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ORIGINAL PAPER

Predictive factors for changes in quality of life among children and adolescents in youth welfare institutions

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Abstract

Purpose Children and adolescents living in youth welfare institutions often have a below average quality of life (QoL), for reasons that include developmental difficulties, history of traumatic experiences, and mental disorders. Youth welfare measures are needed that would have a positive impact, but there is a lack of longitudinal research on which measures are most effective. This study investigated what factors are associated with an improvement in QoL during residential stay.

Methods Residents of youth care facilities in Switzerland and their professional caregivers completed questionnaires that addressed QoL, psychopathology, and experience of traumatic events at two time points. In addition, information regarding mental disorders was obtained through structured clinical interviews. Analyses were conducted on the data obtained from 204 respondents aged 11–18 years. Comparisons with a school sample were conducted.

Results Compared to a school sample, a majority of participants rated their QoL equal, whereas their caregivers rated it as lower. Factors predictive of a poorer QoL were high levels of internalizing and externalizing psychopathology, presence of co-morbidities, and female gender. At the second assessment, the caregivers reported a small improvement, which was associated with reductions in both internalizing and externalizing psychopathology.

Conclusions The finding that a reduction in severity of psychopathology may result in an improvement in QoL underlines the importance of providing professional support for mentally ill residents of youth welfare institutions. Further research is needed to determine the causality of this association.

Keywords Quality of life · Residential care · Youth welfare · Inventory of life quality in children and adolescents (ILC) · Mental health problems/psychopathology

Introduction

Quality of life (QoL) is a multi-dimensional concept that includes, among other aspects, a person's subjective perception of his or her emotional, physical, and social life circumstances [1, 2], and is a sensitive measure for evaluating problems in mental health [3, 4]. The assurance and improvement of QoL is one aim of residential care, because children and adolescents are often being referred due to inadequate living circumstances with limited QoL. For children and adolescents living in youth welfare institutions, the assessment of QoL could be used to help determine appropriate interventions and therapies that may improve their well-being [5, 6]. However, QoL of residential care children and adolescents in general, as well as the interconnection between QoL, mental health and the treatment course in residential youth care in particular, has been a neglected topic.

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QoL of residents living in institutional care can be negatively influenced by a number of different factors. Out of home placement often is linked to an accumulation of various psychosocial risk factors, e.g. children and adolescent who live in a dysfunctional family and/or are exposed to multiple types of maltreatment [7–11]. Moreover, youth in the child welfare system are more likely to suffer from mental health problems [12–15]: prevalence rates of mental disorders among children and adolescents living in residential care settings range from 46 to 76%, and co-morbidities are highly prevalent [16–20]. Emotional, behavioral, or educational problems may cause difficulties in several areas in the life of many residents. Hence, the placement may have been implemented to enable them to access pedagogic and educational supports to improve their social skills, or to attend specialized schools or job training programs [9, 15, 21, 22]. Building on an ecological model of human development [23, 24], preparing youth for later life stages in a supportive surrounding constitutes a principal aim of institutional care. In terms of the ecological theory, it is relevant that the ecological system changes when the youth is administered to a youth welfare institution. However, different domains of QoL are also linked to different systems and the interface between these systems. The findings suggest that a collaboration with school, parents and peer groups is relevant for the improvement of QoL. Finally, while residential care placement has obvious benefits, such as protection from outside risk factors and the provision of supportive services, adverse experiences in these settings are possible. Removing children from their families means separating them from important attachment figures including parents, siblings, and supportive peers. Institutions may include harmful peer influences (e.g. bullying), high turnover of caregivers, unstable placements, and abuse [6, 8, 25–28].

To date, findings from most of the studies that looked at QoL in institutionalized youth raise concerns about the QoL of children in residential care. In a study of 180 Polish children in care where the self-report questionnaires Questionnaire for Measuring Health-Related Quality of Life in Children and Adolescents (KINDL) and World Health Organization Quality-of-Life Scale (WHOQOL-BREF) were used, van Damme-Ostapowicz et al. [29] found that respondents had a poorer QoL compared to children living with their families from the general population. In a study of 111 Serbian youth in institutional care using the self-report Pediatric Quality of Life Inventory (PedsQL) questionnaire, Damnjanovic et al. [30] found that respondents had a poorer QoL across all scales compared to children living in foster care or with their own families. In addition, they found that higher levels of mental health problems were associated with poorer QoL [31]. In a study of 400 institutionalized adolescents, Jozefiak and Kayed [32] found significantly lower scores in most KINDL-R self-report subscales compared to adolescents from the general population.

