Welcome Singapore
Effects of home-based rehabilitation for patients with acute myocardial infarction: A randomized controlled trial

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Study Background

- China has undergone rapid economic growth,
- urbanization and industrialization,
- an ageing population

- has seen a dramatic increase in the incidence and prevalence of coronary heart disease, especially acute myocardial infarction (MI)

- The evidence suggests that rehabilitation plays a significant role in enhancing recovery from an acute cardiac event.
Phase I

- **In-patient rehabilitation**, may occur when the patient is admitted to hospital for a CHD condition such as angina and AMI, and continues until the patient is discharged from hospital.

Phase II

- **Out-patient rehabilitation**, occurs after the patient has been discharged, and usually lasts for 4 to 6 weeks but may last up to 6 months.

Phase III

- **Maintenance rehabilitation**, focuses on maintaining cardiovascular stability and long-term conditioning with an emphasis on secondary prevention.
Components of out-patients CRP (AHA)

- Patient education
- Physical exercise training
- Psycho-social management
- Risk factor modification
Over the past decade, the centre/hospital-based cardiac rehabilitation (CR) programmes have been well developed, and the benefits of attending those programmes have been widely documented.

Unfortunately, the programme uptake rates are disappointingly low with only 10-40% participation reported consistently in the literature.

Home-based CR programme may be more practical and feasible for Chinese patients with MI.

Different approaches:
- Home–based Exercise Training CRPs
- Heart Manual Approach

http://www.theheartmanual.com/Programmes/Pages/default.aspx
We hypothesized that a home-based programme would provide an effective and viable alternative to usual care in improving HRQL and psychological status.
Methods

- **Study design**
  A randomised controlled study

- **Study setting**
  the cardiovascular units of two university-based teaching hospitals in the city of Xi’an in Shaanxi Province in China.

- **Sampling**
  convenience sample of 160 MI patients
Methods (Con’t)

-- Inclusion criteria include patients:

(1) a documented diagnosis of acute MI;
(2) able to speak and read Chinese;
(3) living at home after hospital discharge;
(4) available for telephone follow–up;

-- Exclusion criteria were:

(1) a known history of major psychiatric illness;
(2) pre–existing mobility problems;
(3) unstable angina;
(4) severe complications
Methods (Con’t)

6-week home-based self-management CR programme

Nurse facilitator

Telephone follow-up

Education session

HM

Methods (Con’t)
Methods (Con’t)

- **Intervention** (Heart Manual Approach) – 6-week home-based rehab. programme

- **Heart Manual**: contains three sections:
  1. six weekly topics on health education
  2. answers commonly asked questions about medication, PCI, and anxiety and depression
  3. information on the normal values of cardiac physiological risk parameters

- **Education session** for participants in Ex group

- **Telephone follows** at 3 weeks after discharge for participants in Ex group
Methods (Con’t)

- **Outcome measures**

  -- Chinese Mandarin version of SF-36 (CM:SF-36):
  
  -- Chinese Mandarin version of the Myocardial Infarction Dimensional Assessment Scale (CM-MIDAS)
  
  -- Chinese Mandarin version of the Hospital Anxiety and Depression Scale (CM-HADS)
  
  -- Demographic and clinical data
  
  -- Unplanned service use: cardiac related readmission, emergency visit and unplanned medical consultation
Instruments used in the study

**SF-36**: generic instrument, 36 items, 8 subscales (Physical Function, Role Physical, Bodily Pain, General Health, Vitality, Role Emotional, Social Function, Mental Health)  
Score,  😊  HQoL

**MIDAS**: disease-specific instrument, 35 items, 7 subscales (Physical Activity, Emotional Reaction, Insecurity, Dependency, Diet, Concerns over Medications, Side Effects)  
Score,  😊  HQoL

**HADS**: 14 items, two subscales (Anxiety, Depression)  
Score,  😊  Anxiety and Depression
Data Collection Procedure

Participants recruitment (n=160)

Baseline data collection (T1)

Randomization

Ex. Group (n=80)
6-week HM CRP + usual care

Co. Group (n=80)
Usual care

Data collection at programme end (T2)

Data collection at three months (T3)

Data collection at six months (T4)
Data Analysis

-- **Descriptive statistics**: used for sample description and summarization of the data from the outcome variables.

-- **Independent t-t and Chi-square**: Homogeneity of the study groups

-- **Multivariate repeated measures ANOVA**: was used to compare changes in study outcomes (i.e., time, group, and time×group effects) between the two groups across the four study end points
Results: Sociodemographics

Sociodemographic Data

<table>
<thead>
<tr>
<th>Category</th>
<th>Experimental (n=68)</th>
<th>Control (n=65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex: Males</td>
<td>85%</td>
<td>81%</td>
</tr>
<tr>
<td>Sex: Female</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>Mean Age of Participants</td>
<td>62%</td>
<td>66%</td>
</tr>
<tr>
<td>Marital Status: Married</td>
<td>97%</td>
<td>95%</td>
</tr>
<tr>
<td>Education Level: Secondary (7–13 years)</td>
<td>47%</td>
<td>46%</td>
</tr>
<tr>
<td>Employment Status: Not working</td>
<td>53%</td>
<td>40%</td>
</tr>
<tr>
<td>Employment Status: Full-time work</td>
<td>42%</td>
<td>29%</td>
</tr>
</tbody>
</table>

