Adherence in patients with heart failure: challenges and opportunities to improve non-communicable diseases caring

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Study team

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Heart failure

Heart failure is the final common pathway of many cardiovascular conditions

(Mozaffarian et al., 2016; Dokainish et al., 2016; Laothavorn et al., 2010)
Heart failure

Estimated 5.7 million Americans with more than 915,000 new cases each year

Approximately 1 million Thai with 100,000 new cases each year

Mozaffarian et al., 2016; Dokainish et al., 2016; Laothavorn et al., 2010
Thailand at a glance

- Population: 68,000,000
- Life expectancy at birth women/men: 79/72 yrs.
- Percent urban: 50%
- Total expenditure on health per capita: 600 US$
Background

- CVD is the leading cause of death in LMIC
  - The limitation of knowledge, technology and resources

- Comparing among LMIC, Asians with Heart failure
  - Younger
  - Had lower literacy levels
  - Less likely to have health or medication insurance
  - Most likely to be in NYHA class IV

Mozaffarian et al., 2016; Gaziano et al., 2010; Kelly & Fuster, 2010; Dokainish et al., 2016
Background

• High quality treatments and modern clinical practice guidelines have been developed.
• Interventions aimed to improve outcome of patients with HF have implemented without considering general characteristics of Thai patients
• The outcomes of HF are still not optimal
Background

- Adherence describes the degree to which a patient correctly follows medical advice.
- Adhering to medication regimens is a key behavior in HF self-care.
- Adherence among patients with HF is low, negatively affecting clinical outcomes and leading to increased HF exacerbations.
- Improved adherence was related with positive effects on HF outcomes such as improved QOL, reduced LOS and lower mortality.

Hood et al., 2018; Ruppar, Cooper, Mehr, Delgado, & Dunbar-Jacob, 2016; Unverzagt et al., 2016
Social determinants of health

SDH are the conditions in which people are born, grow, live, work and age.

The circumstances are shaped by the distribution of money, power and resources at global, national and local levels.

Human behavior doesn’t depend on the individual only, but also different level factors.
Social determinants of health

Structural determinants and socioeconomic position
- Sex, Education, Income

Socio-economic and political context
- Public policies; health insurance
- Culture and societal values; religion and traditional treatment

Impact on equity in health and well-being
- Adherence

Society
- age, comorbidity, cardiac function, depression, performance status, frailty
- marital status, living status, caregiver
- special cardiac investigation, specialist provider, level of hospital

Developed from the WHO Social Determinants of Health and Health Inequities conceptual framework (WHO, 2010)
This study aimed to....

• explore the prevalence of medication adherence
• identify the predictors of medication adherence in hospitalized Thai patients with heart failure
• explain the challenges and opportunities to develop the intervention to improve NCDs outcomes in the country considering the social determinants of health
Method

Design

- A cross-sectional study

Sample

- Thai patients with heart failure aged 18 years and over admitted in-patient department due to heart failure diagnosis

Setting

- four tertiary hospitals around Thailand
The New South Wales HF Snapshot study

- Demographic data
- Admission details and past illness history
- Cardiac investigation, current treatment and medication
- Discharge status
- Depressive symptom (Higher score – More depression)
- Performance status (Higher score – Better performance)
- Medication adherence (Higher score – Good adherence)
Data analysis

- Nominal and ordinal data level used prevalence percentage
- Interval and ratio data used mean standard deviation with 95% confidence interval
- Comparing among three categories of adherence (good, moderate and poor)
  - Nominal and ordinal data level used Chi-square
  - Interval and ratio data used one way - ANOVA
- Simple and multiple linear regression
Result

• 336 were included in this study
• 58.2% were female
• Mean age was 64.45(14.98) years
• Assessment of medication adherence found ....
  • 54.3% had good adherence
  • 27% had moderate adherence
  • 18.4% had poor adherence
Result

MARRITAL STATUS
- Married: 73%
- Widowed: 21%
- Single: 5%
- Divorce: 1%

INSURANCE
- UHC: 81%
- CSMB: 11%
- SSS: 7%
- Private: 1%

CAUSE
- Ischemic: 49%
- Rhythm: 8%
- Drug/Diet: 14%
- Infection: 8%
- Other: 21%
Result

- Mean SBP 133.92 (24.61)
- Mean DBP 79.33 (14.95)
- Mean ejection fraction 47.78 (18.79)
## Result

