

## Development and Testing of Health Literacy Scales for Chinese Primary and Secondary School Students

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**Abstract :** Background: Children and adolescent health are crucial for both personal well-being and the nation's future health landscape. Health Literacy (HL) is important to enabling adolescents to self-manage their health, a fundamental step towards health empowerment. However, there are limited tools for assessing HL among elementary and junior high school students. This study aims to construct and validate a test-based HL scale for Chinese students, offering a scientific reference for cross-cultural HL tool development. Methods: We conducted a cross-sectional online survey. Participants were recruited from a stratified cluster random sampling method, a total of 4189 Chinese in-school primary and secondary students. The development of the scale was completed by defining the concept of HL, establishing the item indicator system, screening items (7 health content dimensions), and evaluating reliability and validity. The Rasch model was conducted for quality analysis, and Cronbach's alpha coefficient was used to examine the internal consistency. Results: We developed four versions of the HL scale, each with a total score of 100, encompassing seven key health areas: hygiene, nutrition, physical activity, mental health, disease prevention, safety awareness, and digital health literacy. Each version measures four dimensions of health competencies: knowledge, skills, motivation, and behavior. The knowledge and skills dimensions are judgment-based and multiple-choice questions, with the Rasch model confirming unidimensionality at a 5.7% residual variance. The behavioral and motivational dimensions, measured with scale-type items, demonstrated internal consistency via Cronbach's alpha and strong inter-item correlation with KMO values of 0.924 and 0.787, respectively. Bartlett's test of sphericity, with p-values <0.001, further substantiates the scale's reliability. Conclusions: The new test-based scale, designed to evaluate competencies within a multifaceted framework, aligns with current international adolescent literacy theories and China's health education policies, focusing not only on knowledge acquisition but also on the application of health-related thinking and behaviors. The scale can be used as a comprehensive tool for HL evaluation and a reference for other countries.

**Keywords :** Adolescent Health, Health Literacy, scale, Chinese Populations

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