Medication adherence and predictive factors in patients with cardiovascular disease in Sydney, Australia

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Cardiovascular disease remains the major cause of death worldwide (Lozana et al., 2012).

In Australia, there were 19,077 deaths from CVD in 2016. (Australian Bureau of Statistics, 2016).

Poor adherence to cardiac medications is linked to increased morbidity, hospitalisation and mortality (National Heart Foundation of Australia, 2011; Laba et al., 2013).

Adherence to medication presents a major challenge and non-adherence rates in Australia range from 14% to 43% (WHO, 2003; McKenzie et al., 2015).
Rationale for performing the study

- Medication adherence of people with CVD poses important behavioural health problems world-wide.
- There are few medication adherence studies for patients with CVD.
- Evidence is lacking of which factors influence adherence in patients with CVD in Australia.
- Identifying specific factors at specific points in disease progression offers potential to improve medication adherence for cardiac patients.
Research aims

(Directions)

Research Aim

- To evaluate adherence to cardiac medications and associated factors in patients with CVD.

Specific Objectives

- Identify and compare the levels of cardiac medication adherence.
- Examine the relationships between level of medication adherence and potential behavioural factors.
- Identify predictive factors for medication adherence in patients with CVD.
Design

- Cross-sectional survey.

Study setting

- Tertiary referral hospital in Sydney, Australia:
  - In-patient cardiology ward,
  - Out-patient cardiac rehabilitation centre
Study Methods

- Recruitment
  - Under the supervision of the clinical nurse consultant for cardiac rehabilitation and the clinical pharmacist for the cardiac ward.
  - Eligible consecutive cohorts of patients who expressed interest in the project were referred to the researcher.

- Data collection methods
  - Socio-Demographic and Health Data Sheet.
  - Assessment tools included:
    - Medication Adherence Questionnaire (MAQ)
    - Adherence to Refills and Medications Scale (ARMS).
    - Belief about Medicine Questionnaire (BMQ).
    - Medication Adherence Self-Efficacy Scale-Revised (MASES-R).
    - Medication Specific Social Support (MSSS).
Sample size determination:

- Level of power ($\beta$) = 80%, $\alpha$= 0.05 (two sided) (Ma, et al., 2014)

* Around 125 patients/month were admitted to the cardiac ward
* 18% uptake of referrals to the cardiac rehabilitation centre
* $\approx$ 50% of eligible patients might participate.
* 120 respondents for valid statistical analysis.
### Sample approach: Consecutive sampling

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cardiac rehabilitation and cardiac ward patients who:</td>
<td>All cardiac rehabilitation and cardiac ward patients who:</td>
</tr>
<tr>
<td>o 18 years of age or older.</td>
<td>o blind, deaf or unable to consent.</td>
</tr>
<tr>
<td>o diagnosed with cardiac disease.</td>
<td>o Patients newly diagnosed with cardiac disease and without a history of taking cardiac medication.</td>
</tr>
<tr>
<td>o currently taking at least one cardio-protective medication.</td>
<td></td>
</tr>
<tr>
<td>o having primary responsibility for taking their own medications.</td>
<td></td>
</tr>
<tr>
<td>o Read, speak and understand English</td>
<td></td>
</tr>
</tbody>
</table>
Characteristics of participants

- n=120 patients (60% response rate):
  - n = 89 cardiac ward; n = 31 cardiac rehabilitation.
  - mean (SD) age 66.6 (SD=11.9); 69.9 (11.5) years, respectively.

- Cardiac rehabilitation participants were more often:
  - Married, in a relationship/ co-habiting ($P < 0.03$).
  - Better education ($P < 0.01$).
  - Less likely to remember the names of all their cardiac medications ($P < 0.04$).
Medication Adherence

- Using the Medication Adherence Questionnaire (MAQ) (Morisky, Green, & Levine, 1986).

- Overall 37.5% of both cardiac groups had medium/low cardiac medication adherence.

