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ARTICLE

Why Do Adolescents Say They Are Less Healthy Than Their Parents Think They Are? The Importance of Mental Health Varies by Social Class in a Nationally Representative Sample

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ABSTRACT

OBJECTIVE. We sought to (1) confirm the discrepancy between parent-reported and youth-reported adolescent health in a nationally representative sample, (2) compare the predictors of parent-reported and adolescent self-reported health, and (3) determine whether the discrepancy between the 2 ratings differed by sociodemographic characteristics, particularly income.

METHODS. Data were from the 2001–2002 National Health and Nutrition Examination Survey. A total of 1157 adolescents aged 12 to 15 years, representative of 16 227 827 US youth, were included. Youth and their parents reported on the youth's health status along with other indicators of health and illness and sociodemographic characteristics. To examine predictors of self-rated and parent-rated adolescent health (excellent to poor), bivariate analyses were conducted, followed by multiple linear regression adjusted for relevant covariates. All of the analyses were stratified by income (standardized poverty income index: $\leq$1 vs >1).

RESULTS. Parents and youth differed in subjective judgments regarding the child's health, even when these differences were not supported by other health indicators (days of school missed because of illness or injury or days of poor mental or physical health). Poor adolescents reported worse self-rated health than higher-income youth, and their parents did also. In income-stratified multiple regression models, higher-income adolescents' and their parents' ratings were predicted by indicators of physical health. In contrast, poor youth and parent ratings were better predicted by mental health care use. Poor youth with a mental health visit in the last year reported better health, but their parents saw these mental health visits as an indication of poor health.

CONCLUSIONS. The findings suggest that social class differences in subjective ratings of adolescents' health are related to the differential ways that youth and parents determine what constitutes health and are not simply a reflection of objective health status.

WITH THE NOTABLE exception of injuries, the burden of disease among children and adolescents is extremely low.[1] Nonetheless, when asked to rate their health, a significant portion of youth fail to describe their health as "excellent."[2] In addition, there is a well-documented lack of agreement between adolescents' reports of their health status and parents' reports. Adolescents characterize their health more negatively than their parents; they report worse general health, more physical and mental health problems, and lower quality of life than do their parents.[3–6] Despite this discrepancy, parent reports are often used in addition to, or instead of, self-reports, both to characterize the health of children in the United States and to determine patterns of health care need and use.[7] In this study, we sought to (1) confirm the discrepancy between parent-reported and youth-reported adolescent health

in a nationally representative sample, (2) compare the predictors of parent-reported and adolescent self-reported health, and (3) determine whether the discrepancy between the 2 ratings differed by sociodemographic characteristics, particularly income.

Self-rated health (SRH) is frequently assessed in national social surveys, because, in adults, it has been established as a parsimonious and robust predictor of subsequent morbidity and mortality.[8,9] SRH predicts morbidity and mortality even after adjusting for such objective measures of health and disease as physician diagnoses, health problems, risk factors, lifestyle factors,[10] and psychosocial variables.[9] Thus, SRH is useful for understanding and predicting health status, the onset of disease, and in predicting health care use.[2,9] Although the link between SRH and mortality in children remains largely unexplored, SRH provides other important information about child and adolescent health. Specifically, there is evidence that adolescents take account of domains of functioning outside the bounds of somatic health when reporting on their health, such as family, school, and social relationships.[2] Thus, this simple, global rating of health seems to tap into determinants of health that are difficult to capture with other health assessments. SRH is a window into the internal lives of youth that provides important insight into their health and well-being.

We examined the influence of income on SRH because of its well-documented, graded relationship with health, wherein individuals of lower income have worse health.[11] In addition, previous research in adults suggests that lower-income individuals have worse SRH than higher-income individuals.[12,13] Thus, it is important to understand whether these ratings are based on objective differences in health status alone or on differences in what constitutes health and well-being by income. This may shed light on the biological and psychosocial pathways by which poverty impacts health in early life.

METHODS

Study Population
We used data from the 2001–2002 National Health and Nutrition Examination Survey (NHANES), a nationally representative assessment of the noninstitutionalized, civilian US population.[14] NHANES uses a complex, multistage probability cluster sampling design. Detailed descriptions of the design, methods, and implementation of NHANES are available elsewhere.[15,16]

For 12- to 15-year-old respondents, the 2001–2002 NHANES protocol included a standardized home interview of a parent and a full health examination of the adolescent (76% of all of the NHANES respondents participated in the physical examination).[15] During the medical examination, youth in this age group also reported on their health directly. Adult NHANES respondents were generally parents but also included other household members over age 18 years, or, in rare cases, nonresident family members (eg, in the case of a nonresident divorced parent).[17]

Adolescents included in this analysis had complete data on SRH and parent-rated health. A total of 1157 youth (1157 of 1264 [92%]) aged 12 to 15 years were included, and they were representative of 16 227 827 US adolescents in this age category.

