Chapter 3

Behaviour and social-emotional function in western and non-western obese adolescents; the adolescent and parent perspective

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Abstract

Purpose
Aims of our study were 1) to describe behavioural and social-emotional functioning from an adolescent and parental perspective; 2) to explore behavioural and social-emotional functioning in western and non-western obese adolescents.

Methods
Obese adolescents (11-18 years) visiting an outpatient paediatric obesity clinic completed the Youth Self Report (YSR) and parents the Child Behaviour Checklist (CBCL) to assess adolescents’ behavioural and social-emotional functioning.

Results
109 obese adolescents (mean BMIsds: 2.9±0.4) and their parents participated. Almost all mean YSR and CBCL scores were significantly higher in our obese sample than the reference value (T=50) of the norm population. Parents reported significantly more behavioural problems than their children. Parents, of both ethnicity’s, reported more internalizing and externalizing problems than their children. There were no significant differences between western and non-western adolescents, except for the attention problem score.

Conclusion
Parents of both western and non-western obese adolescents reported higher rates of behavioural and social-emotional problems than their children. These results underscore the need for treatment programs that not only focus on obtaining a healthy weight but also address these behavioural problems and social-emotional malfunctioning.
Background

Overweight and obesity in youth is a worldwide problem (1). In the United States, about 32% of the youth (2-19 years) is overweight or obese, while 17% is obese (2). In Europe, prevalence ranges from 16-22% for overweight including obesity, and from 4 to 6% for obesity (3). In the Netherlands, 13% of the youth is overweight, and 2% is obese (4). Repeating national evidence shows that in the Netherlands the prevalence of obesity and overweight are highest among non-western ethnic minority groups as Moroccan, Turkish and Surinamese South Asian (4,5). In Dutch children from the Turkish origin, prevalence rates are 2 to 3 times higher than in native Dutch children and also increase faster among Turkish children than among native Dutch children (4,5). In 2013, 11.7% of the Dutch population consisted of non-western immigrants. In Amsterdam, where the VU University Medical Center is located, this percentage was much higher with 34.9%.

Childhood overweight has both health and psychological consequences. Several studies showed that obese adolescents have a higher prevalence of psychopathology (behavioural and emotional problems) than normal-weight adolescents (6-9) with a higher prevalence in children seeking clinical treatment (8). Pruder and Munsch concluded that the most frequently implicated psychosocial factors in obese children and adolescents are externalizing problems (impulsivity and attention-deficit hyperactivity disorder) and internalizing behavioural problems (depression and anxiety) (10). These social, emotional, and behaviour problems can have a negative impact on the behaviours related to establishing or maintaining a healthy weight status (i.e. dietary intake and physical activity) (11,12). Previous studies found that healthy adolescents (11-18 years old) reported more behavioural and emotional problems than their parents (13,14). Only a few studies examined both parent and child reports among obese adolescents. These studies reported no mean differences between self-reported and parent-reported behavioural and emotional problems (6-8). However, in our obesity clinic, we noticed that parents were more worried than their children about their children’s health.

Besides obesity also ethnicity can play an important role in social and psychosocial wellbeing. Janssen et al., showed that Turkish immigrant adolescents reported more problems than their Dutch and native Turkish peers (15). As far as we know there is no study available about the effect of ethnicity on behaviour problems and social-emotional function in obese adolescents. Kocken et al., showed that the belief that genetic factors cause overweight was held significantly more often by Turkish parents than by Dutch parents (16). Although overweight and obesity were 3 times as high in the children of this Turkish response group, parental beliefs in this group about overweight prevention and management did not reflect a sense of urgency about changes in their child’s behaviour (16). An explanation for this can be the underestimation of the current weight status of their child. Observations in a multi-ethnic sample
of normal or overweight/obese children aged 5–7 years showed that mothers frequently underestimated the actual weight status of their child, especially mothers from Turkish or Moroccan origin (17). During our multidisciplinary group treatment Go4it, we observed that western adolescents benefited more from the Go4it intervention than non-western adolescents (18). Parental recognition and acknowledgement of their child’s weight are critical steps in the success of interventions aimed at preventing overweight (17).

The first aim of our study was to describe behavioural and social-emotional functioning from an adolescent and parental perspective. The second aim of our study was to explore behavioural and social-emotional functioning in western and non-western obese adolescents. These findings can help us to classify Dutch obese adolescents into different subtypes of behavioural and social-emotional functioning and subsequently offer better tailored treatment programmes.

