

VALIDATION AND ANALYSIS OF THE KID-KINDL QUESTIONNAIRE IN MALAYSIAN PRIMARY SCHOOL CHILDREN

Gisely Vionalita^{1*}, Zalina Ismail²

¹Department of Public Health, Faculty of Health sciences, Universitas Esa Unggul, Jakarta Barat, Indonesia

²BRAINetwork Centre for Neurocognitive Science, School of Health Sciences, Universiti Sains Malaysia, Penang, Malaysia

ABSTRAK

Article History:

Submitted: 15/02/2022

Accepted: 23/02/2022

Published: 10/03/2022

Keywords:

Questionnaire,
Quality of Life,
Research Instrument

Abstract:

Health-related quality of life (HRQoL), conceptualized as the patient's evaluations of their health status, is an essential indicator in evaluating health and health care and treating individual patients. The KID-KINDL questionnaire includes four main components: psychological well-being, social relationships, physical functions, and daily activities. This study aims to validate the KID-KINDL questionnaire in the Malay language and measure the HRQOL of Year One students from the children's perspective. Forward and the Language Centre Universiti Sains Malaysia supervised the backward translation of the KID-KINDL questionnaire. The questionnaire's validation and reliability were assessed with Winstep™ software, using Rasch model statistics. KID-KINDL was applied to 90 Year One students in SK Zainab 2, Kota Bharu, Kelantan. Minor changes were made to the questionnaire after being translated. From the misfit item of those questions, the range to infit and outfit is beyond the acceptable scope for the Likert scale (0.6-1.4), and four questions were deleted in the validated version. Following validation, analysis with Rasch model statistics was carried out. This questionnaire will be used for further in-depth studies on children's health-related quality of life.

Abstrak:

Kualitas hidup terkait kesehatan (HRQoL), dikonseptualisasikan sebagai evaluasi pasien sendiri tentang status kesehatan mereka, merupakan indikator penting dalam mengevaluasi kesehatan dan perawatan kesehatan dan dalam pengobatan pasien individu. Kuesioner KID-KINDL mencakup empat komponen utama seperti kesejahteraan psikologis, hubungan sosial, fungsi fisik dan aktivitas sehari-hari. Tujuan dari penelitian ini adalah untuk memvalidasi kuesioner KID-KINDL dalam bahasa Melayu dan mengukur HRQOL siswa Kelas Satu dari perspektif anak-anak. Terjemahan maju dan mundur dari kuesioner KID-KINDL diawasi oleh Pusat Bahasa Universiti Sains Malaysia. Validasi dan reliabilitas kuesioner dinilai dengan perangkat lunak Winstep™, menggunakan statistik model Rasch. KID-KINDL diterapkan pada 90 siswa Kelas Satu di SK Zainab 2, Kota Bharu, Kelantan. Perubahan kecil dilakukan pada kuesioner, setelah diterjemahkan. Dari item tersebut, ketidaksesuaian yang dapat diterima untuk skala Likert (0,6-1,4) dan empat pertanyaan dihapus dalam versi yang divalidasi. Kuesioner ini akan digunakan untuk studi mendalam lebih lanjut tentang kualitas hidup terkait kesehatan pada anak-anak.



Correspondence Author:

Gisely Vionalita
Department of Public Health,
Universitas Esa Unggul,
Jakarta Barat, Indonesia
Email: gisely@esaunggul.ac.id

How to Cite:

G. Vionalita & Z. Ismail, "Validation and Analysis of The Kid-Kindl Questionnaire in Malaysian Primary School Children", Indonesia. J. Heal. Sci., vol. 6, no. 1, pp. 56-60, 2022.

INTRODUCTION

Health-related quality of life (HRQoL), conceptualized as the patient's evaluations of their health status, is an essential indicator in evaluating health and health care and treating individual patients. Health-related quality of life (HRQoL), which describes the impact of illnesses on the physical, mental and social aspects of patients' lives, provides a more comprehensive measure of health outcomes in children [1]. There have been very few studies regarding primary school children's quality of life information. However, there has been a tremendous improvement of quality-of-life instruments, particularly in adults.

