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Aphasias (or dysphasias) is used to describe the acquired language condition that is caused by left hemisphere brain injury. Aphasia may persist as a chronic disability, and presents in around one third of stroke cases. Writing skills may be selectively or co-morbidly impaired in aphasia.

Traditional approaches to writing impairments (or dysgraphias) for people with aphasia seen in the literature largely focus on single word spelling practice as therapy and single word spelling tests as the primary assessment (e.g. Rayner et al., 2010; Beaton, Higgenson & Rigamonti, 2013; Toepker & Hillis, 2013). Recently, rehabilitation has begun to integrate technology into these interventions (such as software that guides an individual through spelling exercises e.g. Step-by-Step (Moorely, Wisse & Endler, 2006)) as an innovative and current alternative.

Despite their rigour and effectiveness, single-word approaches to writing therapy and assessment (with or without technology) may be challenged in terms of their contribution to an individual’s activity and participation, two health-related domains defined in The World Health Organisation’s (WHO) International Classification of Functioning, Disability and Health Framework (ICF) (WHO, 2007). These domains are major aspects of health-related quality of life (HRQoL) which is repeatedly reported to reduce for people with aphasia (e.g. Hållgren & Byng, 2009). People with aphasia may experience barriers to many aspects of activity and participation when their writing skills are impaired. The writing skills required for good functioning in these domains are referred to as functional writing.

As yet, there does not appear to be an established tool to measure functional writing of people with aphasia, though those for functional verbal communication are increasingly used in practice. While some case studies on participants using technology for functional writing have been published, there is little larger scale research. This paper presents findings addressing these two key issues.

Keywords:
Aphasia
Writing
Technology
Functional Communication
Assessment
Therapy
Speech and Language

Results

Rater’s scores were rationalised onto a 0-10 scale where 0 represents the most negative perspective and 10 represents the most positive.

Technology Assisted Writing

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-therapy</th>
<th>Post-therapy</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing Quality</td>
<td>7.8</td>
<td>9.2</td>
<td>8.8</td>
</tr>
<tr>
<td>Informativeness</td>
<td>4.5</td>
<td>5.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Efficacy</td>
<td>4.2</td>
<td>5.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Grammar Quality</td>
<td>5.0</td>
<td>6.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Reader Comfort</td>
<td>6.0</td>
<td>7.0</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Figure 1: There was a significant difference in scores of social validity across the different time points (Friedman chi^2 = 3.2, p=0.007). People post-therapy scored the highest [median(IQR)= 6.80(2.77)], followed by follow-up scores [5.96(2.24)], with the lowest [4.75(4.63)]. Pairwise comparisons revealed that social validity scores pre-therapy were significantly higher than at baseline (Z= 2.70, p=0.007). Scores between pre-therapy and follow-up (Z= 1.68, p=0.093) (ns), and post-therapy and follow-up (Z= -1.99, p=0.047) (ns) were not significant.

Conclusions

1. Statistically significant differences between pre- and post-therapy social validity measures of writing when using technology suggests this therapy approach may act as a beneficial compensatory approach for writing impairments in aphasia.
2. However, this change was not maintained at 6 weeks follow up indicating further research could be done into strategies to promote preservation of skills.
3. There was not a significant improvement in handwriting scores, suggesting that the therapy approach may act as a beneficial compensatory approach, i.e. no generalisation to handwriting skills. However, there was a trend that handwriting improved after therapy, though this was not significant.
4. Therapy of this nature may improve the ability of people with aphasia to complete functional writing tasks such as writing emails.
5. This in turn may reduce the barriers to activity and participation in daily life for people with writing impairments in aphasia.

References


What this study contributes:
1. Evaluate efficacy of functional writing therapy using technology for a group of people with aphasia.

Figure 2: There was no significant difference in scores of social validity across the different time points (Friedman chi^2 = 0.8, p=0.67(nts)). There was a general trend that scores increase post-therapy, with these scores being the highest [median(IQR)= 6.75(2.81)], surprisingly followed by pre-therapy scores [5.84(1.45), with follow up scores being the lowest [5.64(4.06)].