

Title page

Determinants to implementation of a post-stroke dysphagia evidence-based nursing program in China using the consolidated framework for implementation research: a qualitative study

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Abstract

Background: Post-stroke dysphagia (PSD) is a common complication after stroke, which is worthy of research attention. Active intervention is the key to improving the prognosis of stroke patients, and nurses play an important role. Here, the effectiveness of a Post-stroke Dysphagia Evidence-Based Nursing Program (PSD-EBNP) was evaluated post-stroke in four hospitals in China. Before implementing the trial, it was imperative to identify determinants with the potential to influence its implementation.

Methods: Guided by the Consolidated Framework for Implementation Research (CFIR) framework, an interview guide was formulated to explore factors in four CFIR domains. From June to October 2019, semi-structured qualitative interviews were conducted with 26 nurses from four hospitals in China. The interview data were then qualitatively analysed by two researchers using a thematic framework analysis approach.

Results: Five facilitators and nine barriers were found. The facilitators were: ① support from external agencies; ② a good team climate; ③ perceiving the benefits of implementation; ④ setting the groundwork of clinical practice; ⑤ the caregiver (outside the CFIR domain). Meanwhile, the barriers were: ① a lack of opportunities for institutional cooperation; ② limited patient cooperation; ③ the organisation's lack of accountability and insufficient human support; ④ lack of clear workflow; ⑤ nurses' lack of knowledge and skills; ⑥ a lack of confidence in

the implementation; ⑦ the presence of alternative interventions; ⑧ the complexity of the intervention; ⑨ the implementation costs.

Conclusion: The CFIR provided a valuable framework for identifying determinants before implementation. In the run-up to a PSD-EBNP, the most important tasks are to improve the organisation's accountability, gain the support of staff, and improve nurses' knowledge and skills. When patients are on a ward, it is recommended that nurses organise lectures for the patients, along with their caregivers, who play critical roles in their rehabilitation.

Trial registration: This study was registered in the Chinese Clinical Trial Registry(ChiCTR2000039313), registered 23 October 2020. <http://www.chictr.org.cn/login.aspx?referurl=%2fedit.aspx%3fpid%3d53717%26htm%3d4>

Keywords: CFIR, Implementation, Determinants, Post-stroke dysphagia, Facilitators, Barriers, Evidence-based practice.

Contributions to the literature

- 1.This study shows that qualitative interviews conducted using the consolidated framework for implementation research(CFIR) before implementation can better assess the barriers and facilitators of implementation, and can provide recommendations for the development of intervention programs, which can promote better clinical implementation of interventions;
2. It is proposed that the CFIR should be adapted. Some suggestions we mentioned in the study for the CFIR framework can make it more concise and

adaptable;

3. we provided suggestions in the literature for better implementation of stroke dysphagia care in tertiary hospitals in China.

Reporting standards

Because our study is a qualitative study, so our manuscript follows the standard of Consolidated criteria for reporting qualitative research (COREQ).

Background

Stroke is a cerebrovascular system disease with high morbidity, mortality and disability rates, and with a major incidence worldwide[1]. Post-stroke dysphagia (PSD) is one of the most common and serious symptoms after stroke. The incidence is about 37~78% according to different evaluation methods[2]. Complications of PSD such as aspiration, pneumonia, malnutrition, and psychological disorders affect the prognosis and life quality of the patient. Furthermore, PSD significantly increases post-stroke medical costs[3]. The diagnosis, treatment and nursing of dysphagia patients have attracted the attention of researchers. Early evaluation of swallowing function after stroke and active rehabilitation treatment have a significant impact on shortening the course of disease[4]. Nurses play a critical role in the whole process of PSD treatment and rehabilitation. Improving the quality of nursing practice for PSD is critical to the prognosis of patients.

Evidence-based practice (EBP) in nursing is defined as “a problem-solving approach to clinical decision making that incorporates a search for the best and

latest evidence, clinical expertise and assessment, and patient preference values within a context of caring"[5]. The implementation of EBP leads to high-quality and safe care, which can improve patient outcomes and reduce costs[6]. There are various best practice guidelines created by nursing organizations that can help nurses utilize the principles of EBP in patient care decision-making[7]. In recent years, a Post-Stroke Dysphagia Evidence-Based Nursing Program(PSD-EBNP) have been developed by our research team according to the "knowledge to action framework (KTA)[8]". This covers the key nursing measures for PSD patients and guides clinical nurses.