In contrast, Carroll et al. [33] did not find any significant difference in QoL between 174 male adolescents in a residential setting and male adolescents from a local school assessed with the PedsQL. Büttner et al. [5], who used the Inventory of Life Quality in Children and Adolescents (ILC) as well as both the self-report and parent versions of the Strengths and Difficulties Questionnaire (SDQ), found that only 25% of a sample of 84 children and adolescents in youth welfare programs reported below average ILC scores, whereas 45% reported average, and one-third reported above average ILC scores. Furthermore, a negative association between QoL and emotional problems and behavioral problems, and a positive association between QoL and prosocial behaviors was observed on the self-report version of the SDQ, but not for the parent version.

With respect to factors that may be associated with QoL, Greger et al. [34] showed that maltreated adolescents in residential settings reported poorer QoL than those without a history of maltreatment, and that a higher number of past traumatic experiences was correlated with poorer QoL. However, based on the caregivers' reports, no difference in QoL was found between abused and non-abused residents. Other studies reported that use of psychotropic medication, younger age, female gender, and lower self-esteem were associated with poorer QoL scores in the domains social acceptance and physical appearance in youth in residential care [35, 36]. Bacro et al. [37] found that children who had been in foster families before being placed in an institution had lower QoL scores in the domains family life and separation. They interpreted these results in terms of deteriorating attachment difficulties.

Various studies examined which factors may have an impact on the improvement of QoL for youth in care. Nelson et al. [35] found that continuity in residential placements was associated with an increase in total, physical, and psychological QoL scores as assessed by the PedsQL self-evaluation. Carroll et al. [38] found a general trend, albeit non-significant, for an increase in QoL over three observations (baseline, 12 weeks, and 24 weeks) on the self-report version of the PedsQL. Davidson-Arad et al. [39] and Davidson-Arad [40] used reports of social workers to compare at risk children who had been removed from their homes with those who had not, and found that in assessments at 6 and 15 months after baseline, QoL scores had improved for those in care but had not changed for those who remained at home. The authors interpreted this in terms of a separation from an aversive home environments, a secure environment, better living conditions, and more care and attention that they received in alternative placements.

Measurement of QoL is usually best done using self-report instruments [41]. However, young children and

children with mental disorders may have limited self-perception [42, 43]; for example, children with attention deficit hyperactivity disorder (ADHD) tend to provide overly positive self-evaluations of their competences [44], while those with symptoms of depression provide reports that are too negative [45]. Accordingly, proxy evaluations may be valuable as well. Studies that have compared self- and proxy evaluations of QoL using various instruments have demonstrated low to good correlations and the results differ in respect of the direction of differences in proxy and child reports [32, 46–49]. Upton et al. [49] discussed that each rater contributes different information to an assessment of QoL. For the measurement of psychopathology, comparisons of the Youth Self Report (YSR), which is designed for adolescents aged 11–18 years, and the corresponding Child Behavior Checklist (CBCL), which is completed by parents or caregivers, demonstrated that the results of these two instruments differ with the increase of age. This underscores the necessity and value of obtaining multiple perspectives [50–53]. Cross-cultural differences in QoL, in psychopathology and in cross-informant agreement could be demonstrated [54–56]. However, these differences appear to be negligible between Swiss and German youth, so norms from Germany can be used for Swiss analyses.

In summary, various studies have found that children and adolescents in institutional care have worse QoL compared to those living at home, and that lower QoL is associated with psychosocial risk factors, history of maltreatment, mental health problems, reduced social participation, and separation from family members. However, only a few studies have compared self-reported with proxy-reported QoL scores. Moreover, there is a lack of longitudinal research on factors that may impact QoL in these settings. Therefore, the current study addressed the following questions:

- Do children and adolescents living in youth welfare institutions have worse QoL than juveniles from a representative school sample?
- Do QoL scores differ for self-reports and caregiver reports?
- What factors are associated with poorer QoL?
- Does QoL in residential settings improve over time, and what factors influence this improvement?

