

Scale Evaluating the Information Literacy Self-Efficacy of Medical Students Created and Tested in a Six-Year Belgian Medical Program

De Meulemeester, A., Buysse, H., & Peleman, R. (2018). Development and validation of an Information Literacy Self-Efficacy Scale for medical students. *Journal of Information Literacy*, 12(1), 27-47.

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Evidence Summary

Scale Evaluating the Information Literacy Self-Efficacy of Medical Students Created and Tested in a Six-Year Belgian Medical Program

A Review of:

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Abstract

Objective – To create and validate a scale evaluating the information literacy (IL) self-efficacy beliefs of medical students.

Design – Scale development.

Setting – Large, public research university in Belgium.

Subjects – 1,252 medical students enrolled in a six-year medical program in the 2013-2014 academic year.

Methods – Ten medical-specific IL self-efficacy questions were developed to expand a 28-item Information Literacy Self-Efficacy Scale (ILSES) (Kurbanoglu, Akkoyunlu, & Umay, 2006). Medical students in Years 1 – 5 completed the questionnaire (in English) in the first two weeks of the academic year, with students in Year 6 completing after final exams. Respondents rated their confidence with each item 0 ('I do not feel confident at all') to 100 ('I feel 100% confident'). Principal Axis Factoring analysis was conducted on all 38 items to identify subscales. Responses were found suitable for factor analysis using Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin

measure (KMO). Factors were extracted using the Kaiser-Gutmann rule with Varimax rotation applied. Cronbach's alpha was used to test the internal consistency of each identified subscale. Following a One-way-ANOVA testing for significant differences, a Tamhane T2 post-hoc test obtained a pairwise comparison between mean responses for each student year.

Main Results – Five subscales with a total of 35 items were validated for inclusion in the Information Literacy Self-Efficacy Scale for Medicine (ILSES-M) and found to have a high reliability (Cronbach's alpha scores greater than .70). Subscales were labelled by concept, including "Evaluating and Processing Information" (11 items), "Medical Information Literacy Skills" (10 items), "Searching and Finding Information" (6 items), "Using the Library" (4 items), and "Bibliography" (4 items). The factor loading of non-medical subscales closely reflected studies validating the original ILSES (Kurbanoglu, Akkoyunlu, & Umay, 2006; Usluel, 2007), suggesting consistency in varying contexts and across time. Although overall subscale means were relatively low, immediate findings among medical students at Ghent University demonstrated an increase in the IL self-efficacy of students as they advance through the 6-year medical program. Students revealed the least confidence in "Using the Library."

Conclusions – The self-efficacy of individuals in approaching IL tasks has an impact on self-motivation and lifelong learning. The authors developed the ILSES-M as part of a longitudinal study protocol appraising the IL self-efficacy beliefs of students in a six-year medical curriculum (De Meulemeester, Peleman, & Buyse, 2018). The ILSES-M "...could give a clear idea about the evolution of perceived IL and the related need for support and training" (p. 43). Further research could evaluate the scale's impact on curriculum and, conversely, the impact of curricular changes on ILSE. Qualitative research may afford additional context for scale interpretation. The scale may also provide opportunities to assess the confidence levels of incoming students throughout time.

The authors suggested further research should apply the ILSES-M in diverse cultural and curricular settings.

Commentary

The impact of self-efficacy beliefs on IL behaviors and lifelong learning was first studied by Kurbanoglu (2003), who suggested "Perceived self-efficacy can be accepted as one of the psychological factors which has an impact on information literacy" (p. 637). Through a study of teachers in Turkey, Kurbanoglu, Akkoyunlu, and Umay (2006) developed and validated a 28-item Information Literacy Self-Efficacy Scale (ILSES) in both Turkish and English. The scale was further tested for factor loading and reliability by Usluel (2007). The ILSES has been applied in the medical discipline as a measure of the IL self-efficacy of nursing students (Özbiçakçı, Gezer, & Bilik, 2015; Robertson & Felicilda-Reynaldo, 2015). As Kurbanoglu (2003) suggested, self-efficacy is "domain-specific" (p. 636). The authors' study contributed to the literature by expanding the scale through the inclusion of medical discipline-specific items.

The study demonstrated strengths when evaluated using Glynn's (2006) EBL Critical Appraisal Checklist: the response rate was high; participants represented students from all years of a medical school curriculum; the instrument was included in the publication; and suggestions were provided for further application of the ILSES-M scale. Results of the factor analysis were meaningfully presented, including comparisons of scale factor loadings with those of previous studies.

There were also several areas for study improvement. First, further information on questionnaire administration and the development of the ten medical-specific scale items would have benefited practitioners interested in undertaking similar efforts. Additionally, the use of acronyms (e.g. PICO, MeSH) and potentially vague definitions (e.g. "Use a factual database," "Evaluate bias") in some scale items may have impacted response accuracy. Review of scale items by content experts and members of the target population

could have tested content validity and highlighted any needed improvements. Overall, the study methodology focused heavily on factor analysis and scale reliability. Boateng, Neilands, Frongillo, Melgar-Quinonez, and Young (2018) suggested scale creation additionally requires item validation and pre-testing, as well as tests for item reduction analysis, dimensionality, and validity after initial responses are gathered. Although the reported methodology for subscale creation was robust, applying additional steps would have ensured a thoroughly validated ILSES-M scale.

The use of the ILSES-M in a longitudinal study may provide further insights into its validity and applicability (De Meulemeester, Peleman, & Buysse, 2018). Ultimately, the newly created ILSES-M scale contributes meaningfully to IL self-efficacy measurement efforts through the creation of a discipline-specific tool tested in a large population. Its potential applicability in other medical settings should be considered and may afford opportunities to further validate the scale.

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