However, according to the literature reports[9-10], multiple barriers prevent nurses from implementing EBP, which result in inconsistency between nursing practice and evidence-based recommendation. As such, the current EBP gaps must be identified if implementation strategies are to be further developed [11]. The Consolidated Framework for Implementation Research (CFIR), as a formative assessment tool, provides a systematic way to identify determinants(facilitators and barriers)[12-13]. If the CFIR is applied before implementation, the identified factors can be addressed in a timely manner. In that context, the purpose of this study was to explore the determinants that can influence the intervention programmes before implementation using the CFIR framework and understand adaptations needed to make the implementation better.

Methods

Study design

Semi-structured qualitative interviews were conducted with 26 nurses from four tertiary hospitals from August to October 2019 before the implementation of the PSD-EBNP. The interviewer, who has a strong interest in EBP, learned relevant knowledge and skills concerning PSD before the interviews were held.

Sample and setting

The inclusion criteria were as follows: nurses with clinical practice qualifications; at least three years of working experience in a neurology department; who volunteered to participate in this study. The exclusion criteria were as follows: nurses in training or practice. Data collection was stopped only when no new information appeared. No one refused to participate or dropped out midway. The participants are referred to using a code where the letter denotes their institution: A1, A2, ..., A6; B1, B2, ..., B6; C1, C2, ..., C8; D1, D2, ..., D6. They are head nurses, nurses in charge of teaching, and general duty nurses. Their job titles include co-chief superintendent nurse, nurse-in-charge, and nurse practitioner. All of them hold undergraduate degrees. The ages and working years of the nurses at the time of the interviews were 33.44 ± 4.74 and 11.81 ± 5.31 years, respectively.

Data collection

Based on the CFIR, a guide was developed for the interviews [see Additional file 1]. The guide covered four domain constructs: (1) outer setting (e.g. patient needs, peer cooperation, and policies); (2) inner setting (e.g. implementation readiness, implementation atmosphere, internal relations, structural

characteristics, and organisational culture); (3) individual characteristics (e.g. views and understanding of intervention, confidence in implementation, and identification with the organisation); (4) intervention characteristics (e.g. source of intervention, validity, comparative advantage, complexity of evidence, and cost).

Data were collected using semi-structured interviews. Before the interview, all participants were informed of the purpose of this study and the content of the PSD-EBNP by the researcher. They were informed that their identities and responses would remain confidential. The interview guide was pretested with two nurses who later participated in the study. Interviews were conducted by telephone and lasted 30-60 minutes. No other personnel were present besides the interviewer and interviewee. Detailed information from the interviews was recorded in the interviewer's notes and audio recordings. The audio recordings were transcribed by two researchers within 24 hours after each interview. The transcribed content was submitted to the participants for verification. Repeated interviews were conducted with three participants.

Data analysis

The interviews were transcribed and analysed using a thematic framework analysis approach. Frame analysis is a mature research and analysis method in the field of qualitative research that has been used successfully in many areas of research[14]. It is suitable for applied decision research, such as that addressing specific research problems, for example, studies that need to obtain results or provide advice in a limited time, on a specific study population, or research with

a predetermined topic[15]. As this research fell under application decision research, this method was applicable. There are five steps: (1) familiarization; (2) identifying a thematic framework; (3) indexing; (4) charting; (5) mapping and interpretation[16]. Themes were reviewed and interpreted by considering the participants' perceptions of factors influencing the implementation of a PSD-EBNP. The analysis was completed by two researchers. They analysed the themes from all interviews, and then discussed some differences. The outcome returned to the interviewees for information verification.

Results

In total, five facilitators and nine barriers emerged from the analysis of the interview data[see Additional file 2].