Measures

Outcomes
Adolescents rated their own health, and parents rated their child's health on 2 different questionnaires in NHANES. SRH and parent-rated health (PRH) were assessed by the same question: "would you say your health (your child's health) in general is excellent, very good, good, fair, or poor?" Respondents answered using a 5-point scale from excellent (1) to poor (5). Five-point response scales were used to represent SRH and PRH status as continuous variables.

Predictors
Physical health was measured by using (1) parent report of the number of school days missed because of injury and illness in the last 12 months (continuous variable: 0–365 days), (2) youth self-report of the number of days his or her physical health was "not good" in the last 30 days (continuous variable: 0–30 days), and (3) parent report of whether the youth had a health care visit in the last 12 month (yes = 0/no = 1). Mental health was assessed by using youth self-report of the number of days his or her mental health was "not good" in the last 30 days (continuous variable: 0–30 days) and (2) parent report of whether the youth had seen a mental health professional in the last 12 months (yes = 0/no = 1).

Covariates
Covariates included the youth's age, gender, and race/ethnicity (white, black, Mexican American/other Hispanic, or other/multiracial). Family income was assessed using the US Census-standardized poverty/income ratio (PIR). The ratio compares family income to a federal poverty threshold, taking into account family size and composition. A PIR of ≤1 denotes poverty.[18]

Statistical Analysis
Linear regression was used to obtain unadjusted and adjusted estimates of the relationships between the predictors (physical and mental health indicators) and outcomes (SRH and PRH). The outcome was modeled as a continuous variable in keeping with guidelines for linear transformation of scaled responses with ≥4 categories.[19] Analyses were conducted by using Stata 9.0 (Stata Corp, College Station, TX).[20] All of the estimates were adjusted for NHANES sampling weights, which allow adjustment for the unequal probability of selection, nonresponse, and adjustment to independent population controls.[21]

We examined the correlation among all of the study variables (correlation matrix, Table 2). We then conducted bivariate analyses to estimate the unadjusted relationships between predictors and outcomes. Finally, we used multiple linear regression to examine the predictors of SRH and PRH, adjusted for relevant covariates. Statistical significance was determined by P value of ≤.05.

TABLE 1 Sociodemographic and Health-Related Variables and Health Care Use Among 12- to 15-Year-Old Participants, NHANES 2001–2002, by Income (Adjusted for Sample Weights)

Characteristics[a]	Poor Adolescents (20% of Sample), Proportion (95% CI)[b]	Nonpoor Adolescents (80.0% of Sample), Proportion (95% CI)[b]	Income-Based Difference, P[c]
Sociodemographic			
Gender			NS
Male	44 (0.33–0.56)	48 (0.43–0.52)	
Female	56 (0.44–0.67)	52 (0.48–0.56)	
Race/ethnicity			<.0001
White	34 (0.22–0.49)	0.69 (0.62–0.75)	
Black	29 (0.20–0.41)	0.09 (0.06–0.14)	
Hispanic/Latino	30 (0.18–0.46)	0.17 (0.11–0.26)	
Other/multiracial	06 (0.03–0.13)	0.05 (0.03–0.08)	
Mental health visit in last year			NS
Yes	20 (0.10–0.37)	0.11 (0.08–0.14)	
No	80 (0.63–0.90)	0.89 (0.86–0.91)	
Health care visit in last year			.006
Yes	79 (0.74–0.85)	0.87 (0.85–0.88)	
No	20 (0.15–0.26)	0.13 (0.12–0.15)	
Health-related			
SRH (youth) (1 excellent, 5 poor)	2.4 (2.2–2.6)	2.2 (2.1–2.3)	<.01
PRH (1 excellent, 5 poor)	2.1 (1.9–2.3)	1.7 (1.6–1.8)	<.01
No. of missed school days because of illness or injury (in last year)	5.1 (2.4–7.9)	3.68 (3.2–4.1)	NS
No. of days physical health "not good" in last 30 d	1.5 (1.0–2.0)	1.9 (1.6–2.3)	NS
No. of days mental health "not good" in last 30 d	2.2 (1.2–3.1)	2.2 (1.7–2.6)	NS

NS indicates not significant.

[a] Poor adolescents were at or lower than the federal poverty limit; nonpoor adolescents were at more than the federal poverty limit.