Methods

Study design

In a longitudinal study conducted in Switzerland, Schmid et al. [21] looked at a broad range of disorders affecting children and adolescents living in youth welfare institutions. Each participating resident and the staff member at the facility with whom that resident had the closest contact (in most cases a social worker) completed computer-based questionnaires at two time points with 1 year in between (with intensive interventions between the two measurements) on the following issues: quality of life, emotional and behavioral problems, traumatic life events, personality traits, psychopathy, delinquency, drug abuse, and goal attainment. In addition, mental disorders were diagnosed through structured clinical interviews by trained psychologists. Residents of 64 institutions across the country took part in this study, of whom 592 (32%) agreed. The residents have been recruited from 64 very heterogeneous institutions with different in-house treatment concepts and/or in collaboration with external mental health services. All youth welfare institutions are certificated by the ministry of justice. Hence, all institutions met and fulfilled several criteria of structure und process quality and all offer highest quality residential care. However, the concepts and treatments for every case are very different. Therefore, the treatment remains a "Black box". The representativeness of the sample was verified by asking the caregivers of a sample of residents who declined to participate to anonymously complete the CBCL [57], which assesses the presence of mental health symptoms. Results confirmed no significant differences between participants and non-participants. The study design was reviewed by ethics committees in Basel, Lausanne (Switzerland), and Ulm (Germany), and all participants obtained informed consent (for those younger than 18 years, consent from the parent or legal guardian was obtained as well).

The present paper addresses just the analyses from this study that focused on QoL. Self-reported and proxy-reported QoL data of a subgroup of 204 residents aged 11–18 years who 1) had completed the Inventory of Life Quality in Children and Adolescents (ILC [58]) at both time points and 2) had complete data available from the CBCL [57] and the YSR [59] at both time points will be presented. Of the total sample of 592 participants, 388 participants were not included in the current analyses for the following reasons:

- 100 children were younger than 11 or young adults were older than 18 years
- 126 children and juveniles had missing data (ILC caregiver report, ILC self-report, CBCL, or YSR) at the first point of measurement
- 162 children and juveniles had missing data (ILC caregiver report, ILC self-report, CBCL, or YSR) at the second point of measurement

Reasons for missing data (especially at T2) are e.g. a residential placement for less than a year, termination of the youth welfare measure, a lack of willingness to answer all the questionnaires of the study.

Sample

The mean age of the 204 respondents in this sample was 15.1 years (SD 1.6; range 11.1–17.9), and 62.3% were male. In total, 72.1% lived in the German-speaking region of Switzerland, 17.6% in the French-speaking region, and 10.3% in the Italian-speaking region. In Switzerland, convicted juveniles are often placed in the same residential facilities as those who have been placed there for their own protection or for other reasons, such as voluntary admission [60]. Reason of admission in the current study were child welfare reasons (i.e., civil law) (66.8%), convictions (i.e., penal law) (14.2%), or various other reasons (for example, to attend a special school, or because of severe psychological or behavioral problems) (18.9%). At the time of study enrollment, participants had been living in their institution for a mean of 1.9 years (SD 2.2), and 30.5% had lived in other institutions before their placement for the current study. The mean number of traumatic experiences reported was 0.9 (SD 1.1), and the mean number of psychiatric diagnoses was 1.3 (SD 1.2).

Measurements

QoL was assessed using the Inventory of Life Quality in Children and Adolescents (ILC) [58], which can be administered by children and youth with various disorders, as well as by their parents or caregivers [42, 61–64]. This time-saving instrument is widely used for research and clinical routine assessment in the German-speaking parts of Europe, and is internationally available in different languages. Since the participants were based in three different linguistic regions, either the original German version or a French or Italian translation was used. The ILC asks seven questions about the following domains: (1) school, (2) family, (3) relations with peers, (4) interests and recreational activities, (5) physical health, (6) mental health, and (7) global assessment of QoL. Each item is scored on a 5-point scale where 1 = very good and 5 = very bad. The scores on the seven items are transformed into a scale ranging from 0 to 28, where higher values indicate a better QoL. Standard values based on a large German school sample (9327 pupils, representative for German school forms, several ages and gender) are available [58], and reliability as well as construct criterion and clinical [58] and convergent validity have been valuated as satisfactory. In our study, Cronbach's alpha was 0.62 for the self-report version and 0.68 for the caregiver report version, which are comparable to the findings of for example Mattejat et al. [58] [Cronbach's alpha = 0.63 for students (n = 13,903) and 0.76 for parents (n = 1109) or 0.55 for underage patients (n = 605) and 0.72 for parents (n = 568) or 0.66 for parents in the general population (n = 815)].

Psychopathological symptoms were self-assessed using the Youth Self Report (YSR) [59] and were proxy-assessed by caregivers using the corresponding Child Behavior Checklist (CBCL) [57]. Both of these instruments are internationally established 120-item screening instruments that ask about emotional, behavioral, and social difficulties experienced over the last 6 months. However, in this study, only information from the last 3 months was solicited. Items are scored on a 3-point scale where 0 = not true, 1 = sometimes true, and 2 = often true. Each instrument includes two broadband scales, one for symptoms of externalizing psychopathology and the other for symptoms of internalizing psychopathology. *T* scores can be calculated based on a German, French, or Italian norm sample. Reliability and validity have been demonstrated in a large number of studies [e.g. 66, 67]. In our study, Cronbach's alpha was 0.66–0.94 for the YSR and 0.60–0.94 for the CBCL, including total problem score, broadband scales, and syndrome scales.

The Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime version (K-SADS-PL) [68] is a semi-structured diagnostic interview that is used to diagnose mental disorders. It includes diagnostic subgroups corresponding to DSM-IV diagnostic criteria [69] for affective disorders, anxiety disorders, psychotic disorders, behavioral disorders, substance abuse, eating disorders, and tic disorders. Its validity has been found to be satisfactory [70]. Interviews were conducted by trained psychologists who were part of the project team. For personality disorders, the Structured Clinical Interview for DSM-IV Axis II (SCID-II) [71] was applied.

The Essen Trauma-Inventory for Children and Adolescents (ETI-CA) [72]) was used to assess traumatic events. It presents a list of potentially traumatic experiences, and asks respondents to indicate if they have ever experienced any of these situations personally, as a witness, or both. In the present study, only items involving interpersonal traumatic experiences such as physical abuse, sexual abuse, and neglect were included for evaluation. The psychometric properties of this instrument have been evaluated as good [73].

Statistical analyses

The mean self-reported and caregiver-reported ILC scores obtained at the first assessment point were compared using a factorial repeated-measures ANOVA, and each set of scores was additionally compared to the percentile ranks of scores derived from a survey of German schoolchildren and their parents [54]. Factorial repeated-measures ANOVAs were conducted to compare T1 and T2 of the ILC score. Effect sizes of the differences between means were determined using Cohen's d. To further evaluate the change in ILC scores from the first to the second assessment time point (T2 –T1), each score at T1 was subtracted from the score at T2 (a positive value indicated improvement and a negative

value indicated worsening). Multivariate linear regression analyses were used to identify which factors were associated with poorer ILC scores at T1, as well as which factors were associated with an improvement in ILC scores at T2. Analyses were controlled for age, gender, duration of residence, and institutional care before current placement. Due to attrition, refusal of the interview in the longitudinal study design and single missing anamnestic data, interviews and/or questionnaires, the sample size for the regression analysis had to be reduced to 119. A second set of linear regression analyses was conducted with the sample that included only those variables that were found in the first set to contribute to prediction with a probability of error $p < 0.10$. With the reduced number of variables, the sample size was brought up to 137 and 203, respectively (see Fig. 1). Cohen's d was calculated using Microsoft Excel, and all other calculations were conducted using IBM SPSS Statistics 21.

Results

Comparison of self-rated vs. caregiver-rated QoL

At T1, the self-reported ILC scores were significantly higher than the caregiver-reported scores ($M = 20.2$, SD = 3.5 vs. $M = 17.6$, SD = 3.7; $t = 8.80$; $p < 0.001$; $d = 0.73$). Except for the item "physical health", self-reports reached significantly higher levels of QoL than caregiver reports ($p < 0.001$). Compared to the percentile ranks of a school sample [54], residents reported similar levels of QoL, with the majority (69.1%) reporting average, 17.2% below-average and 13,0.7% above-average levels of QoL. In contrast, the caregivers rated the residents' QoL as being below average in 49.5% of cases and above average in only 2.9%; i.e., they considered them to be doing clearly worse in comparison to the general population. See Table 1.

Factors found to predict QoL

Multiple linear regression analyses were conducted to investigate which factors may have had an impact on the ILC scores at T1, using the variables of age, gender, duration of residence, institutional care before current placement, comorbidities (i.e., number of DSM-IV diagnoses), history of trauma, and severity of internalizing and externalizing psychopathology, as determined by either the YSR or the CBCL. Due to missing data, the evaluable sample size for these analyses was reduced to 119. In a second set of linear regression analyses, with a reduced number of variables, the evaluable sample size was brought up to 137.

For the self-reports, the result of the multiple linear regression analyses was $R^2 = 0.34$; $F = 17.2$; $p < 0.001$, while for the caregiver reports, it was $R^2 = 0.35$; $F = 23.8$; $p < 0.001$. Table 2 lists the variables that were found to be predictive of ILC score, and shows both the beta coefficient (B) with 95% confidence intervals and the standardized beta coefficients (β) for each factor. Female gender and higher levels of internalizing and externalizing psychopathology were found to be a significant predictor of poorer self-reported QoL, and a larger number of DSM-IV diagnoses and higher levels of internalizing and externalizing psychopathology were found to be significant predictors for the caregiver-reported QoL.