The KINDL questionnaire is available with self-report and parental-proxy forms for each of the three age groups: Kiddy-KINDL is usually used for kindergarten students, Kid-Traditionally usually is used for primary school children Kiddo-KINDL for secondary school. In this study, Kid-KINDL was used to obtain the health-related quality of life from the child's perspective. It comprises twenty-four items yielding six dimensions (physical health (PH), general health (GH), family functioning (FAM), self-esteem (PER), social functioning (FREN), and school functioning (SCH)) and a total score [2]. Reverse scoring is applied to some items, and the total score is transformed to a scale of 0-100 such that a higher score represents better HRQoL [2].

The KINDL questionnaire is currently the best questionnaire that can be used to measure the quality of life because it is a measurement that has generic core scales and a variety of disease-specific modules. The questionnaire is short, has been translated into different languages, and has been broadly used across different cultures [3].

Validity is generally defined as the extent to which the measurement measures what it should measure. In contrast, reliability is usually defined as consistency or

reproducibility of height over time or occasions [4]. Rasch analysis provides two sets of general guidelines to help the researcher determine the validity of a group of measures. First, the researcher must assess whether all items work together to measure a single variable. Each person's response pattern must be examined evaluated to determine whether the person was responding in an acceptably predictable way given the expected hierarchy of responses [5].

This study aimed to translate and validate the KINDL Health-related quality of life questionnaire into Malay using misfit items from Rasch analysis.

RESEARCH METHOD

Study design and subjects

The process of translation, pre-test, and validation of this project was using informed consent obtained from the participants after the nature of the procedure was fully explained. Ethical clearance [USM/KK/PPP/JEP/EM 225.3(01)] was obtained from the Human Ethics Committee of Universiti Sains Malaysia, Health Campus, Kelantan, to conduct this research. A sample of this study is from first-year Primary School (SK Zainab) Kota Bharu, Kelantan. This cluster school has 81 first-year students who returned the questionnaire, all-female and Malay.

The translation process of the Questionnaire

KINDL has twenty-four items yielding six dimensions {physical health (PH), general health (GH), family functioning (FAM), self-esteem (PER), social functioning (FREN), and school functioning (SCH)} and a total score (Appendix). The previous study has demonstrated high validity and reliability for instruments.

The translation process was done forwarding and backward to English by professionals who relate to this field and nonprofessional and experts in the

language. The language center, USM Kubang Kerian, was involved in this case. This method was done to ensure the translated version would be correct in terms of grammatical. However, this method has to preserve the meanings and contents of the original one. After the forward and back translations, sentence revision was done by all experts involved in the translation in meetings. Good translations were reflected production of English back translations almost similar to the original English version. We produced a harmonized version of KINDL in the Malay language at the end of this process.

Validation study

After translation, the questionnaire needed to be validated using Rasch model statistics with Winstep Software. Data were entered into a computer spreadsheet and checked for missing responses. There are no missing responses in this data. Data was converted from SPSS to a DAT file so that further analysis could proceed using the Winstep process. This questionnaire uses the Likert scale, which means the range of infit and outfit is 0.6-1.4 (Bond Fox, 2001) (Table 1).

Table 1.
Some Reasonable Item Mean Square
Ranges for Infit and Outfit

Type of Test	Range
Multiple-choice test (high stakes)	0.8-1.2
Multiple choice test (Run of the mill)	0.7-1.3
Rating scale (Likert/survey)	0.6-1.4
Clinical observation	0.5-1.7
Judged (where agreement is encouraged)	0.4-1.2

The new version of the questionnaire was validated and reliable with WinstepTM software, using Rasch model statistics. KINDL were applied to 90 parents and students of Year One in SK (Sekolah

kebangsaan) Zainab 2, Kota Bharu, Kelantan. Total 81 parents and students answered and returned the questionnaire. This is probably a limitation of this study since using all female respondents. Thus, it could be using a pilot study to develop the Malay language questionnaire.

A good measurement process in human sciences will allow for estimating one ability at one time. Each item should be contributed in a meaningful way to the construct/concept and is still being investigated. The Rasch model focuses on the key developmental ideas of construct validity. Construct validity focuses on reflecting a single underlying construct as made explicit about representing it in items or observations—Rasch analysis statistics designed to aid in making interrelated decisions about the data [5]. Rasch analysis provides indicators of how well each item fits within the underlying construct.

