The impact of the community Transitional Care (TC) program on hospital utilisation, mortality and cost

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CONFLICT OF INTEREST DISCLOSURE

I have no potential conflict of interest to report
Introduction

- Aging population with **multiple comorbidity and disability** lead to increased hospital utilisation and vulnerable to poor outcomes during transition from hospital to home.

- **Aim:**
  
  To evaluate the impact of a **3-month time limited** post-hospitalisation transitional care (TC) program on outcomes of 180 days post **hospital utilisation, mortality and cost.**

Study Site & Population

- Total population (2014): ~520,730
- Total population 60 years and above: ~65,040

Singapore – North
Program Description and Study Flow

The TC Program

Fulfill *at least one* of the following:
- Older adults with geriatric syndromes
- Complex medical problems
- Complex nursing needs
- Socially at-risk

Inter-disciplinary team
- Doctor, PT, OT, speech therapist, MSW

KTPH

Community and home help services

Care manager
- First assessment
- Perform nursing procedure
- Chronic diseases management
- Patient education

Post-discharge

Study Flow Diagram

All TC referrals from Apr 12-Mar14 (n=880)

- Excluded (n=101)
  - Institutionalized (n=17)
  - Referred to other services (n=42)
  - Died (n=16)
  - Others (n=26)

Eligible (n=779)

- Accepted TC (n=601)
  - Re-admitted or died 7d post-discharge (n=65)
  - No match with MOH data (n=3)

- Intervention group (n=553)

- Rejected TC (n=178)
  - Re-admitted or died 7d post-discharge (n=16)

- Control group (n=162)
Methodology & Results

**Study design:** Quasi-experimental with Difference-in-difference analysis

**Data source:** retrospective cohort using hospital administrative data

**Baseline:** 180 days prior index hosp

**Follow-up:** 180 days after index hosp

**Outcome measures:**
number of hospitalisation; number of ED visits; hospital bed-days; hospitalisation (yes/no); ED visits (yes/no) and re-admission (yes/no); cost and mortality (yes/no)

**Covariates:** socio-demographic, index hospital bed-days, ADL, CCI, dementia, level of care and ward class

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (n=533)</th>
<th>Controls (n=162)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± SD</td>
<td>81.9 ± 10.0</td>
<td>80.1 ± 12.0*</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>346 (64.9)</td>
<td>109 (67.3)</td>
</tr>
<tr>
<td>ADL limitation (0-4), mean ± SD</td>
<td>2.4 ± 1.7</td>
<td>1.7 ± 1.7***</td>
</tr>
<tr>
<td>CCI, mean ± SD</td>
<td>6.2 ± 2.2</td>
<td>6.0 ± 2.5</td>
</tr>
<tr>
<td>Number of hospital admissions</td>
<td>2.0 ± 1.4</td>
<td>2.3 ± 1.7</td>
</tr>
<tr>
<td>Number of ED visits</td>
<td>2.0 ± 1.5</td>
<td>2.0 ± 1.6</td>
</tr>
<tr>
<td>Index LOS</td>
<td>16.0 ± 16.0</td>
<td>13.9 ± 11.9</td>
</tr>
<tr>
<td>Total hospital bed-days</td>
<td>24.7 ± 21.1</td>
<td>23.1 ± 18.8</td>
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* p< .05; ** p < .01; *** p < .001  
ADL= Activities Daily Living  
CCI= Charlson Comorbidity Index

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Baseline characteristics
Adjusted Odd Ratios between Intervention and Controls during Follow-up period

Re-admission with similar condition as index hospitalization (yes/no)

Mortality (yes/no)

Emergency department visit (yes/no)

Hospitalisation (yes/no)
Difference-in-Difference Estimates between Intervention and Controls at 180-day follow-up & Cost Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Difference-in-Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted</td>
</tr>
<tr>
<td>Number of hospital admission</td>
<td>0.04 (-0.3, 0.4)</td>
</tr>
<tr>
<td>Number of ED visits</td>
<td>0.1 (-0.3, 0.5)</td>
</tr>
<tr>
<td>Total hospital bed-days</td>
<td>-4.1 (-8.6, 0.5)</td>
</tr>
</tbody>
</table>

- At 180-day, the intervention had **4.2 less hospital bed-days/patient** compared to the controls (adjusted for socio-demographic, CCI, functional status, length of stay, ward class, dementia and level of care).

- For this cohort of patients, their total cost saving was analysed based on the sum of inpatient and specialist outpatient clinic saving amount minus the total TC cost, whereas:
  - Inpatient cost saving = adjusted DID hospital bed-days × average inpatient cost/day
  - TC cost = average visits × manpower normed cost

- The cost analysis showed an average cost savings of **€836/patient/year** among intervention group from **societal perspective**, with cost saving for both the patient (€529/patient/year) and the government (€307/patient/year).
Discussion & Conclusion

- Although not statistically significant, patients in intervention group had higher odds of visiting ED, but it did not translate to higher odds of hospitalisation.

- Intervention group had a shorter length of stay; which could be due to early identification of medical, functional and social problems and early treatment in the community.

- TC is able to reduce hospital bed-days and cost among older patients with complex care needs.
THANK YOU