

## FACTORS ASSOCIATED WITH AMERICAN INDIAN TEENS' SELF-RATED HEALTH

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*Abstract: Factors related to American Indian (AI) high school students' self-rated health were examined. Self-rated health was measured as a single-item with a four-point response option ranging from poor to excellent health. Of the 574 participants, 19% reported "fair" or "poor" health, a percentage more than twice that for U.S. high school students in general. Gender (related to family finances), school achievement, social competence, and cannabis use were significantly associated with the AI teens' self-rated health. In comparative examination, factors associated with AI teens' health ratings were found to be similar and dissimilar to ratings of other teens in important ways.*

Self-rated health is the most commonly used health indicator in empirical sociological studies (Blaxter, 1989; Manderbacka, Lahelma, & Martikainen, 1998; Rowan, 1994) and has been a reliable predictor of adult health care utilization, cost, and mortality (Vingilis, Wade, & Seeley, 2002). Although the earliest published investigation of adolescents' self-rated health suggested that how adolescents learn to perceive, interpret, and report their health affects their future health ratings and their actual health behavior (Mechanic & Hansell, 1987), subsequent publications on the topic are relatively scarce. The scant literature that specifically targets the self-rated health of adolescents identifies several important considerations in their subjective health formulations: socioeconomic conditions (Goodman, 1999; Wade & Vingilis, 1999); overall sense of functioning (Vingilis et al., 2002), particularly social functioning and psychosocial characteristics (Mechanic & Hansell, 1987; Rosenthal & Smith, 1996) and psychological well-being (Goodman et al., 1997); child-parent relations (Vingilis, Wade, & Adlaf, 1998); academic achievement (Wade, Pevalin, & Vingilis, 2000); gender (Sweeting & West, 2003); and health-related behaviors (Krause & Jay, 1994).

Given the harsh conditions reported for many American Indians (AI) – namely, their poorer socioeconomic status (Allen & Mitchell, 1996; Goodluck & Willeto, 2000; Kaufman, Kwon, Klein, & Chapman, 1999; U.S. Census Bureau, 2000; U.S. Department of Health and Human Services, 1999) and greater risk of alcohol and mental health problems (Beals et al., 1997; Beauvais, 1996; Costello, Farmer, Angold, Burns, & Erkanli, 1997; Nelson & Manson, 2000) – it is not surprising that one study found AI youth to be “at risk” for poor self-rated health (Blum, Harmon, Harris, Bergeisen, & Resnick, 1992). Blum and colleagues concluded that “poor health is the general perception AI teens have when many aspects of their life are not going well” (p. 1643). This conclusion was based on results from the AI Adolescent Health Survey, a 15-state, cross-sectional survey of middle schools and high schools on reservations, with 13,377 AI respondents aged 12-18 years. Responding to the question, “How would you rate your health: ‘poor,’ ‘fair,’ ‘good,’ or ‘excellent?’” 22.2% of the students reported fair or poor health (Blum et al., 1992). Students who claimed a poor health perception were at least two times more likely to have attempted suicide, to have failed in school, to abuse drugs, to have a poor body image, and to have been physically or sexually abused than those students who rated their health as good. An overrepresentation of participants from one large tribe and students attending Bureau of Indian Affairs’ boarding schools precludes the generalization of findings to all other AI students, but it does illustrate the extent to which poor health appraisals are associated with health-compromising behaviors and psychosocial problems, at least for a large percentage of the study sample.

By way of comparison, 6.5% of a nationally representative sample of U.S. high school students rated their health as fair or poor (Goodman, 1999). Canadian adolescents also claimed more favorable health appraisals, with just 4.2% indicating less than good health ratings (Vingilis et al., 2002).<sup>1</sup> Thus, based on these studies at least, AI youth are more likely than their North American peers to report poor health.

### **A Model of Adolescent Self-rated Health**

In general, AI adolescents face similar broad health-related issues and concerns as do their non-Native peers (Fleming, Manson, & Bergeisen, 1996). To examine the similarities and differences between AI adolescents’ self-rated health and the health ratings of other adolescents, the model of self-rated health proposed by Vingilis et al. (1998) was utilized. Their model is based on a review of the small body of literature on adolescents’ self-rated health and the broader literature on youth health in general. It includes measures that can be broadly categorized as demographic (age, female), family (family finances, single-parent family, child-parent relations), academic (school achievement), behavioral (tobacco, alcohol, and cannabis use), and psychological (self-esteem).