Domains mentioned in CFIR

Outer setting

Institutional cooperation

In the context of institutional cooperation, support from external agencies was found to be a facilitator, while a lack of opportunities for institutional cooperation is a barrier. Nurses who have studied in other hospitals and who still communicate with the personnel there can access more specialised support when they encounter problems. *"I used to study in Zhongshan Third Hospital in Guangzhou. They have a very systematic nursing process, and now I have contact with the teachers there. If I have a problem, I can ask them."*(B2) Conversely, a lack of opportunities for institutional cooperation can hinder implementation. Nurses

in some hospitals emphasised the importance of going for further study in other hospitals, but they lacked an opportunity to do so. *"I wish I could study in wider hospitals as much as possible. But only one or two people in our department have the opportunity to go out and study."* (D4)

Patient needs

Limited patient cooperation is a barrier to implementation (such as, for instance, an insufficient knowledge reserve of patients, lack of effort applied to recover from swallowing disorders, and limitations of their conditions). The interviewees reported that some patients prefer them to treat their day-to-day issues, rather than get to work on complication management for dysphagia. As such, they fail to make a sufficient effort to recover from dysphagia. *"Acute patients who pay more attention to the treatment and nursing of other problems are unwilling to cooperate with rehabilitation of dysphagia."* (C6) Furthermore, as they have limited knowledge, some patients do not cooperate well with nurses. *"The patients are generally uneducated, and maybe when you tell them the trick to eat, they don't really understand."* (A2) Beyond this, a patient's condition can also hinder the implementation. *"Patients with cognitive impairment can't do rehabilitation training."* (A5)

Inner setting

Culture

A good team climate will facilitate the implementation. The departments the sampled nurses work at were noted to have a strong team culture. The

department leaders pay attention to sustaining the harmonious collective working atmosphere and are good at organising the nurses to cooperate. Many interviewees in the four hospitals have team consciousness. *"I have a good relationship with my colleagues and keep pace with them."* (C8)

Implementation climate.

Perceiving the benefits of implementation and setting the groundwork of clinical practice will encourage nurses to implement a PSD-EBNP. Nurses from all four hospitals expressed a belief that the implementation of a PSD-EBNP benefits both nurses and patients, meaning it is consistent with their goals and values and those of their department. *"The work is meaningful and necessary for me because it is good for the patients and the hospital."* (C7) It was also found that although the PSD-EBNP is a "new" practice, the intervention is consistent with the existing clinical nursing practice, with certain compatibility. The current clinical care in the four hospitals covers interventions including screening patients for swallowing disorders, screening for malnutrition risk, oral care, etc. *"We sometimes coach patients on swallowing skills, mouthful size, rehabilitation exercises."* (A2)

Readiness for implementation

Factors related to readiness, including the organisation's lack of accountability, insufficient support from staff, and a clear workflow, are all barriers to implementation. In this scenario, a department needs to provide further support in terms of personnel, authorisation, and human support. *"Doctors, therapists, and nurses all lead rehabilitation training, and there must be*

inconsistencies in our advice. Who should the patients listen to?" (C7) Many details are also unclear; clinical nursing for dysphagia requires specific implementation content and methods, such as resources that set out the workflow, tools, timings, and so on. "There should be a process where different things are implemented in a sequence; otherwise, it seems too complicated. The measures involved will be easier to implement if there is a corresponding care sheet." (A3, B6, D3, D4)

Individual characteristics

Knowledge & beliefs about the intervention

Nurses' lack of knowledge and skills is an obstacle to implementation. Most interviewees reported a lack of knowledge and skills about dysphagia. *"Although there are criteria for assessing swallowing function, not everyone can use them correctly." (A2)*

Self-efficacy

The present situation of multidisciplinary cooperation is not optimistic, leading to a lack of confidence among nurses in the implementation. *"When we screen someone and find they have a swallowing problem, we talk to the doctor. But doctors don't put as much emphasis on swallowing rehabilitation as we do. "* (D1)

Intervention characteristics

Relative advantage

Implementation is hampered by the presence of alternative interventions. There are clinical alternatives to the PSD-EBNP; for instance, oral dietary care can

be replaced by nasal feeding tube care. *"Dietary care is very troublesome; we cannot feed them every meal. Some family members also think it is better to insert a stomach tube."* (B5)

