APPENDIX—Indexes of Related Questions

Factor analysis was used to identify sets of related questions from which indexes were created. The 24 questions on health services (Table 1) fell into five indexes, of which four had acceptable levels of reliability.

The Preventive Medicine Index consisted of 9 items, including questions about provision of female checkups, physical examinations, and blood tests (Cronbach alpha = .86, mean = 17.4, SD = 5.9).

The Assistance with Personal Problems Index was composed of 6 items focusing on health services such as counseling for eating disorders, instruction on the care of children, and mental health counseling (Cronbach alpha = .72, mean = 7.5, SD = 2.5).

The Assistance with Sexual Problems Index was composed of 4 items including distribution of birth control products to girls and boys, counseling for pregnant teenagers, and day care for infants of teenagers (Cronbach alpha = .73; mean = 7.0, SD = 2.7).

The Preventive Education Index consisted of 3 items, including questions about distributing birth control information to girls and boys and provision of drug and alcohol education (Cronbach alpha = .76, mean = 3.3, SD = 1.1).

Because the items presented in Tables 2 and 3 yielded five factors of two questions each, the indexes were no more informative than the individual items and, hence, were not analyzed. The questions on abortion (Table 4) were combined into the Support for Abortion Index (Cronbach alpha = .92, mean = 17.6, SD = 6.1).

The Weights and Heights of Mexican-American Adolescents: The Accuracy of Self-Reports

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ABSTRACT

The accuracy of Mexican-American adolescents' self-reported weights, heights, and body mass indexes was evaluated with data from the Hispanic Health and Nutrition Examination Survey. On average, adolescents with low measured body mass indexes and high measured body mass indexes overestimated and underestimated their weights, respectively. Categories of low and high body mass indexes created by applying cutoffs to reported body mass indexes had low sensitivities. For weight, height, and body mass indexes, measured and reported values were highly correlated. This high correlation suggests that adolescents' reported values can be used as continuous variables in multivariate analyses with only small errors resulting in the coefficients for weight, height, and body mass index. (*Am J Public Health.* 1994;84:459–462)

Introduction

Researchers wanting to collect data on survey participants' weights and heights might find it desirable to obtain such data by self-report. Studies of reported weights and heights usually have focused on adults[1–13]; fewer studies[14–19] have focused on adolescents. To evaluate the accuracy of Mexican-American adolescents' self-reported weights and heights, we used data from the Hispanic Health and Nutrition Examination Survey.

Materials and Methods

Study Design of the Hispanic Health and Nutrition Examination Survey

The Hispanic Health and Nutrition Examination Survey was conducted by the National Center for Health Statistics from 1982 through 1984. The Mexican-American portion was done from July 1982 through December 1983 among civilian, noninstitutionalized persons of Mexican origin or ancestry in Arizona, California, Colorado, New Mexico, and Texas. The sample design was a stratified, multistage probability sample.[20] The weighted estimates presented are representative of Mexican Americans in these states.

The survey included an interview and an examination. For persons who were 12 through 17 years old, either self-response or response by proxy was acceptable. Persons who were 18 years old or older responded for themselves unless they were unable to be interviewed. In the interview, weights (without shoes) were reported in pounds and heights (without shoes) in feet and inches. In the examination (done a few weeks after the interview), weights to the nearest 0.05 kg and heights to the nearest 0.1 cm were measured for participants dressed in light examination clothing without shoes.

