Individually Tailored Stepped Care for Women with Eating Disorders through the Use of Information and Communication Technologies

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Center for Psychotherapy Research Heidelberg

Med-e-Tel, Luxemburg, April 2010
Overview

1. Technology-enhanced care - WHY?
2. Technology-enhanced care in ED
3. Evaluation of an minimum intervention based on text messaging
4. Summary and Future Steps
Technology-enhanced care – WHY?

Overall aim: to improve mental health care...
- by extending the reach of specialized institutions (e.g. maintenance treatment)
- by reaching underserved populations (e.g. in remote areas)
- by facilitating access to care / reducing barriers (e.g. through low-threshold, easy-access interventions)
- by addressing large samples in an efficient way (e.g. prevention)
- by tailoring interventions to individual needs of participants (e.g. flexible adaptation of interventions depending on development of impairment)
Technology-enhanced care – WHY?

Overall aim: to improve mental health care...
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Technology-enhanced care – Relevance I

Together for Health: A Strategic Approach for the EU 2008-2013:

- new technologies have the potential to revolutionise health care

- E-health, genomics and biotechnologies can improve prevention of illness, delivery of treatment, and support a shift from hospital care to prevention and primary care

- E-health can help to provide better citizen-centred care as well as lowering costs and supporting interoperability across national boundaries, facilitating patient mobility and safety.

(European Commission, White Paper, 2007)
Technology-enhanced care – Relevance II

The **NIMH strategic plan** for research on mental disorders:

- define the pathophysiology of disorders from genes to behavior
- map the trajectory of illness to determine when, where, and how to intervene to preempt disability,
- develop new interventions based on a personalized approach to the diverse needs and circumstances of people with mental illnesses
- use health technology and telehealth to improve access and coordination of mental health care, especially for people in remote areas or in underserved populations.

(Insel, 2009)
Marie Curie Research Training Network

INTACT

Individually Tailored Stepped Care for Women with Eating Disorders (2007-2011)

www.intact-rtn.eu
INTACT Partner

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University Utrecht [NL]

Institute of Psychology
Universidade do Minho
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Charles University
Prague [CZ]

Institute of Behavioural Sciences, Semmelweis University
Budapest [HU]

University Hospital of Geneva [CH]

Institute of Psychiatry
University Hospital St. Etienne [F]

NetUnion sarl
Lausanne [CH]
INTACT Work Program

17 ongoing studies in 5 Work Packages

„getting ill“  „getting well“  „staying well“

WP 1 Risk Factors
WP 2 Prevention & Early Intervention
WP 3 Psychotherapy Process-Outcome
WP 4 Maintenance & Carer support
WP 5 Technology:
- Internet-based symptom monitoring
- E-health tools
Stepped Care
(= Combination of interventions of increasing or decreasing intensity)

Step-up programs:
- simpler, less intrusive, less costly intervention is followed by more intense treatment

- Early intervention
- Prevention

Treatment

Relapse prevention / Maintenance treatment

Step-down programs:
- intense inpatient or outpatient treatment is followed by less intensive intervention
Stepped Care
(= Combination of interventions of increasing or decreasing intensity)
## Technology-enhanced care in ED

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Taylor et al. (2006); Jacobi et al. (2007); Bauer et al. (2009); Lindenberg et al. (ongoing RCT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-help</td>
<td>Shapiro et al. (2007); Carrard et al. (2006); Murray et al. (2003; 2007); Ljotsson et al. (2007); Schmidt et al. (2009)</td>
</tr>
<tr>
<td>Counseling</td>
<td>Grunwald et al. (2006); Wesemann et al. (2008)</td>
</tr>
<tr>
<td>Add-on for F-2-F</td>
<td>Shapiro et al. (2009); Yager et al. (2003); Norton et al. (2003)</td>
</tr>
<tr>
<td>Treatment</td>
<td>Mitchell et al. (2008); Robinson et al. (2001; 2003); Bulik et al. (ongoing RCT)</td>
</tr>
<tr>
<td>Aftercare</td>
<td>Bauer et al. (2003; 2006); Robinson et al. (2006); Fichter et al. (ongoing RCT); Jacobi et al. (ongoing RCT)</td>
</tr>
<tr>
<td>Carer support</td>
<td>Sepulveda et al. (2008); Binford et al. (in prep.); Taylor et al. (ongoing RCT)</td>
</tr>
</tbody>
</table>
Stepped Care
(= Combination of interventions of increasing or decreasing intensity)
Maintenance treatment – WHY?

