

Fatigue in children: reliability and validity of the Dutch PedsQL™ Multidimensional Fatigue Scale

M. Suzanne Gordijn · Eline M. P. Cremers ·
Gertjan J. L. Kaspers · Reinoud J. B. J. Gemke

Accepted: 17 December 2010 / Published online: 19 January 2011
© The Author(s) 2011. This article is published with open access at Springerlink.com

Abstract

Purpose The aim of the study is to report on the feasibility, reliability, validity, and the norm-references of the Dutch version of the PedsQL™ Multidimensional Fatigue Scale.

Methods The study participants are four hundred and ninety-seven parents of children aged 2–18 years and 366 children aged 5–18 years from various day care facilities, elementary schools, and a high school who completed the Dutch version of the PedsQL™ Multidimensional Fatigue Scale.

Results The number of missing items was minimal. All scales showed satisfactory internal consistency reliability, with Cronbach's coefficient alpha exceeding 0.70. Test-retest reliability was good to excellent (ICCs 0.68–0.84) and inter-observer reliability varied from moderate to excellent (ICCs 0.56–0.93) for total scores. Parent/child concordance for total scores was poor to good (ICCs 0.25–0.68). The PedsQL™ Multidimensional Fatigue Scale was able to distinguish between healthy children and children with an impaired health condition.

Conclusions The Dutch version of the PedsQL™ Multidimensional Fatigue Scale demonstrates an adequate feasibility, reliability, and validity in another sociocultural context. With the obtained norm-references, it can be utilized as a tool in the evaluation of fatigue in healthy and chronically ill children aged 2–18 years.

Keywords Pediatrics · Fatigue · Health-related quality of life · Validation study · PedsQL™

Abbreviations

HRQOL	Health-related quality of life
PedsQL™	Pediatric Quality of Life Inventory™
ICC	Intraclass correlation coefficient
SPSS	Statistical Package for the Social Sciences
SES	Socioeconomic status

Introduction

Fatigue is a common symptom in pediatric health conditions and is associated with poorer HRQOL [1–8]. The Pediatric Quality of Life Inventory (PedsQL™) Multidimensional Fatigue Scale was designed by Varni and colleagues to measure fatigue in children. The original American version demonstrated adequate reliability and validity [1–4, 9]. Recently, this questionnaire has been translated into Dutch in accordance with internationally accepted methods [10].

Substantial cultural differences regarding sleep and fatigue in children have been reported, precluding generalization of instruments before assessment in other sociocultural contexts has been performed [11–16]. Accordingly, our objectives were to obtain a norm-reference and to test the psychometric properties of the Dutch version of the PedsQL™ Multidimensional Fatigue Scale.

We hypothesized that the reliability and validity of the Dutch version is comparable to the original version. In addition, we expected adolescents to be more fatigued than younger children [17].

M. Suzanne Gordijn (✉) · E. M. P. Cremers · R. J. B. J. Gemke
Department of Pediatrics, VU University Medical Center
Amsterdam, PK 4X 033, P.O. Box 7057, 1007 MB Amsterdam,
The Netherlands
e-mail: ms.gordijn@vumc.nl

G. J. L. Kaspers
Department of Pediatric Oncology/Hematology, VU University
Medical Center, P.O. Box 7057, 1007 MB Amsterdam,
The Netherlands

Methods

The PedsQL™ Multidimensional Fatigue Scale was distributed at day care facilities and schools in urban and suburban areas in the Netherlands, between October 2009 and May 2010. The questionnaire was self-administered, but children aged 5–7 years have been assisted by the researcher. One half of the participants were given the option to receive the questionnaire again after 2 weeks to assess test–retest reliability. The other half received two copies of the questionnaire to be completed independently by both parents to test inter-observer reliability.

The 18-item PedsQL™ Multidimensional Fatigue Scale reflects three subscales: general fatigue (GF), sleep/rest fatigue (SRF), and cognitive fatigue (CF). The questionnaire comprises parallel child self-reports for the ages 5–7 years (young child), 8–12 years (child), and 13–18 years (adolescent) and parent proxy-reports, the latter also including 2–4 years of age (toddler). The participants rated how often a particular problem occurred in the past month, using a 5-point Likert scale and for the young child self-report a 3-point scale. Each item is reverse-scored and rescaled to 0–100 scale, so that higher scores indicate fewer symptoms of fatigue.

