Self-Esteem of Adolescents Who Were Born Prematurely

Saroj Saigal, MD, FRCP(C)*; Michael Lambert, PhD#; Chad Russ, BS#; and Lorraine Hoult, BA*

From the *Department of Pediatrics, McMaster University, Hamilton, Ontario, Canada; and #Department of Psychology, Michigan State University, East Lansing, Michigan.

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ABSTRACT. Objective. To determine whether there are any diff erences between the self-esteem of a cohort of adolescents who were extremely low birth weight (ELBW) in comparison with term controls (cs); and to test the associations between self-esteem and several predefined predictor variables.

Background. Self-esteem is considered to play a significant role in psychological adjustment and scholastic success. Little information exists on how adolescents who were ELBW regard themselves.

Design/Methods. Longitudinal follow-up of a regional cohort of 1321169 (78%) ELBW survivors and 1271 145 (88%) sociodemographically matched Cs, born between 1977 and 1982. Measures: Harter Adolescent Self-Perception Profile (1988) with 9 dimensions, including Global Self-Worth, socioeconomic status (Hollingshead), height-for-age and weight-for-age z scores, and Wide Range Achievement Test-Revised (WRAT-R; Reading, Spelling, and Arithmetic). Data Analysis: General linear model multiple analyses of covariance were performed to determine whether significant relationships existed between the 9 self-esteem dimensions and the independent variables of birth weight status and gender, and the covariates of age, socioeconomic status, physical development, and academic achievement.

Results. Global Self Worth was similar for ELBW and Cs (means: 3.1 and 3.2). Multivariate effects revealed no interactions, but significant main effects emerged for birth weight status, gender, weight-for-age z scores, age in months, and for all 3 WRAT-R subtests, all effect sizes medium to large.

Follow-up, analysis of covariance revealed medium~ size gender effects for athletic competence (means: 3.1 and 2.6), and physical appearance (means: 2.9 and 2.5), where boys rated themselves significantly higher on both domains; and age effects, where older teens rated themselves better for job competence. Significant but small effect sizes emerged for the following: 1) weight-for-age z scores, where heavier youth rated themselves higher on close friendships, 2) gender, where girls had higher ratings for close friendships, 3) birth weight, where Cs rated themselves higher on athletic competence, and 4) WRAT-R math effect, where children with higher math scores rated themselves better on scholastic competence.

Conclusions. Overall, ELBW teenagers do not differ significantly from C teenagers on most dimensions of self-esteem. Gender effects emerged on some Harter domains. Pediatrics 2002;109:429-433; self-esteem, adolescence, self-concept, extremely low birth weight, controls.

ABBREVIATIONS. VLBW, very low birth weight; GSW, global self-worth; ELBW, extremely low birth weight; C, control; SPPA, Harter Self-Perception Profile; WRAT-R, Wide Range Achievement Test-Revised; SES, socioeconomic status; MANCOVA, multiple analysis of covariance; ANCOVA, analysis of covariance; SD, standard deviation; ES, effect size.

The primary focus of most studies on the outcome of children who were born prematurely has been to report on neurodevelopmental morbidity, cognitive functioning, and school difficulties.1-5 A few investigators recently have reported on the behavioral

and emotional adjustments in early to mid-childbood.6-8 It is apparent from these studies that infants who were very low birth weight (VLBW) are at a significantly greater risk for a wide array of neurodevelopmental, cognitive, behavioral, and emotional difficulties than children born at term.1-8 These differences seem to persist even when children with neurologic impairments are excluded from the study population. 5,7

In the last 2 decades, there has been increasing recognition of the profound role that self-esteem plays on all aspects of children's development.9 It is generally agreed that self-esteem is the evaluative component of the self-concept.10 Self-esteem has been variously defined by researchers and clinicians as an "expression of approval or disapproval, involving the extent to which a person believes himself or herself competent, successful, significant and worthy~ "11' Self-esteem also refers to the "discrepancy between a person's actual and ideal self,"10 and how adequately an individual performs in domains in which that individual considers success to be important.12 Thus, low self-esteem would ensue if there is a significant discrepancy between one's expectations and perceived adequacy. 13 However, despite the extensive literature, research on self-esteem is flawed because of ambiguous definitions of the construct, lack of appropriate theoretical models, and inadequate instruments to measure the same. 14,15

Several studies suggest that self-esteem plays a significant role in personal adjustments, quality of peer relationships, motivation, as well as in athletic and scholastic success.9 Harter 16 has shown that among teenagers, physical appearance, particularly among girls, correlates most high1y with global self-worth (GSW). This is followed closely by peer social acceptance, whereas scholastic competence, athletic abilities, and conduct are less influential. It is also often assumed that people with a physical disability have lower self-esteem than the able-bodied. 17 Given that there is little information on how adolescents who were extremely low birth weight (ELBW) regard themselves, we propose to compare first the self-esteem of ELBW and term control (C) adolescents; second, to determine whether there are any differences in self-esteem between adolescents with and without neurosensory impairments; and finally, to test the association between self-esteem and several predefined predictor variables. We hypothesized that there would be no differences in self-esteem. dimensions between ELBW and C teenagers, nor between ELBW teenagers with and without neu~ rosensory impairments.