The Vingilis et al. (1998) self-rated health model was tested with data from the 1993 Ontario Student Drug Use Survey (OSDUS). The OSDUS is a repeated cross-sectional survey conducted every two years since 1977 and is self-administered by students attending regular schools across Ontario. It included a probability sample of 3,574 students in grades 7, 9, 11, and 13. The Vingilis et al. study (1998) was replicated in one that used first-wave data from the U.S. National Longitudinal Study of Adolescent Health (Add Health, Wade et al., 2000). Data for the study were derived from the Add Health public-use data set of 6,072 randomly selected participants from an arbitrary set of U.S. high schools and their feeder schools (a total of 134 schools). Participants completed surveys in school which were supplemented by an in-home parent questionnaire. Ordinary least squares (OLS) multivariate regression was used to examine the effects of the independent variables on self-rated health in both the OSDUS and Add Health investigations. The variables were entered into the analysis in four blocks (models) as follows: demographic, family finances and single-parent family, child-parent relations and academic, and behavioral and psychological.

Findings from the OSDUS' final model included positive and significant direct relationships between students' self-rated health and self-esteem, child-parent relations, school achievement, and family finances. A negative and significant direct effect emerged for females (with males having better self-rated health) and tobacco use. Almost 17% of explained variance in the self-rated health measure was accounted for by the final model. Although measures differed somewhat between the studies, the Add Health data produced similar results in the percentage of explained variance (14.7%) in the self-rated health measure as well as in the pattern of statistically significant predictors. Published results from both the OSDUS and Add Health studies were used as referents for this study (the "comparison studies"). Examining relationships between AI students' self-rated health and factors similar to those used in the comparison studies, e.g., age, gender, family, school, substance use, psychosocial considerations, was one of two goals of the current study.

The second goal of the study was to examine how social competence is related to the AI students' self-rated health. In adolescence, social competence is a complex task that requires the development of a repertoire of skills related to positive communication and interpersonal understanding (Allen, Weissberg, & Hawkins, 1989). Furthermore, social competence facilitates the connection between adolescent and peers, and at the same time maintains ties with adults. It is known that adolescents with good social competence skills have lower rates of substance abuse, depression, delinquency, aggression, and other problem behaviors (Dalley, Bolocofsky, & Karlin, 1994; Scheier, Botvin, Diaz, & Griffin, 1999), and may be better prepared to achieve self-definition in more adaptive ways (Griffin, Epstein, Botvin, & Spoth, 2001). Social competence may also contribute to success in other areas of adolescent life such as school, sports activities, and

involvement with peers in age-relevant social activities that have been found to exert substantial influences on adolescents' self-rated health (Mechanic & Hansell, 1987; Rosenthal & Smith, 1996).

From a cultural perspective, the characteristics of social competence may be an especially important factor in the health appraisals of AI youth because social competence is compatible with many AI concepts of health such as the ability to exist in a harmonious relationship with all living things (Rhoades & Rhoades, 2000). Social competence may also contribute to the maintenance of community integrity and, therefore, may be viewed as a highly desirable characteristic for individuals living in traditional societies.

## Data and Methods

### Sample

Data for this secondary analysis were derived from the Voices of Indian Teens (VOICES) project, a study of the behavioral health of AI high school students.<sup>2</sup> Survey data were collected at seven high schools located in four western U.S. AI communities. Due to a particular interest in the health of AI youth residing in New Mexico, analyses in the present study are inclusive only of those students attending the four participating reservation-based high schools in that state. A total of 701 AI high school students were surveyed at the four schools. However, list-wise deletion of missing data across cases resulted in a final sample size of 574 students. Tests for mean differences revealed no statistically significant differences on key variables between students with complete data and those with missing data. Each paper-and-pencil survey was completed by the student in one 45-minute class period during the fall semester of the 1994-1995 school year. All necessary permissions were collected prior to the administration of the surveys. In order to protect the confidentiality of the tribes involved in the study, no further identifying information is reported.

### Measures

Items used to build the underlying constructs varied across the comparison and VOICES studies. The differences are noted in regard to each construct considered.

#### Dependent Variable

*Self-rated Health.* Self-rated health was assessed by a single question: "In general, would you say your health is," with a four-point response scale coded 1 = poor, 2 = fair, 3 = good, and 4 = excellent. The comparison studies used the same stimulus but offered a five-point response scale.