Change in QoL over time

The mean duration between the two assessment time points was 9.4 months (SD 4.4) for the self-reports and 9.2 months (SD 4.3) for the caregiver reports. Table 3 shows the change in mean ILC scores between T1 and T2. No change was seen for the self-reported scores, but a significant improvement was seen for the caregiver-reported scores, although the effect size was small (Cohen's $d = 0.18$). Gender has already been taken into account as a factor. The interaction between time and gender was not significant. However, males had a significant higher quality of life at both time points of measurements in self-report as well as in the caregiver reports.

Factors found to predict change in QoL over time

The same approach that was used to identify predictors of the ILC score at T1 was used to predict change in score between the two assessment time points. Multivariate linear regression analyses were conducted using the same variables as before (age, gender, duration of residence, institutional care before current placement, number of DSM-IV diagnoses, number of traumas, and severity of internalizing and externalizing psychopathology) plus one more: change in severity of psychopathology between T1 and T2. For each type of psychopathology, the score on the YSR or CBCL at T2 was subtracted from the score at T1 (T1 − T2), with a positive value indicating improvement and a negative value indicating deterioration. Again, the evaluable sample size was reduced to 119 because of missing data, and was brought up to 137 and 203, respectively, in a second set of analyses that included just those variables that were found to contribute to prediction with a probability of error $p < 0.10$.

For the self-reports, the result of the multiple linear regression analyses was $R^2 = 0.07$; $F = 7.6$; $p < 0.001$, while for the caregiver reports, it was $R^2 = 0.35$; $F = 18.1$; $p < 0.001$. Table 4 lists the variables that were found to be predictive of a change in ILC score, and shows both the beta coefficients (B) with 95% confidence intervals and the standardized beta coefficients (β) for each one. For the self-report data, a change of internalizing psychopathology was found to be a significant predictor for a change in ILC scores,

