Usability Evaluation of Online Personal Health Records in Monitoring and Management of Patients with Type 2 Diabetes

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Two pilot studies between 2011 and 2013

**Phase 1:** Evaluate the practical viability of using TELUS PHR in monitoring patients with Type 2 diabetes:

- THS may be used in remote monitoring of patients with type 2 diabetes.

**Phase 2:** Evaluate advanced TELUS PHR functionalities, such as automated data uploading and secure messaging system

- Issues with automated uploading system identified and reported to TELUS.
- The messaging system can successfully be used for communication.
Phase 2 Expansion (2014 – 2015)

Collaboration

Access to Patients

PrimaryCare Network GRANDE PRAIRIE

PrimaryCare Network SOUTH CALGARY

Use of Technology

TELUS HEALTH

Information for Life.
Study Objectives

To determine if:

1) Patients find the TELUS PHR easy to use

2) Use of TELUS PHR improves patient care

3) Use of TELUS PHR results in relevant changes in HbA1C in patients with Type 2 diabetes
Study Procedure

Month

0 1 2 3 4 5 6

Study Timeline

Recruitment and Training

HbA1C measurement

Patient and clinician surveys

Blood glucose, weight, blood pressure, activity

Treatment Groups

THS Group

Control Group
Unified Theory of Acceptance and Usability of Technology (UTAUT), Duyck et al, 2010 and Venkatesh et al, 2003
Participant characteristics at baseline

49 patients signed the consent form
Participant Characteristics (contd.)

Participant Type

<table>
<thead>
<tr>
<th>Type</th>
<th>No. of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>THS-PHR Users</td>
<td>30</td>
</tr>
<tr>
<td>Control</td>
<td>20</td>
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</table>

Age Range of Study Participants

<table>
<thead>
<tr>
<th>Age Range (years)</th>
<th>No. of Participants</th>
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<tbody>
<tr>
<td>31-40</td>
<td>5</td>
</tr>
<tr>
<td>41-50</td>
<td>10</td>
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<tr>
<td>51-60</td>
<td>15</td>
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<tr>
<td>61-70</td>
<td>10</td>
</tr>
<tr>
<td>71-80</td>
<td>5</td>
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</table>

Gender of Participants

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of Participants</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
</tr>
</tbody>
</table>
Usability Evaluation Findings

- Performance Expectancy: +0.689
- Effort Expectancy: -0.483
- Social Influence: +0.336

Factors:
- Gender
- Age
- Experience
- Voluntariness of Use

Behavioral Intention
- Use Behavior
Adherence to the Program Over 6 Months
(HbA1C measurements)

Attrition Among Participants

<table>
<thead>
<tr>
<th>Completed Action</th>
<th>No. of Participants</th>
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<tbody>
<tr>
<td>Consent</td>
<td>40</td>
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<tr>
<td>1st A1C Test</td>
<td>30</td>
</tr>
<tr>
<td>2nd A1C Test</td>
<td>20</td>
</tr>
<tr>
<td>3rd A1C Test</td>
<td>10</td>
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Factors Influencing Adherence

1) Transient population in Grande Prairie
   (AHS reports as high as a 70% no-show rate for appointments in Grande Prairie)

2) Low adherence to long-term programs among this patient population

3) Low perceived health benefits among this patient population
Effects on HbA1C

Patients who adhere to the program may show improvement reflected by decrease in HbA1C levels
Conclusion

1) The type 2 diabetes population is not well suited to long-term health monitoring using PHRs.

2) Personal motivations may negatively impact the long-term use of the system among patients with type 2 diabetes.

3) There is some evidence that using the PHR is effective on clinical outcomes such as HbA1C.
Potential uses of PHRs in Chronic Care

To aid patients in transition by using technology to create a bridge between acute care and the community
~ Thank you ~

For Further Information, Contact
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### Patients' Baseline Usability Questionnaire Results

<table>
<thead>
<tr>
<th>Path</th>
<th>Path Coefficient</th>
<th>t</th>
<th>f²</th>
<th>R²</th>
<th>Quality of fit</th>
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</thead>
<tbody>
<tr>
<td>PE→BI</td>
<td>+0.689</td>
<td>1.980*</td>
<td>0.425</td>
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<tr>
<td>EE→BI</td>
<td>-0.483</td>
<td>2.275**</td>
<td>0.166</td>
<td>0.628</td>
<td>0.475</td>
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<tr>
<td>SI→BI</td>
<td>+0.256</td>
<td>0.886</td>
<td>0.090</td>
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<tr>
<td>FC→BI</td>
<td>+0.336</td>
<td>2.415**</td>
<td>0.101</td>
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</table>

* p<0.05; **p<0.01; f²: effect size $f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{excluded}}$; Q²: $Q^2 = \sqrt{Communality \times R^2}$

(Performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating conditions (FC), Behavioral intention (BI))
Usability Evaluation Findings

- Performance Expectancy: +0.689
- Effort Expectancy: -0.483
- Facilitating Conditions: +0.336

Behavioral Intentions