Development of the Health Education Impact Questionnaire - Korean version (heiQ-K)

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Abstract. The aim of this study was to test the reliability and validity of the Korean version of the health education impact questionnaire (heiQ-K). The participants consisted of 424 University students in Korea. The heiQ-K was developed through forward and backward translation, revision base on teleconference and cognitive interview. Data were analyzed using SPSS 18.0. and AMOS 18.0. Internal consistency was good for 8 scales (Cronbach’s alpha= .65 -.84) and test-retest intra-class correlation coefficients (ICCs) were high for all scales (ICCs=.73-.84). The heiQ-K was validated by confirmatory factor analysis (RMR=.03, GFI=.81). The translated and cultural adapted heiQ-K has good reliability and is valid. The heiQ-K will be able to measure comprehensive evaluation and impact of health education programs in Korea.

Keywords: Reliability, Validity, Health Education, heiQ

1 Introduction

Health education is the foundation and basis for every health policy decision, as well as the most important means of health promotion. Evaluation of health education programs is difficult to express quantitatively, and comparisons between health education programs are challenging due to the variety of such programs and the diverse evaluation methods. Therefore, it is need to develop and research evidence-based health education programs using comprehensive evaluation tools. The Health Education Impact Questionnaires (heiQ) developed in Australia was designed to measure the effects of a health education program and provide valuable information to health and medical professionals, researchers, and policymakers [1]. Currently, the heiQ has been used to evaluate the impact of arthritis self-management, better health self-management, chronic pain management, diabetes health course, stress self-management, tai chi, and obesity programs. The HeiQ have been translated and used in several countries including the U.S., Canada, England, Germany, the Netherlands, and Japan [2]. In this context, the heiQ could also be translated and used in Korea, and the validity and reliability of the heiQ should be evaluated in order to explore possibilities of domestic application in Korea. Therefore, the purpose of the current study was to examine the reliability and validity of a Korean version of the heiQ.
2 Research Methods

2.1 Research design

This is a methodological study that intends to verify the reliability and validity of Korean version heiQ that was developed by Osborne et al. [1].

2.2 Participants

The participants consisted of 424 University students in Korea. Each subject was given an explanation as to the purpose of the study and signed an informed consent document. Subjects were told that they could withdraw from the study at any and that data would not be used for any non-research purposes; confidentiality was assured. Test-retest reliability for the measure was conducted during an interval 2 weeks after the first test administration as recommended by Waltz, Strickland, & Lenz [3], and participants’ anonymity was assured by collecting pre-numbered questionnaires in a collection box.

2.3 Research Instruments

The heiQ was developed by Osborne et al. to assess the impact of a Chronic Disease Self-Management Program on physical, mental, and health-related attitudes and behaviours, as well as evaluate the degree of satisfaction regarding the program in Australia [1]. The heiQ consists of 40 questions categorised into 8 scales: Health directed behaviour (4 items), Positive and active engagement in life (5 items), Emotional wellbeing (6 items), Self-monitoring and insight (7 items), Constructive attitudes and approaches (5 items), Skill and technique acquisition (5 items), Social integration and support (5 items), and Health services navigation (5 items).

2.4 Translation procedure

On receiving approval from the developer of the heiQ, it was translated into Korean in accordance with the translation procedure set by Hawkins and Osborne [4]. The English version was forward translated (FT) into Korean, and each item was modified, one-by-one during a face-to-face conference and reviewed with two nursing professors as independent checkers (ICs). The Korean version of the heiQ was back translated (BT) into English by a healthcare professional, who was a native English speaker and fluent in Korean. Afterwards, each item of the back translated English version and the original heiQ English version were compared to see if the Korean version reflected the original version through discussions and tele-conferencing between the FT, BT and the developer of the original version. The term ‘health
problem’ on the questionnaire was changed to ‘health status’ in order to include both patient populations and healthy individuals.

2.5 Data analysis

Data were analysed using SPSS/WIN 18.0 and AMOS 18.0 statistical programs. General characteristics of subjects were calculated by frequencies and percentages. Reliability of the heiQ-K was analysed via Cronbach’s α for internal consistency analysis and Intraclass correlation coefficients (ICCs) to assess test-retest reliability. A confirmatory Factor Analysis (CFA) was conducted to analyse the validity of the heiQ-K.