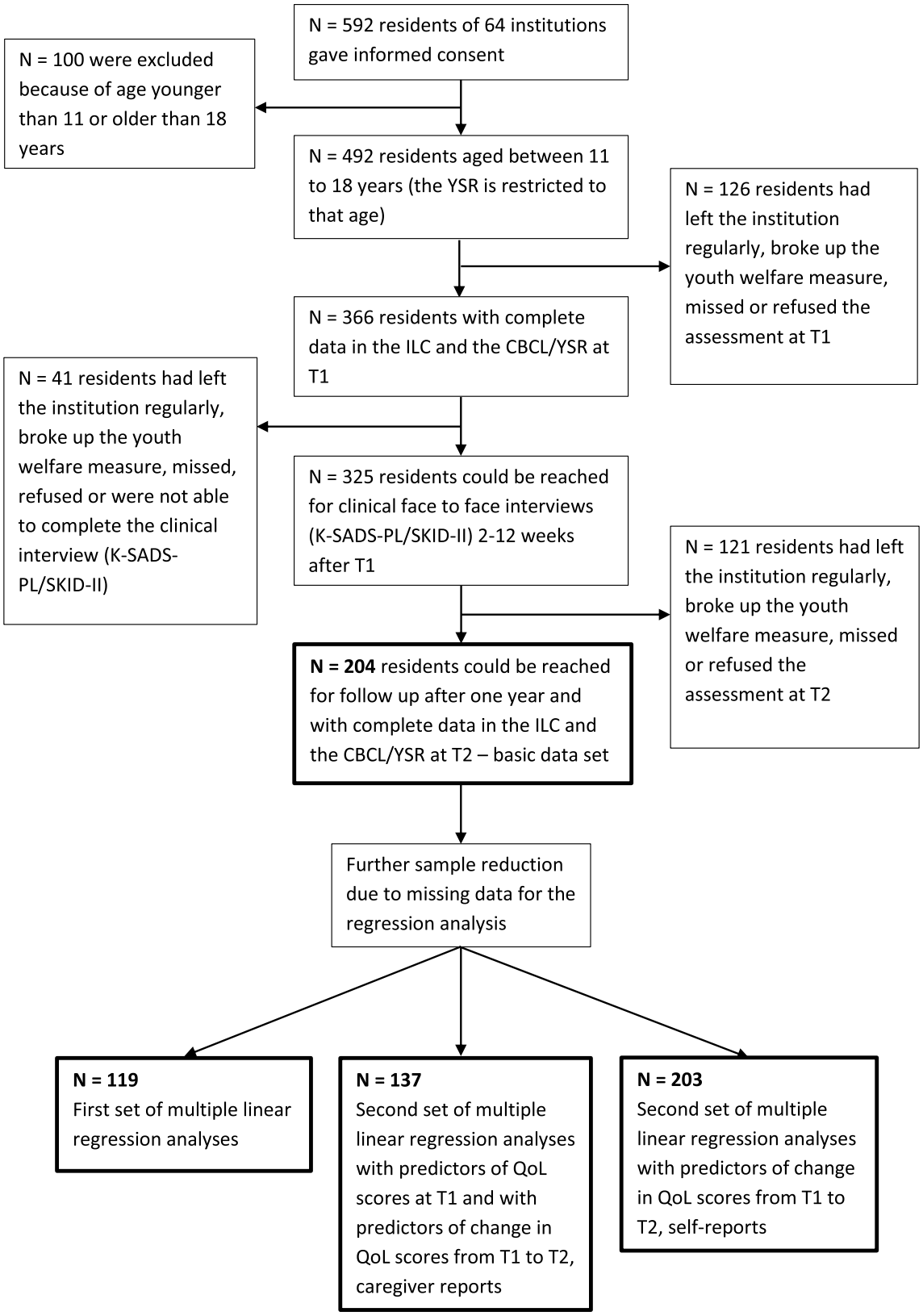

Fig. 1 Flow chart of residents who participated in the study and whose data were analyzed in the regression analyses

Table 1 Percentile rank of QoL scores compared to a school sample at T1 ($N = 204$)

Percentile Rank	ILC self-report (%)	ILC caregiver report (%)
PR ≤ 15	17.2	49.5
15 < PR < 85	69.1	47.5
PR ≥ 85	13.7	2.9

Table 2 Predictors of QoL scores at T1

	B (95% CI)	*β*
ILC self-report ($N = 137$)		
Constant	33.79 [30.20, 37.38]	–
Gender (1 = male, 2 = female)	− 2.33 [− 3.34, − 1.33]	− 0.33***
Number of DSM-IV diagnoses	− 0.48 [− 1.00, 0.04]	− 0.13
Internalizing psychopathology	− 0.09 [− 0.14, − 0.03]	− 0.26**
Externalizing psychopathology	− 0.07 [− 0.13, − 0.02]	− 0.21*
R^2	0.34	
F	17.19***	
ILC caregiver report ($N = 137$)		
Constant	36.32 [31.47, 41.18]	–
Number of DSM-IV diagnoses	− 0.70 [− 1.27, − 0.14]	− 0.18*
Internalizing psychopathology	− 0.10 [− 0.16, − 0.04]	− 0.23**
Externalizing psychopathology	− 0.18 [− 0.24, − 0.12]	− 0.44***
R^2	0.35	
F	23.84***	

The table lists just those variables that were used in the second step of the multivariate linear regression analysis

B beta coefficient, *β* standardized beta coefficients

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 3 Changes in QoL from the first to the second assessment point (factorial repeated-measures ANOVA; $N = 204$)

	T1		T2		Cohen's *d*
	M	SD	*M*	SD	
ILC self-report (total)	20.22	3.54	20.44	3.87	0.06
Male	21.12	3.06	21.21	3.66	0.03
Female	18.73	3.79	19.17	3.89	0.11
Within-subject-Effects	$F(1;202) = 0.93$; $p = 0.335$				
Interaction time × gender	$F(1;202) = 0.39$; $p = 0.532$				
Between-subject-effects for gender	$F(1;202) = 26.35$; $p < 0.001$				
ILC caregiver report (total)	17.57	3.71	18.24	3.54	0.18
Male	17.94	3.82	18.80	3.73	0.23
Female	16.96	3.47	17.30	3.00	0.10
Within-subject-effects	$F(1;202) = 4.61$; $p = 0.033$				
Interaction time × gender	$F(1;202) = 0.87$; $p = 0.351$				
Between-subject-effects for gender	$F(1;202) = 8.14$; $p = 0.005$				

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

with a reduction of symptoms from T1 to T2 associated with an improvement in QoL. For the caregiver-reported data, an improvement in QoL was reported for those residents who (1) had a larger number of DSM-IV diagnoses and a higher level of externalizing psychopathology at T1, and (2) had larger reductions of both internalizing and externalizing psychopathology at T2.