METHODS

Respondents ELBW Cohort

The ELBW survivors, 501 to 1000 g birth weight, were born between 1977 and 1982 Io residents of a geographically defined region in central-west Ontario and followed longitudinally from birth.4 At the time of the current assessment, the children ranged between 12 and 16 years of unadjusted age.

Controls (Cs)

Cs were recruited at 8 years old from a random list of children obtained through the Directors of the Hamilton Public and Roman Catholic Separate School Boards and matched for sex, age, and social class to each index child (1977-1981 births).4 These children were also followed longitudinally and reassessed at the same age as the ELBW adolescents.

Measures

We used the Harter Self-Perception Profile (SPPA) for adolescents. 111 This scale is designed to measure teenagers' perception of their competence in, and the importance to them in the following 8 domains: scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, and close friendship. These domains were discriminable through factor analytic procedures. In addition, the Harter SPPA provides a GSW score. This is a number between 1 and 4 and is the mean score given to 5 items that tap the extent Io which the

adolescent likes himself/herself as a person and is happy with the way he/she is. Thus, it constitutes a global judgment of one's worth as a person, rather than domain-specific competency or adequacy.

The SPPA is comprised of a total of 45 items and is recommended for use for children in the 9th through the 12th grades. The reponse format includes both positively and negatively worded phrases, designed to eliminate the "pull" for socially desirable responses: for example, "some kids have a lot of friends, but others don't have many friends." Harter also introduced a 2-step response format whereby the adolescents must first choose the direction and then the intensity of their response. This instrument is used widely and has been found to have sound psychometric properties.19 The internal consistency ranged from 0.74 to 0.92 (median: 0.81); 6 of the 9 subscales had good internal consistency.

The questionnaire was self-completed by the teenagers in a private room at McMaster University after they completed direct interviews for a study on their health-related quality of life.20 The teenagers also participated in standardized psychometric assessments,5 including the Wide Range Achievement Test-Revised (WRAT-R).21 Physical growth measures, height, weight, and head circumference were obtained by standard techniques. Hollingshead 4-factor index (AB Hollingshead, unpublished data, 1975) was used to describe parental socioeconomic status (SES).

Informed Consent

The study was approved by the Ethics Committee of Hamilton Health Sciences Corporation, and written informed consent was obtained from the parents of all participants.

Statistical Analyses

We performed a general linear model multiple analysis of covariance (MANCOVA) to reduce the probability of Type 1 error (which could have resulted if separate analysis of covariance [ANCOVA] analysis was performed on each self-esteem variable). The independent variables were gender and birth weight status (ELBW vs Cs); the dependent variables were each of the 8 Harter Self-Esteem dimensions and GSW. The following variables were included as covariates in the model, based on a review of the literature that indicates their association with self-esteem: age, physical development, academic achievement, and social class.7,16 Thus, besides the age of the children (calculated in months), standardized weight-for-age and height-for-age z scores were considered as proxies for physical development, and the WRAT-R21 reading, spelling, and math scores were entered separately in the model as proxies for academic achievement. In all, there were 7 continuous independent variables (SES, chronological age, weight-for-age z scores, height-for-age z scores, WRAT-R reading. spelling, and math scores), 2 categorical independent variables (gender and birth weight status), and the 9 Harter indices, including GSW, as multivariate dependent variables.

RESULTS

Study Respondents

ELBW Adolescents

Between 1977 and 1982 inclusive, 179 ELBW infants survived to hospital discharge (48% survival rate), and 10 children subsequently died leaving 169 available survivors. Of these, 13 children were lost; 5 lived too far away, 6 refused to participate, and 9 severely impaired children were untestable, leaving 141 available survivors. One hundred thirty-two children (78%) completed the study questionnaire.

Control Adolescents

A total of 145 Cs were recruited at 8 years of age. Of these, 10 children were lost, 9 refused, and 2 lived too far away. Of the remaining children, 117 (81%) completed the assessment.