Complexity

The complexity of the intervention hinders its implementation. Firstly, multi-step care is difficult to implement clinically. Secondly, the long duration of nurse-patient cooperation hinders nurses from effectively implementing rehabilitation nursing. *"Patients cooperate with simple movement of the tongue, up and down. But if there are many steps, they are not willing to do it."* (B3)

Cost

Interventions that impose costs, especially financial burdens on patients, can be difficult to implement. Interviewees indicated that oral care must be paid for by patients, which can lead to resistance from patients when nurses propose implementing the intervention. *"Oral care requires a doctor's order and is paid for. Some patients may not want to pay."* (A3)

Domains not mentioned in CFIR

Caregivers

Caregivers play an important role in the recovery of PSD patients. Nurses cannot care for patients at every moment, so help and supervision from their caregivers are essential for the rehabilitation of patients. *"Although we are offering nutrition and dietary care every day, the patient's hospital days are relatively short, so we can't see the nursing effect of nutrition in the hospital."* (B1)

Discussion

The CFIR framework provides a valuable structure for identifying facilitators and barriers before the implementation of the PSD-ENBP. The most difficult part of EBP is the start-up stage, and China's dysphagia nursing has begun to move towards the specialized direction, not only support from external agencies can help to implement the project in four target hospitals, but also the groundwork of clinical practice can make nurses familiar of new EBP quickly. The nurse community, which has a good team climate, is conducive to implementation. Yet, an organization's accountability was found to affect the staff support for an intervention, which is different from other forms of EBP[17]. Beyond this, nurses' lack of knowledge and skills represents a further barrier to implementation. Before the PSD-ENBP is given a clinical application, the factors with the potential to influence its implementation should be identified according to CFIR; then, the quality of care and patient outcomes can be better improved when implementing the PSD-ENBP. In one approach, for instance, when PSD patients are on a ward, it is recommended that nurses organise lectures and further promote health education for patients, along with their caregivers, who play critical roles in patients' rehabilitation.

Within outer setting, previous studies have demonstrated the effectiveness of using a multidisciplinary team to enhance the implementation[18]. It was also found by our research that External support will improve the implementation of the PSD-ENBP. In China, dysphagia care has just been popularised and some

hospitals such as Zhongshan Third Hospital in the south of the country can treat difficult and complicated cases of dysphagia, but there are no such hospitals in the central and northern parts of China. Looking ahead, it will be necessary to hold training linking the north and south, to exchange nursing knowledge.

Studies have shown that consideration of the needs and feedback of patients benefits the implementation[19]. In China, patients pay more attention to their underlying diseases than the need for them to engage with swallowing care, and the large medical burden and heavy workload experienced by nurses mean they are not always able to prioritise care for patients' complications. Yet, it is important that nurses offer health education to patients, to enhance their knowledge of their health and improve the efforts they make to recover. Alternatively, interventions may be carried out depending on patients' conditions to overcome any further resistance to their PSD care.

Within inner setting, previous studies have demonstrated that organisational change can promote implementation, along with changes to the team's organisational culture[20-21]. Although the original clinic practice which nurses doing for patients provided the basis for implementation, it was still far from EBP. Furthermore, implementation readiness is a further factor that is important for driving transformation. Only by combining the knowledge, skills, and resources of the organisation and its people can a hospital develop effective and locally feasible solutions [22]. In addition to this, implementation must be approved and authorised by the leader[23]; as such, leadership endorsement is key to fostering

supportive attitudes among nurses that drive the implementation of intervention programs.

At present, there is no clear clinical regulation of who carries out rehabilitation care; so as long as nurses have formal training and master the relevant skills, they can provide rehabilitation care to patients. It has been pointed out that improving the division of labour based on the professional knowledge and experience of nurses and multidisciplinary personnel could be another direct way to improve the efficiency of implementation[24]. To achieve this, the number of PSD-EBNP implementation personnel and a clear division of labour should be determined according to the human resources available in each case.

When nurses' individual characteristics are considered, their belief in EBP is positively correlated with the implementation. In addition, their knowledge level is also one of the important predictors of successful implementation of EBP[25]. Most nurses in this research held positive attitudes towards PSD-EBNP, but they lack knowledge of and skills to care for patients with swallowing disorders. The positive attitudes and firm beliefs of the nurses in this study were essential to their role as facilitators, but nurses should also be equipped with relevant knowledge and skills. Hospitals must do more to train their nurses to care for PSD patients; only in this way can nurses increase their self-efficacy and knowledge, for better implementation.

