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Caregiver Concern in Adolescents with Persistent Obesity: The Importance of Quality of Life Assessment

Christopher C. Cushing, Ph.D.¹, Channele T. Bishop-Gilyard, Psy.D.^{2,3}, Richard E. Boles, Ph.D.⁴, Jennifer Reiter-Purtill, Ph.D.⁵, and Meg H. Zeller, Ph.D.⁵

¹Oklahoma State University

²Perelman School of Medicine at the University of Pennsylvania

³The Children's Hospital of Philadelphia

⁴University of Colorado Denver

⁵Cincinnati Children's Hospital Medical Center

Abstract

Objective—To examine female caregiver and adolescent dyad characteristics that predict the female caregiver's concern about their adolescent's weight, and the degree to which caregiver concern predicts desire for physician intervention.

Method—Fifty three caregivers of adolescents with persistent obesity were asked to report on their adolescent's QOL, weight status, concern about their adolescent's weight, and desire for physician intervention.

Results—Results indicated that only caregiver-reported QOL was a meaningful predictor of caregiver concern for African American adolescents with persistent obesity accounting for 51% of the variance, and that caregiver concern predicted desire for physician intervention accounting for 46% of the variance.

Conclusion—Based on these findings it is recommended that practitioners assess caregiver perception of obesity-specific QOL in their adolescent patients with persistent obesity particularly those who are African American.

Keywords

Obesity; quality of life; adolescents; caregiver concern; assessment

While the prevention and treatment of pediatric obesity has emerged as a critical public health priority, an overwhelming majority of youth with obesity will persist in their obese status throughout adolescence and adulthood.^{1–6} Thus, a sizable number of today's youth face heightened risk for current and subsequent physical and psychosocial morbidity. The problem of persistent obesity is obvious and concerning to members of the health care community, but may not generate the same concern in caregivers. Therefore, it is critical to identify factors that drive caregiver concern which can be modified in clinical practice. Such

Please direct all correspondence to: Meg H. Zeller, Division of Behavioral Medicine and Clinical Psychology, MLC-3015, Cincinnati Children's Hospital Medical Center, 3333 Burnet Avenue, Cincinnati, OH 45229. meg.zeller@cchmc.org, Phone: (513) 636-4336, Fax: (513) 636-3677.

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efforts are important to increase practitioner's ability to prompt increased health care consumption among caregivers of youth with obesity.

At the family level, caregiver feeding concern is a psychological construct measuring how concerned a caregiver is regarding their adolescent's weight and diet, and appears to vary significantly among caregivers of adolescents with obesity.⁷ Increasing caregiver concern is an important goal within the public health effort to curb obesity. Unconcerned caregivers present a problem in terms of health care utilization in conditions such as pediatric obesity where there is growing evidence that caregivers may not recognize that their child or adolescent is obese and may, therefore, not perceive a reason for concern if weight status is the only variable, which they are prompted to monitor.⁸⁻¹² In general, caregivers are only successful in accurately categorizing their child's weight status 21- 31% of the time while caregivers of adolescents with persistent obesity fail approximately one third of the time, with particularly poor rates of accuracy among lower-income families.^{8, 12-15}

In contrast, caregivers appear to be much more effective at identifying when their child or adolescent with obesity is experiencing impairment in their quality of life (QOL). Concordance studies have shown significant correlations and high agreement of child and adolescent report of their own QOL with that of caregivers; additionally, caregivers' report of functional impairment or QOL regularly factors into decision making regarding healthcare utilization, suggesting that QOL may be more salient to caregivers than their adolescent's actual size.^{8, 16, 17} Moreover, it appears that sex and racial differences may exist such that African American caregivers of overweight adolescents report more problems with physical functioning and bodily pain and discomfort than Caucasians, and that caregivers have greater concern for their female adolescent's weight.^{12, 18} In summary, caregivers are critical drivers of healthcare utilization for weight-related health issues in their adolescents, as this developmental period does not yet warrant autonomous health care decision-making. Concern about an adolescent's weight is a key variable that influences a caregiver's decision to seek care. However, it is yet unknown what, in particular, increases or decreases caregiver's concerns about the weight of their adolescent with persistent obesity. One likely variable is the caregiver's perception of the adolescent's quality of life. That is, a caregiver who perceives their child to be suffering in some way is more likely to initiate a health care contact than one who does not perceive the same level of suffering.