Study Population

We used data from the Examination Survey's Mexican-American portion on the Mexican-American males and nonpregnant females who were 12 through 19 years old. Analyses were done on the 392 males and 437 females who self-responded, reported weights and heights,

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TABLE 1—Mean Percentage Difference between Reported and Measured Values for Weight, Height, and Body Mass Index (BMI): Mexican Americans, 12 through 19 Years Old, Hispanic Health and Nutrition Examination Survey, 1982 through 1984

Group	Percentage Difference for Weight (Mean ± SEM)		Percentage Difference for Height (Mean ± SEM)		Percentage Difference for BMI (Mean ± SEM)	
	Males	Females	Males	Females	Males	Females
Measured BMI group						
Low	4.6 ± 0.9[a]	2.4 ± 0.6[a]	−0.2 ± 0.4	−0.2 ± 0.2[a]	5.1 ± 1.1[a]	2.9 ± 0.6[a]
Middle	1.2 ± 0.5	−1.7 ± 0.3	−0.2 ± 0.2	0.4 ± 0.1	1.8 ± 0.6	−2.2 ± 0.4
High	−4.1 ± 1.0	−6.9 ± 1.1	<0.1 ± 0.4	1.1 ± 0.3	−4.1 ± 1.0[b]	−8.8 ± 1.3
Self-described weight status						
Underweight	2.4 ± 0.9	1.5 ± 0.8[c]	−0.1 ± 0.2	1.2 ± 0.4	0.3 ± 1.2	−0.6 ± 1.2
About right	0.7 ± 0.5	−0.6 ± 0.4	−0.2 ± 0.2	0.2 ± 0.2	1.4 ± 0.6	−0.7 ± 0.6
Overweight	−0.2 ± 1.2	−3.4 ± 0.5	0.1 ± 0.3	0.5 ± 0.1	−0.5 ± 0.1	−4.3 ± 0.6[d]
Age group, y						
12–14	<0.1 ± 1.0	−2.7 ± 0.6	−0.7 ± 0.3[e]	−0.2 ± 0.3	1.6 ± 1.0	−1.9 ± 0.9
15–17	0.8 ± 0.5	−1.7 ± 0.5	−0.1 ± 0.2	−0.7 ± 0.1	1.2 ± 0.7	−3.0 ± 0.6
18–19	1.6 ± 0.6	−1.1 ± 0.4	0.5 ± 0.3	0.5 ± 0.2	0.9 ± 0.9	−2.0 ± 0.6

[a]Measured low body mass index group is significantly different from measured high body mass index group.
[b]Males with measured high body mass index are significantly different from females with measured high body mass index.
[c]Underweight group is significantly different from overweight group.
[d]Overweight group is significantly different from about-right-weight group.
[e]Adolescents 12 through 14 years old are significantly different from those 18 and 19 years old.

and had their weights and heights measured.

Statistical Analyses

We used measured values to calculate body mass index as weight/square of height (kilograms/square meter). Based on the 1308 measured body mass indexes of Mexican-American adolescents in the Examination Survey, single year of age-and-sex-specific cutoffs were created (by using sample weights) for three measured body mass index groups: low (≤15th percentile), middle (16th–84th percentile), and high (≥85th percentile). Reported body mass index was calculated by using reported weights and heights and categorized by using these cutoffs.

Sensitivity and specificity of reported low body mass indexes were calculated as (1) sensitivity = 100 × number of adolescents with reported and measured low body mass index/number with measured low body mass index; (2) specificity = 100 × number of adolescents with neither reported nor measured low body mass index/number without measured low body mass index. Analogous methods were used for reported high body mass index.

For each adolescent, a percentage difference between reported and measured values was calculated as 100 × (reported value − measured value)/measured value. The mean percentage difference is the average of these individual percentage differences.

Point estimates were calculated with sample weights. Sampling weights account for selection probabilities and include adjustments for nonresponse and geographic noncoverage. Variances were estimated by multiplying simple-random-sample variance estimates by the average design effect (1.00 in this study).[21] To compare point estimates, *t* tests with 8 *df* were used. To assess trends, linear regression analysis was performed. *P* values of less than .05 were significant.

Results

Self-Reported Weight

The mean percentage difference between reported and measured weights was 0.8% ± 0.4% (SD = 8.5) for males and −1.8% ± 0.3% (SD = 6.7) for females. Weights were reported within ±5% of measured values by 63% of males and 72% of females. For both sexes, adolescents with measured low body mass index on the average overestimated their weights, and those with measured high body mass index underestimated theirs (Table 1).

