

Research Article

A Mixed-Method Study on Nurses' Assessment of Post-Stroke Depressive Symptoms

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Received: April 09, 2021; Accepted: May 04, 2021;

Published: May 11, 2021

Abstract

Background: Stroke is the second leading cause of death in the world and the leading cause of death in China. Post-stroke depression is prevalent, affecting approximately one third of stroke survivors at any given time. However, the depressive symptoms of stroke patients are often overlooked in clinical practice.

Objective: The aim is to investigate the knowledge, attitudes, and practice status of nurse clinicians on the assessment of post-stroke depressive symptoms and explore the influencing factors, so as to provide empirical evidence for clinical education related to Post-Stroke Depression (PSD) and the development of nursing clinical pathways for screening.

Methods: A self-designed questionnaire is used to survey 298 nurse clinicians in Guangdong Province of China. 12 nurses and nurse managers among the study subjects are purposefully invited to participate in semi-structured interviews for in-depth discussion about factors affecting the status of assessment.

Results: The total scores of the survey of clinical nurses assessing post-stroke depression are (84.76±13.255). The scores of knowledge, attitude, and practice of the survey are (25.08±8.975), (33.33±5.483), and (26.35±6.719) respectively. The results of multiple linear regression analysis show that predominate influencing factors of knowledge include position and whether appropriate training is offered by the employer. Nurses' attitudes toward assessment are influenced by where they work. Influencing factors for the practice of assessing PSD symptoms include nurses' positions, participation in training, knowledge level, and attitudes.

Conclusion: The total scores of nurse clinicians in assessing the symptoms of PSD are below average. The current practice needs to be improved.

Keywords: Post-stroke depression; Nurses' assessment of PSD; Influencing factors for PSD screening; Survey on knowledge-attitude-practice

Introduction

Stroke seriously impacts human health and life. A *Lancet* Sino-US collaborative research project shows that stroke is the second leading cause of death in the world and the leading cause of death in China, where 1/5 of the world's population resides [1]. The lifetime risk of stroke of Chinese has reached an alarming 39.3%, which is the highest in the world. The epidemiological data released by the Chinese Stroke Society shows that there are 14.94 million stroke patients in China with 3.3 million new cases each year [2]. Post Stroke Depression (PSD) is a common complication among approximately 1/3 of stroke survivors [3]. PSD affects the recovery of patients' physical function and Activity of Daily Living (ADL) decreasing their quality of life. Severely depressed PSD patients have a high rate of suicide [4]. A number of studies have shown that early identification and interventions of these patients is beneficial for the prognosis related to rehabilitation of neurological function and improvement of quality of life resulting in reduction of disability and mortality rates [5-6]. Canadian Best Practice Recommendations for Stroke Care recommend that all stroke patients should be considered at high

risk for depression and be screened [7]. However, in clinical practice, the depressive symptoms of stroke patients are often overlooked, and the diagnosis rate and treatment rate remain low [8]. There is a disconnect between research findings and clinical applications. Nurses, as the direct caregivers for patients during hospitalization, should be sensitive to the emotional changes of their care recipients. Currently, there is a lack of investigations into the knowledge, attitude, and practice in assessing PSD symptoms by registered nurses in China. This study aims to bridge this gap by exploring various influencing factors related to the assessment of PSD symptoms. We hope to provide empirical evidence for nursing education and the development of clinical pathways for PSD screening. Change of clinical practice will facilitate the improvement of diagnosis and treatment outcome of the disease.

Participants and Methods

Participants

Guangdong is a developed coastal province in China ranking first with 10.9% of the nation's total GDP [9]. The population in the

province has relatively good access to the healthcare system. From December 17, 2019 to July 5, 2020, a convenient sampling method was adopted to investigate the PSD screening practice of nurse clinicians working in neurology, neurosurgery, cardiovascular medicine, and rehabilitation from 18 hospitals in 12 cities in Guangdong. This sample is representative of nurses in the developed regions of China.