Patients and Methods

Adolescents who were overweight or obese in the age range of 11-18 years and had been referred to the outpatient paediatric obesity clinic of the VU University Medical Center were invited to participate in the Go4it study, a multidisciplinary group treatment for obese adolescents (18,19). Adolescents were eligible when they met the following inclusion criteria: 1) aged between 11 and 18 years; 2) overweight or obese according to the definition of Cole et al. These are international cut off points for body mass index (BMI) for overweight and obesity by sex between 2 and 18 years, defined to pass through body mass index of 25 and 30 kg/m² at age 18, obtained by averaging data from Brazil, Great Britain, Hong Kong, the Netherlands, Singapore, and United States (20). Exclusion criteria were as follows: non Dutch-speaking, obese as a result of a known syndrome or organic cause (hypothyroidism), mental retardation, physical limitations, and diagnosed type 2 diabetes mellitus. At the first visit, the paediatric endocrinologist measured height and weight and interviewed the adolescents concerning their medical history, weight development and ethnicity (as part of regular care), according to a standard protocol. Subjects were categorized as being of western ethnicity when both parents were Dutch or with at least one parent born outside the Netherlands but inside Europe (including former Yugoslavia and Soviet Union), North America, Oceania, Indonesia, or Japan. Subjects with at least one parent born in Turkey, Africa, Latin America, or Asia were classified as non-western. This is according the classification of the National Institute of Public Health and the Environment (21). Two questionnaires (CBCL and YSR) were administered as part of the regular care of the obesity clinic to assess adolescents’ behaviour and social-emotional functioning. The medical ethical committee of VU University Medical Center approved the protocol. Adolescents, as well as their parents, gave written informed consent.
Measurements
- Child Behaviour Checklist and Youth Self Report

The 112-item Child Behavior Checklist (CBCL) is a parent questionnaire designed for the assessment of behavioural problems in children aged between 6 and 17 years (22). Adequate reliability and validity of the CBCL were confirmed for the Dutch translation (23). The 113-item Youth Self Report (YSR) questionnaire is a self-report questionnaire designed for assessment of behavioural problems in adolescents aged between 11 and 18 years (24). The YSR is the youth self-report version of the CBCL and assesses the same constructs and reports the same symptom scales. Good validity and test-retest reliability of the YSR have been established and confirmed by the Dutch translation (25). For CBCL and YSR, Cronbach’s alpha were 0.90 for both internalizing scales, 0.94 and 0.90 respectively for the externalizing scale and 0.97 and 0.95 respectively for the total problem scale (26).

These questionnaires cover behavioural, emotional, and social problems that occurred in the past six months. The respondents were asked to rate the occurrence of problems on a 3-point scale: 0 = not true, 1 = somewhat or sometimes true, and 2 = very or often true. The following syndrome scales can be derived from both questionnaires: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behaviour, and Aggressive Behaviour. The first 3 syndromes are also scored on an Internalizing broadband scale while the last 2 syndromes are scored on an Externalizing broadband scale. For each questionnaire, a Total Problem Score is derived by summing all individual item scores. For all subscales, raw scores were converted to T-scores in all subscales with higher T-scores indicating more problematic behaviour using a reference value of the norm population which is standardized at 50 (27). For the syndrome scales, T-scores up to 65 indicate the normal range. Scores from 65 to 69 reflect the borderline range (93rd–97th percentile) and indicate problems rated high enough to be of concern. Scores above 69 (above 97th percentile) reflect the clinical range and indicate problems of relevant deviance. For the Internalizing and Externalizing scale and the Total Problem scale, T-scores below 60 are in the normal range, T-scores of 60 to 63 (84th–90th percentile) are the borderline range, and T-scores above 63 (above 90th percentile) are in the clinical range.

Anthropometrics

Height was measured with an accuracy of 0.1 cm using an electronic stadiometer (KERN250D, De Grood Metaaltechniek, Nijmegen, the Netherlands). Body weight was measured (in underwear) within 0.1 kg with a calibrated electronic flat scale (SECA 861, Schinkel, Nieuwegein, the Netherlands). Weight and height were used to calculate BMI (weight in kilograms divided by the square of height in meters). For BMIsds, reference data of Dutch children collected in 1997 were used (www.growthanalyser.org; version 3.5). The BMIsds
indicates how many standard deviations a measurement is above or below the mean of the normal distribution.

