The effects of telemonitoring on heart failure patients' knowledge, self-care, self-efficacy and adherence

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Declaration of interest
Nothing to declare
The TEHAF-study

The TEHAF-study is a multicentre randomised controlled trial, comparing the effects (on hospitalisation, mortality, costs, knowledge, self-care, self-efficacy and adherence, QOL, depression) of telemonitoring versus usual care in patients with heart failure.
The Health Buddy® system

Decision Support Tools

Content Development Tools

Clinical Information Databases

Health Management Programs

Secure Data Center

Health Buddy® Appliance

Blood Pressure Monitor

Peak Flow Meter

Weight Scale

Blood Glucose Monitor

Monitoring Technologies

CAPHRI School for Public Health and Primary Care
Programme 1
Focus on SKB
90 days
• At start
• Instable HF
Low DS education

Programme 2
Focus on S
30 days
• Instable HF
Well DS education
• After HF-admission

Programme 3
Focus on KB
90 days
• No symptoms
Low DS education

Programme 4
Maintenance
180 days
• No symptoms
Well DS education
Study design

- Multicenter study (2 general and 1 academic)
- Follow-up of 1 year
- Data collection at baseline, after 3, 6, 12 m.

Statistical analyses

- Based on intention to treat
- Analysis performed by the GEE*

* generalized estimating equations

In- and exclusion criteria

**Inclusion**
- Diagnosed for HF
- NYHA classification 2-4
- >18 years
- Capable to give informed consent
- Treated by a HFN and a cardiologist

**Exclusion**
- Physically and/or cognitively unable to use the HB®
- Expected lifespan <1 year
- COPD Gold classification 3-4
- Haemodialysis
Results

• 382 patients with stable HF were included on the HF-clinic
  – 197 intervention group
    • 159 (81%) completed whole follow-up
  – 185 usual care group
    • 142 (77%) completed whole follow-up
## Results: baseline characteristics

<table>
<thead>
<tr>
<th></th>
<th>Intervention (197)</th>
<th>Usual Care (185)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender / male</strong>*</td>
<td>115 (58)</td>
<td>111 (60)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Married or partner</strong>*</td>
<td>122 (62)</td>
<td>123 (66)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>72 (62-81)</td>
<td>74 (64-80)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Duration of HF (mnths)</strong></td>
<td>17,5 (6-42)</td>
<td>14,5 (4-40)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>NYHA 2</strong></td>
<td>110 (56)</td>
<td>105 (59)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>NYHA 3 &amp; 4</strong></td>
<td>87 (44)</td>
<td>76 (41)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>LVEF</strong></td>
<td>36 (28-50)</td>
<td>35 (26-46)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>% LVEF ≤ 45%</strong>*</td>
<td>117 (60)</td>
<td>112 (62)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Primary school</strong></td>
<td>63 (33)</td>
<td>59 (34)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Low vocational</strong></td>
<td>91 (48)</td>
<td>71 (41)</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Middle/high school</strong></td>
<td>36 (19)</td>
<td>43 (24)</td>
<td>ns</td>
</tr>
</tbody>
</table>
Measurement instruments

Knowledge
  Dutch HF-knowledge scale
Self-care
  HF self care behaviour scale
Self-efficacy
  Barnason Efficacy Expectation Scale
Adherence
  Heart Failure Compliance Scale
P-value*  

<table>
<thead>
<tr>
<th></th>
<th>baseline</th>
<th>3 months</th>
<th>6 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-value</td>
<td>0.091</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*corrected for baseline value
*corrected for baseline value
lower value means better self-care
$P$-value* | 0.024 | 0.109 | 0.002 | 0.190

*corrected for baseline value
Adherence

• Effect on fluid restriction and daily weighing.
  – Remarkable: after 1 year, in the TM-group 87.2% daily weigh themselves, but only 75.4% found daily weighing important.

• Effect on importance of medication use.

• No effect om medication intake, appointments, activities, diet, smoking and alcohol cessation.
Conclusions

• Telemonitoring has a significant effect on the improvement of
  – disease specific knowledge
  – self-care
  – adherence for fluid restriction and daily weighing
  – self-efficacy (temporarily)
Limitations

- Standard questionnaires
- Scores are patient reported
- Patients participating in studies are generally more motivated than non-participants
Take home message

This kind of telemonitoring, focusing on education and patient related symptoms, is suitable for daily practice

- to improve patients’ disease specific knowledge
- to diminish the workload of the heart failure nurse with respect to patient education
- to support patients in their self-care abilities
- to support patients regarding their weighing behaviour.
THANK YOU FOR YOUR ATTENTION