Inclusion criteria:

- Those who have unrestricted licensure as registered nurses and
- Have worked in the department for at least one year and
- Have consented to participate in the study.

Exclusion criteria:

- Nurses who have not obtained their RN licensure or
- Are not involved in direct patient care or
- Are on leave of absence, residency, clinical rotation, and practical training.

The qualitative portion of the study adopts a phenomenological research method. Among the respondents of the survey, nurse clinicians or nurse managers from neurology and neurosurgery were purposefully selected for the semi-structured interviews. The selection criteria are: Participants must have worked in the department for 5 years or longer and have expertise in stroke care.

The study proposal has received the approval of the ethics committee of Shantou University Medical College. Principles of multivariate analysis call for a sample size 5 to 10 times the number of variables [10]. This research contains 18 variables. Based on the above ratio, the sample size needed would be 216, considering a 20% drop out rate. The study has a final number of 298 respondents ($n=298$), which meets the requirement.

Methods

This study uses a combination of quantitative and qualitative methods. The quantitative part consists of 2 self-designed questionnaires. The qualitative part employs the approach of semi-structured interviews to explore factors affecting the nurses' practice of PSD assessment.

General demographic of study participants: Data to be collected include gender, educational level, healthcare organization, department, specialty experience, administrative position, technical title, history of participation in training on PSD, and whether the department has a protocol for screening.

Self-designed questionnaire: The survey is compiled after consulting neurologists, nurse specialists, and statisticians. The content of the knowledge dimension is based on the guidelines for post-stroke depression [11] and expert consensus[3]. The knowledge-attitude-practice model is frequently used in the nursing profession, which divides the change of nursing behavior into three continuous processes of acquiring knowledge, generating attitudes and beliefs, and forming nursing practice. Knowledge is the foundation of behavior, and belief is the driving force of behavior [12]. There are 28 items in the survey, 10 of which are in the knowledge dimension. All

are multiple-choice questions. Each question has 5 possible points if answered correctly. The higher the score, the better the respondent's knowledge level of PSD. Attitude and practice dimensions are based on the Likert 5-level scoring method, with 9 items in the attitude and practice dimension respectively. Each item is worth 1 to 5 points with a total possible score of 45 points per dimension. The higher the score, the more positive the nurses' attitudes towards PSD screening and the more likely the nurse would assess the patient's PSD symptoms as well. Standard score (percentage of correct answer) = raw score/full score \times 100. Scores classification: 80=good; <60=poor; 60-79=average [13]. The Cronbach's α coefficient of the questionnaire is 0.86. The half-reliability is 0.608. The survey instrument can be found as supplementary material in the appendix.

Interview questions: Interview questions incorporate the investigators' clinical observation into the framework of the Roy adaptation model with focus on the primary and secondary assessments [14]. The investigators are interested in finding out whether nurses have performed secondary assessment on their patient, that is, whether they would assess the impact of the inherent stimulus, primary stimulus, and secondary stimulus of the patient's emotional disorder. The interview outline has been revised and improved after consultation with nursing experts in the specialty.

Data collection: Data collection in this study is done *via* an online portal. With permission of the hospitals' administration, the link of the questionnaire including uniform instructions is sent to the head nurses of the department who would then distribute it to the staff nurses. Response to the survey is anonymous. All questions must be answered for the survey to be valid. The total time needed to answer all questions is between 10-20 minutes. Data is then extracted and screened strictly according to the exclusion criteria. Two investigators proofread the data to ensure data accuracy. Inappropriate responses are discarded. For the semi-structured interviews, materials are also transcribed and validated by two investigators. The interview is terminated when no new themes emerge, and it is believed to achieve data saturation.

