The impact of adherence on costs and effectiveness of telemedical patient management in heart failure: A systematic review

A. S. Hameed¹,³, S. Sauermann², G. Schreier³

¹Faculty of Business and Economics, Mendel University, Brno, Czech Republic;
²Institute of Biomedical Engineering, University of Applied Sciences Technikum Vienna, Austria;
³Assistive Healthcare Information Technology, AIT Austrian Institute of Technology GmbH, Graz, Austria

Ahmed Saeed Hameed
Faculty of Business and Economics,
Mendel University
xhameed@mendelu.cz
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Current state of economic evaluation

- Crucial economic factors affecting the adoption and acceptance of telemedicine service
- Difficulties to determine the added value of telemedicine services is due to the lack of economic evaluation mechanisms
Objectives of the dissertation

- Development of an economic evaluation model based on the cost-benefit approach to analyze and evaluate the relevant costs and outcomes of telemedicine services as well as the definition of monetary conversion factors.

- Assessment of the impact of patients’ adherence to pharmacological and non-pharmacological recommendations on the costs of treatment.

- Proof of concept for the developed economic model.
Objectives of the systematic review

- Analyze the economic impact of patients’ adherence to pharmacological and non-pharmacological recommendations on the treatment costs of heart failure patients

- Determine whether patients’ adherence has been considered as a key factor in existing economic evaluation models
Methods of systematic review

Multi-stage procedure based on the PRISMA-Statement:\(^1\):

1) **Definition of keywords and technical terms:** telemedicine, telemonitoring, telehealth, eHealth, remote monitoring, adherence, compliance, cost-effectiveness, cost-benefit, heart failure, healthcare costs, hospitalization, drug costs

2) **Review of abstracts and excluded papers:** purely technical focus, lacking the characteristics of a research paper, or being out of scope

3) **Full text review of paper whether if:** healthcare method is specified, patients’ adherence is analyzed, if impact of adherence on healthcare costs is reported

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1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)
Flowchart of the systematic review

Process of identification and review of appropriate literature based on the PRISMA statement

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
<td>Records identified through database searching n=46</td>
</tr>
<tr>
<td></td>
<td>Additional records identified through other resources n=27</td>
</tr>
<tr>
<td>Screening</td>
<td>Records after duplicates removed n=73</td>
</tr>
<tr>
<td></td>
<td>Records excluded n=22</td>
</tr>
<tr>
<td>Eligibility</td>
<td>Full-text articles assessed for eligibility n=51</td>
</tr>
<tr>
<td></td>
<td>Full-text articles excluded with reason n=42</td>
</tr>
<tr>
<td>Included</td>
<td>Studies included in the qualitative synthesis n=9</td>
</tr>
</tbody>
</table>
Results of the systematic review

- Sample size of patients differed considerably (n=20-863)
- Duration of patients’ participation varied widely (3-41 months)
- Geographic area covered countries from North America, Europe and Asia
- Some of the findings were partly contradictory
- Reported cost reduction depended on the used healthcare method (telemedicine vs. standard) and diseases treated
- Usability as factor of influence since the studies were carried out between 1998 and 2014
Conclusion

- There is currently no evidence that increased patients’ adherence, supported by using telemedicine services, has led to a reduction in treatment costs
- A holistic assessment of all relevant economic costs and outcomes related to patient adherence is still missing
Conclusion*

* Simplified presentation

1 Clinical outcomes are the end result of medical interventions applied to patients
2 Healthcare costs are the sum of medical procedures and drug costs

Impact of patients’ adherence

<table>
<thead>
<tr>
<th>Treatment method</th>
<th>Telemedicine</th>
<th>Standard care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical outcomes$^1$</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Healthcare costs$^2$</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Number of papers associated to the criteria
Discussion and outlook

- No general statement can be made regarding the impact of adherence on healthcare costs for patients with HF

- Definition of a common set of criteria for an in-depth aggregation of results is missing (e.g. objective of study, duration and type of treatment, technology used, type of disease and patients’ demographics)
Discussion and outlook

- Open questions
  - Does increased patients’ adherence using telemedicine lead to a reduction of healthcare costs?
  - Availability of necessary data associated with patients’ adherence?

- Next steps
  - Definition of the relevant costs and outcomes estimation parameters for CB model
  - Definition of required medical and economical data samples and specific questionnaire to measure patients’ adherence
Thank you for your attention!