

The feasibility and effectiveness of telecare consultations in nurse-led post-acute stroke clinics: A study protocol

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Abstract

Background: Globally, nurse-led post-acute stroke clinics have been developed to provide secondary care services to stroke survivors. Although synthesized evidence supports the idea that the secondary prevention services delivered by nurses in these clinics can improve the functional ability of stroke survivors and reduce their readmission rates, long travel and waiting times, high costs, and the pandemic have limited the utilization of such clinics. Telecare consultations are a new modality for expanding public access to healthcare services, although how it can be applied in nurse-led clinics has not been reported.

Objective: The aim of this study is to determine the feasibility and effects of telecare consultations in nurse-led post-acute stroke clinics.

Methods: The study adopts a quasi-experimental design. The participants will receive three secondary stroke care consultations in 3 months provided via telecare by experienced advanced practice nurses. The outcome measures include feasibility (reasons for refusing to participate and for dropping-out, the attitudes and satisfaction of both the advanced practice nurses and their patients towards the programme), and preliminary effectiveness (degree of disability after stroke, activities of daily living, instrumental activities of daily living, health-related quality of life, depression) outcomes. Data will be collected at pre-(T1) and post-(T2) intervention.

Conclusions: The findings of this study may help facilitate the implementation of telecare consultations in a nurse-led post-acute stroke clinic, which may benefit the stroke survivors who are having mobility restrictions from accessing customary healthcare services and may protect them from being exposed to the infectious risk.

Keywords

Stroke, nurse clinic, telecare, rehabilitation, advanced practice nurse

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Introduction

Recurrent stroke is becoming more common in post-stroke patients. In 2021, there were over 12.2 million people globally who suffered from stroke; among them, one in four experienced a recurrent stroke within one year.¹ Similar to index stroke, recurrent stroke patients may experience serious complications such as infections, epileptic seizures and thromboembolism, which could result in either

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mortality or increased disability.² To prevent recurrent stroke, a structured, professional-led transitional programme should be tailored to patients immediately after their discharge from the acute stroke unit.³

Globally, nurse-led post-acute stroke clinics have been developed to serve and follow up on stroke patients who have just been discharged from the hospital.⁴ The clinics are run by advanced practicing nurses (APNs) who are experienced in stroke care. The APNs monitor and support the health conditions of those who have survived an acute stroke and encourage them to follow a healthy lifestyle. In each consultation, the APNs conduct a comprehensive health assessment, plan and set realistic goals with the clients, and suggest ways to facilitate their adherence to healthy behaviour at home. They also equip their families with the knowledge and caregiving skills to deal independently with the numerous challenges faced by their loved ones, thereby reducing the feeling of caregiving burden. When necessary, APNs will seek the support of other healthcare professionals such as dietitians and physiotherapists in order to fulfil the holistic needs of the stroke survivors and their family members.⁵

Thus far, the nurse-led post-acute stroke clinics have proven to be effective at maximizing the recovery of post-acute stroke patients who have just been discharged from the hospital. Studies indicate that stroke survivors who are regularly followed up in clinics have shown improvements in medication adherence, blood pressure and health service utilization.^{6,7} De Sousa stated that over 70% of stroke patients complied with the nurses' recommendations to modify their diet and exercise patterns.⁸ Other studies also found an over 50% reduction in stroke readmissions when the patients adhered to the nurse-led clinic appointments.^{9,10}

Although it was proven that the nurse-led post-stroke clinics could be beneficial to the patients' recovery, statistics have shown that about one-fourth of the survivors failed to attend the clinics.¹¹ Physical disabilities, long travelling times, high travel costs and long waiting times in the clinic are some of the shortcomings that stroke survivors have complained about.^{12,13} The government policy of reducing the number of visits during the current COVID-19 pandemic has further limited the ability of stroke survivors to receive much-needed rehabilitative care from the APNs.¹⁴ In this regard, telecare consultations may be an alternative option to sustain post-stroke care services and ensure ongoing communication among patients, families and healthcare professionals.^{15,16}

A telecare consultation is defined as an online meeting between healthcare professionals and patients via audio-video communication tools, such as Zoom and Microsoft Teams.¹⁷ With the use of telecare, APNs are able to exchange medical information, perform remote physical examinations and provide virtual care to their clients.¹⁸

