Peri-discharge nurse-led interventions for reducing 30-day hospital readmissions: abridged secondary publication

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KEY MESSAGES

1. Systematic reviews and network meta-analyses were used to synthesise peri-discharge nurse-led interventions for reducing 30-day hospital readmissions among patients with general medical conditions, heart failure, chronic obstructive pulmonary disease, or recent colorectal surgery.

2. Interventions adaptable to the Hong Kong public healthcare system and supported by local stakeholders were derived using the GRADE Evidence to Decision Framework.

3. The recommended list of interventions could be used by healthcare policymakers to guide resource allocation decisions and inform the implementation and optimisation of interventions in the Hong Kong public healthcare system.

4. Patients and caregivers are important stakeholders in healthcare delivery and intervention. Future research should involve patient and public participation efforts to co-create complex interventions and specific implementation strategies.

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Introduction

Hospital readmissions are costly and associated with adverse outcomes. Many 30-day hospital readmissions can be prevented through appropriate peri-discharge interventions. Rates of 30-day hospital readmission are 20% in the United States and nearly 17% in Hong Kong. A systematic review of 34 studies showed that the median rate of preventable readmissions was 27% (range, 5% to 79%).[1] In Hong Kong, up to 40.8% of 30-day hospital readmissions were considered avoidable.[2] Efforts to reduce 30-day avoidable hospital readmissions can improve healthcare quality. We aimed to develop peri-discharge nurse-led interventions that could reduce 30-day avoidable hospital readmissions.

Methods

Peri-discharge nurse-led interventions were developed to reduce avoidable hospital readmissions among patients with general medical conditions, heart failure, chronic obstructive pulmonary disease (COPD), or recent colorectal surgery.

MEDLINE, EMBASE, Cochrane Database of Systematic Reviews, Global Health Database, and Allied and Complementary Medicine Database were searched, from inception to August 2019, for systematic reviews and randomised controll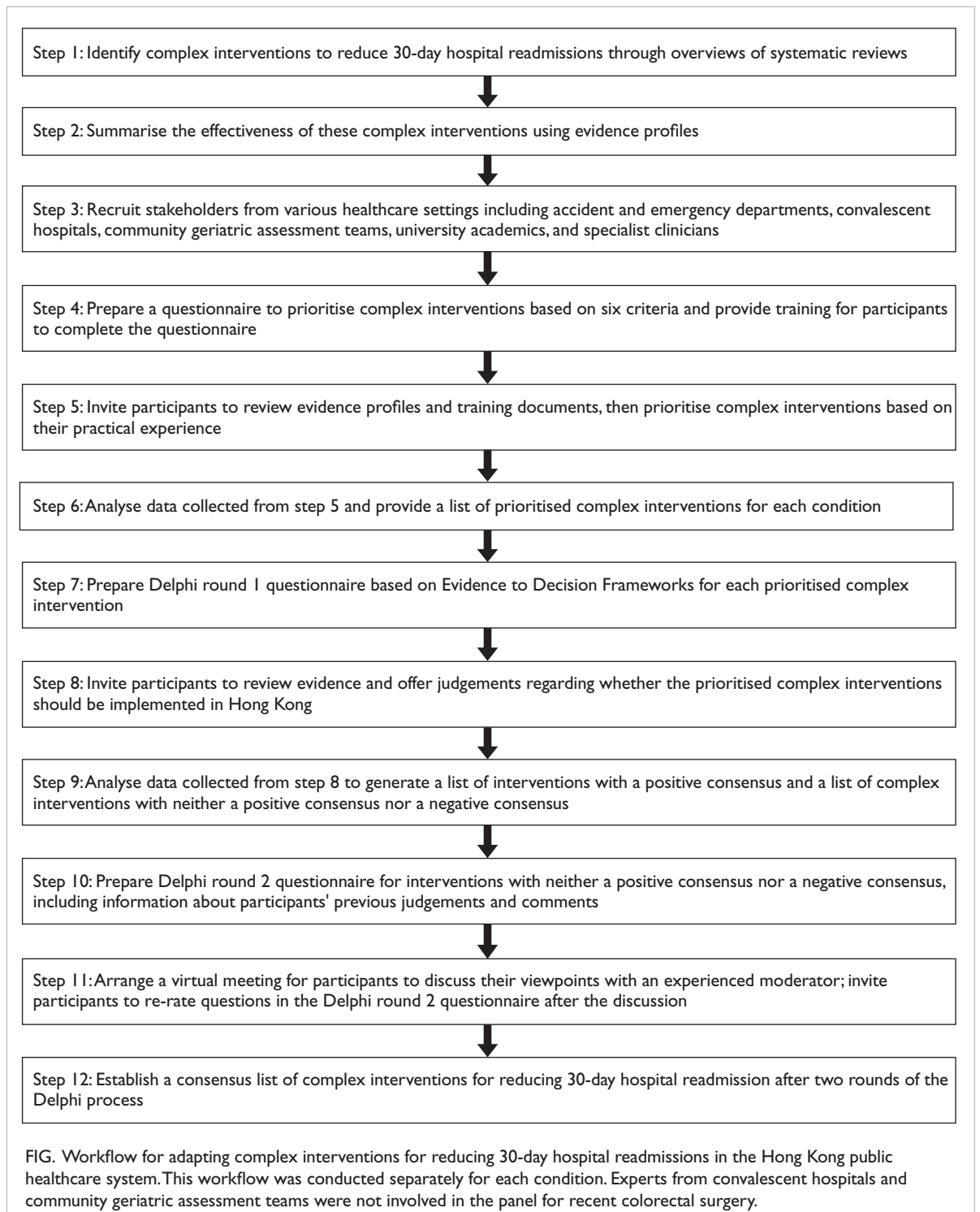ed trials related to peri-discharge nurse-led interventions for reducing preventable hospital readmissions.[3] Inclusion criteria for systematic reviews and randomised controlled trials are listed in Table 1. Intervention components were classified using an established coding framework. Pairwise meta-analysis was carried out using a random-effects model. Dichotomous data were presented as pooled risk ratios with 95% confidence intervals, whereas continuous data were presented as weighted mean differences with 95% confidence intervals. Network meta-analysis was then used to determine the most effective intervention for reducing 30-day all-cause hospital readmissions.[4]