**Statistical analyses**
Descriptive statistics (means ± SD) were used to describe the study sample with regard to demographic characteristics stratified by ethnic background (Table 1). Mean YSR and CBCL scores were compared with the reference group (norm data) by a one-sample test. Group comparisons between adolescents and parents (Table 2), on the eight syndrome scales, the Internalizing and Externalizing scale, and the Total Problem scale were tested with paired t-tests. Group comparisons between both ethnicities (western and non-western) (Table 3) were examined by linear regression analysis adjusted for age, sex and BMI. β-coefficients represent the mean difference between both ethnicities. Descriptive statistics was used to describe the study sample with regard to the percentage of the adolescents who had behaviour scores outside the normal range (e.g. in the borderline and clinical range; Figure 1). Data were analysed using SPSS 20.0. The significance level was set at $p<0.05$.

**Results**

**Participants**
Adolescents were recruited from May 2006 to June 2008. Of the 128 invited adolescents who provided informed consent, 109 (85%) return the questionnaires. There were no significant differences in baseline characteristics between participants and the 19 adolescents who did not fill in the questionnaires. Table 1 shows the characteristics of these 109 adolescents (56% girls) by ethnicity. There were no significant differences in these characteristics between western and non-western adolescents except for mean BMI and BMI SDSs, which were higher among the non-western adolescents (see Table 1).
Table 1: Demographic and anthropometric characteristics of Dutch adolescents (western versus non-western) referred to the obesity outpatient clinic. Data are (mean (sd)) unless otherwise indicated.

<table>
<thead>
<tr>
<th></th>
<th>Western (n=49)</th>
<th>Non-western (n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>14.5 (1.6)</td>
<td>14.0 (1.7)</td>
</tr>
<tr>
<td>Age onset, y</td>
<td>5.5 (4.2)</td>
<td>5.5 (4.4)</td>
</tr>
<tr>
<td>Height, cm</td>
<td>1.67 (0.11)</td>
<td>1.64 (0.09)</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>89.1 (19.4)</td>
<td>91.6 (18.2)</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>31.7 (4.7)</td>
<td>33.8 (4.3)*</td>
</tr>
<tr>
<td>BMIsds</td>
<td>2.79 (0.49)</td>
<td>3.01 (0.38)*</td>
</tr>
<tr>
<td>Overweight/Obese, n</td>
<td>12/37</td>
<td>1/59</td>
</tr>
</tbody>
</table>

Education adolescents, n (%)
- Primary school       8 (16)          18 (30)
- Secondary vocational education 29 (59) 32 (53)
- Higher general secondary education 12 (24) 10 (17)

*indicates p <0.05

**YSR and CBCL**

The mean scores on the Total Problem scale, Internalizing scale, Externalizing scale, and syndrome scales on the YSR and CBCL are shown in Table 2. All mean scores were significantly higher (ranging from 54 to 58) than the reference value (T=50) of the norm population, except for the Externalizing scale of the YSR. Parents reported more problems than their children on all scales.

Table 2: Mean problem scores (mean (sd)) and mean difference (95% CI), between adolescents (Youth Self Report) and their parents (Child Behaviour Check List).

<table>
<thead>
<tr>
<th></th>
<th>YSR n=109</th>
<th>CBCL n=109</th>
<th>Mean difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Problems</td>
<td>53.8 (8.1)</td>
<td>59.6 (9.1)</td>
<td>**5.75 (4.16; 7.34)**1</td>
</tr>
<tr>
<td>Internalizing Problems</td>
<td>54.6 (8.2)</td>
<td>61.5 (10.5)</td>
<td><strong>6.95 (5.29; 8.60)</strong></td>
</tr>
<tr>
<td>Externalizing Problems</td>
<td>51.0 (8.8)</td>
<td>54.6 (9.6)</td>
<td><strong>3.59 (1.74; 5.43)</strong></td>
</tr>
<tr>
<td>Anxious/Depressed</td>
<td>54.7 (5.1)</td>
<td>58.5 (8.3)</td>
<td><strong>3.84 (2.52; 5.17)</strong></td>
</tr>
<tr>
<td>Withdrawn/Depressed</td>
<td>56.1 (5.9)</td>
<td>62.2 (10.7)</td>
<td><strong>6.06 (4.24; 7.89)</strong></td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>57.7 (6.8)</td>
<td>64.4 (9.1)</td>
<td><strong>6.67 (5.09; 8.25)</strong></td>
</tr>
<tr>
<td>Social Problems</td>
<td>56.1 (5.9)</td>
<td>58.8 (8.6)</td>
<td><strong>2.63 (1.03; 4.24)</strong></td>
</tr>
<tr>
<td>Thought Problems</td>
<td>54.6 (5.8)</td>
<td>58.6 (7.6)</td>
<td><strong>4.03 (2.48; 5.58)</strong></td>
</tr>
<tr>
<td>Attention Problems</td>
<td>54.1 (5.1)</td>
<td>56.8 (7.0)</td>
<td><strong>2.71 (1.50; 3.91)</strong></td>
</tr>
<tr>
<td>Rule-Breaking Behaviour</td>
<td>54.4 (6.7)</td>
<td>57.1 (7.9)</td>
<td><strong>1.89 (0.82; 2.96)</strong></td>
</tr>
<tr>
<td>Aggressive Behaviour</td>
<td>54.3 (4.7)</td>
<td>56.2 (6.0)</td>
<td><strong>2.77 (1.28; 4.27)</strong></td>
</tr>
</tbody>
</table>