### **Independent variables**

*Age.* Age and self-rated health have often shown an inverse relationship in adult studies. It was not known whether age within a very small range, such as is found with high school samples, would show a similar relationship. In Mechanic and Hansell's (1987) study, no significant relationship emerged between grade (a proxy for age) and self-rated health, but another found age to have a statistically significant relationship with students' self-rated health (Wade et al., 2000). Age was measured in years in all three studies.

*Gender.* Sufficient evidence has indicated that gender is a significant predictor of adolescent health ratings, particularly for those adolescents of high-school age (Goodman et al., 1997; Mechanic & Hansell, 1987; Sweeting & West, 2003; Vingilis et al., 2002). Females consistently report more negative ratings than do males. Gender was coded 0 = male and 1 = female.

*Family Finances.* Family finances can affect youth self-rated health in a number of ways. In addition to its direct effects, it has been predictive of self-esteem (Avison et al., 1994), family relationships (Gore, Aseltine, & Colton, 1992), school achievement/attachment (Sampson & Laub, 1993), and health-compromising lifestyle behaviors such as tobacco and drug use (Feinstein, 1993; Milio, 1986). Here, the variable was measured by a single question that asked students to compare their families to others in their home community on a three-point scale coded: 1 = poorer than most to 3 = richer than most. In the OSDUS study students rated family finances on a five-point scale from well below average to well above average. The Add Health study used a supplemental parent questionnaire to assess family finances on an 11-point scale that represented \$10,000 income increments.

*Single-parent Family.* The negative effects of a single-parent home on objective youth health have been reported to be exerted through reduced income and greater stress exposure (e.g., Gore et al., 1992; Menaghan, 1999). Single-parent family was measured as a dummy variable coded 0 = two-parent (either biological or step) and 1 = one-parent. This measurement strategy was common to all three studies.

*Family Support.* The comparison studies utilized a measure of child-parent relations that asked questions about feeling close to parents, how much parents care, communication with parents, relationship satisfaction; and ability to talk with parents about problems. However, an equivalent measure could not be constructed from the variables available in the VOICES study. As an alternative method for examining family relations, a measure of family support is included. Several studies have found aspects of family support to be associated with fewer poor health symptoms in youth (e.g., Mechanic & Hansell, 1989; Menaghan, 1999). Family support was a two-item measure derived from a social support scale (Zimet, Dahlem, Zimet, & Farley, 1988) that asked students to rate their agreement (on a scale of 1 = disagree to 5 = agree) with statements that their families try to help them and that they can talk about their problems with their families. Cronbach's alpha for the measure was .75.

*School Achievement.* School achievement has shown a statistically significant and positive relationship with adolescent self-rated health (e.g., Mechanic & Hansell, 1987). In the current study, school achievement was measured by a single question that asked the students to compare themselves with classmates on how well they did in school. The five-point response scale was coded 1 = much below average to 5 = much above average. Measures used in the comparison studies included questions about performance in specific subjects and skipping class (Add Health) and about how well the student was doing in school, how well the student liked school, and the likelihood that the student would finish school (OSDUS).

*Tobacco, Alcohol, and Cannabis Use.* One qualitative study of self-rated health found that youth were more likely than older respondents to consider behaviors such as smoking tobacco and drinking alcohol in their health ratings (Krause & Jay, 1994). Tobacco use was measured by a single question that asked the students if they smoked cigarettes. Responses were coded 0 = not at all; 1 = once in a while, but not everyday; and 2 = every day. Alcohol use was assessed by a single question about the number of days in the past month that the students consumed alcohol (0 = student doesn't drink or 0 days to 31 days). Cannabis use was measured as the number of times used in the last month (0 = student doesn't use or 0 days to 31 days). In the comparison studies, substance use was measured as use in the past year (OSDUS) and frequency over past 30 days (Add Health).

*Self-esteem.* Global self-esteem has been associated with self-rated physical health (Mechanic & Hansell, 1987) and psychological well-being (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). Self-esteem was a six-item measure constructed from the Rosenberg Self-esteem Scale (Rosenberg, 1965). The selected items included statements about students' feelings that they have many good qualities, feelings about being a failure, positive attitudes about self, feeling useless at times, feelings of self satisfaction, and feelings about being no good at all at times. The five-point response scale was coded 1 = disagree to 5 = agree; negative statements were reverse-coded. Cronbach's alpha was .76. Similar measures were used in the comparison studies.

