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The adaptation process and preliminary psychometric evaluation of the Polish version of Kiddo-KINDL questionnaire

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ABSTRACT: The assessment of health-related quality of life (HRQoL) is increasingly important in fields of public health, medicine, sociology and psychology. The aim of the study was to evaluate the psychometric properties of the Polish version of generic Kiddo-KINDL questionnaire for adolescents. The psychometric evaluation was performed using 96 questionnaires fulfilled by adolescents aged 12–16 years. Cronbach's α coefficient for internal consistency and split-half reliability was estimated as well as ceiling, floor effect and correlations among the subscales and total score. The mean reliability for subscales was 0.65 and the Cronbach's α coefficient for the total score was 0.85. The lowest α coefficient was for the School dimension (0.44) and the highest was achieved for the Self-esteem (0.80). The correlation between two parts of the questionnaire and split-half reliability was 0.66 and 0.80 respectively. The first psychometric evaluation of the Polish Kiddo-KINDL showed promising basic measurement properties, but it needs farther assessment, including convergent, construct and discriminant validity estimation.

KEY WORDS: health-related quality of life, KINDL questionnaire, psychometric evaluation, Polish cultural adaptation, adolescents

Introduction

The World Health Organization (WHO) defines quality of life as "people's perceptions of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns" (WHO 1994). Health is considered as one of the main factors affecting this perception because of its impact on physical, mental and social aspects of human's life. Health-related quality of life (HRQoL) defined as "psychological construct describing the physical, mental, social, psychological and functional aspects of well being and function from the human perspective" (Bullinger 1991;

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Ravens-Sieberer and Bullinger 1991) is increasingly important in fields of public health, medicine, sociology and psychology. HRQoL questionnaires are also valuable methods of assessment the children's perception of everyday life quality (Palermo et al. 2008). HRQoL instruments are useful in global assessment of children and youths' population well-being and health of society as well as in monitoring outcomes of pediatric disease treatment. Since generic questionnaires can be applied in any illness setting and in general population with unknown clinical diagnosis, disease-specific HRQoL questionnaires are addressed to explore, in more detail, quality of life in particular groups of patients (Barnes and Jenney 1999). There are available instruments for measuring HRQoL e.g.: in patients with asthma (Varni et al. 1999), dermatological diseases (Lewi-Jones and Finlay 1995), diabetes (Ingersol and Marrero 1991) and cancer (Varni et al. 1998). The major application of these methods is to estimate the outcomes of therapies and interventions (Patrick 1997) but they cannot be applied to assess the difference in HRQoL between patients and the healthy population (Barnes and Jenney 1999; Wee et al. 2007).

Although many HRQoL instruments have been developed, very few were culturally adopted and validated for use in Poland. The lack of Polish language versions of HRQoL questionnaires addressed to children and adolescents, with good psychometric characteristics is even more distinct. Since there is a growing number of studies on health-related quality of life in Polish children (e.g., Dyga-Konarska and Bieganowska 2004; Bączyk 2008; Magiera et al. 2017; Mathiak et al. 2007; Ravens-Sieberer et al. 2007; Kaczmarek and Trambacz 2016; Brzycki et al. 2019), it is very important to increase availability of Polish versions of questionnaires suitable for measuring children's and youths' HRQoL in general population and patients as well.

The KINDL generic questionnaires originally developed in Germany was created to assess health-related quality of life in children and adolescents (age: 4–16 years; Ravens-Sieberer and Bullinger 2000; Ravens-Sieberer 2003). The questionnaires are available with self-report and parental-proxy forms for three age groups: 4–7 years (Kiddy-KINDL), 8–12 years (Kid-KINDL) and 13–16 years (Kiddo-KINDL) (Ravens-Sieberer and Bullinger 2000). The KINDL has been developed on the basis of two approaches mixture: top-down and bottom-up. In the first approach, QoL dimensions relevant to adults were tested if they are reflected in children's and adolescent's experiences. In the second approach children were asked in open questions about their own experiences and point of view on relevant dimensions of quality of life (Ravens-Sieberer and Bullinger 2000).