[b] Note that proportions sum to 1 within each category of income.

[c] Test statistic tests the null hypothesis that proportions (or means for bottom half of table) are not significantly different by income category.

Parsimonious models stratified by income (low income: PIR ≤ 1.0; higher income: PIR > 1.0) were obtained according to published recommendations[22] using backward stepwise elimination of covariates that began with the fully saturated main-effects model. Dummy variables were created for categorical predictors included in the regression models. Fully saturated regression models included the following variables, with no interaction terms: age, race/ethnicity, gender, number of school days missed because of illness or injury, days of poor physical health, days of poor mental health, presence of mental health visit, and presence of a health care visit. Covariates were eliminated one at a time beginning with those with the largest P values. Standard model-fit criteria, Δ-β values, and likelihood ratio tests were examined to guide model building.[22]

RESULTS

Selected demographic and health-related characteristics of the sample are summarized in Table 1.

SRH

Sixty-three percent of youth reported their health as excellent or very good. In bivariate (unadjusted) comparisons, there were no significant differences in SRH by age, having a mental health visit, or having a health care visit in the last year. White youth reported better health than youth of all other race/ethnic categories (P = .024); higher-income youth reported bet-

ter health than low-income adolescents (P = .007). Table 2 summarizes correlations between key study variables, adjusted for NHANES sample weights. For SRH and PRH, higher scores indicated worse health. SRH was statistically significantly positively correlated with PRH, number of school days missed because of illness or injury, days of suboptimal mental and physical health in the last month (more days were associated with worse health), and whether the youth had visited a doctor in the last year (youth without a physician visit reported worse health). SRH was significantly negatively correlated with income (poorer youth reported worse SRH).

PRH

Seventy-eight percent of parents characterized their child's health as excellent or very good. There were no significant differences in the bivariate comparisons of PRH with youth age or gender. Parents of white youth reported better health in their children than parents of all of the other race/ethnic categories (P = .001); higher-income parents reported better health among their children than low-income parents (P = .003). PRH was correlated (Table 2) with the number of school days missed (P = .001) such that parents who reported more missed days reported worse child health. Similar to SRH, PRH was significantly negatively correlated with income (low-income parents reported worse adolescent health);

Variable	SRH	PRH	Age	Income	School Missed	Days of Less Than Good Physical Health	Days of Less Than Good Mental Health	Mental Health Visit	Health Care Visit
SRH	1.00								
PRH	0.30[a]	1.00							
Age	0.03	0.03	1.00						
Income	−0.10[a]	−0.21[a]	0.02	1.00					
School missed	0.10[a]	0.19[a]	0.00	−0.01	1.00				
Days of less than good physical health	0.09[a]	0.04	−0.01	0.04	0.09	1.00			
Days of less than good mental health	0.07[a]	0.03	0.09[a]	0.02	0.08	0.23[a]	1.00		
Mental health visit (last year)	−0.00	−0.08[a]	0.02	−0.02	−0.16[a]	−0.08	−0.17[a]	1.00	
Health care visit (last year)	0.08[a]	0.01	0.04	−0.12[a]	−0.13[a]	−0.03	−0.07[a]	0.04	1.00

[a] $P \le .05$.

parents who reported a youth mental health visit also reported worse PRH.

Correlation Between SRH and PRH

Overall, the correlation between the adolescents' own health ratings and parents' ratings of the adolescents' health was weak. The intraclass correlation was 0.13 (95% confidence interval: 0.00–0.32). A cross-tabulation comparing parent and youth ratings of health is included in Table 3 (proportions are adjusted for NHANES sample weights).

Multivariate Analysis

Based on differences in SRH and PRH (see Table 1), all of the multivariate analyses were stratified by income (PIR ≤ 1 vs PIR > 1). Stratifying by income allowed us to determine whether the effect of race/ethnicity persisted within income groups.

Predictors of Adolescent SRH

In the multivariate analysis, we were interested in determining which sociodemographic and health-related factors were important in predicting self-judgments about health and whether these differed by income. Table 4 summarizes the results of parsimonious multivariate regression models. Both poor and higher-income youth who missed more school reported poorer health ($P = .014$ and $.037$, respectively). Interestingly, however, poor adolescents who reported a mental health visit in the last year reported better health than other poor adolescents ($P = .013$). We did not find the SRH of poor youth to be significantly predicted by parent reports. In contrast, among higher-income youth, parents' assessments of the adolescents' health were very strong predictors of the adolescents' own health ratings ($P = .000$), as were indicators of physical health. Specifically, among higher-income adolescents, those with more days of poor physical health ($P = .006$) and those who had not seen a physician ($P = .050$) reported worse health than their peers in this group.