Feasibility was evaluated from the percentage of missing answers [18]. Range of measurement was based on the percentage of scores at extremes of the scaling range. Scale internal consistency was assessed by calculating Cronbach's coefficient alpha [19]. Test–retest and inter-observer reliability and the parent/child concordance were assessed by intraclass correlation coefficients (ICCs) [20]. ICCs were designated as ≤ 0.40 poor to fair agreement, 0.41–0.60 moderate agreement, 0.61–0.80 good agreement, and 0.81–0.100 excellent agreement [21, 22]. The ability of the questionnaire to distinguish between groups differing in health condition was computed using unpaired *t*-tests. Calculated effect sizes up to 0.20 were considered to be small, about 0.50 moderate and about 0.80 large [23].

The effect of sociodemographic variables was assessed using linear regression analysis. Within-group differences were assessed by analysis of variance with post hoc Bonferroni correction for age and education and *t*-tests for gender, country of birth, and family structure. Data were analyzed using SPSS 15.0.1. A *P* value of <0.05 was accepted as statistically significant.

Results

In total, 1,257 parent reports and 1,000 child reports were distributed, of which 497 and 366 reports were returned, respectively (response rates 40 and 37%). Sociodemographic characteristics of the initial test are presented in

Table 1 Sociodemographic characteristics of sample

	Total sample
Child report	
Age, years: mean (95% CI)	11.4 (11.0–11.8)
Gender, boys (%)	166 (45%)
Impaired health condition (%)	40 (11%)
Medication use (%)	29 (8%)
Ethnicity, Dutch (%)	359 (98%)
Parent report	
Age child, years: mean (95% CI)	9.5 (9.0–9.9)
Gender, male (%)	64 (13%)
Ethnicity, Dutch (%)	466 (94%)
Education, high (%)	203 (42%)
Employment	419 (86%)
Single-parent family (%)	38 (8%)

95% CI 95% confidence interval

Table 1. Most reported chronic health conditions were asthma, allergies, and attention-deficit hyperactivity disorder.

PedsQL™ Multidimensional Fatigue Scale scores are summarized in Table 2. Adolescents had more symptoms of GF than the other age ranges (mean difference = 6.20, $P < 0.001$ for child reports and 5.27, $P < 0.001$ for parent reports). Boys had more symptoms of CF than girls (mean difference = 3.42, $P = 0.0034$ for parent reports). Children of immigrants had more problems with SRF compared to children of parents born in the Netherlands (mean difference = 6.12, $P = 0.017$ for parent reports). Children in a single-parent family had more symptoms of CF (mean difference = 8.29, $P = 0.037$ for parent reports) and lower total fatigue scores (mean difference = 5.93, $P = 0.039$ for parent reports) than children living in a two-parent household. Children of low educated parents had more problems with CF (mean difference = 9.35, $P = 0.03$ for child reports) and lower total fatigue scores (mean difference = 7.17, $P = 0.014$ for child reports) than children of high educated parents.

Missing responses for all items were rare: 0.2% in parent reports and 0.3% in child reports. No floor effects were detected. Ceiling effects ranged from 1.4% in child reports to 5.1% in parent reports. All child report and parent report scales approached or exceeded a Cronbach's alpha of 0.70 (range 0.64–0.93) (Table 3). Forty-three children (12%) and 75 parents (15%) performed the retest. The retest response for the young child was too low for evaluation. Child report and parent report test–retest ICCs had moderate to excellent agreement (range 0.50 to 0.85) (Table 4). At group level, no significant differences emerged between the test- and retest, except for GF which