The current study addresses a gap in the literature by providing preliminary evidence of the drivers of caregiver concern for their adolescents with persistent obesity, and thus, illuminate variables that may be amenable to intervention for the practicing clinician. Based on the available literature, it was hypothesized that: 1) lower caregiver-reported QOL and their adolescent being a female would predict higher caregiver concern; it was predicted that underestimation of body size, female caregiver BMI, and adolescent zBMI would not be meaningfully associated with caregiver concern; and 2) caregiver concern would significantly and positively predict caregiver desire for a physician to address weight in their adolescent.

METHOD

Participants

Following Institutional Review Board Approval and consent and assent, 53 female caregiver-adolescent dyads participated in the present cross-sectional study. These 53 dyads originated from an earlier study (*initial*) regarding psychosocial correlates of obesity in youth (BMI ≥ 95th percentile) at the time of the family's initiation of treatment within a pediatric hospital-based weight management program. Eligibility at *initial* data collection required youth to: 1) be 8–16 years of age, 2) attend mainstream classrooms outside the

home, 3) have a BMI 95th percentile, and 4) reside within 60 miles of the hospital. There were 86 participants at the *initial* assessment study; of those, 21 were ineligible for Time 2 (i.e., 19 aged out, 1 died, 1 had no participation due to caregiver illness). Four years after completion of the *initial* study, participants were approached regarding participation in the study reported here (Time 2) which is cross-sectional and unrelated to the study conducted at the *initial* time period. Six families declined participation in the Time 2 study. Of those, 4 were no longer obese, and 2 had no participating female caregiver leaving the 53 dyads. These 53 dyads were subsequently enrolled for the present cross-sectional study (Time 2). At this time (Time 2) none of the participants were receiving treatment in the program offered at the *initial* time point. Caregiver-adolescent dyads were approached for recruitment for the Time 2 study only if the adolescent remained 18-years-old. Of those adolescents who were age-eligible, 84% participated. Age-eligible nonparticipants at Time 2 had significantly higher *initial* BMIs than participants (38.9 ± 8.3 vs. 34.2 ± 5.8 ; $t(82) = 2.98$; $p < .01$). Given the present study's aim to examine predictors of parental concern among youth with persistent obesity, the current study included only dyads where the adolescent participant persisted in their obesity from *initial* to Time 2. Participants had a mean age of 16.06 ± 1.51 years and zBMI of $2.45 \pm .26$ at Time 2. The adolescent sample was 52.8% female and had a relatively equal representation of Caucasian (50.9%) and African American (49.1%) youth. Female caregivers had a mean age of 41.22 ± 7.97 years and were primarily overweight (18.9%) or obese (64.2%; $M_{\text{BMI}} = 34.53 \pm 9.37$). The majority (96%) of caregivers were mothers; one caregiver was a female legal guardian, and one was a grandmother.

Measures

Demographic questionnaire—The demographic background questionnaire assessed caregiver age and level of education, family income, and family composition at the initial assessment. Adequate data are available to calculate the Revised Duncan (TSEI2), an occupation-based measure of socioeconomic status (SES) with higher values indicating higher SES.^{19–21}

Anthropometric data—Trained research assistants were responsible for collecting height and weight data from adolescents and their female caregivers, using a calibrated custom portable stadiometer (Creative Health Products, Plymouth, MI) and a portable SECA digital scale (SECA, Hamburg, Germany). Measurements were taken in triplicate and the means used to calculate Body Mass Index (BMI: kg/m^2). BMI z-score values (zBMI) were calculated for adolescent participants using age- (to the nearest month) and sex-specific median, standard deviation, and power of the Box-Cox transformation (LMS method) based on national norms from the Centers for Disease Control.²²

Quality of life—Caregiver-reported obesity-specific QOL was assessed using the 22-item *Sizing Them Up* scale, which assesses the caregiver's perspective of their adolescent's emotional functioning, physical functioning, amount of teasing/marginalization, mealtime challenges, positive social attributes, and school functioning as it relates to their "weight, shape or size".¹⁶ *Sizing Them Up* has demonstrated good internal consistency ($\alpha = .91$) and test-retest reliability (.80).¹⁶ In addition, *Sizing Them Up* measures QOL as a multidimensional construct and all of the constructs converge on a unitary "total score" factor. The measure demonstrates appropriate convergent validity with other measures of obesity-specific self-reported QOL (i.e., Impact on Weight Quality of Life-Kids²³; total score correlation $r = .22$) and general QOL (i.e., Pediatric Quality of Life Inventory²⁴; total score correlation $r = .70$).¹⁶ The measure also has demonstrated adequate predictive validity in a sample of adolescents underwent bariatric surgery with pre- to post- surgical effect sizes equaling 2.69 for the total score. For the current study only the total score was computed and

demonstrated adequate internal reliability ($\alpha = .92$) across all participants and ($\alpha = .81$) within African Americans and ($\alpha = .86$) among Caucasians.