1Bold type indicates p<0.05
Adolescent reported problems were not significantly different between western and non-western adolescent (see Table 3) except for the Attention Problems scale (YSR). This was confirmed by the parent (CBCL). Western adolescent (YSR) and their parents (CBCL) reported higher levels on the attention problem scale, respectively 2.38 ($p=0.026$) and 3.26 ($p=0.025$) than non-western adolescents and their parents.

Table 3: Between group difference (western versus non-western) for the Youth Self-Report and Child Behaviour Checklist mean problem scores.

<table>
<thead>
<tr>
<th></th>
<th>YSR</th>
<th></th>
<th>CBCL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Western n=49</td>
<td>Non-western n=60</td>
<td>Adjusted between group difference (95% CI)</td>
<td>Western n=49</td>
</tr>
<tr>
<td>Total Problems</td>
<td>54.6 (7.7)</td>
<td>53.2 (8.4)</td>
<td>1.57 (-1.79; 4.93)$^1$</td>
<td>60.4 (9.2)</td>
</tr>
<tr>
<td>Internalizing Problems</td>
<td>54.7 (8.3)</td>
<td>54.4 (8.2)</td>
<td>0.09 (-3.34; 3.52)</td>
<td>61.3 (10.7)</td>
</tr>
<tr>
<td>Externalizing Problems</td>
<td>51.5 (8.1)</td>
<td>50.6 (9.4)</td>
<td>1.74 (-1.92; 5.40)</td>
<td>56.1 (9.4)</td>
</tr>
<tr>
<td>Anxious/Depressed</td>
<td>55.0 (5.1)</td>
<td>54.4 (5.0)</td>
<td>0.21 (-1.90; 2.31)</td>
<td>59.0 (8.1)</td>
</tr>
<tr>
<td>Withdrawn/Depressed</td>
<td>56.4 (5.6)</td>
<td>55.8 (6.2)</td>
<td>0.68 (-1.78; 3.13)</td>
<td>62.4 (11.3)</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>57.2 (6.3)</td>
<td>58.1 (7.3)</td>
<td>-0.80 (-3.66; 2.07)</td>
<td>64.0 (8.8)</td>
</tr>
<tr>
<td>Social Problems</td>
<td>56.7 (5.8)</td>
<td>55.7 (6.1)</td>
<td>0.88 (-1.56; 3.32)</td>
<td>59.8 (9.7)</td>
</tr>
<tr>
<td>Thought Problems</td>
<td>54.6 (4.8)</td>
<td>54.7 (6.6)</td>
<td>0.27 (-2.16; 2.70)</td>
<td>59.1 (7.3)</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>55.4 (5.9)</td>
<td>53.0 (4.1)</td>
<td>2.38 (0.29; 4.46)</td>
<td>58.5 (8.4)</td>
</tr>
<tr>
<td>Rule-Breaking</td>
<td>54.4 (4.6)</td>
<td>54.2 (4.8)</td>
<td>0.53 (-1.42; 2.47)</td>
<td>56.7 (5.7)</td>
</tr>
<tr>
<td>Aggressive Behaviour</td>
<td>54.2 (5.5)</td>
<td>54.5 (7.5)</td>
<td>0.53 (-2.22; 3.28)</td>
<td>58.0 (8.4)</td>
</tr>
</tbody>
</table>

$^1$B (95% CI) adjusted for age, sex and BMI; bold type indicates $p<0.05$
Figure 1 shows the percentages of adolescents (separated for both ethnicities) who have YSR and CBCL scores in the borderline and clinical range. Of the western adolescents, 37% reported internalizing and 16% reported externalizing problems, versus 28% and 18%, among the non-western adolescents. Among parents of western ethnicity, 59% reported internalizing and 37% reported externalizing problems, versus 53% and 27%, respectively of non-western parents.

![Figure 1: Percentages of the 109 adolescents' scores in the borderline or clinical range in the YSR and CBCL (w=western, nw=non-western)](image)

**Discussion**

This study shows that obese adolescents experience serious behaviour problems and social-emotional malfunctioning, which was confirmed by their parents. Mean YSR and CBCL scores for total and all subscales were significantly higher than the reference group, except for the Externalizing scale of the YSR. Parents reported more problems than their children on all scales. There were no significant differences between western and non-western adolescents, except for the attention problem score.