Data analysis: SPSS22.0 is used for data processing and analysis. Calculation data is described as frequency and percentage. Multiple-choice questions are analyzed by prevalence rate and response rate. On the premise of measurement data conforming to the normal distribution through normality test, the mean standard deviation is used for statistical description, and the non-parametric test is used for the non-normal distribution. When comparing two groups, the independent sample t test is used. The analysis of variance is used to compare multiple groups. The difference is statistically significant if $p < 0.05$. Multivariate linear regression analysis is used to analyze the influencing factors ($a_{in} = 0.05$; $a_{out} = 0.10$). The qualitative study has adopted the Colaizzi analysis method [15]. Themes and sub-themes are identified, clustered, and reported.

Results

328 nurses have participated in the survey with 298 valid responses at a return rate of 90.85%. Demographic information of survey respondents is shown in Table 1.

The 12 participants in the semi-structured interviews are all female including 3 head nurses, 3 nurse specialists, 3 nurse team

Table 1: Demographic information of survey respondents (n=298).

Characteristics	Number (n)	Percentage (%)
Gender		
Male	10	3.36
Female	288	96.64
Educational level		
Vocation school	11	3.69
Associate degree	90	30.2
Undergraduate	190	63.76
Master	7	2.35
Healthcare organization*		
Community hospital	41	13.76
Grade II hospital	19	6.38
Grade III, general hospital	44	14.76
Grade III, Level A	194	65.1
Department		
Neurology	120	40.27
Neurosurgery	85	28.52
Cardiovascular Medicine	8	2.68
Neurology outpatient clinic	2	0.68
Other	83	27.85
Specialty experience		
1-3 years	48	16.1
3-5 years	63	21.15
5-10 years	87	29.2
10-20 years	62	20.8
> 20 years	38	12.75
Administrative position		
Staff nurse	212	71.14
Nurse team leader	61	20.47
Head nurse	25	8.39
Technical title		
Registered nurse	60	20.13
Nurse specialist	130	43.62
RN care manager	93	31.22
Deputy chief nurse (clinician)	15	5.03
Participation in training		
Yes	89	29.86
No	209	70.14
Departmental protocol for screening		
Yes	77	25.84
No	221	74.16

*Note: China has a 3-tier classification of healthcare organizations with Grade III at the highest level.

leaders, 1 nurse educator, and 2 staff nurses. One nurse has a master’s degree, 6 have baccalaureate degrees, and 5 have associate degrees. The demographic information is shown as supplementary Table 1.

Table 2: Classification of the scores (expressed as %).

Classification	Knowledge	Attitude	Practice	Total score
Good	n=17 (5.71)	n=118 (39.60)	n=30 (10.07)	n=18 (6.04)
	113 (37.91)	154 (51.68)	131 (43.96)	190 (63.76)
Poor	168 (56.38)	26 (8.72)	137 (45.97)	90 (30.20)

Table 3: Comparison of knowledge, attitude, and practice scores of nurses with different backgrounds in assessing PSD symptoms (n=298).