Discussion

Children and adolescents living in youth welfare institutions may experience a poor QoL for reasons that include psychosocial risk factors, history of abuse, mental health problems, reduced social participation, and separation from family members. In this study, in a sample of youths in residential care the QoL was rated significantly lower by their caregivers than the QoL of juveniles in the general population, while the residents themselves rated their QoL as equal compared to the aforementioned juveniles from the general population. The caregiver findings are consistent with those of Jozefiak and Kayed [32] and the self-report findings are consistent with those of Carroll et al. [33]. However, several studies with self-reported measurements found low QoL in samples of youth in residential care as well [29, 30, 32, 35].

Studies that have compared self-reported and proxy-reported QoL scores have demonstrated low to moderate correlations [32, 46]. Possible explanations for the discrepancy between the two types of reports are difficulties that institutionalized youth have in self-perception due to mental health problems such as ADHD, trivialization of symptoms, or being surrounded by peers whose own QoL is below the norm [43, 44]. Another explanation could be that many individuals in these settings are from such difficult home circumstances that by comparison they perceive their current QoL as being better than it actually is, whereas their caregivers may be taking other criteria into consideration and have higher expectations as to what constitutes a good QoL. In addition, residents may often fail to recognize or to take into account how much support they are receiving from their teachers and caregivers to compensate for their difficulties. On the other side, caregivers may certify a lower QoL because of the cumulated risk factors and the biography of the youth in residential care.

With respect to factors that might predict QoL, lower self-reported QoL scores were associated with high levels of internalizing and externalizing mental health problems,

Table 4 Predictors of change in QoL scores from T1 to T2

	B [95% CI]	*β*
ILC self-report ($N=203$)		
Constant	0.06 [− 0.58, 0.70]	
Earlier placements	− 0.58 [− 1.70, 0.53]	− 0.07
Change in internalizing psychopathology	0.09 [0.04, 0.13]	0.25***
R^2	0.07	
F	7.60***	
ILC caregiver report ($N=137$)		
Constant	− 5.37 [− 9.61, − 1.13]	
Number of DSM-IV diagnoses	0.68 [0.09, 1.26]	0.16*
Externalizing psychopathologies at T1	0.07 [0.00, 0.13]	0.16*
Change in internalizing psychopathologies	0.14 [0.06, 0.21]	0.31***
Change in externalizing psychopathologies	0.10 [0.02, 0.19]	0.22*
R^2	0.35	
F	18.13***	

The table lists just those variables that were used in the second step of the multivariate linear regression analysis

B beta coefficient, *β* standardized beta coefficients

*$p<0.05$, **$p<0.01$, ***$p<0.001$

as well as with female gender. The last is consistent with the findings of Damnjanovic et al. [30] and Nelson et al. [35], both of whom found that girls in residential or foster care reported poorer QoL than boys. Furthermore, other studies found that girls experienced more maltreatment, had more mental disorders, were placed later in residential care, and talked more frequently about their problems [11, 21, 74]. Based on the caregiver-reported data, the presence of co-morbid psychopathologies but not gender was associated with lower QoL. Several studies have demonstrated an association between mental health and QoL [3–5, 31, 34, 75, 76]. In terms of this close association between psychopathology and QoL, meta-analytic findings have shown that the reduction of psychopathology in residential care is much better if the institutions add evidence based psychotherapeutic treatments [77, 78]. QoL should also be a relevant outcome of psychotherapeutic treatment. It will be important to gain more knowledge about the effects of specific evidence based treatments on QoL in general and in youth welfare populations. Therefore, either proper study designs in homogeneous institutions with manualized treatment or qualitative studies are needed.

At the second assessment time point, a significant increase in QoL was seen in the caregivers' reports, albeit with a small effect size. This is consistent with the findings of Carroll et al. [38], who found a non-significant increase in QoL over three observations, and of Nelson et al. [35], who found an association between the length of time spent at the same residential setting and an improvement in QoL. No change in QoL over time was seen in the self-reports. As the participants in this study had been in residential care for an extended period (a mean of almost 2 years) and would have had received treatment during that time, and as they reported a relatively high level of QoL at the first assessment point, it could be that their QoL had improved since the time of admission but that further treatment were of less importance: i.e., there was a ceiling effect. This would be consistent with the findings of Davidson-Arad et al. [39] and Davidson-Arad [40], who found that in children who were referred to residential or foster care, significant improvements in QoL were observed during the first months but only small improvements occurred thereafter.

