How does the use of 'think aloud' usability testing affect the design of a web-based decision aid?

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Purpose

To determine how the use of iterative ‘think-aloud’ usability testing can improve the usability of a web based decision aid

Objectives

1. What users paid attention to when using the tool
2. Changes made to the tool during usability testing
ANSWER

- Has been shown that patients want unbiased information about treatment so they can make an informed decision

- Led to development of the ANSWER tool, a decision aid to assist RA patients in deciding whether or not to take methotrexate

(Li et al, 2009)
Methotrexate

- Current treatment guidelines involve the use of DMARDs within six months of diagnosis.

- MTX is the most commonly used DMARD for treatment of RA.

- Well established risk-benefit profile but has some serious, but rare, side effects.

- Patients desire information to assist with this decision making process.

(Lacaille et al, 2005; Visser & Heijde, 2009; van Ede et al, 1998)
Based on the educational entertainment model, known as “edutainment”

Includes six animated, non-threatening scenarios in video format that patients can identify with

Development team: Health researchers, computer animation experts, patients with RA
Usability Testing

- Usability: Ease of use and learnability of a human-made object

- Important in developing a computer based educational intervention

- Target population uses tool and provides feedback

- Most effective when performed throughout the development of a tool or program

(Pak et al, 2010; Gustafson & Wyatt, 2004)
Think Aloud Protocol

- Participants asked to think aloud or verbalize thoughts as they perform a task
- Found to be more reliable than post test questionnaires and interviews
- Concurrent think aloud protocol allows researchers to:
  - Gain insight into decision making
  - Identify usability problems
  - Obtain qualitative data

(Currie, 2005; Kushniruk et al, 1997)
Methods: Participants

- 15 self selected individuals
- Recruited from Mary Pack Arthritis Centre & patient/consumer groups
- Majority over 50 y.o. and university/college graduates
- Diagnosed with RA
- Referred for or already taking MTX
Methods: Analysis

- Two hour session at ARC
- Think aloud’ protocol
  - Participants instructed to verbalize thoughts as they used tool
- Entire session recorded and transcribed verbatim
- Session conducted by research staff
  - Prompted participants to elaborate when necessary
  - Took field notes
Methods: Analysis

Issue Identification

• Content Analysis
  • Transcribed audiotapes
  • Field notes

• Identification
  • Excluded comments on what users liked, features that did not yet exist, when users supposed what others might do, or where meaning was unclear
Methods: Analysis

- Themes identified
  - Issues categorized according to emerging themes
  - Themes revised as an analysis progressed

- Categories within each theme defined
  - Category definitions revised as analysis progressed

- Group worked in pairs in close proximity to maximize inter-rater reliability when coding
Methods: Analysis

Change Identification

• Reviewed:
  • Print outs of tool
  • Communication between tool collaborators

• Identified:
  • Issues raised and changes made
  • Issues raised and changes not made
Results: Themes

- Entertainment Theme
  - The affability and engagement of the tool

- Content Theme
  - The factual information provided by the tool

- User-Interaction Theme
  - The ease of use of the tool
Entertainment Theme

- Emotional Involvement
  - Emotional response elicited by the ANSWER tool

- Relevance
  - The information and/or scenario is applicable to the user

- Video Credibility
  - Believability of the story, context, and characters
Content Theme

- Clarity
  - Information presented is easy to understand

- Agreement
  - Information is consistent with prior knowledge and beliefs

- Comprehensiveness
  - Sufficient information is provided to satisfy the user
Welcome to the Answer Tool

- You should use the ANSWER (Alimentarium, Self-care, Nutritional Research) Tool only if you have Rheumatoid Arthritis (RA) and your doctor has suggested Methotrexate as a treatment option for you.
- Use this program only if you have Rheumatoid Arthritis AND your doctor has suggested Methotrexate.
- This program will help you decide if Methotrexate is the right treatment for you.
- Two different options:
  1. To start Methotrexate - OR -
  2. To discuss other treatment options with your doctor.
- When deciding, consider:
  1. How Rheumatoid Arthritis affects you - RA -
  2. How Methotrexate affects you - RA -
  3. How Methotrexate benefits and potential side effects
- Your answers will appear on a page for you to print and take to discuss with your health care provider.
“Add a little more colour, make it fun so you actually feel like you are eager to go into this site” [Female participant 3]

“As to the colour and layout, I think it needs, it’s kind of flat and uninteresting, okay?”

[ Female participant 9]
Sensory Appeal of Video

“You know what? I have three daughters and two of them are in high school but they do a lot of drawing on the computer. And frankly I think you could have better graphics”

[Female participant 12]
“Yeah, ‘cause when it says ‘enter answer’ you’re kind of wondering like am I supposed to answer something but it doesn’t really ask you a question” [Female participant 11]
User Control

“\textquote I’m a bit of a research hound. I’d like some way to check out the citations\textquote ” [Female participant 9]
Website Architecture

“Do you know that you can actually play a clip?”

“No, I don’t know.”

“Ah, okay, so it wasn’t very obvious...”

“No, it wasn’t.”

[Researcher & Female Participant 8]
Discussion

- Offers comprehensive insight to the refinement and development of a web-based tool by systematically analyzing data from a number of different sources
  - As opposed to outlining usability testing was conducted

- Highlights the importance of usability testing prior to wide scale use in order to ensure appropriateness for a target population
  - Responding to users, reminder who the user is, what they’re going through, and what they need
Results: Changes

- Issues raised and changes made
  - Navigation

- Issues raised and changes not made
  - Emotional Involvement
Discussion: Theme Development

- Developed themes and categories in response to data
- Iterative nature ensured comprehensive definitions
- Initially as a group
- Subsequently in pairs, in close proximity
Discussion: Think Aloud

- Offers insight to user’s thought process
  - High face validity
  - More verbalizations vs. retrospective feedback

- Impact of this process
  - Mental overload decreases reactivity
  - Reactivity increased by environment and the fact they’re being observed
Discussion: Outstanding Issues

- Remainders mostly under Entertainment Theme
  - Emotional response triggered by the tool was very individual
  - User’s history and stage of life affected the personal relevance
  - Not central to usability
Limitations

- Analysis of only negative feedback
  - Inclusion of positive feedback

- Identifying changes from print outs and communications
  - Access to digital copy of tool at different stages of development
Future Directions

- Document positive and negative comments
- Video of subjects completing task as 3rd data source
- Change identification: access to digital tool at different stages of development
Conclusion

This study intended to ascertain how usability testing affected the development of a web-based decision aid.

This was accomplished by identifying issues raised and changes made during usability testing.
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References


References


Questions?