Caregiver concern—The three items from the Child Feeding Questionnaire²⁵ that make up the concern scale were used to create a scale score. Items included: “How concerned are you about your child eating too much when you are not around him/her?”; “How concerned are you about your child having to diet to maintain a desirable weight?”; and “How concerned are you about your child becoming overweight?” Responses are arrayed on a scale from 1 (Unconcerned) to 5 (Concerned). The concern scale of the CFQ has been demonstrated to be a meaningful factor with good internal consistency ($\alpha = .82$), uniform factor loadings of the three items, predictive validity for adolescent BMI (e.g., $\beta = 7.98$, $p < .001$), and convergent validity with the other constructs that make up the child feeding questionnaire in a sample of parents of adolescent aged 10–19 ($M = 15$).²⁶ In the current study the concern scale of the CFQ demonstrated adequate internal reliability ($\alpha = .82$) across all participants and ($\alpha = .90$) within African Americans and ($\alpha = .78$) among Caucasians.

Misperception of Body Size—To assess the caregiver’s misperception of their adolescent’s current weight status, caregivers completed an item from the CFQ, which were formulated into a discrepancy score for the present study. Caregivers were asked to respond to the item “Your teen from 9th grade through 12th grade is...” utilizing a 5-point scale and response choices of very underweight, a little underweight, just right, a little overweight, or very overweight. A discrepancy score was then calculated using caregiver perception of the adolescent’s weight and the actual clinical category appropriate for the adolescent (i.e., overweight, obese, or extreme obesity [BMI 99th percentile]). This is similar to the method of calculating a discrepancy score from a caregiver’s report on the Children’s Body Image Scale²⁷ employed by Lampard and colleagues,⁷ but uses text based prompts rather than images. For the current sample, all participants were obese and the discrepancy score was 0 if caregivers marked “very overweight”, 1 if they marked a “little overweight”, and 2 if they marked “just right.”

Caregiver desire for intervention—Caregivers were asked to respond to three items designed for the purposes of the present study: “How much would you like your teen’s doctor to talk with your teen about his/her weight”, “How much would you like your teen’s doctor to talk with your teen about his/her eating habits”, and “How much would you like your teen’s doctor to talk with your teen about his/her level of physical activity?” Responses were coded on a four point scale from 1 to 4 and summed to create a score with higher scores indicating a greater desire for intervention. The desire for intervention scale demonstrated adequate reliability in the current sample ($\alpha = .83$) across all participants and ($\alpha = .74$) within African Americans and ($\alpha = .90$) among Caucasians.

Data analysis plan

In order to test the hypotheses stated above, the data were entered into a multivariate path model using Mplus6.²⁸ Sex, caregiver-reported QOL, underestimation of body size, female caregiver BMI, and adolescent zBMI were entered into the model as exogenous variables predicting caregiver concern and desire for physician intervention. To specifically model the differences between Caucasian and African American adolescents, the sample was assigned to two different groups for the purpose of the statistical analysis. Mplus6 provides model fit statistics based on the entire sample and individual parameter estimates are estimated for each group. Therefore, the current model yields one set of fit statistics, but individual regression coefficients are representative of either the Caucasian or African American group. To investigate an indirect effect of caregiver-reported QOL on desire for physician

intervention caregiver concern was specified as a mediator of these two variables. Due to the small sample size the current analysis incorporated 5,000 bias-corrected bootstrapped samples to better estimate the population parameters of adolescents with persistent obesity.^{29, 30} Bias-corrected bootstrapping allows for power of .80 when samples are small (e.g., as low as 34) and standardized correlations are moderate.³¹ To assess the overall model fit, results were evaluated by examining the chi-square test of significance, comparative fit index (CFI), non-normed fit index (NNFI), and the root mean squared error of approximation (RMSEA). Model fit was considered acceptable if the CFI and NNFI were above .90 and the RMSEA was below .1.³²