The evidence suggests that telecare consultations may not only bring convenience to stroke survivors but may also be an effective preventive measure to reduce person-to-person contacts, hence lowering infection risks for this vulnerable group during the pandemic.¹⁹ In the long term, telecare consultations could be a way of providing care to stroke survivors that is comparable to onsite face-to-face consultations, but at a lower cost.²⁰

However, implementing telecare consultations in nurse-led clinics is easier said than done. Some patients may not have access to the Internet or mobile devices, and thus may not be in a position to benefit from telecare services.²¹ Although technological devices are very common nowadays, using these as a formal channel for communication is still a hurdle for some patients, especially those who are older and have no experience in using them. Some patients even expressed concerns about the security of using a webcam and expressed uneasiness during a telecare consultation.²²

To the best of our knowledge, there are few studies examining the feasibility and acceptability of implementing telecare consultations for both healthcare providers and patients in nurse-led clinics.^{23,24} Although Chau et al.²⁵ and Mani et al.²⁶ have shown that telecare services are acceptable and potentially effective for older adults with chronic obstructive pulmonary disease and paediatric obesity, respectively, both programmes used the telephone as their delivery medium. Coco et al.²⁷ and Cosh et al.²⁸ evaluated the acceptability and feasibility of holding training workshops for providers on the use of videoconferencing. It remains to be seen whether telecare consultations are feasible and can be used as a substitute for conventional face-to-face consultations in nurse-led post-acute stroke clinics. The aim of this study is to develop a protocol for assessing the feasibility and potential effectiveness of providing telecare consultations to stroke survivors. If proven feasible and effective, the programme can provide an alternative way for stroke survivors to receive care from healthcare professionals without leaving their home, thereby improving their appointment attendance rate and quality of life.

Methods

This protocol paper was guided by the SPIRIT statement.²⁹

Study design and setting

This study will adopt a quasi-experimental, one-group pre-test post-test research design. It is being conducted in collaboration with a neurological medical ward in one of the biggest hospitals in Hong Kong. The present study is being conducted according to the principles indicated in the Declaration of Helsinki.

Participants and recruitment strategy

The programme targets stroke patients who have been discharged from the ward and who have at least one risk factor such as diabetes or hypertension. The criteria for inclusion in this programme are: (1) to have received a confirmed diagnosis of stroke within 1 month before enrolment, (2) to have been referred to a nurse-led post-acute stroke clinic, (3) to be aged 18 or above, (4) to be cognitively competent with a score equal to or greater than 22 in the Montreal Cognitive Assessment Hong Kong version,³⁰ (5) to be living at home before and after being discharged from the neurology medical ward, and (6) to have a smartphone or be living with a family member who has a smartphone. The criteria for exclusion from this study are: (1) to have hearing or vision loss, (2) to not be reachable by smartphone, (3) to be bedbound, (4) to be living in an area with no Internet coverage or (5) to require physical contact during a consultation, that is, wound dressing.

The identification of individuals who potentially meet the inclusion criteria will be facilitated by the use of a Clinical Management System in the hospital. A research assistant (RA) will meet the potential subjects at their bedside one day before they are discharged. During the visit, the RA will screen the subjects for eligibility, explain the programme, seek their consent to participate in the study and help them download Zoom on their smartphone and provide guidance on using the software. To ensure that the subjects can use Zoom without difficulties, the RA will conduct a trial run with the subjects in the ward immediately after the recruitment procedures are completed. The RA who is involved in recruitment will be trained and provided with a set of protocols, including the workflow of the study and guidelines on the use of the software. The subjects will also receive pamphlet and hospital hotline in case they have difficulties in using Zoom for consultation session.

Sample size

Since this is a study aimed at evaluating the feasibility and potential effectiveness of the telecare programme among stroke patients, a sample size calculation is not required.³¹ The general rule is to have 30 patients.³² Assuming a drop-out rate of 20%, the total sample size needed in this study is 36 subjects.

Interventions

Each subject will receive three telecare consultations by an experienced APN, with the first consultation scheduled within two weeks after the subject is discharged from the hospital. The subject will have the second

and third consultations in the second and third months, respectively.