The KINDL has sufficient psychometric evaluation. For the German version, the α coefficient for the total score was 0.84 and for the six subscales between 0.63 and 0.76. The subscales from two popular HRQoL questionnaires, the Short Form Health Survey (SF-36) and Child Health Questionnaire (CHQ), were used to establish convergent validity. Discriminant validity was established between healthy population and children with asthma, atopic dermatitis and obesity (Ravens-Sieberer and Bullinger 2000). The KINDL is available in 30 language versions (including our translation into Polish). The psychometric evaluation of a few of them are known, e.g.: the α coefficient for the total score

and for six domains is 0.82 and 0.53 – 0.78 for Norwegian version (Helseth and Lundt 2005), 0.81 and -0.31–0.84 for Taiwanese version (Lee et al. 2008), 0.83 and 0.44–0.84 for Singapore English Kiddo-KINDL version (Wee et al. 2007), 0.78 and 0.54–0.69 for Turkish version (Eser et al. 2008), 0.80 and 0.42–0.72 for Serbian version (Stevanovic et al. 2009). High reliability of the most of subscales and the total score of different language versions suggest universality of the questionnaire. The lowest but still acceptable α coefficient was found for School dimension (e.g.: Singapore-English version: 0.44, Turkish version: 0.54) (Wee et al. 2007; Eser et al. 2008). Only the evaluation of Spanish and Taiwanese versions showed insufficient School subscale reliability (Fernandez-Lopez et al. 2004; Lee et al. 2008). Nevertheless, these findings may suggest differences in meaning of the School subscale items between cultures. There are other studies that showed cross-cultural differences in the KINDL items' meaning perception (compare: study on Iranian and Serbian children and adolescents; Jafari et al. 2016).

Such advantages of KINDL as appropriate theoretical frame, availability of self-report and parental-proxy form for different age groups, high reliability of the total score and the most of subscales as well as simplicity and low items number, make the questionnaire optimal for measuring health-related quality of life in children and adolescents. This paper describes a procedure of KINDL questionnaires' translation into Polish and the cultural adaptation process. The preliminary psychometric evaluation of one of the KINDL questionnaires family, Kiddo KINDL, regarding internal consistency, distribution of the test-scores and inter-scale correlation is also presented.

Material and method

Participants

The study was approved by the ethics committee of Poznan University of Medical Sciences (number of decision: 855/05). The target population of the study was students of grammar and secondary schools located in Poznan, aged 12 – 16 years. Only students whose parents gave written consent participated in the research. Children consent was also required. The number of 150 individuals was asked for participation in the study. The response rate was 103 (68.8%). The final sample (only completely fulfilled questionnaires was taken into consideration) was 96 students (50 girls and 46 boys). Average age in the sample was 13.61 (0.84) years.

The KINDL questionnaire

Authors of the original KIDNL gave permission for translation into Polish and adaptation procedure of all KINDL versions. The Kiddo-KINDL consists of 6 dimensions (subscales) of quality of life: Physical Well-being, Emotional Well-being, Self-esteem, Family, Friends and School. Each of them contains 4 items. All items (24) can be transformed into the total score representing general HRQoL. The questionnaire includes both positive and negative wording. The items are five-pointed Likert scales in which the lowest score is 1 (never) and the highest score is 5 (always). Negatively worded items are scored reversely. The scores are summarizing for each subscale and entire questionnaire. The transformation to a 0 – 100 scale is the next step. Higher values of subscales and the total score mean more positive quality of life perception.

Translation and cultural adaptation procedures

The translation and cultural adaptation procedures were conducted at the Institute of Anthropology, University of Adam Mickiewicz, Poznań, in line with developers' guidelines. Two independent forward translations from English into Polish language were carried out by Polish native speakers fluent in English. The single developmental forward version was prepared during reconciliation meeting. The back-translation of the reconciled forward version was conducted by German native speaker fluent in Polish. The back-translation was discussed with the developers of the original German version. In the next step, the group of 30 children, 10 (5 boys and 5 girls) in each age category (4–7 years, 8–12 years, 13–16 years) agreed to discuss the items of self-report questionnaires with expert. The children from the youngest age group were interviewed in presence of parents. Children from older age groups were asked to fulfill an age adequate questionnaire version and to tell investigators if they found any difficulties in understanding the items. The separate 45-min. focus group meeting was arranged for each age category. In case of the Kiddo-KINDL version, which was an object of further psychometric evaluation described in this paper, children suggested that phrases 'was tired'