Table 2 Scale descriptives for PedsQL Multidimensional Fatigue Scale

Scale	Age group (years)														
	Toddler (2–4)			Young child (5–7)			Child (8–12)			Adolescent (13–18)			Total sample		
	N	Mean	CI	N	Mean	CI	N	Mean	CI	N	Mean	CI	N	Mean	CI
Child report															
Total fatigue	NA			68	76.59	73.16–80.03	143	78.70	76.63–80.76	155	75.24	73.34–77.14	366	76.84	75.54–78.14
General fatigue	NA			68	83.46	79.61–87.30	143	82.66	80.53–84.80	155	76.72	74.44–78.99	366	80.29	78.81–81.77
Sleep/rest fatigue	NA			68	74.00	69.47–78.52	143	77.55	75.06–80.03	155	71.88	69.63–74.12	366	74.49	72.88–76.09
Cognitive fatigue	NA			68	72.24	66.99–77.49	143	75.76	72.60–78.92	155	77.15	74.72–79.58	366	75.69	73.83–77.56
Parent report															
Total fatigue	104	82.87	80.77–84.96	83	83.01	80.43–85.49	149	81.25	79.18–83.31	161	79.17	76.99–81.35	497	81.21	80.10–82.32
General fatigue	104	82.80	80.49–85.10	83	84.46	81.76–87.15	149	82.27	80.01–84.53	161	77.71	75.23–80.19	497	81.27	80.01–82.52
Sleep/rest fatigue	104	82.92	80.36–85.49	83	87.77	85.11–90.43	149	85.49	83.35–87.62	161	80.87	78.53–83.22	497	83.84	82.62–85.06
Cognitive fatigue	104	82.77	79.84–85.70	83	76.71	72.96–80.46	149	75.98	72.80–79.15	161	78.93	76.13–81.73	497	78.48	76.90–80.06

CI 95% confidence interval

Table 3 Internal consistency reliability for PedsQL Multidimensional Fatigue Scale

Scale	Age group (years)				
	Toddler (2–4) α	Young child (5–7) α	Child (8–12) α	Adolescent (13–18) α	Total sample α
Child report					
Total fatigue	NA	0.79	0.85	0.86	0.83
General fatigue	NA	0.67	0.71	0.80	0.73
Sleep/rest fatigue	NA	0.66	0.67	0.64	0.64
Cognitive fatigue	NA	0.74	0.86	0.81	0.81
Parent report					
Total fatigue	0.88	0.89	0.91	0.93	0.91
General fatigue	0.78	0.80	0.83	0.86	0.83
Sleep/rest fatigue	0.72	0.70	0.79	0.81	0.77
Cognitive fatigue	0.90	0.90	0.92	0.93	0.92

α Cronbach's coefficient alpha

was reported to be better after 2 weeks by the parents. Fifty-five participants (11%) returned two questionnaires, completed by both parents. Inter-observer reliability ICCs had poor to excellent agreement (range 0.27–0.93) (Table 5). At group level, there were no significant differences between fathers ($n = 169$) and mothers ($n = 440$), except for lower SRF scores reported by the mothers. Parent/child concordance ICCs had poor to good agreement (range 0.10–0.68) (Table 6). At group level,

means of SRF, CF, and total fatigue of the parent report were significantly higher compared to the child report.

Child report and the parent report total scores and most subscale scores demonstrated a significant difference between the healthy participants (89%) and the participants with an impaired health condition (11%) (Table 7). Effect sizes varied from small to medium, with children with an impaired health condition showing lower scores and thus more fatigue.

Table 4 Test–retest reliability for PedsQL Multidimensional Fatigue Scale

Scale	Age group (years)									
	Toddler (2–4)		Young child (5–7)		Child (8–12)		Adolescent (13–18)		Total sample	
	N	ICC	N	ICC	N	ICC	N	ICC	N	ICC
Child report										
Total fatigue	NA		NA ^a		19	0.84	23	0.71	43	0.78
General fatigue	NA		NA ^a		19	0.74	23	0.75	43	0.77
Sleep/rest fatigue	NA		NA ^a		19	0.85	23	0.50	43	0.69
Cognitive fatigue	NA		NA ^a		18	0.75	23	0.78	43	0.75
Parent report										
Total fatigue	24	0.68	NA ^a		24	0.82	25	0.81	75	0.78
General fatigue	24	0.57	NA ^a		24	0.69	25	0.82	75	0.71
Sleep/rest fatigue	24	0.59	NA ^a		24	0.83	25	0.64	75	0.69
Cognitive fatigue	24	0.69	NA ^a		24	0.73	25	0.74	75	0.73

ICC internal consistency reliability

^a Only 1 child and 2 parents filled in the retest

Table 5 Inter-observer reliability for PedsQL Multidimensional Fatigue Scale

Scale	Age group (years)									
	Toddler (2–4)		Young child (5–7)		Child (8–12)		Adolescent (13–18)		Total sample	
	N	ICC	N	ICC	N	ICC	N	ICC	N	ICC
Total fatigue	40	0.62	7	0.93	12	0.81	71	0.56	130	0.64
General fatigue	40	0.43	7	0.71	12	0.54	71	0.45	130	0.52
Sleep/rest fatigue	40	0.87	7	0.84	12	0.67	71	0.66	130	0.76
Cognitive fatigue	40	0.27	7	0.90	12	0.87	71	0.47	130	0.52