Characteristics	Knowledge (x±s)	Attitude (x±s)	Practice (x±s)
Gender			
Male	19.50±9.27	32.60±6.42	25.40±7.63
Female	25.28±8.92	33.35±5.46	26.38±6.70
T value	-2.01	-0.43	-0.45
P value	0.045	0.67	0.65
Department			
Neurology	25.71±9.69	33.87± 5.11	26.66±6.80
Neurosurgery	24.12±8.46	34.01± 5.55	26.36±6.38
Cardiovascular Medicine	20.63±7.76	29.88±5.72	29.00±10.74
Neurology outpatient clinic	22.50±3.54	28.50 ±3.54	28.00±0.00
Other	25.66±8.55	32.30 ±5.72	25.59±6.58
F value	1.01	2.58	0.67
P value	0.401	0.037	0.616
Administrative position			
Staff nurse	24.01±8.75	33.04±5.54	25.68±6.66
Nurse team leader	27.70±9.73	34.13±5.53	28.28±7.11
Head nurse	27.80±7.23	33.84±4.80	27.28±5.34
F value	5.42	1.06	3.87
P value	0.005	0.347	0.022
Technical title			
Registered nurse	21.58±8.66	33.40±5.79	26.82±7.32
Nurse specialist	25.69±8.46	33.53±5.32	25.85±6.50
RN care manager	25.70±9.57	32.84±5.60	26.26±6.72
Deputy chief nurse (clinician)	30.00±6.81	34.33±5.16	29.40±5.69
F value	5.09	0.48	1.38
P value	0.002	0.7	0.249
Participation in training			
Yes	27.25±8.92	34.34±5.28	28.36±6.54
No	24.16±8.86	32.90±5.52	25.49±6.63
T value	7.54	2.08	3.43
P value	0.006	0.038	0.001
Departmental protocol for screening			
Yes	25.71±9.45	34.78±5.80	28.31±6.61
No	24.86±8.82	32.82±5.29	25.67±6.64
T value	0.51	2.72	3.02
P value	0.475	0.007	0.003

The total score of 298 respondents is 84.76±13.255 with a minimum raw score of 37 and maximum of 115. The standard

score is 60.94. The knowledge score ranges from 5-50 (25.08±8.975) with a standard score of 50.16. The attitude score ranges from 9-45 (33.33±5.48) with a standard score of 74.067. The practice score ranges from 9-45 (26.35±6.72) with a standard score of 58.556. These scores are described in Table 2.

For the two questions with the highest and lowest scores, please refer to supplementary Table 2 and 3.

Using the demographic and other factors as independent variables, the differences in knowledge, attitude, and practice of nurses in assessing PSD symptoms are analyzed. The results of a single factor analysis indicate that there is statistical significance among the knowledge scores by gender, position, technical title, and participation in training. The attitude scores are also statistically significant when differentiated by department, participation in training, and the existence of a protocol in the workplace. There is statistical significance in the practice scores by work responsibilities (technical titles of nurses), participation in training, and a departmental protocol.

The statistically significant independent variables in the univariate analysis are analyzed in the multiple linear regression model. The knowledge, attitude, and practice of PSD symptom screening are used as dependent variables. The scores of knowledge and attitude dimensions are added to the multiple linear regression model of the practice dimension. The results of the analysis are shown in Table 4.

The results of the quantitative study show that only 89 (29.86%) respondents have participated in training on PSD, and 209 respondents have never participated in training. The results of multiple response analysis show that sources of knowledge acquisition are as follows: 63 (29.58%) respondents have participated in mini-lectures in the department; 53 (24.88%) have received in-hospital training; 50 (23.47%) have attended lectures or seminars. 38 (17.84%) respondents obtain knowledge through in-service by the head nurse. The remaining 9 (4.23%) respondents obtain knowledge through other means. $X^2=40.592, P=0.000$.

Barriers hindering nurses' assessment of PSD symptoms include lack of knowledge/ training (19.04%), lack of time (18.72%), and the belief of patients or family members that mental intervention is secondary to stroke treatment (17.12%), no standardized protocol (15.36%), lack of communication between doctors and nurses (12.00%), and other factors (0.32%), $X^2=228.960, P=0.000$.

The qualitative data of 12 interviewees is analyzed and clustered. Six themes and 17 sub-themes of barriers are identified. Three themes and 9 sub-themes of positive factors have emerged. This information is summarized in Table 5 and 6.

Discussion

Nurses need to improve their knowledge and practice of PSD symptom assessment

In the quantitative study, the total score of the survey respondents for assessing PDS symptoms is (84.76±13.255), and the standard score is 60.96, which is moderately low. Although the attitude of the clinicians is relatively positive, the scores of knowledge and practice dimensions are lower than a generally accepted passing line of 60 indicating inadequacy. This is consistent with the findings of other

Table 4: Results of multiple linear regression analysis of the survey participants' assessment of PSD symptoms.

