Health Cards for Consumer Health Search

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Consumer Health Search (CHS)

- CHS: **people searching for health advice online**. 59% of U.S. adults has searched online for health information (Fox & Duggan, 2013).

- Search results strongly bias people’s health decisions (Pogacar, 2017).

- People **struggle to understand** health search results (Alpay, 2009).

- 59% of self-diagnosers decided **NOT to confirm their condition with a health professional** (Fox & Duggan, 2013).
Assisting Users in Understanding Health Search Results

• Health cards have been used by commercial search engines to present coherent, easy to understand and trustworthy health information.

• The appearance of a health card is triggered by queries that contains a health condition name or its aliases.

• Our study investigated the benefits of health cards for broader search tasks than only to know more about a health condition.
RQ1: Are Health Cards Beneficial for CHS?

1. **Selected** as a source of information
2. Increase the number of **correct** answers
3. Reduce the **time** needed
4. Reduce the **effort** required
5. Reduce the perceived **workload**
6. Improve the user’s **satisfaction**
RQ2: How Does the Benefit Vary Across Search Intents?

We considered two types of search scenario:

• **Factual scenarios** consider search tasks related to a known health condition.
  
  E.g., **Scenario:** Your physiotherapist has mentioned you may have **pelvic inflammatory disease** and suggested you to go to a doctor.
  
  **Task:** Find out more information about how this disease can be treated.

• **Intellectual scenarios** consider search tasks based on **symptoms**.
  
  E.g., **Scenario:** It's few days now that you have been getting hiccups after eating. You felt you eat enough every time, in fact, you felt full. At the same time, you feel something in the back of your throat: like if you had a bump or lump.
  
  **Task:** Find out what you may have and when its time to make an appointment with a doctor.
Methods: User Study

• 48 Participants x 8 health search tasks = 384 Data Points.

• Participants worked on tasks using 2 types of user interface:
  1. with a health card
  2. Without health card
User Interface with a Health Card
Impact of Health Cards on Search Behaviour

On average, participants spent 55% of their time to observe the health cards.
Impact of Health Cards on Search Behaviour (2)

Participants tend to consider health cards earlier in a session.

![Graph showing the attention on health cards and snippets over the progress in the session.]

- Attention on Health Cards
- Attention on Snippets
- Percentage of participants
- Progress in the session
RQ1: The Benefits of Health Cards

(1) Selected as a source of information

Six Measurements:

1. Selected
2. Correctness
3. Time
4. Effort
5. Workload
6. Satisfaction

There was no significant difference between the number of tasks completed with and without selecting information from health cards.
Why Participants Did Not Select Information from Health Cards?

• 28% (13) of participants never selected information from the health cards!

• 94% of participants had searched online for health information but 41% of them never noticed health cards prior to this study.
RQ1: The Benefits of Health Cards

(2) Increase the number of correct answers

Six Measurements:

1. Selected
2. Correctness
3. Time
4. Effort
5. Workload
6. Satisfaction

The number of correct answers are comparable across conditions.
RQ1: The Benefits of Health Cards

(3) Reduce the time needed

Six Measurements:

1. Selected
2. Correctness
3. Time
4. Effort
5. Workload
6. Satisfaction

The average times needed to complete a task are comparable across conditions.
RQ1: The Benefits of Health Cards

(4) Reduce the Spent Effort

Six Measurements:
1. Selected
2. Correctness
3. Time
4. Effort
5. Workload
6. Satisfaction

The number of clicks is significantly less when information from health cards was selected.
RQ1: The Benefits of Health Cards

(5) Reduce the perceived workload

**Six Measurements:**

1. Selected
2. Correctness
3. Time
4. Effort
5. **Workload**
6. Satisfaction

There were no significance differences in the level of perceived workload across conditions.
RQ1: The Benefits of Health Cards

(6) Improve the user’s satisfaction

Participants felt significantly more satisfied with their own answers when selecting information from health cards to complete a search task.
Health Cards Bridged the Gap of Prior Knowledge

- Participants' prior knowledge positively correlates with correctness in their answers. This is inline with findings by Hu & Haake (2010).

- Selecting health cards helps bridging the gap between knowledgable and less knowledgable participants.

<table>
<thead>
<tr>
<th>Prior Knowledge</th>
<th>Correctness</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>2.22</td>
<td>0.0453*</td>
</tr>
<tr>
<td>little</td>
<td>2.48</td>
<td>0.0346*</td>
</tr>
<tr>
<td>some</td>
<td>2.56</td>
<td></td>
</tr>
<tr>
<td>great deal</td>
<td>2.80</td>
<td>0.122</td>
</tr>
</tbody>
</table>
RQ2: Benefits Across Search Intents?

**Factual:**
1. Selected
2. Correctness
3. Time
4. Effort
5. Workload
6. Satisfaction

Benefits of health cards were found to be significant for Factual Tasks. Health cards provide no significant benefits for Intellectual tasks.
Health Cards Alone Are Generally Insufficient

![Bar chart showing frequency of information source]

- **Factual**: Health Cards (36), Health Cards & WebPage (44), WebPage (48)
- **Intellectual**: Health Cards (33), Health Cards & WebPage (33), WebPage (48)

Source of Information: Health Cards, Health Cards & WebPage, WebPage
Conclusions (1)

• Overall, presenting health cards reduced the *effort* spent and improved the user’s *satisfaction*.

• Health cards *helped the less knowledgeable* to perform as effective as the knowledgeable (in terms of correctness).

• Health cards were significantly *beneficial for well-defined health search tasks (Factual)*.

• In contrast, health cards provided *no significant benefits for “exploratory” health search tasks (Intellectual)*.
Conclusions (2)

• 28% of participants never used any of the presented health cards.

• While 94% of participants had searched for health information online, yet 41% of participants never experienced health cards prior to this study.

• Lack of user engagement with health cards may leave the benefits of health cards unreaped.
Questions?

For further details: http://ielab.io/publications/jimmy-2019-healthcard

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