*Social Competence.* Social competence was a three-item measure based on the work of Allen et al. (1989) and derived from a general competencies scale used in the VOICES study. Students were asked to assess the extent to which each of the following items described them: how good the student is at making other kids feel comfortable, telling jokes that make other kids laugh, and making friends with people. The four-item response scale was coded: 1 = rarely or never to 4 = almost always. Cronbach's alpha for the measure was .73.

## Analytic Strategy

Separate analyses were conducted to investigate the various characteristics of the sample, relationships among the variables, and to address study goals. Descriptive statistics were employed to identify the characteristics of the sample and a correlation matrix was designed to reveal zero-order bivariate relationships among the key measures. The same analytic strategy described in the comparison studies, hierarchical multivariate ordinary least squares (OLS) regression, was used to address the first goal of the current study. To address the second goal of the study a measure of social competence was introduced in a new model of the AI teens' self-rated health. The multivariate regression with backward elimination utilizing a statistical significance removal level of .05 was employed in order to build a final model with only those measures that have a statistically significant relationship with the teens' self-rated health. In order to examine what can be important gender differences in the AI teens' health ratings, interactions of gender and each of the other main effects were considered in the process of obtaining the final model.

## Results

As shown in Table 1, with a mean age of almost 16 years and equally divided by gender, the AI adolescents rated their health as good, on average. Consistent with the results reported by Blum et al. (1992), however, 19.1% of the AI teens rated their health as fair or poor. Most students indicated that their family financial resources were about the same as those of other families in their communities and a majority reported living in two-parent homes. Mean scores for family support, school achievement, self-esteem, and social competence show that these AI teens generally had positive perceptions about these aspects of their daily lives. As indicated by the standard deviations for the tobacco, alcohol, and cannabis variables, a fair amount of variation occurred in the use of those substances. (To smooth the distributions for alcohol and cannabis use, the natural log transformation was employed; descriptive statistics for the transformed variables are reported as footnotes to Table 1). Examination of the percentage distributions revealed that 53.1% used at least occasionally, 47.9% consumed alcohol at least one day in the past month, and 48.4% reported cannabis use at least in the past month.

Table 2 presents the zero-order relationships between self-rated health and all other variables used in the regression analyses. More positive self-rated health was reported by students who were male; had better family finances; higher levels of social support and school achievement; lower use of tobacco, alcohol, and cannabis; higher levels of self-esteem; and social competence. The strongest bivariate correlations were among the substance use measures.

**Table 1**  
**Descriptive Statistics (N=574)**

Measures <sup>a</sup>	Mean	SD
Self-rated health	3.08	.73
Age	15.98	1.37
Gender (F=1)	.50	.50
Family finances	2.09	.34
Single-parent family	.39	.49
Family support	3.53	1.23
School achievement	3.27	.78
Tobacco use	.68	.72
Alcohol use <sup>b</sup>	2.59	5.40
Cannabis use <sup>c</sup>	5.94	10.01
Self-esteem	3.38	.45
Social competence	2.71	.77

<sup>a</sup>Response scales for selected variables: self-rated health (4-point scale, 1-4); family finances (1=poorer; 3=richer); family support (5 point scale, 1-5); school achievement (5-point scale, 1-5); tobacco use (0=not at all, 2=every day); alcohol use (0=don't drink/0 days, 31=31 days); cannabis use (0=don't use/0 days, 31=31 days); self-esteem (5-point scale, 1-5); social competence (4-point scale, 1-4).

<sup>b</sup>Natural log of alcohol use, mean .72, SD .92.

<sup>c</sup>Natural log of cannabis use, mean 1.04, SD 1.27.

Table 3 shows results of the hierarchical analyses (the design used in the comparison studies) in which the independent variables were grouped and entered in blocks representing models 1-4. In model 1, the demographic variables accounted for less than 1% of the variance in the self-rated health measure. In model 2, family finances was statistically significant and explained an additional 2% of the variance (living in a one-parent versus a two-parent home had no relationship to self-rated health).

Models 3 and 4 added 7.1% of variance explained in the self-rated health measure. Model 3 shows that school achievement, but not family support, was significantly associated with self-rated health; the addition of these two variables to the model slightly weakened the relationship for family finances. In Model 4, the addition of the substance use (tobacco, alcohol, and cannabis) and self-esteem variables resulted in statistical significance for the relationship between being female and self-rated health; males rated their health more positively than did females. Of the measures introduced in Model 4, only cannabis use and self-esteem exhibited a statistically significant relationship with self-rated health. Cannabis use is negatively associated with self-rated health while self-esteem showed a positive association. The final adjusted R<sup>2</sup> indicates that only about 10% of the variability in self-rated health responses was accounted for by these variables.