ICC internal consistency reliability

Table 6 Parent child concordance for PedsQL Multidimensional Fatigue Scale

Scale	Age group (years)									
	Toddler (2–4)		Young child (5–7)		Child (8–12)		Adolescent (13–18)		Total sample	
	N	ICC	N	ICC	N	ICC	N	ICC	N	ICC
Total fatigue	NA		68	0.25	140	0.68	153	0.52	361	0.53
General fatigue	NA		68	0.22	140	0.48	153	0.50	361	0.44
Sleep/rest fatigue	NA		68	0.10	140	0.46	153	0.41	361	0.36
Cognitive fatigue	NA		68	0.22	140	0.66	153	0.45	361	0.49

ICC internal consistency reliability

Discussion

Our cohort showed that adolescence was associated with more fatigue, which might reflect the decrease in sleep duration at that age [16, 17, 24]. Boys reported more fatigue than girls, indicating socially related gender differences [25]. Fatigue was more common in children living in a single-

parent family, which might be explained by the higher prevalence of sleep problems in these children [16]. Being a child of an immigrant was associated with more fatigue, stressing the influence of the sociocultural background on fatigue. Children of low educated parents reported more fatigue, corresponding with lower reported HRQOL in populations with low socioeconomic status [26].

Table 7 Construct validity for PedsQL Multidimensional Fatigue Scale

Scale	Healthy sample			Impaired health condition sample					
	N	Mean	CI	N	Mean	CI	Difference	Effect size	P value
Child report									
Total fatigue	326	77.40	76.06–78.73	40	72.31	67.46–77.15	5.09	0.42	0.047
General fatigue	326	80.48	78.92–82.04	40	78.75	73.97–83.53	1.73	0.12	0.47
Sleep/rest fatigue	326	75.00	73.37–76.64	40	70.25	64.04–76.46	4.75	0.32	0.07
Cognitive fatigue	326	76.65	74.77–78.52	40	67.92	60.39–75.44	8.73	0.51	0.03
Parent report									
Total fatigue	442	81.90	80.75–83.06	55	75.61	72.04–78.18	6.29	0.51	<0.001
General fatigue	442	82.00	80.69–83.30	55	75.41	71.49–79.33	6.59	0.47	0.001
Sleep/rest fatigue	442	84.76	83.49–86.03	55	76.41	72.58–80.23	8.35	0.62	<0.001
Cognitive fatigue	442	78.91	77.27–80.56	55	75.00	69.55–80.45	3.91	0.22	0.13

CI 95% confidence interval

The questionnaire was found to be feasible because of the minimal missing item responses. All scales approached or exceeded a Cronbach's alpha of 0.70, recommended for comparing groups. Parent report total scores approached or exceeded a Cronbach's alpha of 0.90, recommended for analyzing individual patient scales [27, 28]. Test–retest reliability was low in the toddler version, suggesting that this version should be applied with caution. The low test–retest concordance in adolescents might be a real variation due to the fluctuations in nocturnal sleep duration. Inter-observer agreement was low in toddlers and adolescents. This observation is difficult to explain and requires further exploration. The father/child agreement and the mother/child agreement were low in the young child, the adolescent and the total sample. This may be due to differences in reasoning and response reactions between parent and child [29]. Children scored lower than their parents. The low parent/child concordance (including the weakest agreement for the young child and lower scores reported by the children) has consistently been observed in HRQOL measurement, particularly for internalizing problems [30–33]. These findings support the need to measure the perspectives of the child and the parent, since both may influence healthcare utilization. The assumption was confirmed that the questionnaire was able to distinguish between healthy children and children with an impaired health condition. It is expected that a clinical sample with more severely ill children will demonstrate worse fatigue scores and higher effect sizes.

Regarding the current study several limitations need to be mentioned. First, we had low response rates, which might lead to non-response bias. Second, the ethnicity of the participants was rather homogenous; only 2% of the children and 6% of the parents were born outside the Netherlands, compared to 10 and 10%, respectively in the Dutch population [34]. A possible explanation is the

language problems that immigrants experienced and therefore decided not to participate in this study. Third, the educational background of our parent respondents showed that 42% were highly educated, compared to 18% of the Dutch population [35]. Highly educated parents might have been more aware of the necessity of this study wherefore more willing to participate. Children from immigrants as well as from low educated parents may experience more fatigue; hence, the obtained norm-reference may underestimate fatigue in the general population. Information on nonparticipants was not available, thus generalization of the norm-results should be made with caution.