Table 1. The items of the Kiddo-KINDL

Subscale	Items
Physical Well-being	1. I felt ill
	2. I was in pain
	3. I was tired and worn out
	4. I felt strong and full of energy
Emotional Well-being	5. I had fun and laughed a lot
	6. I was bored
	7. I felt alone
	8. I felt scared or unsure of myself
Self-esteem	9. I was proud of myself
	10. I felt on top of the world
	11. I felt pleased with myself
	12. I had lots of good ideas
Family	13. I got on well with my parents
	14. I felt fine at home
	15. We quarreled at home
	16. I felt restricted by my parents (or primary caretaker)
Friends	17. I did things together with my friends
	18. I was a 'success' with my friends
	19. I got along well with my friends
	20. I felt different from the others
School	21. Doing my schoolwork was easy
	22. I felt lessons were interesting
	23. I worried about my future
	24. I worried about getting bad marks

and 'worn out' in the item 3 have similar meaning, therefore one of them is not necessary. Children have also difficulties in understanding the phrase 'unsure of myself' in the item 8. They had doubts if the phrase is related to feelings, as anxiety, or thoughts about themselves, e.g.: about their competency or safety. Items 9 and 11 were very close in meaning for participant of the focus group. Children suggested that if someone is proud of himself, is also pleased with himself, in that reason these items may often give the same scores. There are also other studies that showed the subscales possess unimportant items and suggesting revision for the KINDL (Stevanovic 2009). Nevertheless, because the questionnaire should give possibility to compare results between different countries, we decided to leave problematic items without changes (Table 1).

Statistical methods

The internal consistency of the Kiddo-KINDL questionnaire and its subscales was evaluated using Cronbach's α coefficient. Split-half reliability and the correlation between two parts of the questionnaire were also examined. The lowest and the highest score, subscales and the total score mean value was assessed. Ceiling and floor effects were estimated for the total score and each of dimensions. Correlations between subscales and the total score were assessed using Spearman's method. All statistical analysis were performed using the Statistica 8.0 software.

Results

The internal consistency was the lowest for School dimension (0.44) and the highest for Self-esteem (0.80; Table 2). The mean reliability of subscales was 0.65 and the Cronbach's α coefficient for the total score was 0.85. The correlation between two parts of the questionnaire was 0.66 and split-half reliability was 0.80.

Mean value of the total score was 64.22 (13.09) (Table 2). The lowest mean was obtained for School domain, 46.25 (18.74) and the highest for Family domain (75.57, SD=20.79). Floor and ceiling effects was below 10%. The values above 5% was estimated for ceiling effect in Family and Friends domain.

Correlation between the subscales varied from 0.07 (School and Friends) to 0.62 (Emotional Well-being and Physical Well-being) (Table 3). The lowest correlation with the total score was found for Friends domain (0.54). The highest correlation with the total score was revealed for Emotional well-being domain (0.74).

Table 2. Internal consistency and descriptive statistics of Polish version of Kiddo-KINDL

Subscale	Mean	SD	95% CI	Cronbach's α	% floor effects	% ceiling effects
Physical well-being	58.68	20.66	54.45; 62.87	0.78	1.04	1.04
Emotional well-being	73.08	19.59	69.12; 77.05	0.69	2.08	3.12
Self-esteem	58.01	21.32	53.69; 62.33	0.80	2.08	3.12
Family	75.57	20.79	71.35; 79.78	0.78	0	9.37
Friends	73.76	17.12	70.29; 77.23	0.54	0	6.25
School	46.25	18.74	42.45; 50.04	0.44	2.08	0
Total	64.22	13.09	61.57; 68.88	0.85	0	0

Table 3. Spearman's coefficients for subscales' correlation

	Emotional well-being	Self-esteem	Family	Friends	School	Total[a]
Physical well-being	0.62*	0.27*	0.21*	0.07	0.38*	0.66*
Emotional well-being		0.40*	0.24*	0.28*	0.36*	0.74*
Self-esteem			0.18	0.49*	0.29*	0.66*
Family				0.26*	0.40*	0.57*
Friends					0.15	0.54*
School						0.67*

Note: Statistically significant at *$p<0.05$; [a] – the correlation between subscales and the total score had not been corrected for overlap.

Discussion

Only two subscales of Polish Kid-do-KINDL have the Cronbach's α coefficient bellow 0.65: School (α=0.44) and Friends (α=0.54). Mean value for subscales' reliability was 0.67. The total score reliability (α=0.85) was comparable to other language and cultural versions: Norwegian (α=0.82), Taiwanese (α=0.81), Singapore (α=0.83), Turkish (α=0.78), Serbian (α=0.80) and to the original questionnaire (α=0.84) (Ravens-Sieberer and Bullinger 2000; Helseth and Lundt 2005; Wee et al. 2007; Lee et al. 2008; Eser et al. 2008, Stevanovic et al. 2009). The split-half reliability was also assessed for Polish version of the questionnaire. The lowest mean was found for School domain and the highest for Family domain. Floor and ceiling effects were satisfying and fitted below the level of 10%. The values above 5% was estimated only for ceiling effect in Family and Friends domain.