Dependent	Independent	B	SE	Beta	t	Sig
Knowledge	constant	3.17	1.193	-	2.658	0.008
	technical title	0.343	0.154	0.157	2.224	0.027
	training participation	-0.658	0.221	-0.168	-2.973	0.003
Attitude	constant	38.316	1.52	-	25.215	0
	department constant	-0.403	0.19	-0.122	-2.121	0.035
Practice		20.48	3.199	-	6.401	0
	position	1.447	0.57	0.137	2.538	0.012
	training participation	-2.245	0.851	-1.53	-2.638	0.009
	Attitude score	0.384	0.066	0.314	5.828	0

Notes: ① $R^2=0.081$ adjust $R^2=0.068, F=6.422, P<0.001$; ② $R^2=0.043$, adjust $R^2=0.034, F=4.437, P=0.005$; ③ $R^2=0.184$, adjust $R^2=0.170, F=13.177, P<0.001$.

Table 5: Themes of barriers for nursing assessment of PSD symptoms (n=12).

Themes	Sub-themes
Insufficient knowledge	Inadequate opportunities for training
	Lack of systematic learning
	No resources
Staffing shortage	Increased workload
	Complexity of routine nursing tasks
Resistance within the team	Lack of administrative support
	Lack of interdisciplinary collaboration
	Efforts not supported by institutional policy
Lack of advocacy for PSD screening	Importance of assessment not recognized by staff members
	Mental issues not the focus of the healthcare system
	Insufficient efforts for research dissemination
Concerns about implementation	Not enough time during patient's hospital stay
	Lack of nursing competence for screening
	Questionable qualification of nursing staff
	Lack of patient cooperation
Low financial incentive	Low return on investment of time and efforts
	Costs outweigh the benefits

nursing researches on nurse competence [16,17]. In addition, nurses in this study have a lower knowledge level than similar studies. Our survey findings show that only 5.71% of the participants have a good knowledge level about PDS, and 56.38% are below the passing score. There is an urgent need to improve nurses' knowledge about PDS. In the qualitative study, 9 out of 12 respondents said that they had not or rarely had a chance to participate in training on this subject. N1 confided, "I have not participated in any lecture on post-stroke depression yet". N4 stated, "The learning opportunity is hard to come by. We were supposed to scan a bar code publicized on the official site for online learning. I was able to attend a virtual seminar once, but never went to any on ground activities".

Nurses fare better in the attitude dimension. 39.60% have a positive attitude. 51.68% have an Okay attitude. Only 8.72% have a poor attitude. This is an indication that nurses have a generally positive attitude and awareness of the need for assessing PSD symptoms. In

Table 6: Themes of positive factors for nursing assessment of PSD symptoms (n=12).

Themes	Sub-themes
Strong sense of responsibility by nurses	Compassion and empathy for the patient
	Establishing a trusting nurse-patient relationship
Attention by all walks of life	Support of the national health insurance policy
	Importance of screening recognized by society
	Increased research activities
Long-term benefits from assessment	Building knowledge and experience for nurses
	Promoting evidence-based practice
	Enhanced reputation of the workplace
	Reduced patient financial burden in the long run

the practice dimension, 45.97% of the respondents are at a poor level, and only 10.07% reach a good level. Only one of the 12 interviewees indicated that they had screened depressive symptoms of conscious patients post stroke. This has revealed the reality that nurses do not implement screening routinely in their clinical settings.

