PAPER

Quality of life after in-patient rehabilitation in children with obesity

U Ravens-Sieberer[1,2]*, M Redegeld[2] and M Bullinger[2]

[1]Robert Koch Institute, Berlin, Germany; and [2]Department for Medical Psychology, University of Hamburg, Germany

OBJECTIVE: Treating obesity concerns not only medical concomitants and future complications but also quality of life. The study was planned to investigate the effect of obesity and obesity treatment on quality of life in children.
DESIGN: In the study presented, quality of life as well as psychosocial, clinical, sociodemographic and family related information was obtained from both children and their parents, at four time points by questionnaires: (1) Prior to in-patient rehabilitation (at home); (2) at the end of the in-patient rehabilitation (in clinics); (3) three months after admission into rehabilitation clinics; and (4) twelve months after admission into rehabilitation clinics.
MEASUREMENT: Quality of life (QoL) was assessed in children using the revised German KINDL[R] quality of life questionnaire, a 24 item instrument yielding six dimensions and a total score as well as a chronic generic and an obesity module. Psychosocial determinants included assessments of stress, emotional support, coping and internal locus of control as well as expectations and motivations with regard to the rehabilitation programme.
SUBJECTS: Seven large German in-patient rehabilitation clinics participated in the study in which 1019 children participated. These children were suffering from obesity ($n = 584$) or asthma/atopic dermatitis ($n = 330$) or both ($n = 105$).
RESULTS: Children as well as parents did not differ across the diagnostic groups in sociodemographic and general clinical variables. QoL in children was dependent on age and gender with increased age over 13 y and female gender being associated with lower self reported QoL. Differences between diagnostic groups were significant, indicating higher impairments in QoL in children with obesity. Multiple regression analysis showed that stress level, coping, as well as lack of emotional support and poor global health explained 37% of the variance of the KINDL[R] total score at the first measure point in the obesity group. Predicting QoL at the end of rehabilitation from data collected at the beginning of the study, psychosocial variables explained 28% of the variance. The results indicate that QoL of children with obesity is affected by age and gender and can be explained by stress, coping and support as well as global health ratings. QoL of obese children differs from the QoL of children with asthma/atopic dermatitis and improves from before to after rehabilitation. QoL after rehabilitation is predicted by psychosocial indicators, health resources and strains.
CONCLUSION: The results of the study suggest that QoL assessment in children with obesity is relevant in understanding what life is like for children with obesity, which aspects of their life affect their well-being and how quality of life can be improved through rehabilitation programmes.
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Introduction

Obesity in children is one of the most prevalent and increasing health problems in industrialized nations.[1,2] It is a risk factor for a variety of diseases in adult life and is associated with increased morbidity in childhood and adolescence itself.[3] Studies of the psychosocial development and adjustment of children suffering from obesity have shown that obesity has negative consequences such as stigmatization, restriction of access to social contacts and decreased self-esteem.[4] It is important to know more about quality of life (QoL) in obesity in order to understand which impairments of function and well-being are associated with the condition and what kind of needs for care emerge. QoL as one of the major outcomes of treatment is needed to identify prognostic factors that predict changes in QoL as a function of comprehensive treatment.

*Correspondence: U Ravens-Sieberer, Head, Child and Adolescent Health, Robert Koch Institute, Stresemannstraße 90, D-10963 Berlin, Germany.
E-mail: Ravens-SiebererU@rki.de

The following study uses data from a longitudinal research project into the outcomes of in-patient rehabilitation for children and adolescents to examine the QoL of this patient group in comparison to respiratory and dermatological conditions, to identify determinants of QoL, to examine changes over time from before to after in-patient rehabilitation treatment for obesity and to find prognostic factors to explain variance in QoL immediately after rehabilitation.