Table 2  
Bivariate Correlations Matrix (N=574)

	1	2	3	4	5	6	7	8	9	10	11	12
1 Self-rated health	1.000											
2 Age	.074	1.000										
3 Gender (F=1)	-.075*	.221***	1.000									
4 Family finances	.154***	.045	-.002	1.000								
5 Single-parent family	.012	.117**	.023	-.047	1.000							
6 Family support	.098**	.066	.091*	.038	-.057	1.000						
7 School achievement	.235***	.021	.036	.260***	-.075*	.152***	1.000					
8 Tobacco use	-.152***	.010	-.169***	-.095*	.024	-.122**	-.158***	1.000				
9 Alcohol use	-.106**	.071*	-.146***	.032	.083*	-.154***	-.130**	.383***	1.000			
10 Cannabis use	-.176***	.060*	-.120**	-.042	.060	-.159***	-.163***	.453***	.479***	1.000		
11 Self-esteem	.148***	-.042	-.036	.089*	-.002	.175***	.138***	-.081*	-.113**	-.143***	1.000	
12 Social competence	.252***	.010	.076*	.115**	-.003	.273***	.142***	-.107***	-.031	-.042	.198***	1.000

\*  $p < .05$ , two-tailed. \*\*  $p < .01$ , two-tailed. \*\*\*  $p < .001$ , two-tailed.

**Table 3**  
**Summary of Hierarchical Regression Analysis for Variables Predicting AI**  
**Teens' Self-rated Health (N = 574)**

Measure	Model 1		Model 2		Model 3		Model 4	
	B	SE B	B	SE B	B	SE B	B	SE B
Age	.032	.023	.028	.023	.021	.022	.027	.022
Gender (F=1)	-.089	.062	-.092	.062	-.163	.061	-.142*	.061
Family finances			.329***	.090	.212*	.091	.194*	.090
Single-parent family			.022	.062	.050	.061	.055	.060
Family Support					.042	.025	.020	.025
School Achievement					.191***	.040	.159***	.040
Tobacco use							-.071	.047
Alcohol use (ln)							-.013	.037
Cannabis use (ln)							-.060*	.028
Self-esteem							.143*	.068
Adj. R <sup>2</sup>		.006		.025		.069		.096

\**p* < .05, two-tailed. \*\**p* < .01, two-tailed. \*\*\**p* < .001, two-tailed.

Table 4 presents the OLS regression results across studies and provides a unique opportunity to examine similarities and differences in factors affecting the self-rated health of AI teens compared to their (predominately) non-Native peers. In general, the pattern of statistical significance indicates agreement across studies such that being male and having the perception of higher levels of family finances, school achievement, and self-esteem were all significantly related to better self-rated health. Similarities across studies also were found in the non-significance of factors such as single-parent family and alcohol use.

Mixed results were evident regarding the importance of age. The VOICES and OSDUS samples found no association, but the Add Health sample had a significant association such that older students reported better self-rated health. Although measures between the VOICES and comparison studies were not precisely equivalent, the relationship of family support with self-rated health was similar in its non-significance to child-parent relations in the Add Health study, whereas, child-parent relations was a significant factor for the OSDUS.

Major differences between the VOICES results and the comparison studies were found for tobacco and cannabis use. Although tobacco use was negatively related to self-rated health across all three studies, it was only a statistically significant factor in the comparison studies. Conversely, cannabis use had a negative, non-significant association for the students' self-rated health in the comparison studies but was a statistically significant consideration in the current study. A comparison of the total amount of

**Table 4**  
**Comparison of Student Self-rated Health Models (standardized coefficients)**

Measure	OSDUS N=840 B	Add Health N=5,673 B <sup>a</sup>	VOICES N=574 B
Age	-.044	.055*	.051
Gender (F=1)	-.123***	-.058**	-.097*
Family finances	.101**	.058***	.089*
Single-parent family	.020	-.027	.037
Child-parent relations	.071*	.011	____.b
Family support	____.b	____.b	.034
School achievement	.143***	.115***	.169***
Tobacco use	-.140***	-.105***	-.070
Alcohol use	.037	.015	-.016
Cannabis use	-.034	-.007	-.104*
Self-esteem	.227***	.275**	.087*
Adj. R <sup>2</sup>	.167	.147	.096

a\*\*\* t > 4.15; \*\* t > 3.70; \* t > 3.30

<sup>b</sup>Measure not included in regression model.