To ensure that the selected peri-discharge nurse-led interventions were appropriate for the Hong Kong public healthcare system, a Delphi consensus based on the GRADE Evidence to Decision (EtD) framework[5] was independently conducted for each of the four conditions (general medical conditions, heart failure, COPD, and recent colorectal surgery). The Figure shows the step-by-step workflow for the Delphi consensus.

Eligible participants were frontline healthcare professionals from accident and emergency departments, convalescent hospitals, community geriatric assessment teams, university academics, and departments of general medicine, cardiology, respiratory, and surgery. Convalescent hospitals and community geriatric assessment teams were

TABLE 1. Inclusion criteria for systematic reviews and randomised controlled trials

Inclusion criteria	Systematic reviews	Randomised controlled trials
Participants	Patients aged ≥18 years admitted to an inpatient ward for ≥24 hours with a diagnosis of general medical conditions, heart failure, chronic obstructive pulmonary disease, or recent colorectal surgery. Patients with behavioural health issues or paediatric or obstetric admission were excluded.	
Interventions	Any pre-emptive peri-discharge interventions to reduce readmissions	
Comparisons	Any types of control including usual care	
Outcomes	Readmission outcomes in both intervention and control groups	30-day all-cause hospital readmissions in both intervention and control groups

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Step 1: Identify complex interventions to reduce 30-day hospital readmissions through overviews of systematic reviews

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Step 2: Summarise the effectiveness of these complex interventions using evidence profiles

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Step 3: Recruit stakeholders from various healthcare settings including accident and emergency departments, convalescent hospitals, community geriatric assessment teams, university academics, and specialist clinicians

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Step 4: Prepare a questionnaire to prioritise complex interventions based on six criteria and provide training for participants to complete the questionnaire

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Step 5: Invite participants to review evidence profiles and training documents, then prioritise complex interventions based on their practical experience

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Step 6: Analyse data collected from step 5 and provide a list of prioritised complex interventions for each condition

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Step 7: Prepare Delphi round 1 questionnaire based on Evidence to Decision Frameworks for each prioritised complex intervention

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Step 8: Invite participants to review evidence and offer judgements regarding whether the prioritised complex interventions should be implemented in Hong Kong

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Step 9: Analyse data collected from step 8 to generate a list of interventions with a positive consensus and a list of complex interventions with neither a positive consensus nor a negative consensus

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Step 10: Prepare Delphi round 2 questionnaire for interventions with neither a positive consensus nor a negative consensus, including information about participants' previous judgements and comments

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Step 11: Arrange a virtual meeting for participants to discuss their viewpoints with an experienced moderator; invite participants to re-rate questions in the Delphi round 2 questionnaire after the discussion

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Step 12: Establish a consensus list of complex interventions for reducing 30-day hospital readmission after two rounds of the Delphi process

FIG. Workflow for adapting complex interventions for reducing 30-day hospital readmissions in the Hong Kong public healthcare system. This workflow was conducted separately for each condition. Experts from convalescent hospitals and community geriatric assessment teams were not involved in the panel for recent colorectal surgery.

not involved in the care for patients with recent colorectal surgery in Hong Kong; therefore, they were not involved in the corresponding panels. Stakeholders included chiefs of service, consultants, and team heads of the specific departments. Each panel comprised 18 participants, except for the recent colorectal surgery panel (n=10).