Methods

In seven large German rehabilitation clinics consecutive patients with indications of obesity or atopic dermatitis/asthma (children/adolescents and their parents) were contacted at home prior to admission (time point 1), at the clinic before discharge (time point 2) and were followed up through the study three months (time point 3) and twelve months (time point 4) after admission. To assess QoL, the 24 item version of the German KINDL[R] questionnaire was used in the self-report version for children and the parent-report version for parents.[5] The questionnaire consists of six dimensions in assessing QoL in terms of physical functioning and psychological well-being, self-esteem, friends, family and school. Additionally a newly developed chronic disease (CD) module and a 12-item obesity (OB) module were used. In terms of determinants or predictors, social support, coping, internal health locus of control and stress were assessed, sociodemographic and clinical data was included as well as expectation and motivation with regard to rehabilitation. Data analysis is presented for the first two measure points prior to, and at the end of, rehabilitation and included descriptive statistics, analysis of variance and correlation and regression analysis via SPSS.

Results

At the first measure point in which the questionnaires were sent home to 1184 children and their parents, 1019 responses were obtained, reflecting a response rate of 86.1%. 584 children with a primary diagnosis obesity participated as compared to 330 children with a primary diagnosis of asthma and atopic dermatitis (105 cases were excluded from this analysis because of overlapping diagnoses).

Mean age of the children in the both groups was 12 y, the proportion of girls was slightly higher in the obesity group (51.6% vs 47.9%). Parents (87% mothers) mean age was 39 y, over 72% of the parents were married, but a higher proportion of single parents was found in the obesity group (19.3% vs 15.8%). The groups were comparable with regard to 50% white colour workers. 70% of the parents were employed, 38% full-time and 33% part-time.

In the KINDL[R] (range: 0 lowest to 100 highest score) children above the age of 13 y significantly differed from younger ones with regard to a lower scale score in physical functioning ($t = 2.08$, d.f. $= 565$, $P = 0.037$), self-esteem ($t = 3.11$, d.f. $= 564$, $P = 0.002$) as well as schooling ($t = 3.48$, d.f. $= 556$, $P = 0.001$) with differences in family subscale just failing to reach significance. Girls differed from boys in terms of having lower scores in physical functioning ($t = -2.54$, d.f. $= 571$, $P = 0.01$), psychological well-being ($t = -2.30$, d.f. $= 575$, $P = 0.02$) and self-esteem ($t = -3.74$, d.f. $= 571$, $P = 0.001$). The KINDL[R] total score also indicated lower QoL in girls as compared to boys ($t = -3.17$, d.f. $= 510$, $P = 0.002$). To identify differences in KINDL[R]-scores between disease groups, a 3-way-variance analysis including age, gender and diagnostic groups was performed. For all KINDL[R]-subscales (except the physical functioning scale) highly significant impairments in QoL were found indicating lower scores for children with obesity. Multiple regression to explain variance of the KINDL[R] total-score before rehabilitation from variables collected at the first measure point yielded 4 factors which explained 36.7% ($P < 0.01$) of the variance: stress (standardized β coefficient $= -0.15$, $P = 0.001$), coping ($\beta = -0.09$, $P = 0.02$), emotional support ($\beta = 0.39$, $P = 0.001$) and global health ($\beta = 0.24$, $P = 0.001$). From before, to the end of the rehabilitative treatment, significant increases were found for all KINDL scores (except psychological well-being) in the obesity group (3-way-ANOVA: time, age, gender). In prediction of KINDL[R] total score, the factors coping, support, global health and expectations explained 21.7% of the variance.

Discussion

This study shows that QoL of children with obesity differs with regard to gender and age. Although QoL is rated lower in children suffering from obesity than in other chronic conditions, factors associated with reduced QoL such as stress, coping and lack of emotional support could be identified which exceed clinical indicators in their predictive power. The results show that in-patient rehabilitation treatment for obesity in children is associated with an increase in QoL. However, long-term data have not been collected so this preliminary finding should only be interpreted cautiously. Predictions of QoL after rehabilitation suggest that it is important to understand the role of family and social environment for the child's well-being and changes in QoL associated with treatments. Assessing QoL in obesity may serve as an important additional outcome criterion in the evaluation of treatment effects; it may help to understand the concomitants and consequences of obesity for children and families and may guide innovations in interventions to include parents and family.

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