As in previous studies (Fernandez-Lopez et al. 2004; Wee et al. 2007; Lee et al. 2008; Eser et al. 2008), psychometric analysis of the Polish Kid-do-KINDL showed the lowest reliability of School domain (Polish, α=0.44; Singapore, α=0.44; Turkish, α=0.54; Taiwanese, α=-0.31). Lee, Chang and Ravens-Sieberer (2008) decided to not reverse item 24 to improve reliability of School domain in Taiwanese version. The Cronbach's α coefficient increased than from α=-0.31 to α=0.49. After providing this change into the Polish version the reliability decreased to α=-0.14. There was not also any rational basis to provide other changes into positions' construct or scoring method, therefore we decided to leave the all original items without corrections (Ravens-Sieberer and Bullinger 2000).

The stronger correlation with the total score was find for Emotional Well-being subscale. Although all subscales were correlated significantly with the total score, the lack of statistically significant correlation was found for pairs of several domains: Family and Self-esteem, Friends and Physical Well-being, Friends and School. This outcome suggests that some of the quality of life (QoL) dimensions could be partly independent and are not always related to the others, since HRQoL is the construct composed of different aspects of well-being in the human perspective: physical, mental, social, psychological and functional (Bullinger 1991; Ravens-Sieberer and Bullinger 2000).

The paper has a few limitations. The sample size was restricted to 96 students (the response rate was relatively

low). Although it was sufficient for research aim, the number of participants was small and not random therefore if one's want to generalize the results on the population a caution is recommended. Since the study had preliminary character, we have focused on the most basic measurements. Thus the factorial analysis, convergent and discriminant validity, repeatability and other useful psychometric characteristics were not estimated in this study.

Conclusions

The evaluation of the Polish version of Kiddo-KINDL questionnaire revealed sufficient psychometric properties of the total score as well as subscales. Suitable translation and adaptation procedure resulted in high reliability of the instrument. Nevertheless the questionnaire needs farther detailed psychometric evaluation in large sample of Polish adolescents. The examination of utility of Polish versions of other questionnaires from KINDL family are also warranted.

Authors' contributions

TH collected the data, conducted statistical analysis, wrote the manuscript and prepared its final form. UR-S developed the original KINDL questionnaire, consulted translation into Polish process and cultural adaptation of the KINDL questionnaires' family, made significant corrections of the manuscript and approved its final form.

Conflict of interest

The authors declare that there is no conflict of interests regarding publication of this paper.

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References

Barnes PM, Jenney ME. 1999. Measuring quality of life. Current Pediatrics 12:476–80.

Bączyk G. 2008. Przegląd badań nad jakością życia chorych na reumatoidalne zapalenie stawów [Review of quality of life research in patients with chronic rheumatic arthritis]. Reumatologia 46(6):372–79.

Brzycki P, Chichocka-Jarosz E, Tarczoń I, Jedynak-Wąsowicz U, Tomasik T, Lis G. 2019. Health-related quality of life in children and adolescents after systemic sting reaction. Ann Agric Environ Med 26(1):103–8.

Bullinger M. 1991. Quality of life – definition, conceptualization and implications – a methodologists view. Theor Surg 6:143–49.

Dyga-Konarska M, Bieganowska K. 2004. Jakość życia dzieci i młodzieży ze stymulatorem serca w ocenie rodziców pacjentów [Parents' esteemation of quality of life in children and adolescents with heart stimulator]. Cardiol J 11(1):47–51.

Eser E, Yüksel H, Baydur H, Erhart M, Saatli G, Cengiz özyurt C, et al. 2008. The Psychometric Properties of the New Turkish Generic Health-Related Quality of Life Questionnaire for Children (Kid-KINDL). Türk Psikiyatri Derg 19(4):1–9.

Fernandez-Lopez J, Fernandez Fidalgo M, Cieza A, Ravens-Sieberer U. 2004. Measuring health-related quality of life in children and adolescents: Preliminary validation and reliability of the Spanish version of the KINDL questionnaire. Aten Primaira, 33(8):434–42.

Helseth, S, Lundt T. 2005. Assessing health-related quality of life in adolescents: Some psychometric properties of the first Norwegian version of KINDL. Scand J Caring Sci 19(2):102–9.