One day before the consultation date, the RA will call the subjects via Zoom to remind them of the scheduled consultation and confirm that they are capable of using Zoom to meet with the APN. The APN in the clinic will provide protocol-driven, patient-centred care to effectively meet the holistic needs of stroke survivors. The protocols that use by the APN in the consultation sessions are developed based on the National Clinical Guideline for Stroke from the National Health Service and the 2021 Guideline for the Prevention of Stroke in patients with stroke from the American Stroke Association and validated by the Hong Kong Hospital Authority and the Department of Health.^{33,34} During the first telecare appointment, the APN will comprehensively assess the health conditions, signs and symptoms of recurrent stroke and the drug and treatment compliance of the patients. Based on the assessment results, an individualized stroke management plan and goals will be formulated together with the patients. Throughout the three consultations, the APN will follow up on and emphasize the following: post-stroke self-care management skills and techniques, lifestyle modifications and precautions, monitoring of symptoms and progress in accomplishing goals. When necessary, the patients will be referred to a multidisciplinary team that includes a neurologist, a dietitian and a physiotherapist, according to the referral guidelines.

Ethical considerations

This study was reviewed and approved by our institution's ethics committee. Written informed consent will be obtained from all eligible subjects. They will be assured of their right to refuse to participate and to withdraw from the study at any time. No recordings will be made during the telecare consultations. The data obtained from questionnaire will be accessible only to the research team.

Outcome measures

There are three sets of measures: demographics, feasibility outcomes and potential effectiveness outcomes.

Demographics. Each participant will be required to provide demographic information, including their age, gender, marital status, past medical history, stroke type (ischaemic or haemorrhagic), days from hospital discharge to first telecare consultation and travelling time to clinic.

Feasibility outcomes (reasons for refusal and drop-out, risks and constraints, acceptance of and satisfaction with the use of telecare consultations). When subjects decline to take part in the study or choose to drop out after baseline data have been collected, the RA will ask the subjects, either

face-to-face or through telephone, about their reasons for doing so. In addition, the confidence of using telecare consultation via smartphone will be assessed in the questionnaire. Semi-structured interviews will be used to explore the risks and constraints, acceptance and satisfaction of both the APN and the stroke survivors towards the use of telecare consultations. The patients' attitude and service satisfaction towards telecare consultations will also be measured by a questionnaire. To prevent bias, there will be separate interview sessions for the APN and the stroke survivors.

Effectiveness outcomes (degree of disability after stroke, basic and instrumental activities of daily living, stroke-specific quality of life, depression level). The degree of disability after stroke will be measured using the simplified modified Rankin Scale.³⁵ The scale ranges from 0 to 6, with 0 representing no residual symptoms after stroke and 6 indicating death. It shows good reliability, with a Kappa score of 0.82.³⁵

Basic activities of daily living will be measured using the Chinese version of the Modified Barthel Index.³⁶ This 5-point Likert scale evaluates the performance of subjects on 10 basic activities of daily living including feeding, dressing, grooming, bathing, toileting, bed-chair transfer, bladder and bowel control, ambulation and stair climbing. The scores range from 0 to 100, with higher scores representing higher levels of functional independence. The scale demonstrated high internal consistency ($\alpha = 0.93$) and test-retest reliability ($k = 0.81-1.00$).

The Chinese version of the Lawton Instrumental Activities of Daily Living will be used to measure the instrumental activities of daily living of stroke survivors. This 4-point Likert scale measures nine activities, namely, use of the telephone, transportation, shopping, meal preparation, housework, handyman work, laundry, medication management and money management.³⁷ The scores range from 0 to 27, with higher scores representing higher levels of independence. The scale has been shown to have high inter-rater reliability (0.99) and a high correlation coefficient (0.91).³⁸

Stroke-specific quality of life will be measured using the Cantonese version of the Stroke Impact Scale.³⁹ The scale consists of eight questions related to the stroke survivors' strength, memory and thinking, emotions, communication, ADL/IADL, mobility, hand function and social participation. The ninth question in the scale asks about the survivors' perceived recovery level, with 0 indicating no recovery and 100 indicating full recovery. The scale has good content validity and internal consistency.⁴⁰

Depression levels will be measured using the Chinese version of the Geriatric Depression Scale.⁴¹ The scores on the scale range from 0 to 15, with higher scores representing higher levels of depressive symptoms. A cut-off point of 8 indicates high sensitivity and specificity, at

96.3% and 87.5%, respectively.⁴² The scale has high internal consistency and test-retest reliability.⁴² The research team has obtained permission from the copyright holders to use the questionnaires included in the study.