Study findings show that there is a correlation between nurses' knowledge, attitude, and practice [18]. Our study has confirmed a correlation between attitude and practice with $r=0.356$ ($p<0.05$). Surprisingly, knowledge is not related to attitude and practice in this study. It might have been related to how nursing education is delivered. Nursing students at school learn to focus on the disease pathology, diagnosis, treatment, and psychomotor nursing skills, but knowledge related to the emotional aspect is frequently undervalued. After the graduate nurses enter the work force, systematic training for post-stroke emotional disturbance is seriously lacking. Therefore, it is difficult for nurses to fully understand PSD [17]. The knowledge level of the respondents of our study is predominately at a low to mediocre level. The interviewees also admitted that the channels for nurses to acquire specialized knowledge were limited. N1 said, "My employer does not provide a platform to learn this new knowledge. I have no idea how to obtain training." N11 stated, "We didn't really have a chance to learn how to provide emotional care at school. I have always thought that mental disorders such as depression and anxiety should be handled by the psychiatric professionals."

Among the participants of the study, only 89 (29.86%) have attended formal training on PSD. The two questions in the knowledge dimension with the lowest scores are: "According to the consensus of experts of clinical practice in China, which of the following instruments is a simple and easy tool recommended for screening potential patients with depression?"

"Which of the following statements about post-stroke depression is wrong?"

The two questions with the lowest scores in the attitude dimension are:

"Do you think you have the competence to take care of PSD patients?"

"Do you think your knowledge of PSD is sufficient for clinical practice?"

Nurses are confused about the basic concepts of PSD and unaware of the screening instruments used for the condition. They think that they do not have the knowledge base about the disorder. It may be related to the severe lack of training in the clinical setting. While there exists a vast variety of assessment tools for depression, there is no unified standard and the application in clinical practice is inconsistent [19].

The two questions with the lowest scores in the practice dimension are:

"How often do you use depression assessment tools in your nursing practice?"

"How often do you assess the depressive symptoms of stroke patients in your nursing practice?"

Knowledge deficits and unawareness of screening tools result in a decrease in the frequency of routine assessment of patients for PSD symptoms and a decrease of the frequency in use of these tools.

The result of this study is also verified by the interview data. Most interviewees indicated that nurses had a low level of knowledge. N1 stated, "We learned a little bit about these screening tools for depression and anxiety in our geriatric nursing class. This allows for preliminary screening of patients post stroke, but it is limited to the use of the scale itself only. We need to learn more about the diagnosis, symptoms, treatment of PSD as well as reinforcement on the information about the screening tool." N8 stated, "I think my level of knowledge is still relatively low. On a scale of 0-10, I think I'm at a 4 at most."

We therefore strongly recommend that nurse administrators and educators should actively develop training opportunities for their clinical staff. Staff nurses should be encouraged to participate in conferences and online learning activities such as Massive Open Online Courses (MOOCs) and other venues to broaden their knowledge base on PSD. Only when clinicians' awareness of the disorder is enhanced, screening would become an inherent part of the routine practice. With early referral for treatment and proper interventions, improvement of patient outcome could be achieved.

Analysis of influencing factors for nurses' assessment of post-stroke depressive symptoms

Nurses with higher technical titles and participation in training have better knowledge of PSD: The results of multiple linear regression analysis show that nurses with higher technical titles have better knowledge about PSD than nurses with junior titles. This may be related to the lack of clinical experience and specialty training of nurses in junior positions. Most of these nurses focus their energy on the day-to-day nursing tasks and basic operation. Seasoned nurses usually have a broader knowledge base compared with their novice colleagues. During the interviews, participants also expressed their concerns about nurses' lack of clinical experience to conduct assessment of PSD symptoms. N12: "Different nurses could produce different results using the same scale. For instance, a new nurse's finding may be quite different from one with seniority. So, the recognition of a patient's condition may be affected by inaccurate assessment result".

Currently, stroke nursing as a specialty in China is at the early

stage of development. Options for the training of stroke nurse specialists are still being explored [20]. Classification of stroke nurse specialists is roughly divided into three categories: stroke emergency specialist, stroke center specialist, and stroke rehabilitation specialist. There is no specific training for stroke nurses in mental health despite the benefits of early identification and intervention of PSD patients in terms of rehabilitation of neurological function and improvement of quality of life [21-23].