Demographic Data

Table 1 shows the demographic data on both ELBW and C adolescents. The mean birth weight of the ELBW infants was 839 (standard deviation [SD]: 125) g and the mean gestational age was 27 (SD: 2) weeks. There were no significant differences in the SES between the 2 cohorts. Neurosensory impairments were present in 24% of the ELBW participants. One C child had mild cerebral palsy. The mean age at assessment was 14.1 (SD: 1.6) years for the ELBW cohort and 14.5 (SD: 1.3) years for Cs.

Comparisons of Adolescents With and Without Impairments

Before conducting the MANCOVA analyses, we compared 31 ELBW teenagers with and 101 teenagers without impairments. Our tests revealed no differences in the mean scores between the groups on any of the 8 Harter domains or in the GSW scores, nor was there any interaction between gender and neurosensory impairments.

MANCOVA Effects

All significant MANCOVA and follow-up ANCOVA effects were interpreted using Cohen's IS22 criteria for effect sizes (ES), where effects are deemed small, medium, and large if they account for 1% to 5,8%, 5,9%,to 13,8% of the variance, respectively. The 2 (birth wieght status) X 2 (gender) MANCOVA revealed significant multivariate main effects for birth weight status. No Interaction emerged, indicating that birth weight status, gender, weight-for-age z score, age in month, and the WRAT-R reading, spelling, and math scores are associated independently with the multivariate measure of self-esteem.

Univariate Effects

The 2 categorical independent variables, birth weight status and gender, and 5 of 7 continuous independent variables (weight-for-age z score, age in months, and the 3 WRAT~R subtest scores), were used as covariates in an ANCOVA, to test the effects on each of the 9 dependent variables considered separately. The Bonferroni procedure, 23 which set a at .005, was used to reduce the chance of Type 1 error.

Birth Weight

The analyses revealed significant birth weight status effects on athletic competence F (1226) = 13.78, P = .0001, ES = 5.7%. Table 2 indicates that C children rated themselves as having higher athletic competence than their ELBW peers.

Gender

Gender effects emerged for the following domains: athletic competence, F(1226) = 16.73, P = .0001, ES = 6.9%; physical appearance, F(1226) = 15.56, P = .0001, ES = 6.4%; and close friendships, F(1226) = 11.62, P = .001, ES = 4.9%. The means listed in Table 2 show that boys rated themselves significantly higher than girls on athletic competence and physical appearance. The converse was true for close friendships.

Weight for Age

Weight-for-age z score effects emerged for close friendships only (F(1226) = 10.87, P = .001, ES = 4.6%) indicating lower close friendship scores for children with higher weight-for-age z scores.

Achievement

There was a WRAT-R math effect for scholastic competence (F(1226) = 8.13, P = .005, ES = 3.5%) indicating that children with higher math achievement scores rated themselves higher on scholastic competence. No significant achievement effects emerged for reading or spelling.

Age

An age effect emerged for job competence (F(1226) = 20.23, P < .001, ES = 8.2%) revealing that older children rated themselves higher in job competence than their younger peers, but no age effects emerged for the other self-esteem domains.

DISCUSSION

Adolescence is an interesting period of transition that poses unique challenges for the individual and the family. During this period, important decisions have to be made regarding future education, work, and independent living, which are like1y to have a life-Long impact. The literature suggests that aspirations and subsequent achievement may be related to a person's level of self-esteem.17 Although a considerable body of research is available on the neurodevelopmental and scholastic sequelae of extreme prematurity,'-' the question of whether these children differ from Cs with respect to their self-concept is a relatively neglected area.

Recent attempts to address this issue have resulted in studies that are not strictly comparable. The key deterrents have been the lack of a theoretical framework and differing operational definition of self-esteem .14,1' Other limitations include inconsistency in the measures used, self-report or parent report, wide age range of the respondents, inclusion and/or exclusion of children with disabilities, and variations in the racial and sociodemographic composition of the study participants. It is therefore not surprising that there is conflicting information on whether children who were premature have lower levels of self-concept and whether those who have disabilities are doubly compromised.

We have shown that at adolescence there were no differences between our ELBW and sociodemographically matched term Cs on most perceived self-esteem domains, including GSW, nor in the importance of such domains. The only differences which emerged were in athletic competence where ELBW adolescents rated themselves significantly lower than Cs. This is consistent with objective measurements of poorer motor performance among VLBW children, which persist even when children with neurosensory impairments are excluded .24 We found no differences by gender, except for the physical appearance domain, where females rated themselves significantly lower than males. This is also consistent with other published reports where adolescent girls are reported to have lower self-esteem. 15,16 Overall, birth weight group, gender, and neurosensory impairments did not contribute significantly to most Harter SPPA domain scores.

