The aim of this study is to investigate whether and how interactivity can be used for improving recall of online health information. Interactive environments may stimulate cognitive responses since they enable nonlinear, cognitively flexible information use (cognitive flexibility theory). Interactivity may challenge individuals’ information processing capacities by putting an extra burden on users. Evidence suggests that interactivity improves information processing, especially among low need for cognition individuals. In our conceptual model, we will test whether cognitive involvement, perceived active control, and cognitive load mediate the relationship between interactivity and recall. In addition, we will look at whether the need for cognition and health literacy moderate the proposed mediation effects. In sum, we aim to answer the following research questions: through which mechanisms does interactivity affect recall of health information? Do these mechanisms differ according to individuals’ level of need for cognition and health literacy?

METHODS

A between-subjects experiment with three levels of interactivity (no interactivity, moderate interactivity, high interactivity) was conducted to investigate the effects of interactivity on cognitive involvement, perceived active control, cognitive load, and recall. In our paper, we did not explicitly mention “online environment” as the setting of our study, because given the fact that we examined how interactivity affects recall of website information, it is obvious that our study was conducted in an online setting. Individuals were asked to complete a short questionnaire about health literacy, need for cognition, and educational level. Evidence suggests that interactivity improves information processing, especially among low need for cognition individuals.
In interactivity research, three approaches are distinguished: structural, experiential, and message exchange. In the structural approach, interactivity is conceptualized in terms of the technical attributes of the medium. Such technical attributes include on-screen interactive features such as menus that allow users to control, manipulate, and receive feedback from the system.

In our experiment, participants were randomly assigned to one of the three versions of a website about vitamin B6 and dietary supplements. The random allocation was programmed by the website developer, Done Digital Kft. The method of allocation was completely at random within each stratum.

To examine differences between subgroups regarding the mediations (high vs low health literacy, high vs low need for cognition), model 4 (10,000 bootstrapped samples) was run for each group separately. Subgroups were created based on a mean split.

For each condition, the sample was divided into three strata: low, medium, and high educational level. Participants were randomly assigned to one of the three versions of a website about vitamin B6 and dietary supplements. The random allocation was programmed by the website developer, Done Digital Kft. The method of allocation was completely at random within each stratum.

Due to technical issues, data of 15 respondents were lost in the pre-exposure measurement. Therefore, these participants were excluded from the analysis.

In our sample of 2,621 respondents, 524/983 (53.3%) had used dietary supplements in the last 12 months. Participants can be regarded as neutral toward the topic vitamin B6 since they were not particularly informed or interested in it. Moreover, the topic was not particularly relevant to their immediate needs or desires.

Participants were invited to participate in the actual experiment during a 2-week period. The invitation was sent by email on March 21, 2017, and participants could reply at any time during the following 48 hours. On April 25, 2017, participants were invited to take part in the actual experiment.

In our study, we investigated the effects of interactivity on cognitive involvement, perceived active control, cognitive load, and recall.

A between-subjects experiment with three levels of interactivity (no interactivity, moderate interactivity, high interactivity) was conducted to investigate the effects of interactivity on cognitive involvement, perceived active control, cognitive load, and recall.

We did not explicitly mention "online environment" as the setting of our study, but it is clear from the context that the study was conducted in an online setting.

In our study, everyone was exposed to the experimental stimulus, so the experiment took place as it was intended. There is no comparison made between users and non-users, because everyone saw one version of the website. There were no non-users.
17a) CONSORT: For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)

See results section.

17a-i) Presentation of process outcomes such as metrics of use and intensity of use

17b) CONSORT: For binary outcomes, presentation of both absolute and relative effect sizes is recommended

Not applicable, we did not have binary outcomes.

18) CONSORT: Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory

"Manipulation Check of Interactivity: ... Thus, the manipulation was successful."; "Descriptive Statistics of User Actions ... Within the high interactivity condition, the proportion of participants who used all infographics was higher (36/124, 29.0%) than of those who used all dropdown menus (11/124, 8.9%)."; "Subgroup analysis of comparing only users

19) CONSORT: All important harms or unintended effects in each group

Not applicable. There were no harms or unintended effects in the three groups.

19-i) Include privacy breaches, technical problems

"Due to technical issues, data of 15 respondents were lost in the preexposure measurement."; "Due to personal browser settings such as a disabled Javascript, user activity data of 524 participants out of the 983 participants were collected."

19-ii) Include qualitative feedback from participants or observations from staff/researchers

DISCUSSION

20) CONSORT: Trial limitations, addressing sources of potential bias, imprecision, multiplicity of analyses

20-i) Typical limitations in eHealth trials

This is addressed in the limitations section of the discussion.

21) CONSORT: Generalizability (external validity, applicability) of the trial findings

21-i) Generalizability to other populations

21-ii) Discuss if there were elements in the RCT that would be different in a routine application setting

22) CONSORT: Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence

22-i) Restate study questions and summarize the answers suggested by the data, starting with primary outcomes and process outcomes (use)

This is described in the discussion section under principal findings.

22-ii) Highlight unanswered new questions, suggest future research

Other information

23) CONSORT: Registration number and name of trial registry

The study was not registered in a trial registration.

24) CONSORT: Where the full trial protocol can be accessed, if available

Our research protocol is archived and stored at the server of Maastricht University and can be obtained upon request from the authors. The protocol is not publicly accessible.

25) CONSORT: Sources of funding and other support (such as supply of drugs), role of funders

"This research was supported by the Netherlands Food and Consumer Product Safety Authority."

X26-i) Comment on ethics committee approval

X26-ii) Outline informed consent procedures

X26-iii) Safety and security procedures

X27-i) State the relation of the study team towards the system being evaluated