In conclusion, the Dutch version of the PedsQL™ Multidimensional Fatigue Scale demonstrates overall adequate psychometric properties in another sociocultural context. With the obtained norm-references, it can be utilized as a tool to evaluate fatigue in children.

Acknowledgments We would like to thank all the children and parents who participated in this study. We are also grateful to the day care facilities and schools for making this project possible.

Open Access This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

References

- Varni, J. W., Burwinkle, T. M., Katz, E. R., Meeske, K., & Dickinson, P. (2002). The PedsQL in pediatric cancer: Reliability and validity of the Pediatric Quality of Life Inventory Generic Core Scales, Multidimensional Fatigue Scale, and Cancer Module. *Cancer*, *94*(7), 2090–2106.
- Varni, J. W., Burwinkle, T. M., Limbers, C. A., & Szer, I. S. (2007). The PedsQL as a patient-reported outcome in children and adolescents with fibromyalgia: An analysis of OMERACT domains. *Health and Quality of Life Outcomes*, *5*(9), 9.

3. Varni, J. W., Burwinkle, T. M., & Szer, I. S. (2004). The PedsQL Multidimensional Fatigue Scale in pediatric rheumatology: Reliability and validity. *Journal of Rheumatology*, *31*(12), 2494–2500.
4. Varni, J. W., Limbers, C. A., Bryant, W. P., & Wilson, D. P. (2009). The PedsQL Multidimensional Fatigue Scale in type 1 diabetes: Feasibility, reliability, and validity. *Pediatric Diabetes*, *10*(5), 321–328.
5. Meeske, K. A., Patel, S. K., Palmer, S. N., Nelson, M. B., & Parow, A. M. (2007). Factors associated with health-related quality of life in pediatric cancer survivors. *Pediatric Blood & Cancer*, *49*(3), 298–305.
6. Zebrack, B. J., & Chesler, M. A. (2002). Quality of life in childhood cancer survivors. *Psychooncology*, *11*(2), 132–141.
7. Zeltzer, L. K., Recklitis, C., Buchbinder, D., Zebrack, B., Casillas, J., Tsao, J. C., et al. (2009). Psychological status in childhood cancer survivors: A report from the Childhood Cancer Survivor Study. *Journal of Clinical Oncology*, *27*(14), 2396–2404.
8. Romberg-Camps, M. J., Dagnelie, P. C., Hesselink-van de Kruijs, M. A., Kester, A. D., Engels, L. G., et al. (2010). Fatigue and health-related quality of life in inflammatory bowel disease: Results from a population-based study in the Netherlands: The IBD-South Limburg cohort. *Inflammatory Bowel Diseases*, *16*(12), 2137–2147.
9. Varni, J. W., Limbers, C. A., Bryant, W. P., & Wilson, D. P. (2008). The PedsQL Multidimensional Fatigue Scale in pediatric obesity: Feasibility, reliability and validity. *International Journal of Pediatric Obesity*, *5*(1), 34–42.
10. Bullinger, M., Alonso, J., Apolone, G., Lep  ge, A., Sullivan, M., Wood-Dauphinee, S., et al. (1998). Translating health status questionnaires and evaluating their quality: The IQOLA Project approach. *International Quality of Life Assessment. Journal of Clinical Epidemiology*, *51*(11), 913–923.
11. Latz, S., Wolf, A. W., & Lozoff, B. (1999). Cosleeping in context: Sleep practices and problems in young children in Japan and the United States. *Archives of Pediatrics and Adolescent Medicine*, *153*(4), 339–346.
12. Roberts, R. E., Roberts, C. R., & Chen, I. G. (2000). Ethnocultural differences in sleep complaints among adolescents. *Journal of Nervous and Mental Disease*, *188*(4), 222–229.
13. Jenni, O. G., & O'Connor, B. B. (2005). Children's sleep: An interplay between culture and biology. *Pediatrics*, *115*(1 Suppl), 204–216.
14. Liu, X., Liu, L., Owens, J. A., & Kaplan, D. L. (2005). Sleep patterns and sleep problems among schoolchildren in the United States and China. *Pediatrics*, *115*(1 Suppl), 241–249.