To build a measurement tool that will be empirically useful enough in practice to make a meaningful assessment of children's development of that ability will require the writing and testing of items in the knowledge that during scale development, some items may be rejected due to lack of empirically tested reliability and validity. The validation of this questionnaire was using the Rasch model statistic. Rasch model will provide the criterion for successful measurement. Fit statistics help determine whether item estimation may be held as meaningful quantitative summaries of the observation. From graphic item misfit, the researcher can obtain information about how the perspective of each respondent regarding answering each of question. The Rasch model will check the infit and outfit each item through misfit items in both questionnaires. Due to this questionnaire using the Likert scale, so infit and the outfit should be in the acceptable range (0.6-1.4). That item with infit and business beyond that range needs to be excluded from this study.

RESULTS AND ANALYSIS

RESULT

KINDL Questionnaire for student's perspective

This questionnaire uses the Likert scale. Thus, the range of infit and outfit is 0.6-1.4. Some questions must be deleted from the misfit table, infit, and business questionnaire. The validity and reliability process uses Winstep and consists of deleting questions where the range is beyond that which is acceptable for this type of test. From the misfit table, infit and outfit this questionnaire, some questions have to be deleted (Figure 1).

ENTRY	RAW			MODEL	INFIT	OUTFIT	PTMEA			
NUMBER	SCORE	COUNT	MEASURE	S.E.	MNSQ	ESTD	MNSQ	ESTD	CORR.	ITEM
20	284	81	.07	.09	1.47	3.32	1.19	6.21	.16	FR4
24	269	80	.17	.09	1.51	3.61	.68	4.11	.14	SC4
23	202	81	.70	.09	1.53	3.51	.57	3.41	.19	SC3
12	253	81	.31	.09	1.24	1.91	.43	2.91	.34	SE4
18	255	81	.29	.09	1.33	2.61	.38	2.62	.25	FR2
16	291	81	.02	.09	1.32	2.31	.29	1.81	.31	FAM4
4	308	81	-.13	.09	1.07	.51	.31	1.71	.35	PW4
21	322	81	-.26	.10	.92	-.51	.30	1.61	.35	SC2
10	211	81	.63	.09	1.25	1.81	.26	1.81	.33	SE2
8	286	81	.06	.09	1.09	.71	.07	.51	.40	EW4
14	300	81	-.06	.09	1.08	.61	.03	.31	.46	FAM2
15	308	81	-.13	.09	1.01	.11	.98	.01	.44	FAM3
6	294	81	-.01	.09	.90	-.71	.98	-.11	.42	EW2
11	299	81	-.05	.09	.89	-.81	.90	-.61	.50	SE3
9	271	81	.17	.09	.90	-.81	.86	-.10	.59	SE1
3	320	81	-.24	.10	.87	-.91	.89	-.61	.39	PW3
7	325	81	-.29	.10	.86	-.91	.83	-.91	.45	EW3
19	321	81	-.25	.10	.82	-.12	.78	-.12	.53	FR3
17	309	81	-.14	.09	.78	-.17	.81	-.12	.48	FR1
5	284	81	.07	.09	.74	-.21	.51	-.11	.54	EW1
22	350	81	-.58	.12	.70	-.11	.71	-.21	.60	SC2
2	298	81	-.04	.09	.62	-.31	.66	-.21	.33	PW2
13	331	81	-.35	.10	.62	-.21	.61	-.21	.54	FAM1
1	291	81	.02	.09	.57	-.31	.58	-.31	.42	PW1
MEAN	290.9	81.0	.00	.09	1.00	.01	.07	.41		
S.D.	34.2	.2	.28	.01	.28	2.1	.39	2.3		

Figure 1. Item Misfit KINDL Questionnaire

The red number indicates that the range of those questions is beyond 0.6-1.4. So thus, four questions have to eliminate, and those are questions with code FR4, SC4, SC3, PW1. After the deletion of the four questions, the questionnaire and all the sub-factors are now considered valid and reliable.

