Internet-based Patient Education Intervention for Fibromyalgia: a Model-driven Evaluation

Luca Camerini
Anne-Linda Frisch
Peter J. Schulz

Institute of Communication and Health
Università della Svizzera italiana, Switzerland
Outline

• The ONESELF project
• ONESELF as a model-based intervention
• ONESELF model-based evaluation
• Sample and measures
• Results
• Discussion and limitations
• Conclusion
The ONESELF project (www.oneself.ch)

Context of the project:

• Chronic (recurrent) pain is one of the most symptomatic reasons why people seek healthcare
  
  CHF 739 million per year (direct impact)
  CHF 1.126 billion (indirect impact)

(Swiss Federal Office of Public Health, 2001)

• Necessity to offer support for self-management of chronic conditions (cLBP, FMS)
The ONESELF project

Goals:

• Increase patients’ **knowledge** of the chronic condition

• Increase patients’ **ability to judge** the information and to **make sense** of their condition in their everyday life

• Increase the overall sense of **empowerment**

• Increase patients’ **self-management**

• Ultimately, improve patients’ **health outcomes**
ONESELF as a model-based intervention

**ONESELF DESIGN**

Information-oriented tools:
- Virtual library
- Virtual gymnasium
- FAQ

Support-oriented tools:
- Online forum
- Chat room
- Testimonies

**ONESELF DESIGN**

**KNOWLEDGE**

**EMPOWERMENT**

**SELF-MANAGEMENT**

**HEALTH OUTCOMES**
Knowledge and Health Literacy

Theoretical perspectives:

Functional-oriented HL:
Ability to read, write, and make basic calculations

  E.g. Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs of the AMA (1999)

Hierarchical-oriented HL:
Functional, Interactive, and Critical HL (Nutbeam, 2000)
Integrative HL (Schulz & Nakamoto, 2005)

Explorative perspective on HL:
HL from the patients’/laypeople’s perspective (Jordan et al., 2010)
Knowledge and Health Literacy

Measures:

Two measures of health literacy are the Rapid Estimate of Adult Literacy in Medicine (REALM) test (Davis et al., 1991) and the Test of Functional Health Literacy in Adults (TOFHLA) (Parker et al., 1995).

→ Mainly functional-oriented

One way to measure health literacy beyond word recognition, comprehension, and numeracy skills in the health domain is with health knowledge tests.

→ Mainly context-dependent
E.g. Brief Diabetes Knowledge Test (Fitzgerald et al., 1998)
Empowerment

Theoretical perspectives:
Originally introduced in the educational and organizational setting (Rappaport, 1987; Wallerstein & Bernstein, 1988).

Empowerment is seen as an enabling individual characteristic, allowing people to take control over their actions, construct meaning, and engage in conscious decision-making.

Conger & Kanungo, 1988

Self-Efficacy Theory (Bandura, 1977)
Self-Determination Theory (Deci, 1975; Ryan & Deci, 2000)
Empowerment

Theoretical perspectives:

Cognitive model of empowerment

**Impact:** the degree to which behavior is seen as “making a difference” in terms of accomplishing the purpose of a task.

**Competence:** the degree to which a person can perform task activities skillfully when he or she tries.

**Meaningfulness:** the degree to which a person cares about a given task.

**Choice:** the degree to which a person’s behavior is perceived as self-determined (similar to the locus of causality).

(Thomas & Velthouse, 1990; Spreitzer, 1995)
ONESELF as a model-based intervention

ONESELF DESIGN

Information-oriented tools

- Virtual library
- Virtual gymnasium
- FAQ

Support-oriented tools

- Online forum
- Chat room
- Testimonies

Knowledge

Self-management

Health outcomes

Internet-based Patient Education Intervention for Fibromyalgia: a model-driven evaluation
ONESELF model-based evaluation

Virtual library

FAQ

Virtual gymnasium

Knowledge

Exercise

Drug intake

Negative health outcomes

H1a+

H1b+

H1c+

H2+

H3-

H4+

H5-

d1

d2

d3

d4

Model of ONESELF effects. Exogenous variables are allowed to be correlated.
Sample & sample characteristics

Sample size:
209 FMS patients

Inclusion criteria: (self-report)

a. Availability of Internet access

b. Sufficient confidence in computer use

c. Formal diagnosis received from a doctor

<table>
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<th>N</th>
<th>%</th>
<th>Mean</th>
<th>SD</th>
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<td>Secondary school</td>
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<td>(9 years)</td>
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<td>High school</td>
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<tr>
<td>(13 years)</td>
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<td>Other</td>
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<td>Years affected by FMS</td>
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<td>5.6</td>
<td>± 4.7</td>
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<td>Knowledge about FMS</td>
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<td>6.7</td>
<td>± 1.7</td>
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<td>FIQ score</td>
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<td></td>
<td>54.0</td>
<td>± 20.1</td>
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Measures

Usage of website tools:
ordinal scale (1-2 ; 3-5 ; 6-10 ; >20 times); based on self-report; median split transformation to dichotomize into “low frequency” and “high frequency” groups

Knowledge:
multiple choice knowledge test yielding a sum score ranging from 0 (not knowledgeable) to 10 (very knowledgeable)

Self-management:
assessed with two single item indicators: a) Level of physical activity (5-points scale); b) Drug intake (on a 4-points scale)

(Negative) health outcomes:
assessed with the Fibromyalgia Impact Questionnaire (FIQ, Burckhardt et al., 1991), which ranges from 0 (no impact of FMS) to 100 (full impact of FMS).
Results

Global Fit Indices:
- Chi-square > 0.05
- CFI .98
- RMSEA .21
- p-value for close fit > 0.05
- St. RMR < 0.05

Final model with unstandardized coefficients; standardized coefficients in parentheses; *p<0.05, ****p<0.001; dashed arrows indicate not significant paths. Exogenous variables are allowed to be correlated.

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The use of the virtual library and the FAQ section account for about 3% of the variance in knowledge.
Results

Knowledge and the use of the virtual gymnasium account for 14% of the variance in physical exercise.

GLOBAL FIT INDICES:
Chi-square > 0.05
CFI .98
RMSEA .21
p-value for close fit > 0.05
St. RMR < 0.05
The relationship between the level of physical exercise and health outcomes is fully mediated by drug intake.
Discussion & limitations

• The model-based evaluation of the ONESELF intervention was overall satisfactory.

• The Internet-based intervention had a positive impact on patients’ knowledge and self-management, which resulted in a general improvement in health status.

• However, the analysis is not strictly causal, and some limitations of the analysis persist (e.g. the use of single-item indicators, self-report measures, or the quantitative-oriented measure of usage).
Conclusion

In sum, we believe that model-driven design and evaluations should be pursued more often in eHealth research. While several studies on this topic are strictly experimental, the need for theory-driven evaluations is mostly needed.
Thank you!

luca.camerini@usi.ch
Extra:
On dichotomization (median-split)

Pros:
1. Equally sized groups can be obtained.
2. “Rough” way of dealing with non-normal continuous.

Cons:
1. Loss of individual differences (individuals around the median are divided and their similarity is lost)
2. Correlation is artificially inflated.
3. Loss in reliability.
4. Fuzzy effect size.