Predictors of PRH

Paralleling our analysis with the youth, we examined the predictors of parent ratings of adolescent health, stratified by income (see Table 4 for detailed multivariate regression results). In both income groups, parent assessments of their child's health were predicted by the youth's own health assessment (this effect was particularly large in the higher-income group) and the days of school that the youth missed. Like their children, poor parents' ratings of child health were influenced by whether the youth had a mental health visit in the last year ($P = .021$). Unlike their children, poor parents whose child had a mental health visit rated their child's health as worse than those whose children did not seek services ($P = .02$). In contrast, mental health indicators were not significant predic-

TABLE 3 Cross-tabulation of Youth and Parent Assessments of Adolescent's General Health: "Would You Say Your Health (Child's Health) Is Excellent (1), Very Good, Good, Fair, or Poor (5)?"

		PRH (Proportion)					
		Excellent	Very Good	Good	Fair	Poor	Total
SRH (Proportion)	Excellent	.16	.04	.02	.00	.00	.22
	Very good	.21	.13	.05	.01	.00	.41
	Good	.12	.08	.08	.02	.00	.30
	Fair	.14	.02	.02	.01	.00	.07
	Poor	.00	.00	0	0	.00	.01
	Total	.50	.28	.17	.04	.04	1.0

Data were adjusted for sample weights.

TABLE 4 Results From Parsimonious Models: Predictors of SRH and PRH by PIR in 12- to 15-Year-Olds in the United States

Variable	PIR ≤ 1.0			PIR > 1.0		
	β	95% CI	P	β	95% CI	P
Predictors of SRH						
PRH status (progressively worse health; range: 1–5)	—			.372	0.303 to 0.440	<.001
Days missed school (per day increase; range: 0–120)	.022	0.005 to 0.038	.014	.009	0.001 to 0.017	.037
Days physical health not good (per day increase; range: 0–30)	—			.020	0.007 to 0.033	.006
Days mental health not good (per day increase; range: 0–30)	—			—		
Did not see a doctor last year	—			.154	−0.002 to 0.311	.050
Did not see a mental health professional last year	1.12	0.159 to 1.13	.013	—		
Predictors of PRH						
SRH status (progressively worse health; range: 1–5)	.128	0.005 to 0.251	.042	.391	0.404 to 0.478	<.001
Days missed school (per day increase; range: 0–120)	.031	0.014 to 0.048	.001	.017	0.003 to 0.030	.017
Days physical health not good (per day increase; range: 0–30)	—			—		
Days mental health not good (per day increase; range: 0–30)	—			—		
Did not see a doctor last year	—			—		
Did not see a mental health professional last year	−.368	−0.673 to −0.063	.021	—		

— indicates variables that were included in fully saturated models but were dropped in the model-fitting process. Fully saturated regression models (estimates not shown) also included the following variables: age, race/ethnicity, and gender. Note that β coefficients denote the increase in SRH/PRH associated with each unit increase in the independent variables (ranges provided for continuous variables). For example, for each additional day missed from school (range: 0–120 days), there was a corresponding increase (worsening) in SRH score of 0.02, holding other model variables constant.

tors of parent ratings of adolescent health in the higher-income group.

DISCUSSION

This study confirms, in a nationally representative sample of 12- to 15-year-olds, the well-established finding that adolescents' and parents' subjective ratings of health are discrepant and that parents tend to rate their adolescents' health better than the adolescents themselves.[7,23] Thus, adolescents' own ratings provide insight into their health that their parents may not have, more evidence that parent and youth reports should not be treated as interchangeable in clinical or research contexts. More importantly, this study contributes insight into why this well-established discrepancy exists. Specifically, we found that in addition to the expected "generation gap" between parents' and adolescents' ratings, income affected the factors that individuals included in their assessments of health and illness.

Poor parents and adolescents both characterized the youth's health as worse compared with their higher-income counterparts. In addition, we observed income-based differences in use: poor youth were more likely to seek a mental health visit but less likely to have used health care services compared with higher-income youth. Nonetheless, indicators of physical and mental health (missed school days, days of sub-par physical health, and days of sub-par mental health) were not different by income. Taken together, our evidence suggests that social class differences in subjective ratings of adolescents' health are related to the differential ways that people determine what constitutes health, rather than solely reflecting differences in more "objective" measures of health status.