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Moderate</th>
<th>Good</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS</td>
<td>7.31 (7.15)</td>
<td>5.79 (6.06)</td>
<td>5.10 (3.27)</td>
<td>0.012</td>
</tr>
<tr>
<td>Frailty</td>
<td>3.05 (1.62)</td>
<td>2.79 (1.23)</td>
<td>2.84 (1.07)</td>
<td>0.415</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>2.50 (1.70)</td>
<td>2.19 (1.67)</td>
<td>1.01 (1.34)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Depression</td>
<td>9.97 (5.71)</td>
<td>7.09 (5.11)</td>
<td>3.53 (2.95)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>AKPS</td>
<td>64.19 (17.88)</td>
<td>68.02 (14.62)</td>
<td>78.85 (12.37)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EF</td>
<td>39.82 (17.06)</td>
<td>48.87 (19.85)</td>
<td>50.41 (18.20)</td>
<td>0.003</td>
</tr>
<tr>
<td>Age</td>
<td>68.47 (13.17)</td>
<td>66.74 (15.72)</td>
<td>62.04 (14.78)</td>
<td>0.003</td>
</tr>
</tbody>
</table>
### Result

<table>
<thead>
<tr>
<th></th>
<th>Crude</th>
<th>Adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Length of stay</td>
<td>-0.05</td>
<td>(-0.08, -0.02)</td>
</tr>
<tr>
<td>Frailty score</td>
<td>-0.13</td>
<td>(-0.26, 0.01)</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>-0.35</td>
<td>(-0.45, -0.25)</td>
</tr>
<tr>
<td>Depression</td>
<td>-0.17</td>
<td>(-0.20, -0.14)</td>
</tr>
<tr>
<td>AKPS</td>
<td>0.04</td>
<td>(0.03, 0.05)</td>
</tr>
</tbody>
</table>

Adjusting for sex, age, living status, income, smoking status, cardiac function and alcohol consumption.
## Result

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression</strong></td>
<td>-0.172*</td>
<td>-0.154*</td>
<td>-0.143*</td>
<td>-0.140*</td>
</tr>
<tr>
<td><strong>Comorbidity</strong></td>
<td>-0.249*</td>
<td>-0.241*</td>
<td>-0.241*</td>
<td>-0.217*</td>
</tr>
<tr>
<td><strong>AKPS</strong></td>
<td>0.012**</td>
<td>0.011**</td>
<td>0.012**</td>
<td>0.011**</td>
</tr>
<tr>
<td><strong>LOS</strong></td>
<td></td>
<td></td>
<td>-0.029**</td>
<td></td>
</tr>
<tr>
<td><strong>R square</strong></td>
<td>0.278</td>
<td>0.342</td>
<td>0.351</td>
<td>0.359</td>
</tr>
<tr>
<td><strong>F test</strong></td>
<td>F(1,333) = 128.49</td>
<td>F(2,332) = 86.09</td>
<td>F(3,331) = 59.71</td>
<td>F(4,330) = 46.26</td>
</tr>
<tr>
<td></td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
</table>

* p<0.001  ** p<0.05
Challenges and opportunities

• Most patients were elderly, low-educated, low-income
• Universal healthcare coverage
Challenges and opportunities

- **Universal Coverage Scheme (UCS)**
  - Thai citizens
  - General tax; (79US$/cap)
  - Ministry of Public Health
  - 75% of population

- **Social Security Scheme (SSS)**
  - Private sector employees
  - Tri-party (71US$/cap)
  - Ministry of Labor Social Security Office
  - 16% of population

- **Civil Servant Medical Benefit Scheme (CSMBS)**
  - Government employees
  - General tax; (367US$/cap)
  - Ministry of Finance
  - 9% of population

- **Private Insurance**
  - Those insured
  - Insurance buyer
  - Private Companies
  - Est. 6-9 million

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Challenges and opportunities

- Depressive symptom, poor performance status, longer LOS and more comorbidities were associated poor adherence.
- During hospitalization, majority of Thai Heart Failure patients had good medical adherence.
- Heart failure management should not mainly focus on symptoms alleviation.
- Using a community as a health resource to prevent and control the symptoms exacerbation.
Challenges and opportunities

Community-based intervention

• Intervention group had significantly higher adherence score at 3 and 6 months after intervention by 1.66 and 1.45, respectively, when adjusting for other variables

• After 6 months, the intervention was associated with a significant improvement in adherence when adjusting for other variables

• This study provides evidence to support the use of community-based interventions as an effective adjunct to hospital-based care of hypertension patients in Thailand