Allowing for differences between low-literate and literate people in the design of informative pictures

Preferences for level of detail, type of background, and type of frame of icons depicting organs

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Introduction

Information that accompanies medication is often too complex, which may lead to serious health risks for medication-users. Images can help to instruct, explain and anchor information in memory. Attractive visuals can also influence attitude towards the message and facilitate its integration. Visuals are particularly helpful for people who have trouble reading. However, it has been shown that low-literate people are generally less health-literate and may struggle with complex images. This study therefore addresses context and detail in visuals targeted at low-literate people.

Objectives

- To evaluate characteristics of icons that visualise organs, for the development of a systematic set of health pictograms.
- To involve low-literate people in the design process to target the visuals to their perceptual preferences.

Methods

Graphic designers, pharmacists, and communicators developed icons. These were shown to 191 visitors of a pharmacy in the Netherlands.

Literacy levels of participants were assessed using the (validated) Dutch Rapid Estimate of Adult Literacy in Medicine, the REALM-D.

Participants were asked to evaluate:
- the level of detail of the depicted organ,
- the type of background used in that picture, and
- the type of frame in which the organ was depicted.

Materials

Level of detail

- high
- medium
- low

Background

- arbitrary organs
- organ system
- skeleton
- empty

Frame (body)

- full view
- partial view
- smaller view
- isolated organ

Similar icons were developed for the kidneys, ears and lungs.

Results

For all organs, participants opt for lower levels of detail of the organ.

Arbitrary organs are the preferred background for the intestines and ear, but the least preferred option for the lungs and kidneys. The empty background scores well overall.

Multinomial logistic regression shows that low-literate participants (n=30) are more likely than literate participants (n=161) to opt for less context in the form of the body frame. The table below gives the odds ratios for three organs, corrected for demographic variables.

<table>
<thead>
<tr>
<th></th>
<th>whole body</th>
<th>partial view</th>
<th>smaller view</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
</tr>
<tr>
<td>low-literate</td>
<td>referent</td>
<td>0.74 0.16-3.36</td>
<td>0.04 0.00-0.37</td>
</tr>
<tr>
<td>literate</td>
<td>referent</td>
<td>0.11 0.02-0.57</td>
<td>0.15 0.03-0.70</td>
</tr>
<tr>
<td>low-literate</td>
<td>referent</td>
<td>0.20 0.05-0.80</td>
<td>0.08 0.01-0.47</td>
</tr>
<tr>
<td>literate</td>
<td>referent</td>
<td>0.15 0.03-0.70</td>
<td>0.19 0.07-0.53</td>
</tr>
</tbody>
</table>

*p<0.05; ** p<0.01  OR=odds ratio, CI=confidence interval

“Isoalted organ” is reference category

Discussion

These results seem to contradict literature that advises to visualise body parts within the body. However, this study’s participants knew which organ was depicted, so that context was not needed for interpretation. Instead, it might have become a redundant detail, by which low-literate people are supposed to be more easily distracted than literate people.

Non-probability sampling was used because of the difficulty to recruit low-literate participants. While this led to unequal group sizes, the ratio encountered in this study is similar to that of the Dutch population.

In future steps of the design process, also understanding and effects on health management should be tested in the context of a leaflet.

Conclusions

- For icons of known organs, a limited amount of context is preferred. Low-literate people want to see less context than literate people.
- Differences in preference between literate and low-literate people call for continued involvement of the latter in the design process.

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