DISCUSSION

Despite the selection of the subjects, this study had limitations in the aspect of the study population. Its study population did not reflect the actual Malaysian population. This study only represents one cluster primary school. The success of this study is highly dependent upon the availability of reliable and valid measures of the quality of life outcomes. These

measures need to be conceptually consistent with a wide range of perspectives from students and parents. This study was conducted to translate and validate this KINDL questionnaire using a misfit items.

Rasch suggested using chi-square fit statistics to determine how well any set of empirical data met the model's requirement. Rasch analysis usually reports fit statistics as two chi square: infit and outfit mean square statistics [6]. Infit is an information in a Rasch observation is its variance, the standard deviations (SD) of that estimate square (SD^2), which is larger for well targeted observations and smaller for extreme observations. Outfit is based on the conventional sum of squared standardized residuals, so for person n , each standardized residual cell is squared and the string of those square residuals, one of each and every item encountered by person n , is summed and its average found by dividing the number of items to person responded, hence 'mean-square'[6].

The reasonable item mean square range for infit and outfit in the Likert scale questionnaire is between 0.6 and 1.4 [7]. Those questions beyond the reasonable range need to be deleted. From misfit item in Rasch model of this questionnaire, there are some questions that need to be deleted. Because of those questions have infit and outfit beyond the reasonable range. An item that does not fit the unidimensional construct is those that diverge unacceptably from the expected ability pattern. Fit item help determines whether each item contributes to the measurement of only one construct.

A process of confirmation is made whether the assumption of unidimensionality holds up empirically [8]. Therefore, the decision to drop those questions was made. The analysis is also helpful in describing the students' quality of life measurements. This method using Rasch can validate the questionnaire used in other populations that use the Malay Language.

CONCLUSION

In conclusion, the KINDL questionnaire is a valid and reliable instrument that can be generalized to a broader population to obtain primary school students' health-related quality of life.

ACKNOWLEDGMENTS

This study was supported by BRAINetwork Centre for neurocognitive science School of Health USM. The authors would like to express their deepest gratitude to the parents and students who participated in this study and the staff at primary schools in SK Zainab 2 Kota Bharu Kelantan.

REFERENCES

- [1] M. Avramovic and V. Stefanovic, "Health-related quality of life in different stages of renal failure," *Artificial organs*, vol. 36, no. 7, pp. 581–589, 2012.
- [2] A. D. Warner-Czyz, B. Loy, E. A. Tobey, P. Nakonezny, and P. S. Roland, "Health-related quality of life in children and adolescents who use cochlear implants," *Int. J. Pediatr. Otorhinolaryngol.*, vol. 75, no. 1, pp. 95–105, 2011.
- [3] U. Ravens-Sieberger, A. Karow, D. Barthel, and F. Klasen, "How to assess quality of life in child and adolescent psychiatry," *Dialogues Clin. Neurosci.*, vol. 16, no. 2, p. 147, 2014.
- [4] H. K. Mojahan, "Two criteria for good measurements in research: Validity and reliability," *Ann. Spiru Haret Univ. Econ. Ser.*, vol. 17, no. 4, pp. 59–82, 2017.
- [5] K. R. Muis, P. H. Winne, and O. V. Edwards, "Modern psychometrics for assessing achievement goal orientation: A Rasch analysis," *Br. J. Educ. Psychol.*, vol. 79, no. 3, pp. 547–576, 2009.
- [6] M. Müller, "Item fit statistics for Rasch analysis: can we trust them?," *J. Stat. Distrib. Appl.*, vol. 7, no. 1, pp. 1–12, 2020.
- [7] T. Y. Wu, C. T. Chen, Y. J. Huang, W. H. Hou, J. D. Wang, and C. L. Hsieh, "Rasch analysis of the 9-item shared decision making questionnaire in women with breast cancer," *Cancer Nurs.*, vol. 42, no. 3, pp. E34–E42, 2019.
- [8] J. Stochl, P. B. Jones, and T. J. Croudace, "Mokken scale analysis of mental health and well-being questionnaire item responses: a non-parametric IRT method in empirical research for applied health researchers," *BMC Med. Res. Methodol.*, vol. 12, no. 1, pp. 1–16, 2012.