Utility Evaluation of the Web-based “Should I start Insulin?” Patient Decision Aid for Patients with Type 2 Diabetes

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>50% PDAs registered in the Decision Aid Library Inventory have some form of Internet function (Hoffman, 2013)

Expert consensus of web-based PDAs: Additional studies are needed to test how web-specific features (e.g. audio voice-overs, interactive graphics, touch-screen data entry) impact patients’ decision making (Hoffman, 2013)
Setting: Malaysia

• Dual-healthcare system
• Multi-cultural society
• Middle-income
• 67.8% of households were connected to the Internet in 2014
• 1/3 of users used the Internet to look for health-related information
• Insulin use is poor; T2DM prevalence at 16.6% (IDF 2014), insulin use at 7.2% (vs 36% in the US) (Letchuman 2010; CDC 2009)
Aim

• To evaluate the utility of the “Should I Start Insulin?” web-based PDA
  • impact on decision process
Website development

Content

- Needs assessment (interviews)
- Literature review
- IPDAS Quality Checklist
Website development

Content

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Website sections

• Diabetes and insulin
• Concerns about insulin
• Blood sugar and risk
• Treatment options
• Knowing your priority
• Support and decision
• Summary print-out
WHAT IS INSULIN?

Have you ever wondered what insulin is and where does it come from?

Insulin is a hormone produced by the body and it helps to remove sugar from the blood and store it in muscle and fat.

In diabetes, the blood sugar level is high because the body does not:

- produce enough insulin
- respond to insulin properly
Methods 1: Website development

**Content**
- Needs assessment
- Literature review
- IPDAS Quality Checklist

**Website sections**
- Diabetes and insulin
- Concerns about insulin
- Blood sugar and risk
- Treatment options
- Knowing your priority
- Support and decision
  - Summary print-out

**Design features**
- Animations
- Slide-by-slide scrolling
- Personalized HbA1c and complication risk charts
- Attribute selectable treatment options info
- Drag-and-drop concerns
Animations

Personalised HbA1c and complications risk chart
Methods: Utility testing

• **Design:** Qualitative, pragmatic methodology

• **Sample:** Patients with type 2 diabetes at the outpatient clinic of the University of Malaya Medical Centre (UMMC), Malaysia; advised to start insulin; English-literate; experience with IT

• **Sampling:** Convenience sampling at UMMC outpatient clinic

• **Data collection:**
  - **Pre-post questionnaire** (demographics, website usability and utility ratings)
  - **Retrospective think aloud:** Computer screen movement + facial expressions recorded simultaneously → interview on users’ views and experiences while watching playback
Methods (continued)

• Website revision
  • Same-day field notes
  • Framework analysis based on interview
  • Research team consensus meeting

• Cycle repeated until no major issues emerged (3 cycles)
Results

• Three rounds of website testing with 13 patients (n=6, 4, 3)
• Age: Median 65 years
• Gender: 10 men, 3 women
• Education level: 9 secondary/diploma, 4 graduate/postgraduate degree
Utility effect 1: Patient information

• Insulin-related knowledge increased

I'm not aware….Insulin may cause hypo. Yes I've taken some tablets and became hypo, so my concern is once you use insulin, you might become hypo.

Patient B, Cycle 1

• Personalized blood sugar control trend and complications risk chart helped them understand their risk.

This is very informative, like now I immediately, in my case I can see the 32% get complications, so I'm still in the safe zone (laughs).

Patient B, Cycle 1

At least you can highlight are you at the dangerous zone or moderate (talking about HbA1c trend chart). You know where you stand.