- Residual symptoms at the end of inpatient treatment
- High risk of relapse after end of treatment
- Often no immediate aftercare available / accessible
- Lack of second-level interventions (Mitchell et al., 2002; 2004)

Development of a minimum intervention based on text messaging to maintain treatment gains following inpatient treatment.
Using Text Messaging

- Large dissemination
- Permanent availability
- Flexibility with respect to time and place
- Low costs (time and money)
- Interactive medium
Concept

- Minimum intervention
- Weekly interaction via text messaging: Patients submit information on body dissatisfaction, frequency of binges, frequency of compensatory behaviors
- Internet-based, semi-automatized software program
- Evaluation of changes from week to week
- Standardized feedback messages
  - to provide social support,
  - reinforce positive changes,
  - remind participants of skills they learnt in treatment,
  - express concern in case of negative developments
Using Text Messaging

HOW?

Patient → Symptom SMS → Server + Modem
Using Text Messaging

**HOW?**

**Patient**

Patient

Feedback SMS

Symptom SMS

**Server + Modem**

Software
Feedback

Feedback Algorithm:

<table>
<thead>
<tr>
<th></th>
<th>Week 1</th>
<th>Week 2</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>functional</td>
<td>functional</td>
<td>„unchanged positive“</td>
</tr>
<tr>
<td>2</td>
<td>nonfunctional</td>
<td>nonfunctional</td>
<td>„unchanged negative“</td>
</tr>
<tr>
<td>3</td>
<td>nonfunctional</td>
<td>functional</td>
<td>„improved“</td>
</tr>
<tr>
<td>4</td>
<td>functional</td>
<td>nonfunctional</td>
<td>„deteriorated“</td>
</tr>
</tbody>
</table>
Feedback

Feedback Algorithm:

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</tr>
<tr>
<td>functional</td>
<td>nonfunctional</td>
<td>„deteriorated“</td>
</tr>
</tbody>
</table>

Feedback Messages:
- 64 change categories
- 15-20 feedback messages per category
- semi-automation: software automatically analyzes symptom change and selects an appropriate message from the pool of pre-formulated SMS
Internet-based Software
Pilot Study (2003/2004)

- $N = 33$
- well-accepted by patients
- promising satisfaction rates
- low drop-out rate


RCT (2005-2009)

Intervention Group (SMS)
- Inpatient treatment
- Admission
- Discharge
- Follow-up I
- Follow-up II

Control Group (TAU)
- Inpatient treatment
- Admission
- Discharge
- Follow-up I
- Follow-up II

- 4 months
- ~2 months
- 4 months
## Assessments

<table>
<thead>
<tr>
<th></th>
<th>Self-report</th>
<th>Expert rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Admission</strong></td>
<td>demographics; illness history; EDI; SEED; KPD; HAQ; EQ-5D; BDI</td>
<td>LIFE</td>
</tr>
<tr>
<td><strong>During treatment</strong></td>
<td>SEED; EDI; KPD; HAQ</td>
<td></td>
</tr>
<tr>
<td><strong>Discharge</strong></td>
<td>EDI; SEED; KPD; HAQ; EQ-5D; BDI; ZUF-8</td>
<td>LIFE</td>
</tr>
<tr>
<td><strong>Follow-up I</strong></td>
<td>EDI; SEED; KPD; EQ-5D; BDI; health care utilization; [SMS acceptance]</td>
<td>health care utilization</td>
</tr>
<tr>
<td><strong>Follow-up II</strong></td>
<td>EDI; SEED; KPD; EQ-5D; BDI; health care utilization</td>
<td>LIFE; health care utilization</td>
</tr>
</tbody>
</table>
Objectives

- **Primary:**
  
  Higher remission rate of intervention group at follow-up II?

- **Secondary:**
  
  . Differences in health care utilization (outpatient treatment)?
  
  . Cost-effectiveness?
Flow of participants

Assessed for eligibility (n = 184)

Excluded (n = 19):
- not meeting inclusion criteria (n = 5)
- refused to participate (n = 10)
- other reasons (n = 4)

Randomized (n = 165)

Allocated to SMS intervention (n = 82)
- received allocated intervention (n = 78)
- did not receive allocated intervention (n = 4 did not send any SMS)

Allocated to TAU intervention (n = 83)
- received allocated intervention (n = 83)
- did not receive allocated intervention (n = 0)

Lost to follow-up I: n = 7
Lost to follow-up II: n = 11
To be analyzed: n = 71

Lost to follow-up I: n = 9
Lost to follow-up II: n = 14
To be analyzed: n = 69
## Sample