Constituents of Health Among Poor Youth and Their Parents

When assessing their health, poor youth considered different factors to be salient than their higher-income peers. Specifically, higher-income adolescents' SRH was predicted by their parents' rating, along with their assessments of physical health (missed school, days of sub-par health, and health care use). Although the SRH of poor youth was determined, in part, by the amount of school that they missed, their ratings were overwhelmingly predicted by whether they had a mental health visit in the last year. Poor adolescents without a mental health visit rated their health worse than those who had a visit, after adjusting for the number of missed school days. Given that SRH encompasses a breadth of domains, including school and family,[2] the worse health ratings of poor youth may have been a reflection of more general life stressors associated with poverty. Low-income, uninsured, and racial and ethnic minority adolescents are more likely to have unmet mental health needs compared with other youth.[24] With this in mind, our findings suggest that mental health is an important constituent of SRH among low-income adolescents, and having a mental health need met has a measurable positive effect on their general health and well-being.

Like their children, low-income parents' ratings of their children's health were influenced by mental health concerns. This may be a reflection of an attribution bias reported in the literature. Specifically, there is a societal tendency to attribute the health problems of the poor to mental health issues, whereas attributing somatic causes to higher-income individuals' problems.[25] In this study, we observed that parents tended to see mental health visits as an indication of poor or compromised health, whereas youth saw them as salutary. This may be because of generational or cultural biases against seeking mental health care[26] or a lack of communication between parents and youth about the benefits that the adolescents derive from mental health assessment or treatment.

Constituents of Health Among Higher-Income Youth and Their Parents

Among higher-income respondents, mental health was not a significant predictor of SRH or PRH. Youth and parent ratings were highly correlated, even after adjusting for relevant covariates. Higher-income parents and youth used physical health indicators (ie, school missed) to inform their health ratings; mental health was not a significant predictor of health ratings for parents or adolescents. As noted above, it is possible that poor youth may have seen mental health as more salient to overall health, because they particularly benefited from mental health services or identified an unmet need. Similarly, higher-income youths may not have mental health indicators as central to health, because their mental health needs were being adequately addressed.

Role of Mental Health in Health Assessments

Previous research has suggested that parents may be better at rating their adolescents' physical health than at rating less-observable emotional or social functioning.[27,28] In addition, adults put more emphasis on physical health than mental health when constructing their own health assessments, compared with adolescents.[29] However, when stratified by income, we found that parents identified the same constituents of health as the youth in that income group, including mental health concerns. This suggests that parents are cognizant of their adolescents' mental health. The fact that low-income parents did account for mental health in their ratings of adolescent health refutes the hypothesis that the discrepancy between youth and parent ratings could be explained by the parents imposing their physical-health-based perspectives on their children's health. Instead, our results provide support for the hypothesis that the way individuals experience their health and the factors that they consider important to good health differ by income: in effect, income affects the way individuals see the world.

Limitations

NHANES offers a rich opportunity to examine predictors of SRH in a nationally representative sample; most adult respondents in this study were parents; however, the NHANES data set does not provide information on the relationship of the adult respondent to the youth in their household. Some studies have found that the reliability of some kinds of data (eg, exposures) varies by the relationship of the respondent to the patient.[30] Fathers' reports have been shown to be less correlated with children's reports than mothers' in some studies,[4] whereas other studies have found no difference between mothers' and fathers' reports.[31] Older respondents, such as grandparents, may also be less reliable proxies.[32] It is possible that the relationship of the respondent to the adolescent varied by income and that more distantly related proxies had more discrepant assessments. Grandparents and other nonparental guardians may be more common among poor children.

We stratified our analyses by income using the US Census-standardized PIR equal to 1. The federal poverty line is quite low. Therefore, our estimates are likely conservative, because many individuals with incomes above a PIR equal to 1 are significantly economically disadvantaged. However, we selected this cutoff because of its designation as a federal poverty indicator.

Our indicators of physical health (number of school days missed) and mental health (number of poor mental health days) in this study are limited and still somewhat subjective. Future studies should confirm the relationships that we observed with more nuanced and standardized measures of physical and mental health.

CONCLUSIONS

SRH is an important construct, because it reflects domains of functioning that are integral to the way adolescents perceive their health but are rarely captured by traditional health measures. In this study, we found that the determinants of adolescents' SRH and PRH were different by income. Among higher-income youth and parents, ratings were driven by indicators of physical health. In contrast, among poor youth and parents, mental health was integral to health ratings. Although poor youth who had accessed mental health services saw this as a benefit to their health, their parents viewed mental health service use as an indication of poor health. Our results suggest that income affects the way youth and their parents understand and report the youth's health, in addition to the determinants of health and illness.

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