15. LeBourgeois, M. K., Giannotti, F., Cortesi, F., Wolfson, A. R., & Harsh, J. (2005). The relationship between reported sleep quality and sleep hygiene in Italian and American adolescents. *Pediatrics*, *115*(1 Suppl), 257–265.
16. van Litsenburg, R. R., Waumans, R. C., van den Berg, G., & Gemke, R. J. (2010). Sleep habits and sleep disturbances in Dutch children: A population-based study. *European Journal of Pediatrics*, *169*(8), 1009–1015.
17. Varni, J. W., & Limbers, C. A. (2008). The PedsQL Multidimensional Fatigue Scale in young adults: Feasibility, reliability and validity in a University student population. *Quality of Life Research*, *17*(1), 105–114.
18. McHorney, C. A., Ware, J. E., Jr, & Raczek, A. E. (1993). The MOS 36-item short-form health survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care*, *31*(3), 247–263.
19. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*, 297–334.
20. Deyo, R. A., Diehr, P., & Patrick, D. L. (1991). Reproducibility and responsiveness of health status measures. Statistics and strategies for evaluation. *Control Clinical Trials*, *12*(4 Suppl), 142S–158S.
21. Bartko, J. J. (1966). The intraclass correlation coefficient as a measure of reliability. *Psychological Reports*, *19*(1), 3–11.
22. Wilson, K. A., Dowling, A. J., Abdolell, M., & Tannock, I. F. (2000). Perception of quality of life by patients, partners and treating physicians. *Quality of Life Research*, *9*(9), 1041–1052.
23. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
24. ter Wolbeek, M., van Doornen, L. J., Kavelaars, A., & Heijnen, C. J. (2006). Severe fatigue in adolescents: A common phenomenon? *Pediatrics*, *117*(6), e1078–e1086.
25. Upton, P., Eiser, C., Cheung, I., Hutchings, H. A., Jenney, M., & Maddocks, A. (2005). Measurement properties of the UK-English version of the Pediatric Quality of Life Inventory 4.0 (PedsQL) generic core scales. *Health and Quality of Life Outcomes*, *3*(22), 22.
26. Varni, J. W., Burwinkle, T. M., & Seid, M. (2006). The PedsQL 4.0 as a school population health measure: Feasibility, reliability, and validity. *Quality of Life Research*, *15*(2), 203–215.
27. Nunnally, J. C., & Bernstein, I. R. (1994). *Psychometric theory*. New York: McGraw-Hill.
28. Streiner, D. L., & Norman, G. R. (2003). *Health measurement scales. A practical guide to their development and use*. New York: Oxford University Press.
29. Davis, E., Nicolas, C., Waters, E., Cook, K., Gibbs, L., Gosch, A., et al. (2007). Parent-proxy and child self-reported health-related quality of life: Using qualitative methods to explain the discordance. *Quality of Life Research*, *16*(5), 863–871.
30. Eiser, C., & Morse, R. (2001). Can parents rate their child's health-related quality of life? Results of a systematic review. *Quality of Life Research*, *10*(4), 347–357.
31. Theunissen, N. C., Vogels, T. G., Koopman, H. M., Verrips, G. H., Zwinderman, K. A., Verloove-Vanhorick, S. P., et al. (1998). The proxy problem: Child report versus parent report in health-related quality of life research. *Quality of Life Research*, *7*(5), 387–397.
32. Upton, P., Lawford, J., & Eiser, C. (2008). Parent-child agreement across child health-related quality of life instruments: A review of the literature. *Quality of Life Research*, *17*(6), 895–913.
33. Felder-Puig, R., Frey, E., Proksch, K., Varni, J. W., Gadner, H., Topf, R., et al. (2004). Validation of the German version of the Pediatric Quality of Life Inventory (PedsQL) in childhood cancer patients off treatment and children with epilepsy. *Quality of Life Research*, *13*(1), 223–234.
34. Bevolking: geslacht, leeftijd, herkomstgroepering en generatie, 1 januari. <http://www.stateline.cbs.nl>. 2010 [cited July 24, 2010].
35. Beroepsbevolking; behaalde onderwijs naar herkomst geslacht en leeftijd. <http://www.stateline.cbs.nl>. 2010 [cited August 7, 2010].