3 Results & Discussion

3.1 Reliability of the heiQ-K

The Cronbach's α value for the entire questionnaire was .85 with an ICC of .80. Cronbach's α values for the 8 subscales - Health directed behaviour, Positive and active engagement in life, Emotional wellbeing, Self-monitoring and insight, Constructive attitudes and approaches, Skill and technique acquisition, Social integration and support, and Health services - were 83, .77, .84, .70, .65, .75, .77, and .73, respectively, and the ICCs were 83, .87, .84, .81, .73, .75, .83, and .85, respectively (Table 1). These results are similar to the reliability analysis of the original heiQ conducted in Australia (full scale Cronbach's alpha = .86; .70 - .89 for the 8 subscales) [1], as well as an analysis from a Japanese sample (.70 -.88 for the 8 subscales) [5]. ICCs for the current study were .80, which was slightly lower when compared to results from Japan (.83) [5]. Higher ICCs mean higher reliability, and when their values are between .80 - 1.00, it means almost excellent correlation. The ICCs for the current study were adequate.

Table 1. Reliability Test of heiQ-K

<table>
<thead>
<tr>
<th>Items</th>
<th>Item number</th>
<th>Cronbach’s α (n=424)</th>
<th>Intraclass Correlation Coefficients (ICCs) (n=172)</th>
</tr>
</thead>
<tbody>
<tr>
<td>heiQ_d1</td>
<td>4</td>
<td>.83</td>
<td>.83</td>
</tr>
<tr>
<td>heiQ_d2</td>
<td>5</td>
<td>.77</td>
<td>.87</td>
</tr>
<tr>
<td>heiQ_d3</td>
<td>6</td>
<td>.84</td>
<td>.84</td>
</tr>
<tr>
<td>heiQ_d4</td>
<td>6</td>
<td>.70</td>
<td>.81</td>
</tr>
<tr>
<td>heiQ_d5</td>
<td>5</td>
<td>.65</td>
<td>.73</td>
</tr>
<tr>
<td>heiQ_d6</td>
<td>4</td>
<td>.75</td>
<td>.75</td>
</tr>
<tr>
<td>heiQ_d7</td>
<td>5</td>
<td>.77</td>
<td>.83</td>
</tr>
<tr>
<td>heiQ_d8</td>
<td>5</td>
<td>.73</td>
<td>.85</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>.85</strong></td>
<td><strong>.80</strong></td>
</tr>
</tbody>
</table>
heiQ_d1: Health directed behavior; heiQ_d2: Positive and active engagement in life; heiQ_d3: Emotional wellbeing; heiQ_d4: Self monitoring and insight; heiQ_d5: Constructive attitudes and approaches; heiQ_d6: Skill and technique acquisition; heiQ_d7: Social integration and support; heiQ_d8: Health services navigation

3.2 Validity of heiQ-K

The goodness of fit index of the model that included all 40 items was $Q(\chi^2/$df) = 2.55, RMR = .03, GFI = .81, AGFI = .80, CFI = .82, and TLI = .80. Comparing this result with an analysis of 38 items (eliminating the two items with low factor loadings) produced the following values: $Q(\chi^2/$df) = 2.52, RMR = .03, GFI = .83, AGFI = .80, CFI = .83, and TLI = .81 (Table 2). The difference in values compared to the goodness of fit index of the entire 40 items was very slight, and excluding these two items did not seem to enhance the adequacy of the entire model. Therefore, it is more appropriate to include all 40 items as our final model. One advantage of using the full-scale model is that international comparisons between countries become possible. The heiQ-K will be able to use as an evaluation tool of health education impact in Korea. Additionally, follow-up studies should be conducted with respect to health education evaluation using the heiQ-K; this could be the basis for the development and activation of evidence-based health promotion/education programs, while enabling inter-country comparisons of program efficacy.

Table 2. Model Fit Indices for heiQ-K from Confirmatory Factor Analyses

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$ (p)</th>
<th>df</th>
<th>$Q$</th>
<th>RMR</th>
<th>GFI</th>
<th>AGFI</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>(40 items)</td>
<td>1818.95</td>
<td>712</td>
<td>2.55</td>
<td>.03</td>
<td>.81</td>
<td>.80</td>
<td>.82</td>
<td>.80</td>
</tr>
<tr>
<td>Modification</td>
<td>1608.39</td>
<td>637</td>
<td>2.52</td>
<td>.03</td>
<td>.83</td>
<td>.80</td>
<td>.83</td>
<td>.81</td>
</tr>
</tbody>
</table>

Q: $\chi^2$/df; RMR: Root Mean Squared Residual; GFI: Goodness Fit Index; AGFI: Adjusted Goodness Fit Index; CFI: Comparative Fit Index; TLI: Tucker-Lewis Index.

4 Conclusion

This study was conducted to verify the application of the heiQ with a Korean sample. As a result of testing the heiQ-K for reliability and validity, Cronbach’s α and ICC values showed high reliability and satisfactory construct validity. These results suggest that the heiQ-K is appropriate for use as a health education evaluation tool in Korea. Considering that the present subjects were general University students, this study suggests that additional verification of the reliability and validity of the heiQ-K is performed targeting chronic patients. Furthermore, studies involving its practical application are also required.
References