Data collection

The quantitative data will be collected at two-time intervals: at baseline pre-intervention (T1) and at two months when the programmes are completed (T2). A trained RA will collect the T1 and T2 data face-to-face at the patients' bedside in the ward and through a telephone call, respectively.

The qualitative data will be collected through semi-structured interviews with (1) APNs, and (2) patients separately after the completion of the programme at T2. Twelve (30%) subjects will form two focus groups because studies have shown that six to eight subjects per group is optimal for a complete understanding of the issues and variety of perspectives involved.⁴³ The duration of each interview will be approximately 1 h.

Data processing and analysis

The Statistical Package for the Social Sciences (SPSS) version 26 software will be used to analyze the quantitative data. The demographic data of the subjects will be presented in terms of mean and standard deviation for continuous variables, median and quartile range when the continuous variables are not normally distributed, and percentage and frequency for categorical variables. A paired t-test or Wilcoxon signed-rank test will be used to compare pre- and post-test differences in preliminary effectiveness outcomes.

The principles of thematic analysis will be used to analyze the data collected in the semi-structured interviews. The interview data will be transcribed, and then imported into NVivo 12. Two members of the research team will independently examine the raw data. Thematic saturation will be reached when no new themes emerge.⁴⁴ The team will compare and contrast themes from the APN and the subjects using the triangulation approach.

Discussion

Recovery following an acute episode of stroke is often a protracted experience for post-stroke patients, warranting continuous, comprehensive care to manage post-stroke symptoms and support family members. Beyond the stroke itself, patients may also be required to self-manage other underlying comorbid chronic diseases such as diabetes and hypertension, if present. Despite this great need, many patients discharged from an inpatient stroke

unit have limited access to outpatient rehabilitation or comprehensive support, particularly those who live in rural settings.⁴⁵ Moreover, the evolving COVID-19 pandemic has shifted significant attention away from persons who are recovering from various acute and chronic illnesses and created an increasing demand for comprehensive post-discharge professional support.⁴⁶ Thus, now more than ever, it is paramount to consider novel approaches to supporting persons recovering from stroke.

The proposed study responds to a great need for ongoing professional support and, if successful, will provide evidence regarding an alternative pathway to organizing comprehensive professional support for persons recovering from stroke. In addition, the telecare nature of the proposed intervention is likely to resolve challenges associated with physical disabilities, which affect visits to clinics, long travelling distances, high travel costs and long waiting times, which have been reported as shortcomings associated with current hospital-based outpatient services.¹³ Thus, the use of the telecare approach can potentially help to reach more patients following their discharge, with support commensurate to their needs.

Further to the above, the proposed programme extends the function of nurses to advanced roles in care coordination and the delivery of post-stroke care support in the comfort of the patients' homes. The embedded process evaluation phase in which qualitative methods are employed may also help to uncover aspects of the implementation process from the perspectives of both APNs and the study participants. With this approach, it will be possible to unearth contextual factors that may have hindered or facilitated the delivery of the telecare programme of care. By combining both quantitative and qualitative data, the study will attain greater power to illuminate existing evidence.

Although the strength of the study is apparent, the research team also anticipates limitations when conducting the programme. First, based on previous trials, older patients might drop out at a high rate due to difficulties in operating technological tools such as Zoom. We will address this anticipated limitation by providing a training workshop, information brochures, and a rehearsal session to the participants before they are discharged from the acute stroke unit. Second, procedures including physical examinations cannot be carried out in the nurse-led clinic. When deemed necessary, the APN will call patients back to the hospital to undergo these procedures. The number of patients who have returned to the hospital during the programme will be recorded and their data will be analyzed in a subgroup analysis. Third, the findings from the embedded qualitative phase may be unique to the study setting.

Conclusion

A feasibility study was presented involving a telecare consultation programme for persons recovering from stroke. The study offers an opportunity to reach a vulnerable group as they recover. The use of the telecare approach is novel, reflecting the ever-changing nature of healthcare service delivery locally and globally. The findings from this study have the potential to inform future actions to improve post-stroke care even at a distance.

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