With respect to factors that might underlie a change in QoL over time, data from the caregiver reports indicated that the greatest improvement was seen in those residents who had high levels of externalizing psychopathology and co-morbidities at the first assessment time point (and thus presumably had the greatest potential for improvement), and that improvement in QoL was associated with a reduction in symptoms of externalizing psychopathology. Data from both the caregiver reports and the self-reports indicated that improvement in QoL was associated with a reduction in symptoms of internalizing psychopathology. Limiting the results of the self-reports is the fact that the relatively small changes of self-reported QoL led to a small proportion of total variance in the regression model. Moreover, the predictors included in the model explained only a small amount of variance in self-reported QoL, which could be due to the fact that there was not enough variance in the outcome (especially with regard to the change of QoL). However, these results do not allow any conclusions to be made as to whether the reduction in psychopathology was a causal

factor in this improvement. Indeed, in a study of children and adolescents with high levels of psychopathology, which obtained information from parents about QoL and psychopathology at two time points a year apart, Bastiaansen et al. [79] found that 28.6% of subjects showed either a reduction in psychiatric symptoms or improvement in QoL, but not both.

Strengths and limitations

This study is the first study to conduct a longitudinal assessment comparing self-reported and caregiver-reported QoL among children and adolescents in institutional care. The longitudinal design permitted an assessment of factors associated with changes in QoL over time, although no conclusions can be derived with respect to causality. The assessment tool used, the ILC, is widespread in the German-speaking region and has high reliability and validity [2, 58], which enables comparison of the present results with those of other studies. While the ILC contains fewer items than the instruments used in most QoL studies, such as the KINDL or the PedsQL [29, 30, 32–35, 38], it has an advantage in being able to more specifically detect the main aspects of QoL in self- and proxy evaluations [42, 65]. The use of both questionnaires and clinical interviews to obtain different types of data expanded the types of data that were investigated. Finally, the sample size is adequate to answer the research question and comparable to other longitudinal studies in regard with QoL in residential care settings. The verification of sample representativeness [21] supports the validity of the findings.

A number of limitations must be recognized. First, although it was established that there were no significant differences in psychopathology between residents who agreed to participate and those who declined, it is still possible that the voluntary participation resulted in a sample bias. Second, the study was conducted in a Swiss sample but the standardized QoL scores, against which participants' scores were compared, were derived from a sample of German youth, so cultural differences may have impacted the results. However, several studies demonstrated only very small differences in QoL between these two countries in comparison to the huge differences between other countries. Especially, QoL of children and adolescents in Germany, Switzerland and the Scandinavian countries was comparable [54, 55]. Moreover, the ILC is a well-established assessment tool in Germany and Switzerland, so, therefore, cultural influences probably would have been reported earlier. Third, since most participants had been in care for more than 2 years before the first assessment, a ceiling effect could not be excluded, because different studies [39, 40] reported the greatest gain of QoL within the first months after referral. The interval between the admission to residential care and the first assessment might result in an underestimation of the ability of residential institutions to improve QoL. Although QoL may have improved between the time of admission (when QoL was very limited) and the time of the first assessment, it could not improve further between the first and second assessments because a high level of Qol was already reached during the first year. The design and the resources of the study did not allow for assessments to be done prior to or immediately after admission. Even if a ceiling effect is taken into account it is important to detect the effect of further residential care on QoL because out of home placement is often a longer time and the effects will still be visible years after admission [18, 80]. Still, nearly nothing is known about the course of QoL during residential care. Finally, because of this long standing effect of residential care, the very short interval between the first and the second measurement needs to be added as a limitation—probably greatest gains happen after admission and in the last phase of residential care, in the month before transition to less intensive measures.

Conclusions

Encouragingly, participants in this study reported their QoL to be equivalent compared to that of children living with their own families. This provides evidence for high standards of youth welfare institutions in Switzerland. However, according to the caregiver assessments, the QoL of residents was significantly poorer than average. Since improvements over time in QoL as assessed by caregivers were found to be associated with decreases in mental health problems, it is important that residential care facilities expand the provision of evidence-based treatment options for reducing psychopathology and improving mental health. More research is needed to better recognize and understand causalities about the impact of out-of-home placements on QoL and to better understand gender differences, such as the higher QoL of male residents. Liaison services need to be established for under-provisioned residents to combine institutionalized care with evidence based psychotherapeutic interventions and to ensure the removal of barriers to treatment and to reduce its stigmatization; and these services must be provided with structure, adequate resources, and financial support [9, 21]. It has been shown that such services result in more children in need receiving treatment, and can reduce days in in-patient treatment in child and adolescent psychiatric departments [81]. Last but not least, longitudinal studies with a longer follow-up period should be conducted to assess gains in the QoL for youth in these circumstances.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval The study design was reviewed by ethics committees in Basel, Lausanne (Switzerland), and Ulm (Germany), and all participants provided informed consent (for those younger than 18 years, consent from the parent or legal guardian was obtained as well).

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