**METHODS**

**INTRODUCTION**

Fatigue in children with other chronic conditions has been linked to school absences, reduced academic performance, sleep disturbances and negative changes in quality of life. Even for pediatric patients with CHL, fatigue levels have been reported which, in turn, may have a negative impact on daily activities. In addition to physical symptoms (e.g. sluggishness, sleepiness, etc.), anecdotal reports suggest that CHL may experience cognitive and/or emotional fatigue as a result of difficulty listening.

**PURPOSE**

Overall study goal: Construct a valid measure of related fatigue in CHL that can be completed by the child, their parents, or teachers and used in schools or clinics.

**Phase 1:** A literature review and data from focus groups and interviews provided a framework for developing a multi-dimensional measure of listening-related fatigue for CHL. Focus group and interview data were used to create a pool of potential test items. Phase 2 (data collection on-going): Participants are responding to pre-test questions which will be used to develop the final version of the Vanderbilt Fatigue Scale.

**METHODS**

**Phase 1:** Focus group and interviews (See Table 1), led by a trained audiologist/psychologist, and examined the following:

1. Characteristics of listening situations that may result in fatigue
2. Behavioral manifestations of listening-related fatigue
3. Coping strategies following the experience of fatigue
4. Temporal characteristics of the fatigue development and coping

Phase 1 focused on CHL behaviors that may be related to fatigue; interviews were audio-recorded and transcribed.

**Phase 2:** Additional data collection on-going: Participants are responding to pre-test questions which will be used to develop the final version of the Vanderbilt Fatigue Scale.

<table>
<thead>
<tr>
<th>Group</th>
<th>Phase I</th>
<th>Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent of CHL</td>
<td>17</td>
<td>149</td>
</tr>
<tr>
<td>Teacher of CHL (general, special, and deaf education)</td>
<td>17</td>
<td>32</td>
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<tr>
<td>Service Provider (SLP, audiologist, interpreter)</td>
<td>11</td>
<td>0</td>
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<tr>
<td>CHL (age 7-17)</td>
<td>41</td>
<td>71</td>
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<tr>
<td>TOTAL</td>
<td>86</td>
<td>252</td>
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**Focus Group Questions and Sample Items**

- **Child Questions:**
  - Younger children participated in a focus group with CHL. As a result, they discussed the experience of fatigue. Questions were designed to elicit children’s perspectives on fatigue-related experiences in communication situations.
  - "I feel tired when I’m trying to learn new things." "I feel so tired when I have to do something that I can’t concentrate.

**Phase 2:** Data collection on-going: Participants are responding to pre-test questions which will be used to develop the final version of the Vanderbilt Fatigue Scale.

**MULTI-DIMENSIONAL CONSTRUCT MAP**

![Figure 1: Multi-dimensional construct map](image)

**Domains of Listening-Related Fatigue**

- **Social-Emotional**
  - Changes in listener’s ability to focus with their implanted device is nearly impossible.
  - I feel like I’m not doing a specific task. I can’t keep up.

- **Cognitive**
  - I feel like I’m not doing a specific task. I can’t keep up.
  - I feel like I’m not doing a specific task. I can’t keep up.

- **Physical**
  - I feel like I’m not doing a specific task. I can’t keep up.
  - I feel like I’m not doing a specific task. I can’t keep up.

**Phase 2:** Data collection on-going: Participants are responding to pre-test questions which will be used to develop the final version of the Vanderbilt Fatigue Scale.

**Fatigue Scale Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
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<tbody>
<tr>
<td><strong>Child:</strong></td>
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<td><strong>Teacher:</strong></td>
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**Next Steps:**

- Data collection for Phase 2 is on-going. Participants in each subgroup are completing the preliminary version of the scale.
- Once a large sample is collected for each group, statistical analyses will be conducted to reduce the number of items to ensure the scale can be easily administered in clinics and schools.
- Please let us know if you would be willing to help with data collection by distributing the preliminary scale to potential participants by emailing: hilary.davis@vanderbilt.edu

**Clinical Recommendations**

- CHL are at increased risk for listening-related fatigue and may exhibit negative consequences. These intervention studies have not yet been undertaken, but you can discuss listening-related fatigue with your patients and their families. Encourage them to look for:
  - Tiredness
  - Fatigue
  - Sleepiness
  - Inattentiveness
  - Mood changes

- Probe further than a simple query: "Are you tired?". The observable behaviors associated with listening-related fatigue may not be captured by this question.
- Talk with teachers and parents about the importance of accommodations, such as taking listening breaks.
- See our website for additional information on listening-related fatigue in CHL: [https://my.vanderbilt.edu/listeninghearinglab/](https://my.vanderbilt.edu/listeninghearinglab/)

**References**


**Acknowledgements**

This research is supported by the Institute of Education Sciences (IES), U.S. Department of Education, through Grant #R324A150029 to Vanderbilt University. The opinions expressed are those of the authors and do not represent the views of the Institute or the U.S. Department of Education.