<table>
<thead>
<tr>
<th></th>
<th>SMS</th>
<th>TAU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age [M (SD)]</strong></td>
<td>29.9 (7.9)</td>
<td>30.0 (9.5)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>single</td>
<td>71.1%</td>
<td>67.5%</td>
</tr>
<tr>
<td>married</td>
<td>14.5%</td>
<td>18.2%</td>
</tr>
<tr>
<td>living seperately</td>
<td>2.6%</td>
<td>2.6%</td>
</tr>
<tr>
<td>divorced</td>
<td>11.8%</td>
<td>9.1%</td>
</tr>
<tr>
<td>re-married</td>
<td>0.0%</td>
<td>1.3%</td>
</tr>
<tr>
<td>widowed</td>
<td>0.0%</td>
<td>1.3%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in school</td>
<td>5.3%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Hauptschulabschluss</td>
<td>7.9%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Mittlere Reife</td>
<td>42.1%</td>
<td>32.5%</td>
</tr>
<tr>
<td>Abitur / Fachabitur</td>
<td>43.4%</td>
<td>51.9%</td>
</tr>
<tr>
<td>Other</td>
<td>1.3%</td>
<td>2.6%</td>
</tr>
<tr>
<td><strong>Professional</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in training</td>
<td>8.9%</td>
<td>10.9%</td>
</tr>
<tr>
<td>apprenticeship / voc</td>
<td>50.3%</td>
<td>56.6%</td>
</tr>
<tr>
<td>master</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>UAS / University</td>
<td>14.5%</td>
<td>18.2%</td>
</tr>
<tr>
<td>no qualification</td>
<td>17.1%</td>
<td>10.4%</td>
</tr>
<tr>
<td>other</td>
<td>7.9%</td>
<td>2.6%</td>
</tr>
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</table>
Participation

- 13 – 16 weeks: 67%
- 9 – 12 weeks: 17%
- 5 – 8 weeks: 10%
- 0 – 4 weeks: 6%

Note. n = 4 (5%) did not send any SMS referring to the weekly questions
n = 3 (4%) asked to terminate the program
n = 50 (61%) participated over the full duration of 16 weeks
Satisfaction

- Quality of the program: 79%
- I would recommend it: 82%
- I would participate again: 80%
- Little effort: 83%
- Quality of messages: 70%
Definition of remission:
Maximum one binge episode per week for one month, use of compensatory means not more than once per week for one month (Kordy et al., 2002).
Efficacy – Remission rate

Definition of remission:
Maximum one binge episode per week for one month, use of compensatory means not more than once per week for one month (Kordy et al., 2002).

Remission rate at t4:

\[ \chi^2 (1) = 3.44; p < .05 \]
Utilization of outpatient treatment after discharge

<table>
<thead>
<tr>
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<th>TAU</th>
</tr>
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<tbody>
<tr>
<td>Proportion of utilizers</td>
<td>53% (n = 38)</td>
<td>52% (n = 36)</td>
</tr>
<tr>
<td>Number of sessions –</td>
<td>M = 9.1</td>
<td>M = 9.5</td>
</tr>
<tr>
<td>Total group</td>
<td>(SD = 13.8; range = 1-80)</td>
<td>(SD = 15.7; range = 2-85)</td>
</tr>
<tr>
<td>Number of sessions –</td>
<td>M = 18.2</td>
<td>M = 17.0</td>
</tr>
<tr>
<td>Utilizers</td>
<td>(SD = 18.1; range = 1-80)</td>
<td>(SD = 15.4; range = 2-85)</td>
</tr>
</tbody>
</table>
Remission rates for utilizers versus non-utilizers of outpatient treatment

<table>
<thead>
<tr>
<th>Remission rate (%)</th>
<th>SMS</th>
<th>TAU</th>
</tr>
</thead>
<tbody>
<tr>
<td>outpatient PT</td>
<td>63.2%</td>
<td>55.6%</td>
</tr>
<tr>
<td>no outpatient PT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Remission rates for utilizers versus non-utilizers of outpatient treatment

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<thead>
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<th>Outpatient PT</th>
<th>No Outpatient PT</th>
</tr>
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<tr>
<td>SMS</td>
<td>63.2</td>
<td>54.5</td>
</tr>
<tr>
<td>TAU</td>
<td>55.6</td>
<td>30.3</td>
</tr>
</tbody>
</table>
Summary I

- Low drop-out rate from SMS intervention and high satisfaction
- SMS intervention proved efficacious in stabilizing treatment gains
- Substantial deteriorations after discharge in control group (indicating need for aftercare), especially when patients do not engage in outpatient treatment
Summary II

- SMS intervention did not lead to a difference in the proportion of patients who took up outpatient treatment

- However, it appears to have influenced who engaged in outpatient treatment and who did not, i.e. led to an improved match of need and support
Next Steps I

- Replication needed
- Analysis of the cost-effectiveness of the SMS program
- Semi-automated character and low costs allow for transfer of the program into routine care
- Implementation in routine care to study:
  a) reach: uptake, adherence, participation, and completion rates
  b) effectiveness outside of RCT
  c) public health impact / population effectiveness (as function of reach and effectiveness)
Next Steps II: Internet-platform “Stay on track” for ED aftercare

- **Components:**
  - Psychoeducation, information material
  - Message board for peer support
  - Continuous monitoring and feedback
  - Automatized alarm system
  - Group chat sessions
  - Individual chat sessions
  - Timely readmission if necessary
  - Provision of flexible support depending on participants’ needs
THANK YOU FOR YOUR ATTENTION!

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