Participants were asked to determine whether the interventions should be prioritised using a Likert scale of 1 (least important) to 5 (most important). An intervention was prioritised if the summative rating score was ≥50% of the overall score (ie, a sum of all participants' ratings ≥45). New combinations suggested by ≥3 participants were also prioritised for further evaluation.

A two-round Delphi questionnaire was then produced for the prioritised interventions for the four conditions, based on the GRADE EtD framework, with respect to benefits, harms, values and preferences, equity, acceptability, and feasibility. Only interventions with neither a positive consensus nor a negative consensus were re-assessed. A virtual meeting was held to discuss the participants' judgements. The consensus cutoff level was 70%.

A positive consensus was defined as ≥70% of participants rating to suggest/recommend an option, whereas a negative consensus was defined as ≥70% of participants rating to not suggest/recommend an option. A list of finalised interventions was developed for each condition, including all interventions with a positive consensus after two rounds.

Results

For general medical conditions, four nurse-led interventions were recommended to reduce 30-day hospital readmissions in Hong Kong (Table 2).

For heart failure, the supportive-educative intervention was considered the best intervention for reducing 30-day all-cause hospital readmissions, followed by the disease management intervention, which was considered the best intervention for reducing 30-day heart failure–related hospital readmissions. Five of 10 complex interventions for heart failure had a positive consensus; the percentage of agreement ranged from 72.2% to 83.3% (Table 2).

For COPD, complex interventions involving patient education, self-management, patient-centred

TABLE 2. Peri-discharge nurse-led interventions for patients with general medical conditions, heart failure, chronic obstructive pulmonary disease, or recent colorectal surgery.

General medicine conditions	Heart failure	Chronic obstructive pulmonary disease	Recent colorectal surgery
Intervention 1: components of primary care provider communication, provider continuity, case management, and streamlining	**Intervention A:** components of medication intervention and patient education	**Intervention I:** components of patient education, patient-centred discharge instructions, telephone follow-up, and case management	**Intervention a:** components of patient-centred discharge instructions and self-management
Intervention 2: components of primary care provider communication, provider continuity, discharge planning, and rehabilitation intervention	**Intervention B:** components of medication intervention, patient education, and self-management	**Intervention II:** components of patient education, patient-centred discharge instructions, telephone follow-up, and self-management	**Intervention b:** components of patient-centred discharge instructions, self-management, and rehabilitation intervention
Intervention 4: components of discharge planning and streamlining	**Intervention C:** components of medication intervention, patient education, self-management, telephone follow-up, community service, and scheduled follow-up	**Intervention IV:** components of provider continuity, rehabilitation intervention, discharge planning, and self-management	**Intervention c:** components of patient-centred discharge instructions, self-management, case management, and patient education
Intervention 5: components of case management, patient hotline, and telephone follow-up	**Intervention D:** components of medication intervention, patient education, self-management, telephone follow-up, case management, and discharge planning	Intervention VII: components of patient education and rehabilitation intervention	**Intervention d:** components of provider continuity, patient education, telephone follow-up, and case management
	Intervention E: components of telephone follow-up and patient hotline	**Intervention IX:** components of provider continuity, rehabilitation intervention, discharge planning, self-management, and patient education	**Intervention f:** components of self-management and telephone follow-up
	-	**Intervention X:** components of patient education, patient-centred discharge instructions, telephone follow-up, case management, provider continuity, rehabilitation intervention, discharge planning, and self-management	

discharge instructions, and telephone follow-up were significantly more effective than usual care in reducing 30-day hospital readmissions. Six complex interventions for COPD had a positive consensus; the percentage of agreement ranged from 70.6% to 94.1% (Table 2).

For recent colorectal surgery, network meta-analysis indicated no significant difference in reducing 30-day hospital readmissions across all complex interventions. However, fast-track rehabilitation was considered the most effective intervention for reducing the length of stay. Five of 12 complex interventions for recent colorectal surgery had a positive consensus; the percentage of agreement ranged from 75.0% to 88.9% (Table 2).

Discussion

The use of the GRADE EtD framework facilitated transparent recording of stakeholders' decisions and considerations while reaching a consensus. This transparency allows policymakers to assess the decision-making process, thereby enhancing the acceptability and creditability of the recommended interventions.

Conclusion

We identified peri-discharge nurse-led interventions for reducing 30-day hospital readmissions that could be adapted for the Hong Kong public healthcare system. Guided by the GRADE EtD framework, we developed a list of stakeholder-endorsed interventions for patients with general medical conditions, heart failure, COPD, or recent colorectal surgery.

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Disclosure

The results of this research have been previously published in:

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