RESULTS

Preliminary Analysis

The variables entered into the model were normally distributed except for underestimation of body size, which was significantly skewed and was mean centered prior to analysis. Table 1 provides unadjusted mean and standard deviation values for the sample. Initial screening of correlations between the study variables revealed that SES was uncorrelated with any other variables in the current study. Therefore, SES was not included. Significant bivariate correlations were observed for: 1) caregiver and adolescent BMI, 2) caregiver perception of the adolescent's QOL and race, 3) concern and caregiver perception of the adolescent's QOL, biological sex and desire for physician intervention, 4) underestimate of the adolescent's weight and caregiver perception of the adolescent's QOL, 5) and concern and underestimate of the adolescent's weight. Bivariate correlations are presented in Table 2.

Path Model

The path model revealed close fit to the data $\chi^2 = (22, n = 53) 49.08, p < 0.001, RMSEA = .0.0, CFI = 1.00, NNFI = 1.00$. However, significant differences were observed across Caucasian and African American groups. In the Caucasian group, none of the paths were significant, although there was a trend toward significance for caregiver-reported QOL on caregiver concern ($\beta = -.12; p = .08$). In the African American group the current model accounted for 51% of the variance in caregiver concern. As predicted in hypothesis 1 the path from caregiver-reported QOL to caregiver concern ($\beta = -.13$; see Figure 1 representing the model in the African American sample) was significant indicating that lower quality of life was associated with higher caregiver concern while the paths from underestimation of body size, sex, caregiver BMI, and zBMI were nonsignificant. As predicted in hypothesis 2 the path from caregiver concern to caregiver desire for physician intervention was significant ($\beta = .42$) and accounted for 46% of the variance in caregiver desire for intervention indicating that as caregiver concern increased the desire for physician intervention also increased. The test of bias-corrected bootstrapped standard errors indicated that caregiver concern did mediate (95% CI = $-.113 - -.002$) the relationship between caregiver-reported QOL and desire for physician intervention. Therefore, in the African American participants, there is a direct effect of caregiver-reported QOL on caregiver concern and a direct effect of concern on desire for physician intervention, and an indirect effect of caregiver-reported QOL on desire for intervention through concern.

DISCUSSION

Persistent obesity among adolescents is a problem well known to health care providers. An obvious clinical intervention is to attempt to increase a caregiver's concern for their adolescent's well-being by pointing out the obesity and its persistence to ensure that a caregiver has an accurate understanding of the adolescent's weight status and physical health risks. However, the results of the current study indicate that information about the

adolescent's weight has no bearing on increasing caregiver concern for adolescents with persistent obesity. Instead, in this context, caregivers determine their level of concern based on the effect that an obese adolescent's weight has on their QOL. This is in contrast to Kaur et al²⁶ who reported a significant correlation ($r = 0.59$) between parent's perception of adolescent weight and concern, and may be due to the fact that the Kaur study did not include QOL in their model. As we hypothesized, the current data suggest that caregiver-reported QOL accounts for parental concern while perceived weight does not contribute when examining only unique sources of variance.

As hypothesized, caregiver underestimation of their adolescent's body size, adolescent zBMI, and caregiver BMI do not appear to play a meaningful role in determining concern among caregivers of adolescents with persistent obesity. Thus, health care providers treating these patients should consider discussing caregiver-perception of QOL as a means of changing caregiver concern rather than discussing clinical categories of weight, which are understandably concerning to the physician but appear to be discounted by the caregiver.

Within this sample of adolescent's with persistent obesity, caregiver concern for their adolescent's weight significantly predicted the desire for a physician to address the condition. These findings are consistent with previous studies demonstrating that caregiver concern for their adolescent's health plays an important role in determining whether caregivers desire an intervention.³³ Moreover, these findings provide initial evidence that caregiver-reported QOL serves as a more salient factor than the caregiver's perception of their adolescent's clinical weight category or the adolescent's actual zBMI.