Patient O, Cycle 1
Utility effect 2: Deliberating between options

Before making a decision, it is important that you consider the advantages and disadvantages of each treatment option. You can compare the advantages and disadvantages of each treatment option that are relevant to you by ticking the boxes below:

- HbA1c
- Diabetes complications
- Diabetes symptoms
- Hypoglycemia
- Pain
- Cost
- Weight change

Patient-selectable attributes
Utility effect 2: Deliberating between options

Advantages & Disadvantages of the Treatment Options

<table>
<thead>
<tr>
<th>Treatment Option</th>
<th>Make no change</th>
<th>Start insulin injection</th>
<th>Start another type of injection (non-insulin)</th>
<th>Use alternative treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HbA1c</strong></td>
<td>No change or increase</td>
<td>Decrease by about 2%</td>
<td>Decrease from 0.5 to 1%</td>
<td>No evidence</td>
</tr>
<tr>
<td><strong>Diabetes Complications</strong></td>
<td>May develop or worsen the complications</td>
<td>Prevent or slow down the progression</td>
<td>May prevent or slow down the progression</td>
<td>Lack of evidence</td>
</tr>
<tr>
<td><strong>Diabetes Symptoms</strong></td>
<td>Will remain the same or get worse</td>
<td>Will improve</td>
<td>May improve</td>
<td>Lack of evidence</td>
</tr>
<tr>
<td><strong>Hypoglycemia</strong></td>
<td>Unknown</td>
<td>2 to 6 out of 10 people may have hypo; 4 to 8 may not</td>
<td>2 to 3 out of 10 people may have hypo; 7 to 8 may not</td>
<td>Lack of evidence</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>No added cost</td>
<td>Between RM80 to RM190 / month (for 10 unit / day)</td>
<td>RM550 to RM600 / pen</td>
<td>Varies</td>
</tr>
<tr>
<td><strong>Weight Change</strong></td>
<td>Unknown</td>
<td>May put on weight by 1 to 2 kg</td>
<td>Weight loss by 1 to 2 kg</td>
<td>Lack of evidence</td>
</tr>
</tbody>
</table>
Utility effect 2: Deliberating between options

• Clarifying which options were available (elimination)
  It helped me to understand that I need insulin as I have taken maximum oral tablets.
  
  Patient C, Cycle 3

• Felt the website was biased towards insulin
  I think you are trying to persuade me to start insulin. Most of the information are towards that.
  
  Patient N, Cycle 2
Utility effect 2: Deliberating between options

• The combination of Hba1c chart, the complication risk chart and the weighing scales of their values formed an evidence base for decisions
  I think, the HbA1c chart, my risk and the weighing scales...gives me a summary of my results. [So I am clear] on certain terms, based on my result, why I should start insulin.
  Patient W, Cycle 2

• Patients refusing insulin would reconsider
  I have made up my mind (not to start insulin). But I learn quite a lot. The pics are quite scary. I think again I may consider starting insulin. But not now.
  Patient N, Cycle 2
Utility effect 3: Involving others in the decision

• With family: Share the website with them
  Frankly speaking, my wife will say “No, why do you want to go on insulin, it’s so troublesome”. They think its best you can do without it... You see you need to make the next person to understand that you need insulin.
  Patient G, Cycle 1

• With HCP: Show the summary to the doctor
  I would keep (the pdf summary) for reference and show to the doctor and discuss.
  Patient C, Cycle 3
Discussion

• Personalized view of risk information
  • Simple rule-based risk score
    • the HbA1c chart and personalized information on risk → patients view it as their personal risk.
  • Elaboration Likelihood Model
    • people pay attention, actively process information more if seen as personally-relevant (Petty and Cacioppo 1990, Hoffman, Volk et al. 2013).
• But...felt they were being persuaded
Discussion

• Matrix-selectable options for options information
  • 6 (options) x 7 (attributes) = 42 item matrix
  • Strategy: allowing patients to select the attributes of interest to them, and screening out unnecessary options beforehand → Matrix reduced
  • More precise focus on their own information needs, less information to digest

• More studies are required on adapting other preference-based PDA sections (e.g. patient values elicitation) to web-based formats
Conclusion

• Interactive web functions provided tailored information according to patient preferences.
• This helped patients feel engaged with the information presented to them and they used this information when making a decision.
Acknowledgement

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References


