Developing a Measure of Fatigue for Deaf and Hard of Hearing Students

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Introduction

Fatigue is a common experience among students, and has been shown to impair motor processes and cognitive functions, inevitably leading to poor academic performance (Kronholm et al. 2015, Mizuno et al. 2011).

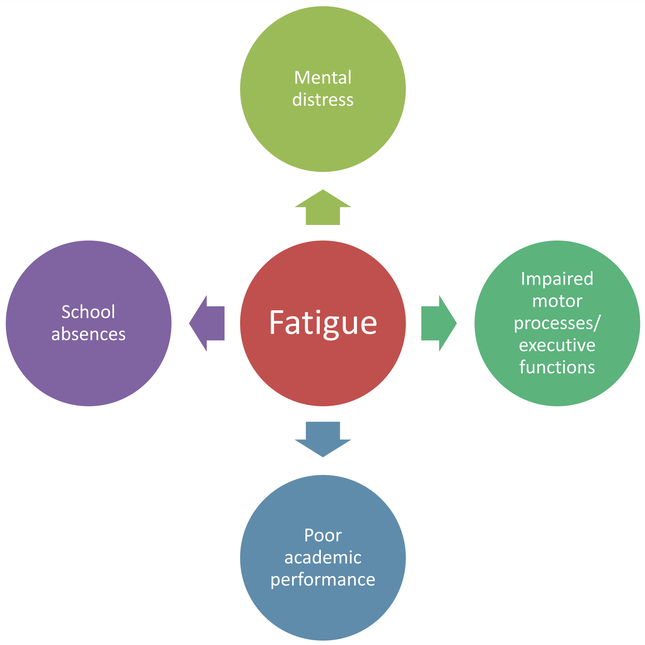

Figure 1. Outcomes of fatigue (Kronholm et al., 2015, Mizuno et al., 2011)

Fatigue is an especially prevalent problem for students who are D/HH as they must generate increased auditory and visual efforts to attend information in the classroom, leading to increased levels of cognitive and physical fatigue (Rohatyn-Martin & Hayward, 2016). Many measures of fatigue exist, but none specifically address fatigue in D/HH students. To remedy this, the present study examined existing measures of fatigue to inform the development of a measure specifically for D/HH students.

Methods

Literature Search

- Search terms included: ((measure OR survey OR questionnaire) AND fatigue) and ((develop* OR validat*) AND (measure OR survey OR questionnaire) AND fatigue)
- Databases searched: Web of Science, PubMed, JSTOR

Results

What makes a good measure?

- Clear, unambiguous language
- Appropriate length (Robinson, 2018)
- Items generated based on experience of intended participants
- High internal reliability
- High construct validity
- High criterion validity

Preliminary items should be generated based on focus group interviews and a preliminary version of the measure administered. Statistical tests are used to determine the reliability and validity of the items, and can also assist in eliminating redundant items.

Unidimensional or multidimensional?

There is no general consensus on whether fatigue should be assessed with a unidimensional scale (i.e. as a score totaled over multiple categories) or a multidimensional scale (i.e. assess scores for each category individually) (Lai et al., 2007). When considering existing measures of fatigue, a unidimensional approach seems to be the most common. An ideal measure would address each dimension of fatigue that D/HH students experience (cognitive fatigue, physical fatigue, and social-emotional fatigue) (Bess & Hornsby, 2014), which can be done with a unidimensional or multidimensional measure.

Response format

Several response formats exist, the most common of which is the Likert scale (Hinkin, 1998). The 5-point and the 7-point Likert scale are largely regarded as the optimal number of response points as they tend to produce higher quality data than shorter or longer scales (Robinson, 2018). Additionally, Detmar et al. (2006) found that a 5-point Likert scale was preferred by adolescents in comparison to other response formats.

Question category	Likert value				
	0	1	2	3	4
Perceived impact	No opinion	No impact	Slight impact	Considerable impact	Great impact
Frequency of occurrence	Never	Seldom	Occasionally	To a considerable degree	Almost always

Figure 2. Example of 5-point Likert scales measuring severity and frequency of occurence

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Conclusions

Significance and next steps

Identifying fatigue in D/HH students is the first step in identifying and implementing strategies to mitigate fatigue and improve educational outcomes. The next steps of this research is to generate preliminary items based on the information gathered from focus groups interviews with D/HH students, parents of D/HH students, and professionals with experience working with D/HH students.

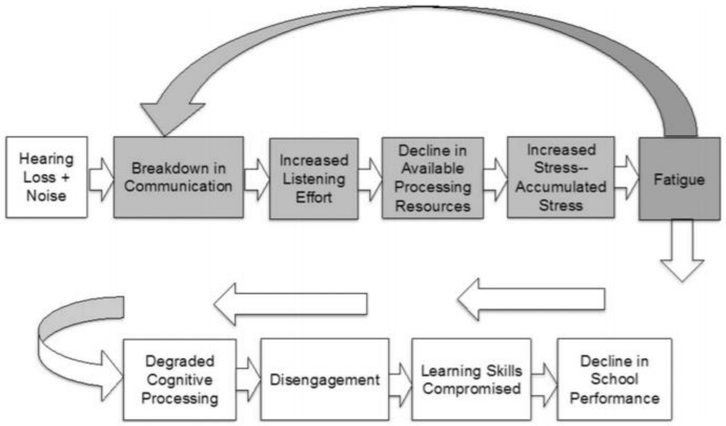

Figure 3. Factors contributing to fatigue in D/HH students and the outcomes of fatigue (Bess & Hornsby, 2014)

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