Neurosurgery and neurology nurses have a better attitude toward assessing PSD symptoms: The results of multiple linear regression analysis show that nurses working in neurosurgery and in-patient neurology have a better attitude than nurses in cardiology, neurology clinic, and other departments (including rehabilitation, geriatrics, and residential treatment, etc.) toward assessment of PSD. Those working in neurosurgery are better than neurology. It may be related to the fact that the neurology specialty has the most concentration of stroke cases. Hence, clinical learning experience and resources are abundant. According to previous studies, the incidence of depression in the early stage of ischemic stroke is 32.2% [24], and the incidence of depression in the early stage of hemorrhagic stroke is 66.4% [25]. The occurrence of depression after neurosurgery is approximately twice as much as those managed without surgery. This explains the reason why nurses working in neurosurgery are more likely to assess their patient's emotional changes. Therefore, nurses in the neurosurgery department would have a more positive attitude toward assessment than those in the neurology department. All the nurses in the interview agreed that it was necessary to assess the depressive symptoms of stroke patients. N7 stated, "Evaluation and screening are definitely necessary. If you conduct the process early, you can intervene early as well. It will definitely help to mitigate patient's suffering and improve the prognosis of the disease."

Nurses who score higher in the attitude dimension, hold higher positions, and have participated in training have better practice related to the assessment of PSD symptoms: According to the results of multiple linear regression analysis, nurses score higher in the attitude dimension also have better practice related to the assessment of PSD symptoms. This is consistent with the findings of other researches on nursing competence [26]. In addition to the attitude scores, administrative positions and participation in training are also factors affecting nurses' behavior in assessing PSD symptoms. The results of the single factor analysis show that score in the practice dimension of the nurse team leader is higher than that of the head nurse and the staff nurse. This is also consistent with the results of a previous study on the knowledge of neurology nursing and behavior pattern of nurses [27]. A possible explanation for this is that a nurse team leader is more involved in direct patient care whereas the head nurse has more administrative duties. In addition, nurses who have participated in training have better practice in assessment of PSD symptoms. Acquisition of knowledge can change nurses' attitude toward a clinical practice. Knowledge is also the foundation for behavioral change.

The top three hindering factors and facilitating factors for the assessment of PSD symptoms: A multiple response analysis of the multiple-choice questions in the quantitative study conclude that the top three hindering factors for the assessment of PSD symptoms are: lack of training, staffing shortage, and poor awareness of patients or

family members. The interviews have expounded these factors. The additional factors include lack of financial incentive for screening, concerns about improper implementation, and lack of administrative support among others. Facilitating factors include strong sense of nursing responsibility, societal advocacy, and potential long-term benefits of early identification and interventions for patients with the disorder.

Limitations

This study uses a mixed method combining quantitative and qualitative research approaches. Quantitative data collection is conducted by means of online surveys. The responses to the questions may be subjective, thus causing a certain degree of bias in the data. The participants are nursing staff in Guangdong Province. Therefore, the sample can only represent the current situation of the healthcare system in the region. In the future, it is recommended that nursing researchers conduct further research in more healthcare organizations across the country.

Conclusion

The knowledge, attitudes, and practice of nurses in Guangdong Province related to the assessment of PSD symptoms are generally at a low level. This situation is calling for immediate improvements. Training of stroke nurse specialists would be an important way for nurses to acquire knowledge about PSD. We are also hoping to see more research data nationwide to provide evidence bases for institutional policies and clinical pathways for PSD screening and assessment. A change of clinical practice is an important step in the stroke care continuum starting from basic nursing education. This change process may be a paradigm shift coming from the policy makers of the healthcare system. It should also be a grassroots effort that involves the multi-disciplinary team members including the hospital administrators, healthcare providers, nurse clinicians, and patients and their family members.

Acknowledgement

This research is supported by a grant from the Shantou city government, No. 2019-106-9.

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