Red indicates Experimental (n=68) and blue indicates Control (n=65)
Results: Clinical Data

Clinical Data

- Myocardial Infarction: First
  - Experimental (n=68): 91%
  - Control (n=65): 89%

- Family history of CHD
  - Experimental (n=68): 12%
  - Control (n=65): 20%

- Smoker
  - Experimental (n=68): 58%
  - Control (n=65): 50%

- Hypertension
  - Experimental (n=68): 64%
  - Control (n=65): 54%

- High cholesterol
  - Experimental (n=68): 63%
  - Control (n=65): 62%

- Diabetes
  - Experimental (n=68): 22%
  - Control (n=65): 18%

- PTCA/stent
  - Experimental (n=68): 50%
  - Control (n=65): 42%
Results – SF-36 (Group Effect)
### Results – MIDAS (Group Effect)

<table>
<thead>
<tr>
<th>Physical Activity</th>
<th>Insecurity</th>
<th>Emotional Reaction</th>
<th>Dependency</th>
<th>Diet</th>
<th>Concerns Over Medications</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Graph" /></td>
<td><img src="image2.png" alt="Graph" /></td>
<td><img src="image3.png" alt="Graph" /></td>
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<td><img src="image5.png" alt="Graph" /></td>
<td><img src="image6.png" alt="Graph" /></td>
<td><img src="image7.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

*Significant effects: \( \rho = 0.032 \), \( \rho = 0.02 \), \( \rho = 0.027 \)
Results – HADS (Group Effect)

Anxiety

Depression

$p = .046$

Baseline 6 weeks 12 weeks 24 weeks

Baseline 6 weeks 12 weeks 24 weeks

Experimental Group Control Group

Experimental Group Control Group
## Results: Cardiac risk factors

### Quit smoking

<table>
<thead>
<tr>
<th></th>
<th>Experimental (n = 40)</th>
<th>Control (n = 33)</th>
<th>( \chi^2 )</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Programme end</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quitter</td>
<td>29 (72.5)</td>
<td>21 (63.6)</td>
<td>0.65</td>
<td>0.42</td>
</tr>
<tr>
<td>Non-quitter</td>
<td>11 (27.5)</td>
<td>12 (36.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3-month follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quitter</td>
<td>26 (65.0)</td>
<td>18 (54.5)</td>
<td>0.82</td>
<td>0.36</td>
</tr>
<tr>
<td>Non-quitter</td>
<td>14 (35.0)</td>
<td>15 (45.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6-month follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quitter</td>
<td>21 (52.5)</td>
<td>16 (48.5)</td>
<td>0.12</td>
<td>0.73</td>
</tr>
<tr>
<td>Non-quitter</td>
<td>19 (47.5)</td>
<td>17 (51.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The graph shows the smoking cessation rate over time. The blue line represents the experimental group, and the pink line represents the control group. The data indicates a gradual decrease in smoking cessation rate over time for both groups, with the experimental group showing a slightly higher rate of cessation compared to the control group.
## Results: Unplanned Health Service Use

Comparison of unplanned health service use (Mean, SD) at the 6-month post-test study endpoint between the study groups

<table>
<thead>
<tr>
<th></th>
<th>Experimental (n = 68) Mean (SD)</th>
<th>Control (n = 65) Mean (SD)</th>
<th>Z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unplanned cardiac-related hospital readmission</td>
<td>0.10 (0.30)</td>
<td>0.17 (0.37)</td>
<td>-1.11</td>
<td>0.266</td>
</tr>
<tr>
<td>Unplanned cardiac-related emergency room visit</td>
<td>0.15 (0.39)</td>
<td>0.15 (0.44)</td>
<td>-0.12</td>
<td>0.904</td>
</tr>
<tr>
<td>Unplanned cardiac-related medical consultation</td>
<td>0.63 (0.88)</td>
<td>1.03 (0.10)</td>
<td>-2.11</td>
<td>0.035*</td>
</tr>
</tbody>
</table>
Discussion

- There were significant differences in the main outcomes when the home-based group was compared with the usual care group at 6 weeks, 3 and 6 months.

- The home-based group had significantly higher scores on 4 of the 8 domains of the Chinese SF-36 and 3 of the 7 dimensions of the Chinese MIDAS, and significantly lower scores on the anxiety, but not the depression, subscale of the Chinese HADS.
Discussion (Con’t)

- The study may provide a useful tool to help health–care professionals to meet the cardiac rehabilitative care needs of patients with MI.

- It empowers patients to take responsibility and accountability for their own disease management and helps confronting the challenge of limited health care resources.

- Such a model appears appropriate for Chinese MI patients.
Limitations

- Convenience sampling
- The absence of a blind condition may threaten the internal validity of the study
- The researcher played the role of both intervener and outcome assessor and this might have influenced participants to provide desired answers, and so interviewer bias cannot be excluded.
- In the absence of an evaluation of the level of adherence, the integrity of the intervention cannot be assured.