Only 1 other study has addressed the issue of self-concept of 13- to 14-year-old adolescents who were VLBW, using multiple respondents.7 Premature children had lower scores on the Tennessee Self-Concept Scale and were reported by their parents and teachers to manifest more behavioral disturbances than Cs, both at home and at school. These findings persisted even when children with neurologic impairments were excluded. In a study of all admissions to the neonatal intensive care unit, Speechley et a125 have shown that the admission itself had a greater impact on adolescent girls than boys. Admission was associated with lower social competence and self-esteem than was admission to the normal nursery.

McCormick et al 26 obtained parental ratings of the child's competence on the Harter Scale at age 8 to 10 years, on a multisite sample of premature children (<1000 g, 1001-1500 g, and 1501-2500 g) and Cs. Highly significant differences were found between birth weight groups, with the lower birth weight children being rated as less competent. These differences were seen for all subscales of the Harter Scale, except for physical appearance. However, the overall scores for both cohorts were higher than expected,

based on the published reference samples, so that ELBW children were considered by their parents to be similar to the general population. The limitations of this study include the biases inherent in a multisite sample, a very high attrition rate with disproportionate losses of the disavantaged group, and lack of direct responses from children. It is also not clear whether children with neurosensory impairments were excluded. Taylor et a127 found no group differences in self-perceived competence, parental ratings of competence, or teacher ratings of social skills for infants <750 g and 750 to 1499 g, when assessed at a mean age of 11 years. Zelkowitz et a1211 reported no differences in self-concept between nonimpaired VLBW children and Cs at 6 years old. However, at 9 years old, the VLBW cohort perceived themselves as less scholastically competent than Cs. Furthermore, although social status was not related to self-concept, birth weight and lower academic achievement were associated with more negative self-perception in the area of scholastic competence. In another study of a more mature cohort of underprivileged prematurely born infants, social class was an overwhelming factor that accounted for the variance in the self-perception of cognitive competence at late adolescence.29

The literature on the self-esteem of adolescents with physical disabilities is equally conflicting. In a commentary on the self-esteem of children with physical disabilities, Llewellyn 30 reports that 3 studies found low self-esteem in young people, whereas 7 other studies found no significant differences compared with C participants. This inconsistent picture was felt to be attributable to methodological problems in carrying out disability research. For example, variables such as age of onset of the disability, severity, and the visual appearance of an impairment, selection criteria of the inception cohort, sample size problems, and whether the children attended a special school or were in main stream education, could have all played a role in the self-perception of children. Nevertheless, the majority of studies suggest that adolescents with physical disabilities report good self-esteem 31-35 strong family relationships, and as many close friends as adolescents in the national sample .31 However, adolescents with physical disabilities participated in fewer social activities and had less intimate relationships with their friends .31 Crocker and Major 36 speculate that members of a stigmatized group might attempt to protect their self-image by comparing their outcomes with other individuals who are more severely disabled, selectively devaluate dimensions in which they fare poorly, or attribute negative feedback by others to prejudice. Whether there is a certain lack of realism or overcompensation to achieve among individuals with disabilities can only be resolved through qualitative studies.

We believe that the strengths of our study are that the participants are population-based, and therefore the findings are generalizable to populations with similar sociodemographics; the measurement tool, ie, the Harter,18 is widely accepted; and, the attrition rate was relatively low. We should, however, point out that 9 severely impaired ELBW teenagers were unable to participate in the self-assessments, and this might have contributed to some of the lack of differences observed between the impaired and nonimpaired teenagers. We also found no differences in self-esteem between ELBW and C children at 8 years old~6 but unfortunately, because a different measure (Piers-Harris) was used, the data cannot be considered strictly longitudinal. Our findings of no differences in self-esteem between the 2 groups at adolescence are consistent with the overall high self-reported health-related quality of life scores, which were provided concurrently by the same cohort of ELBW teenagers and reported in our previous publications.20,37

The self-esteem and social and emotional wellbeing of children are important domains that should be monitored closely in VLBW children who are considered to be at high risk for problems with adjustment. There is now a consensus that all aspects of a child's daily activities, motivation, and behavior are impacted by the child's self-esteem.9 It appears that the self-perception profiles change over time, and adolescence is a particularly vulnerable period.16 Chronically low self-esteem may contribute to anxiety, depression, lack of motivation, and poorer achievement in both occupational goals and interpersonal relationships at adulthood.14 Additional longitudinal studies on self-esteem and emotional adjustments of infants who are premature are encouraged to establish a trajectory for children's long-term mental well-being, to elucidate antecedents of maladjustments, and to plan for timely intervention strategies to foster better self-

esteem.9

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