The importance of caregiver buy-in and participation in weight-loss interventions for their children is well established.^{34–36} The current American Academy of Pediatrics recommendations on the prevention, assessment, and treatment of pediatric overweight and obesity acknowledge the importance of the family and the need for caregivers to make changes in the adolescent's home environment, dietary intake, and exercise schedule when treating pediatric overweight and obesity; however, little guidance is given on how providers should motivate caregivers of patients to make changes when they do not perceive a problem or when the changes required are difficult.³⁷ Assessments of obesity-specific QOL in pediatric populations provide brief and targeted information regarding an adolescent's subjective functioning in physical, social, and emotional domains.¹⁶ Items are typically face-valid questions about a given adolescent's functioning. Generally speaking, an obesity-specific QOL assessment administered to a caregiver is a detailed and valid method of asking, "How is your adolescent doing day-to-day with regard to weight?" It is likely that indicators of QOL are more consistent with the methods caregivers are already using to assess their adolescent's functioning, and may tap more into a caregiver's desire to promote general well-being in their adolescent than anthropometric methods.⁸ In a way, QOL provides a method for physicians and caregivers to "speak the same language" regarding concerns for these difficult to treat patients.

It is also noteworthy that the effect of caregiver-reported QOL on caregiver concern, while present only as a trend in Caucasians, is pronounced in African American caregivers. This indicates that QOL discussions are particularly important to ensure appropriate care is available to African American adolescents who are persistently obese. The markedly greater magnitude of the finding in African Americans combined with the previous literature indicating that African American caregivers are more likely to identify problems with physical functioning and bodily pain in their adolescent result in a particularly compelling case for caregiver report of obesity-specific QOL assessment among African American adolescents who are persistently obese.¹⁸

Limitations

Departing from study hypotheses, adolescent sex did not emerge as a significant predictor of caregiver concern most likely due to low statistical power. Future studies, and with larger and more diverse samples (e.g., race/ethnicity, socioeconomic status), are needed to fully examine these associations and to understand whether they vary across demographic sub-groups (i.e., moderator or group-wise analysis). In particular a larger study examining boys and girls as independent groups may be useful. Finally, the present sample is arguably unique given they represent adolescents who, despite their previous presentation to a hospital clinic setting for weight management intervention, remained obese over time. Admittedly, this was an unexpected finding that emerged only when we executed the present follow-up of the originally “clinical” sample. It is possible that caregiver concern is different for adolescents with persistent obesity who have never sought clinic-based treatment, or adolescents with new onset of obesity, or adolescents with prior obesity (e.g., successful weight loss) who remain overweight.

CONCLUSION

Physicians and affiliated healthcare providers should consider incorporating caregiver-report of obesity-specific QOL assessment into their practice with adolescents who are persistently obese. If the busy practitioner is not able to administer and score a full obesity-specific questionnaire, then a simple clinical interview question such as “how is your son/daughter’s size affecting their day-to-day life” may provide a good starting point. By understanding caregivers’ assessment of their adolescent’s quality of life, clinicians can better understand the causes for their concerns and use these to help motivate initiation or maintenance of a weight-loss regimen.

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Figure 1. Final Model of Caregiver Concern in African Americans

Note: Desire for physician intervention was also regressed on each independent variable, but these paths are omitted for clarity. The indirect effect of QOL on desire for physician intervention was significant (95% CI = $-.113 - -.002$). NS = Nonsignificant regression path at the $p < .05$ level.

Table 1

Sample Means and Standard Deviations

Scale	<i>M</i> (<i>n</i> = 53)	<i>SD</i>	Range
Adolescent zBMI	2.45	.26	1.9–2.85
Caregiver-reported QOL	76.65	16.24	35–100
Caregiver Concern	11.78	3.66	3–15
Desire for Physician Intervention	9.16	2.18	3–12
Misperception of Body Size	.55	.67	--
Caregiver BMI	34.53	9.37	18.8–60.5
Caregiver SES	35.29	18.42	15–85.06

Note: Misperception of body size was mean centered for analysis

Table 2

Bivariate Correlations of Study Variables

Header	Adolescent zBMI	Caregiver BMI	Sex	Race	QOL	Concern	Desire for Physical Intervention
Caregiver BMI	.438**						
Sex	.017	-.022					
Race	-.148	-.245	.100				
QOL	-.115	.193	-.072	-.406**			
Concern	.210	.092	.011	-.194	-.428**		
Desire for Physical Intervention	-.010	-.191	-.282*	-.220	.025	.268	
Underestimate of Adolescent's Weight	-.088	.047	.126	-.039	.327*	-.339*	-.009

Note: $N = 53$,

* $p < 0.05$,

** $p < 0.01$.