/degree of freedom; RMSEA, root mean square error of approximation; IFI, incremental fix index; TLI, Tucker-Lewis index; CFI, comparative fix index.

Hypothesis 2: The path coefficient from knowledge to practice is 0.410 ($P < 0.001$), which indicates that their knowledge level is positively and significantly associated with their practices.

Hypothesis 3 The path coefficient from attitude to practice is 0.656 ($P < 0.001$), indicating that the middle-aged and elderly population's attitude was positively associated with practices.

The effect of other factors including "marital status", "physical exercise frequency", and "monthly income per capita" on the three dimensions mentioned above were also investigated (Table 6).

The fitting index of the structural model (CMIN/DF = 0.949; RMSEA<0.001; IFI = 1.001; TLI = 1.002; CFI = 1.000) outperformed the respective threshold value, signifying that the data fit the structural model satisfactorily (Table 7).

Discussion

The findings of this study illustrate that the middle-aged and elderly population residing in Shanghai manifest insufficient knowledge, positive attitudes, and moderate practices towards ultrasound screening for strokes. There exists a requisite for enhancing comprehension pertaining to stroke risk factors, symptoms, and urgent interventions within this cohort.

The previous study revealed a spectrum of understanding across various domains encompassing stroke symptoms. The investigation unearthed areas of concern. Participants displayed comparatively diminished knowledge pertaining to stroke risk factors (K2) and techniques of ultrasound screening (K8), factors that may influence their grasp of stroke prevention and screening. Additionally, while a heightened awareness was observed concerning the optimal timing for post-stroke thrombolysis (K5) and the role of ultrasound screening (K9), instances of misconceptions or inadequate comprehension were still prevalent. The findings of the prior investigation are consistent with those of a cross-sectional study encompassing 228,240 adults who engaged in the 2017 Korean Community Health Survey.[14] Within this study, there was a notable deficiency in the awareness of symptoms associated with stroke and heart attacks. In a parallel vein,

an integrative assessment of published studies concerning stroke cognition and consciousness was undertaken by querying electronic bibliographic repositories utilizing specified keywords, spanning the temporal interval from 1966 to 2008. This review unveiled a paucity in the comprehension of stroke identification and prevention within the surveyed populace.[15] Similarly, in a study assessing the understanding of stroke in Spain, it was noted that a cohort of adolescents exhibited limited knowledge regarding cerebrovascular diseases.[16] Hence, there exists a clear imperative for enhanced educational initiatives and awareness campaigns aimed at augmenting public enlightenment in these areas. Additionally, a compelling rationale emerges for integrating this knowledge into the school curriculum.

In the previous study, the outcomes underscored that a majority of respondents harbored a sense of responsibility for self-initiated stroke prevention (A1), expressed a readiness to acquire knowledge about ultrasound screening through diverse channels (A2), displayed interest in participating in ultrasound education initiatives (A3), and articulated an intent to engage medical practitioners in discussions about ultrasound screening (A4). However, noteworthy concerns also emerged. Some respondents held a fallacious belief that ultrasound screening bears potential harm (A7), an aspect possibly stemming from misconceptions about ultrasound technology, signifying an exigent need for more precise information dissemination. Moreover, although a majority of participants evinced the aspiration to advocate for ultrasound screenings for stroke prevention (A9), the actual realization of this intent may encounter certain constraints. An investigation focusing on interventions addressing racial/ethnic disparities in stroke prevention and treatment has delved into an examination of the social determinants of health as well as the factors contributing to racial/ethnic disparities in healthcare. The study presents a concentrated synopsis of specific interventions designed to mitigate stroke risk factors, enhance recognition of stroke symptoms, and facilitate access to stroke care. These interventions are poised to effectively diminish discrepancies in stroke fatality rates among different racial and ethnic groups. Additionally, the study deliberates on areas of insufficient understanding and charts potential trajectories for future research.[17] To more effectively expedite stroke prevention and control, sustained endeavors in public awareness and education are indispensable for instilling accurate attitudes and convictions.

As for the tangible practices associated with ultrasound screening for strokes, the study identified a spectrum of proactive behaviors exhibited by respondents. For instance, they evinced a willingness to glean knowledge from diverse sources (P1), conveyed an inclination to initiate communication with medical professionals to arrange appointments for ultrasound screening (P2), and displayed enthusiasm for participation in educational initiatives centered around ultrasound screening (P3). However, practical challenges also came to the fore. Despite intentions, certain respondents might encounter impediments in initiating discussions about ultrasound screening with medical practitioners or actively participating in the establishment of health records (P7, P10). Additionally, some respondents displayed a limited awareness of emerging ultrasound screening technologies (P9), underscoring the need for heightened public education. A study focusing on the prevention, management, and rehabilitation of stroke in low- and middle-income countries has recommended that individuals grappling with a persistent condition such as stroke might necessitate lifelong pharmaceutical intervention, the maintenance of a particular lifestyle, acquisition of self-management proficiencies, and robust caregiver and family backing. These measures are imperative for attaining optimal health outcomes. In this regard, rehabilitation serves to ameliorate the physical, speech, and cognitive faculties of stroke-afflicted individuals.[18] Furthermore, an investigation into the efficacy of a self-management intervention for stroke risk among adults with prehypertension has demonstrated that the implementation of such an intervention is practicable and correlates with enhanced self-administration of stroke risk determinants. This positive association is especially notable in the context of primary stroke prevention within the prehypertensive populace.[19]

This study has several limitations. Primarily, the utilization of self-reported data introduces the potential for recall bias and subjectivity, thus exerting an influence on the veracity of responses. Additionally, the study's cross-sectional design inherently precludes the establishment of causal relationships, consequently restricting the capacity to deduce causality links among knowledge, attitudes, practices, and demographic factors. Nevertheless, this study addresses a crucial gap, it not only evaluates middle-aged and elderly population's level of knowledge but also provides an in-depth analysis of their attitudes and actual behaviors towards stroke preventive screening-areas that have been insufficiently explored in previous research.

Based on the findings of this study, there are potential avenues for future research. Primarily, future investigations may consider expanding the study's participant demographic to encompass a broader age spectrum, specifically including the ultra-elderly population aged over 85 years. Given the notable differences in comorbidity profiles between this age group and others, it is conceivable that their KAP toward ultrasound screening for strokes may exhibit disparities. This subgroup may present unique challenges and opportunities that warrant further exploration. Secondly, it is worth contemplating the development of KAP-based intervention programs as an extension of the current research. By assessing KAP scores both before and after the implementation of these interventions, researchers can effectively gauge the efficacy of such programs in effecting behavioral and knowledge changes within the target population.

Conclusions

The comprehensive evaluation of knowledge, attitudes, and practices concerning ultrasound screening for strokes yields invaluable insights into the disposition of the middle-aged and elderly cohort towards embracing preventive protocols. This underscores the presence of a foundational platform that can facilitate the development of bespoke educational interventions targeted at addressing the specific knowledge lacunae pinpointed within this investigation.

Data Sharing Statement

All data generated or analysed during this study are included in this article.

Ethics Approval and Consent to Participate

All procedures were performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The study participants were middle-aged and elderly population. The study was approved by the Ethics Committee of Shanghai Eighth People's Hospital (approval No. 2023-043-003), and all participants provided written informed consent. All methods were performed in accordance with the relevant guidelines and regulations.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The author reports no conflicts of interest in this work.

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