- Cardiac rehabilitation participants reported lower levels of adherence to their cardiac medications ($p = 0.001$).
## Findings

### Medication Adherence

<table>
<thead>
<tr>
<th>Level of medication Adherence (MAQ)</th>
<th>Total n (%) n=120</th>
<th>Cardiac Rehab. n (%) n=31</th>
<th>Cardiac Ward n (%) n= 89</th>
<th>Chi-Square Test</th>
<th>df</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>75 (62.5%)</td>
<td>18 (58.1%)</td>
<td>57 (64.0%)</td>
<td>28</td>
<td>1</td>
<td>0.001*</td>
</tr>
<tr>
<td>Medium/Low</td>
<td>45 (37.5%)</td>
<td>13 (41.9%)</td>
<td>32 (36.0%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Medication Adherence Factors

- Both patients’ group responses demonstrated factors significantly associated with participants’ level of medication adherence (MAQ)
- Moderate-strong positive correlations which explained 45%, 15% and 11% of patients’ adherence to cardiac medications:
  - The ability to refill medications (self-management+ refill)
  - Medication adherence self-efficacy (confidence)
  - Beliefs about medications (necessity, concern, overuse, harm)
## Medication Adherence Factors

<table>
<thead>
<tr>
<th>Predictors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ARMS</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. MASESR</td>
<td>.516**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. BaMQ</td>
<td>.425**</td>
<td>0.385**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. MSSS</td>
<td>-.044</td>
<td>-.203*</td>
<td>-.037</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5. MAQ</td>
<td>.676**</td>
<td>.392**</td>
<td>.335**</td>
<td>-.036</td>
<td>1</td>
</tr>
</tbody>
</table>
Predictors of cardiac medication adherence

- Patient responses demonstrated two significant predictors of cardiac medication adherence:
  - Patients with a greater ability to refill cardiac medications were more likely to report better medication adherence $p < 0.001$.
  - Patients with a greater belief about the necessity, less concern over use and harm to take cardiac medications were more likely to report better medication adherence too $p = 0.041$. 
Findings

Predictors of cardiac medication adherence

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Odds ratio B</th>
<th>Standard Error S.E.</th>
<th>Wald</th>
<th>Cox and Snell R square</th>
<th>df</th>
<th>Sig.</th>
<th>Odds ratio Exp(B)</th>
<th>95% C.I. EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARMS</td>
<td>-.771</td>
<td>.170</td>
<td>20.520</td>
<td>.396</td>
<td>1</td>
<td>0.001*</td>
<td>.463</td>
<td>.332 - .646</td>
</tr>
<tr>
<td>BaMQ</td>
<td>.133</td>
<td>.065</td>
<td>4.178</td>
<td></td>
<td>1</td>
<td>0.041*</td>
<td>1.142</td>
<td>1.005 - 1.298</td>
</tr>
<tr>
<td>Constant</td>
<td>30.220</td>
<td>6.990</td>
<td>18.689</td>
<td></td>
<td>1</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary

Medication Adherence

1. 1/3 of both groups had medium/low medication adherence.

2. Cardiac rehab. patients reported lower levels of cardiac medications adherence.
## Summary

### Factors Influencing Cardiac Medication Adherence

1. The ability to refill cardiac medications  
2. Medication adherence self-efficacy  
3. Beliefs about medications

### Factors Predicting Cardiac Medication Adherence

1. The ability to refill cardiac medications  
2. Beliefs about the necessity, concern, general harm and overuse of cardiac medications.
Messages for policy makers

- Medication adherence should be recognised as an essential focus throughout the cardiac patient journey, with measures established to support this as a priority.

- Prioritise medication adherence education and counselling for cardiac patients in all hospital settings.

- Reinforce the importance of medication adherence during cardiac rehabilitation and in routine follow up visits.

- Establish medication adherence intervention plans for patients in cardiac care settings.
Messages for policy makers

- Greater attention to the role of cardiac nurses in assessing patients’ cardiac medication self-management.

- Clinical nurses and pharmacists need to build trust with their cardiac patients in order to be able to address belief-related adherence barriers.

- An effective care provider-patient relationship may be an important component to build an encouraging environment to achieve treatment goals.

- Tailoring educational interventions to target patients’ beliefs about cardiac medication may be an effective approach to improve patients’ beliefs.
Conclusion

• Strategies are urgently required to improve the unacceptable levels of medication adherence.

• Strategies should be tailored to factors that deter timely medication refill and which are linked to more negative beliefs about medication adherence.

• Cardiac nurses and pharmacists can enhance their roles in assessing and improving patients’ ARMS and their beliefs about cardiac medications which, in turn, should improve patients’ medication adherence and outcomes.
References


Questions