\**p* < .05 \*\**p* < .01 \*\*\**p* < .001

Note: Two-tailed tests were performed for the VOICES study; comparison studies did not name significant test.

explained variance (Adj. R<sup>2</sup>) in the self-rated health measure across studies indicates that the model held less explanatory utility for the VOICES data than for the comparison studies.

The final model of AI teens' self-rated health, which included a measure of social competence and an interaction term for gender and family finances, revealed several notable findings. First, the overall model increased the explained variance by 4% with fewer factors than shown in Table 4. Second, the self-esteem variable was reduced to statistical non-significance. Third, cannabis use increased in level of statistical significance and maintained a negative direction of relationship with self-rated health. Fourth, social competence and school achievement demonstrated the strongest, positive association with the self-rated health of these AI students. The fifth and final note is that with the finding of statistical significance (*p* = .043) for the interaction term gender\* family finances, and its inclusion in the final model, a clearer picture emerges for the interpretation of the relationship between gender and self-rated health and family finances and self-rated health. The interaction between gender and family finances and the direction of its relationship to the dependent variable indicates that family financial status is

positively associated with self-rated health and that the association is gender specific such that AI females are more likely to have more negative health ratings than males when family finances are low.

### Discussion

Results of the comparative examination of teens' self-rated health suggest broad, mutually important health-related concerns across national and cultural borders while at the same time revealing distinct health concerns of the AI youth. In general, the current findings about the self-rated health of AI teens are cause for both concern and encouragement. The consistent finding (Blum et al., 1992) that about 20% of these AI teens rated their health as fair or poor is a major concern. Other findings suggest ways in which certain attributes or resources of these teens might be developed to improve their subjective health appraisals.

School achievement presents one such opportunity. The measure of school achievement retained its statistical significance across all models of the AI teens' self-rated health. This finding contributes to the growing number of empirically verified ways in which academic achievement is associated with adolescent health and, importantly, the robustness of academic achievement in the face of ethnic and cultural considerations: Efforts that facilitate AI teens' academic success may have an added effect of increasing positive health perception.

Given the reported high risk for tobacco and alcohol use among AI youth, the finding that the two substances were not significantly correlated with the students' health perceptions deserved further examination. The positive and moderate to strong correlations among the substance use variables suggests consistency with other findings of poly-substance use among AI teens (e.g., Beauvais, 1992; Novins & Mitchell, 1998). It is likely that the correlations among the substance use variables (Table 2) contributed to the regression findings of non-significance for all but cannabis use (Table 3) and that cannabis use may partially explain the relationship between tobacco use and self-rated health as well as between alcohol use and self-rated health. To confirm this hypothesis, two additional regression models were fitted. In model one, cannabis use was held out from Model 4, Table 3. Tobacco use became statistically significant ( $p = .022$ ), while the p-value for alcohol use was also reduced dramatically (from .732 to .246), though not reaching the .05 level of significance. In Model 2, cannabis use and tobacco use were held out from Model 4. Alcohol use then became statistically significant ( $p = .037$ ). The interpretation of the findings is that all three substances use is negatively related to self-rated health, but since they are correlated with each other and cannabis use seems to be able to provide more information than the other two in explaining the variability of the dependent variable, the effects of tobacco and alcohol use tend to disappear when cannabis use is included in the model. Thus, the substantive, if not

strictly speaking the statistical, importance of tobacco and alcohol use as contributors to the negative health ratings of AI youth should remain of concern for some AI communities.

With the introduction of social competence in Table 5, the initial statistical significance of self-esteem disappeared. A plausible and interesting cultural explanation that would require a separate study is that in traditional AI societies an individual tends to place greater value on attributes and attitudes that contribute to the collective good and that secure one's place within the social circle (social competence) rather than on attributes that enhance, gratify, or benefit the individual (self-esteem). Support for that explanation is found in one study that reported higher mean self-esteem scores for AI teens identifying more strongly with the White culture versus their AI culture and higher mean social competence scores for those AI teens identifying more strongly with their AI culture versus the White culture (Moran, Fleming, Somervell, & Manson, 1999). For the present discussion, social competence has a demonstrated highly significant relationship with the AI students' self-rated health and provides evidence for engaging AI students in social competence-building activities.