The new intervention has a strong comparative advantage over alternative intervention[26]. Yet, if the evidence backing up the new intervention is not very

convincing, the original interventions will hinder its implementation. Of chief importance, the complexity and costs of an intervention stand as barriers to its implementation[20]. In this study, the clinical implementation of multi-step nursing measures such as the PSD-EBNP was found to be difficult; potentially, its complexity could be reduced to support its better implementation. Furthermore, if the intervention places an economic burden on patients, they may not be willing to cooperate; therefore, simple, low-cost intervention measures should be selected as far as possible.

Regarding the CFIR framework, in carrying out this study, some problems were encountered with its use. Certain questions were difficult for participants to answer, such as questions about the organisation's structure. Furthermore, as some interviews were conducted before the implementation, the participants could not accurately answer certain questions, such as those on the organisational incentives and goals. Therefore, it is proposed that the CFIR should be adapted, with some repetitive items combined into one, and difficult questions' wording adjusted so participants can more easily understand them and give an answer. Hopefully, once changes such as these are made, the CFIR will become a highly useful tool in the process of implementation. To add to its efficacy, an addition to the CFIR concerning the patient's caregiver(s) should be considered. The nurse should impress on the caregiver the importance of their role, and instruct them on how to carry out the rehabilitation concerning the patient's swallowing disorder after their discharge. For example, nurses may share videos aimed at

caregivers of patients, which they can watch and rewatch as learning tools, to improve their ability to help the patient with their rehabilitation.

Limitations

This study had multiple limitations that must be noted at this point. First, this was a single qualitative study that used purposive sampling. The results were limited to those gained from interviewees who agreed to participate in the interviews, which could have led to selection bias. Second, the study was only conducted before the implementation of the intervention, so not all of the constructs of the CFIR could be assessed. Studies have found that interviews to assess CFIR variables after implementation are also critical to assess the predictive value of baseline assessments[13]. Despite these limitations, every effort was made to collect and analyse the views of all participants. This study was novel in that it utilised data collection and analysis involving individuals at all hospitals willing to participate in the implementation. Since the interviews were conducted with respondents from four hospitals in China, the diversity of the sample facilitates the findings' application and transfer to other hospitals.

Implications for application to other organizations

The CFIR provides a valuable framework for identifying factors before implementation that can be used by others when implementing evidence-based practice. Taking the time before implementation to identify influencing factors is a key step to successful implementation. Applying the existing evidence can improve the quality of nursing and support a more comprehensive endeavour.

Integrating the CFIR before implementation may also contribute to more successful and sustainable nursing.

Conclusions

As the findings indicate, the use of theoretical models to assess influencing factors before its implementation can improve the precision of an intervention's design and implementation. In the run-up to a PSD-EBNP, the most important tasks are to improve the organisation's accountability, gain support from the staff, and improve nurses' knowledge and skills. When patients are on a ward, it is recommended that nurses organise lectures and further education for patients, along with their caregivers, who play critical roles in their rehabilitation. This study provides foundational information for the clinical implementation of PSD nursing in China, and it is expected to provide a reference for other EBPs.

List of abbreviations

PSD: Post-stroke dysphagia;

PSD-EBNP: Post-stroke Dysphagia Evidence-Based Nursing Program;

CFIR: Consolidated Framework for Implementation Research;

EBP: Evidence-based practice.

Declarations

Ethics approval and consent to participate

Ethical approval for this study was received from the Second Military Medical University Translational Medicine Ethic Committee (TMEC2018-003) in May 2018.

Participants signed a participant consent form to participate in the study.

Consent for publication

Not applicable.

Availability of data and materials

The qualitative data will not be shared to protect participants' confidentiality and privacy.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

JT, YW, and LZ conceived the papers' aims and drafted and edited the manuscript. YW, BZ and QW reviewed earlier versions of the paper and provided the critical feedback. JL and YW analyzed the qualitative data. WZ, YW and XC conducted the interviews. All authors read and approved the final manuscript.

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