There was no overall preference of the VAS-V and VAS-H on the tablet device (see Table 3); participants that The 11-point NRS was most preferred because it gave more room “to manoeuvre” and was less “crude” (see Figure 5).

Where possible use an 11 point NRS scale and avoid the use of a VAS

The Visual Analogue Scale (VAS) has been reported to be the least reliable scale when compared with numeric rating scales (NRS), verbal rating scales (VRS) and Likert scales (Chiou et al 2013, and Lambert et al 2010). VAS is often reported to be quicker to perform, and less “invasive” (see Figure 4).

In order to better understand the impact of different types of scales presented on different platforms, this study examined patient’s perceptions and preferences for pain response scales on three administration methods.

METHODS

A literature search was conducted using Medline, EMBASE, PsycINFO and Google Scholar to explore patient preferences of response scales.

Following the literature search, a qualitative study was conducted in the UK with patients with experience of pain, to assess preferences for response scales on paper and electronic platforms.

Twelve participants were recruited through a database of participants held by Oxford Outcomes. All participants had to experience pain on a daily basis, for at least a month. A randomised, crossover design was used in the study with a qualitative interview setting.

Questions about pain “right now” and “at its worst in the last 24 hours” were completed by all participants using the three administration methods:

- Paper
- Handheld device
- Tablet device

The scales were presented in different layouts:

- Landscape: NRS, VAS-H and Vertical VAS (VAS-V)
- Portrait: NRS, VAS-H and Vertical VAS (VAS-V)
- Orientation of VAS and NRS: portrait and landscape.

Orientation of VAS: horizontal (VAS-H) and vertical (VAS-V).

The handheld device used in the study was a HTC HD2; the specifications of this device are: 120.5 x 67 mm, 480 x 800 pixels, 4.3 inch screen display.

The tablet device used in the study was an Acer Iconia W500; the specifications of this device are: 210 x 230 mm, 1280 x 800 pixels, 10.1 inch HD screen display.

Both devices used a touch screen, requiring participants to use their finger to select responses from the screen.

After completing each layout of each scale on all administration methods, participants were interviewed about their preferences for, and perceived differences of, the different types of scales and different platforms.

Overall, the landscape setting for the handheld device was preferred because there was “more room” and the scale was “more spaced out” making it appear “bigger”.

VAS-H orientation was most preferred on the handheld device (see Figure 3), and on paper because people were used to reading things in this way (i.e. left to right and opposed to up to down); this layout was commented on as “more natural” and people were “more accustomed” to this layout.

VAS-V orientation was not preferred by the majority of participants on the handheld device because it was “alien to how we expect it” and “required more thinking” (see Table 2).

Table 2 – Preferences for layout on the handheld device

<table>
<thead>
<tr>
<th>Scale</th>
<th>Portrait</th>
<th>Landscape</th>
<th>No preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Analogue Scale (VAS)</td>
<td>No preference</td>
<td>Portrait</td>
<td>Landscape</td>
</tr>
<tr>
<td>Vertical Visual Analogue Scale (VAS-V)</td>
<td>Portrait</td>
<td>No preference</td>
<td>Landscape</td>
</tr>
<tr>
<td>Verbal Descriptor Scale (VDS)</td>
<td>No preference</td>
<td>Portrait</td>
<td>Landscape</td>
</tr>
<tr>
<td>Likert Scale (LS)</td>
<td>No preference</td>
<td>Portrait</td>
<td>Landscape</td>
</tr>
</tbody>
</table>

There was no overall preference of the VAS-V and VAS-H on the tablet device (see Table 3); participants that preferred performing the VAS-V commented it was because of the additional markers (see Figure 4).

The increasing severity scale was the most preferred because this scale was “working upwards [which] seemed more logical, rather than working down”, and this seemed the “logical order” (See Figure 5).

The VAS was the least preferred scale because it was not clear how it should be interpreted.

The handheld device was preferred (83%) over the handheld device (48%) because it had a bigger screen and it appeared cleaner to participants; the handheld device was the least preferred when participants were asked (48%); however this was again because of the relatively small screen.

Participants did not express any usability issues with the handheld device (although one participant had commented a stylus would have been easier to mark his answers with).

Table 3 – Preferences for layout on the tablet device

<table>
<thead>
<tr>
<th>Scale</th>
<th>Portrait</th>
<th>Landscape</th>
<th>No preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Analogue Scale (VAS)</td>
<td>No preference</td>
<td>Portrait</td>
<td>Landscape</td>
</tr>
<tr>
<td>Vertical Visual Analogue Scale (VAS-V)</td>
<td>Portrait</td>
<td>No preference</td>
<td>Landscape</td>
</tr>
<tr>
<td>Verbal Descriptor Scale (VDS)</td>
<td>No preference</td>
<td>Portrait</td>
<td>Landscape</td>
</tr>
<tr>
<td>Likert Scale (LS)</td>
<td>No preference</td>
<td>Portrait</td>
<td>Landscape</td>
</tr>
</tbody>
</table>

CONCLUSIONS

- Consistent with previous literature, the study has shown that the VAS was the least preferred of the three scales.
- The 11 point NRS being preferred by most participants is consistent with previous research (Murphy et al, 1988), as it is reported that scales less than 11 points are less sensitive (Jensen et al, 1994).
- The findings are consistent with previous research by Williams and Hoggatt (2003) who found the VAS resulted in more practical difficulties and had the highest failure rate.
- Moreover, participants preferred the VRS for simplicity and the NRS for its sensitivity. This undermines two perceived strengths of the VAS (its simplicity and sensitivity).
- Although the same scale generates these findings difficult, this exploratory study highlights the importance of assessing usability of such scales, and also preferences based on informed decisions.

RECOMMENDATIONS

- Where possible use an 11 point NRS scale and avoid the use of a VAS.
- Use the appropriate screen orientation when using handheld devices, depending on the type of response scales used.
- Further research is necessary to evaluate these scales from a quantitative perspective

REFERENCES