Compared to Dutch adolescents treated in outpatient clinics, our obese sample experienced more behavioural and social-emotional problems than for instance adolescents with type 1 diabetes mellitus, sickle cell disease or born after IVF.
This underscores that obesity affects not only health but also psychological well-being. This is in line with previous studies outside the Netherlands that found that obese adolescents have a higher prevalence of psychopathology (behavioural and emotional problems) than normal-weight adolescents (6,8,9).

Erermis et al. (2004) studied the presence of psychopathology with the CBCL between clinically obese adolescents (obese adolescents seeking treatment in an outpatient clinic), non-clinical obese adolescents, and normal weight adolescents. The clinical obese adolescents scored significantly higher on behavioural and emotional problems than the other 2 groups (31). In both the study of Erermis et al. and in our study, the question remains whether the higher scores on the CBCL resulted from the children’s behaviour or parent’s concern about their children’s behaviour because the CBCL scores were based on parental reports. In our study, the self-reported YSR scores were significantly lower than the parent-reported CBCL scores in contrast to 2 other studies in obese adolescents which found that the amount of behavioural and emotional problems were almost equal between parent and child report (6,14). These study samples had comparable mean BMI or BMIsds to our study sample. A possible explanation could be that the referral to a hospital influenced the parent-youth (dis)agreement. We noticed that parents’ perceptions of problems regarding the level of obesity were often the reason for referral to a hospital rather than the adolescents’ perception. The explanation for these differences is that the child perspective reflects the individual’s perception, judgement, and tolerance of his/her behaviour and their feelings, thoughts, and fantasies across different situations. Parent-reports are mainly based on the observable behaviour of their child at home compared with other children, and verbal reports by their child and others. Especially adolescents are indispensable informants about their problem behaviour, because many of the problems they experience remain unnoticed by their parents (14). Furthermore, the observed discrepancies might be a response shift or adaptation of the adolescents according to their amount of overweight. Several studies showed a correlation between BMI and psychopathology. Bogt et al., demonstrated that BMI was correlated with internalizing and externalizing problem behaviour, as well as social, attention and thought problems (32). Britz et al., found a higher prevalence of psychiatric disorders (mood, anxiety, eating disorders) in extremely obese adolescents (BMI=42.4 kg/m²) compared to obese adolescents (BMI=29.8 kg/m²) (33). In our study we did not find a correlation between reported problems and BMI or BMIsds, which may be due to the finding that our study sample was rather homogeneous with respect to both BMI and reported psychiatric problems. The increased prevalence of behaviour and emotional problems in obese adolescents advocates for an interdisciplinary approach in the treatment of obesity in a clinical setting. We recommend not only to provide
behavioural interventions (34), but also evaluate the psychological well-being of adolescents during treatment.

Our study sample limits the generalizability to children seeking treatment for obesity in a large city of the Netherlands. Our results may not be generalizable to all adolescents with obesity or those treated by general health practitioners in smaller cities in the Netherlands. The majority lived in Amsterdam, where almost 50% of the population is of non-western descent in contrast to other regions of the Netherlands where generally 30% of the population is of non-western descent (www.zorgatlas.nl). Only 34% of our sample was of Dutch origin, the majority of the non-western adolescents were of Turkish descent.

A strength of our study is that we included both parent and self-reported questionnaires.

Very little research on emotional and behavioural problems has been conducted in Dutch obese children. The only study that assessed the CBCL as a secondary outcome in overweight and obese children reported similar total problem scores (internalizing and externalizing scores were not reported) (29). Limitations of both questionnaires are the reliance on self-report and the fact that to the best of our knowledge both questionnaires have not been validated in an obese population.

Our results underscore the relatively high prevalence of emotional and behavioural problems in treatment-seeking adolescents, in concordance with previous studies. Treatment-seeking has also been associated with disturbed eating behaviour, depressive and anxiety symptoms and a higher degree of overweight (6,31,35). This emphasizes the need for psychological support and treatment of these adolescents in clinical practice. It would be worthwhile to replicate our study on a population of overweight children followed in general child health care or who are not clinically-referred.

**Conclusions**

Obese adolescents perceive serious behavioural problems and social-emotional malfunctioning. Their parents reported even more problems than their children. These results underscore the need for treatment programs that not only focus on healthy weight but also address these behavioural problems and social-emotional malfunctioning.
Reference List