Ingersol GM, Marrero DG. 1991. A modified quality of life measure for youths: psychometric properties. Diabetes Educ 17:114–18.

Jafari P, Stevanovic D, Bagheri Z. 2016. Cross-cultural measurement equivalence of the KINDL questionnaire for quality of life assessment in children and adolescents. Child Psychiatry Hum Dev 47(2):291–304.

Kaczmarek M, Trambacz S. 2016. HRQoL impact of stressful life events in children beginning primary school: results of a prospective study in Poland. Qual Life Res 26(1):95–106.

Lee P-H, Chang L-I, Ravens-Sieberer U. 2008. Psychometric evaluation of the Taiwanese version of the Kiddo-KINDL generic children's health-related quality of life instrument. Qual Life Res 17:603–11.

Lewi-Jones MS, Finlay AY. 1995. The Children's Dermatology Life Quality Index (CDLQI): initial validation and practical use. Br J Dermatol 132:942–49.

Magiera M, Sowa A, Jacek R, Pac A. 2017. The quality of life among middle-school adolescents in Krakow. Dev Period Med 21(2):124–30.

Mathiak KA, Karzel K, Mathiak K, Ostaszewski P, Łuba M, Wolańczyk T. 2007. Kwestionariusz Jakości Życia w Padaczce Dziecięcej – polska adaptacja i walidacja kwestionariusza [Polish adaptation and validation of the Health-Related Quality of Life in Childhood Epilepsy Questionnaire]. Neurol Neurochir Pol 47(3):203–14.

Palermo TM, Long AC, Lewandowski AS, Drotar D, Quittner AL, Walker LS. 2008. Evidence-based assessment of health-related quality of life and functional impairment in pediatric psychology. J Pediatr Psychol 33(9):983–996.

Patrick DL. 1997. Rethinking prevention for people with disabilities, Part I: a conceptual model for promoting health. Am J Health Promot 11:257–60.

Ravens-Sieberer U, Auguier P, Erhart M, Gosch A, Rajmil L, Bruil J, et al. 2007. The KIDSCREEN-27 quality of life measure for children and adolescents: psychometric results from a cross-cultural survey in 13 European countries. Qual Life Res, 16(8):1347–56.

Ravens-Sieberer U, Bullinger M. 1991. Assessing health-related quality of life in chronically ill children with the German KINDL: first psychometric and content analytical results. Qual Life Res 7:399–07.

Ravens-Sieberer U, Bullinger M. 2000. KINDL^{R}. Questionnaire for Measuring Health-Related Quality of Life in Children and Adolescents. Revised Version. Manual. Available at: http://www.kindl.org/fragebogenE.html. [Accessed 16 March 2007].

Ravens-Sieberer U. 2003. Der Kindl-R Fragebogen zur Erfassung der gesundheitsbezogenen Lebensqualität bei Kindern und Jugendlichen – Revidierte Form [The KINDL-R Questionnaire for assessing health-related quality of life in children and adolescents – Revised]. In: J. Schumacher, A. Klaiberg and E. Brähler, editors. Diagnostische Verfahren zu Lebensqualität und Wohlbefinden [Diagnostic tools for Quality of Life and Well-being] Göttingen: Hogrefe Verlag. 184–88.

Stevanovic D. 2009. Serbian KINDL questionnaire for quality of life assessments in healthy children and adolescents: reproducibility and construct validity. Health Qual Life Out 7(1):79.

Stevanovic D, Lakic A, Vilotic J. 2009. The psychometric study of the Serbian KINDL questionnaire for health related quality of life assessment in children and adolescents. Scand J Caring Sci 23(2):361–68.

Varni, JW, Katz ER, Seid M, Quiggins DJ, Friedman-Bender A, Castro CM. 1998. The Pediatric Cancer Quality of Life Inventory (PCQL). Instrument development,

descriptive statistics and cross informant variance. J Behav Med 21:179–204.

Varni JW, Seid M, Rode CA. 1999. The PedsQL: measurement model for the pediatric quality of life inventory. Medical Care 37:126–39.

Wee H-L, Ravens-Sieberer U, Erhart M, Li C. 2007. Factor structure of the Singapore English version of the KINDL children quality of life questionnaire. Health Qual Life Out 5:4.

World Health Organization Quality of life Group. 1994. The development of the World Health organization Quality of Life Assesment Instrument (WHOQOL). In J. Orley and W. Kuyken, editors. Quality of Life Assessment: International Perspectives Berlin: Springer-Verlag. 41–57.