**Table 5**  
**AI Teens' Self-rated Health Model Including Social Competence and**  
**Gender\*Family Finances Interaction (N = 574)**

Predictor	B	SE B	B
Intercept	2.133	.261	---
Gender (F=1)	-.892	.361	-.610*
Family finances	.026	.113	.012
School achievement	.151	.039	.161***
Cannabis use	-.088	.023	-.153***
Social competence	.213	.038	.224***
Gender*Family finances	.346	.170	.505*
Adj. R <sup>2</sup>			.134

\*p < .05    \*\*p < .01    \*\*\*p < .001

Although the adolescent self-rated health literature shows consistency across studies that, compared with males, females report significantly more negative health ratings, Table 3 shows that for the AI teens, gender was not, independently, a significant correlate of their self-rated health. The results presented in Table 5 show a statistically significant interaction between gender and family finances, which provides important clarification for the relationships between both gender and family finances and the AI students' health ratings. Without that clarification it could be interpreted from the previous analysis (Table 3, Model 4) that AI females, for unspecified reason, tend to rate their health more negatively than AI males (which would support the small body of literature on adolescent self-rated health) and that family finances has a positive and significant relationship with the adolescents' self-rated health in general. Yet, the interaction suggests something different for the AI teens: namely, that the association between family finances and self-rated health is much more apparent for AI females in that at lower levels of family finances the females report more negative health ratings than do the males. Interactions between gender and other factors were not reported in the comparison studies so it is not known whether the current study findings are unique to AI adolescents nor could the current study provide an explanation for the finding of interaction. However, although Swedish adolescents and gender differences were not examined, one study found worry about family finances to be strongly related to the adolescents' perceived poor health (Hagquist, 1998). One speculation in line with that finding is that the household roles often assumed by AI girls at an early age may put them at increased risk for worry about family well-being that might be dependent, at least in part, on economic stability. Clearly, further study is needed in order to understand the complex relationships between the AI youth's health ratings by gender and family finances and to develop effective strategies that will target the relevant negative health perceptions.

This study had several important limitations. The absence of physical health measures during adolescence (for example, body mass index) limits the understanding of self-rated health as a global measure of adolescent health and the contribution of physical health as an explanation for variability in the AI adolescents' health ratings. The school-based sample is a limitation since it did not include those teens too sick to be in school or those who had dropped out of school. Thus, the percentage of less than good health ratings may be underestimated in this AI teen cohort. Due to the cultural diversity of AI populations and the fact that the current study includes a small proportion of the tribes nationally, differences in factors related to the self-rated health of AI teens, as well as in the distribution percentages of the self-rated health measure, may be found in other studies. In addition, the cross-sectional nature of the data precludes defining casual links among the variables. For instance, it may be that the subjective appraisal of good health allows a teen to participate in activities and to engage in relationships that facilitate a positive sense of social competence. Despite its limitations, this investigation

contributes an important voice to the literature on adolescent health, a body of knowledge that often is silent about the health of AI youth.

### Conclusion

This report revealed similarities and differences in the subjective health ratings of AI teens compared to health ratings of other teens. The fact that almost one-fifth of the AI students rated their health as fair to poor, coupled with the relatively small amount of explained variance in the self-rated health measure, supports the need for further study in order to identify other major factors underlying the negative health ratings of AI youth. For the AI teens in the current study, factors related to their self-rated health included gender, specifically being female with low family financial status; school achievement; social competence; and cannabis use. Strategies that promote or reduce those factors may contribute to an improved sense of health for the AI teens.

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### Footnotes

<sup>1</sup>Both the U.S. and Canadian studies used a five-point response scale with their self-rated health question while the AI survey used a four-point scale. With a fifth response option, the percentage of fair-poor ratings for AI youth may be reduced. However, studies that measured self-rated health based on a five-point response scale showed that AI adults (Eberhardt et al., 2001) and early adolescents (Whitbeck, 2003) had higher percentages of fair-poor health ratings than what is reported for any other U.S. ethnic groups.

<sup>2</sup>Website links to a full description of VOICES study methods, survey, and scale development can be assessed at: <http://www.uchsc.edu/ai/ncaianmhr/pastrsch/vcsitprj.htm>