The correlation coefficient between measured and reported weight was .95 for males and .93 for females and varied little with age group.

Self-Reported Height

The overall mean percentage difference between reported and measured heights was −0.1% ± 0.2% (SD = 3.2) for males and 0.4% ± 0.1% (SD = 2.4) for females. The reported height fell within ±2% of the measured height for 63% of males and 70% of females. Adolescents 12 through 14 years old on the average slightly underestimated their heights, whereas 18- and 19-year-olds slightly overestimated theirs (Table 1).

The correlation coefficient between measured and self-reported height was .86 for males and .86 for females. This coefficient varied little with age group except for males 18 and 19 years old, for whom it was .71.

Self-Reported Body Mass Index

The overall mean percentage difference between the self-reported and measured body mass indexes was 1.3% ± 0.5% (SD = 9.8) for males and −2.4% ± 0.4% (SD = 8.4) for females. On average, reported weights and heights overestimated the body mass index of adolescents with measured low body mass indexes (Table 1). Reported values tended to underestimate the body mass index of adolescents with measured high

TABLE 2—Cross-Tabulation of Self-Reported and Measured Body Mass Index (BMI) Groups, by Sex: Mexican Americans, 12 through 19 Years Old, Hispanic Health and Nutrition Examination Survey, 1982 through 1984

BMI Groups Based on Self-Reported Weight and Height	BMI Groups Based on Measured Weight and Height, %		
	Low	Middle	High
Males			
Low	7.1	4.1	0.2
Middle	7.6	60.7	3.9
High	0.0	3.7	12.8
Females			
Low	10.4	7.2	0.0
Middle	4.2	63.8	5.5
High	0.0	1.0	7.9

Note. Percentages do not add to 100 because of rounding.

TABLE 3—Sensitivity and Specificity of Low Reported and High Reported Body Mass Index (BMI) Groups: Mexican Americans, 12 through 19 Years Old, Hispanic Health and Nutrition Examination Survey, 1982 through 1984

Group	Sensitivity		Specificity	
	%	95% Confidence Interval	%	95% Confidence Interval
Low reported BMI				
Males	48	33, 63	95	92, 98
Females	71	58, 85	92	88, 95
High reported BMI				
Males	76	63, 88	96	93, 98
Females	59	44, 74	99	98, 100

body mass indexes, with greater underestimation for females than males. On average, reported body mass indexes were underestimates to a greater degree for females self-described as overweight than for those described as underweight or about the right weight.

The correlation coefficient between measured and reported body mass indexes was .87 for males and .85 for females and varied little with age group.

The distribution of reported vs measured body mass index groups is shown in Table 2. In neither sex did the sensitivities for reported low and high body mass index reach 80% (Table 3). The specificities for reported low and high body mass index ranged from 92% to 99%. For each sex, there were no significant trends by age group in sensitivity or specificity.

Discussion

We found that categories of reported body mass indexes had low sensitivities. That indicates that cutoffs based on absolute values had a poor ability to correctly classify adolescents. Therefore, using these categories to estimate relative risks associated with categories of body mass index might result in large errors in the estimates, and it is probably best not to use such categories to estimate relative risks.

We found high correlations between reported and measured values for weight, height, and body mass index, indicating that reported values reflect well the relative ranking of measured values. In multivariate analyses with continuous data, using reported values that are highly correlated with measured values is likely to cause relatively small errors in a variable's coefficient.[22] Therefore, using adolescents' reported values in these analyses might result in only small errors in the coefficients for weight, height, and body mass index.

Similarities between this study and most previous studies of reported values in adults and adolescents include a high correlation between reported and measured values[2,4,7,9,10,14,18,19] and a tendency for persons with high body mass indexes to underestimate their weights more than other persons,[2–10,15–18] a tendency that causes a low sensitivity of high body mass index categories formed from reported values.[7,10,13] These similarities suggest that the limitations and possible uses of reported values of Mexican-American adolescents described here will apply to most other adolescent populations. □

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The Prevalence of Intrauterine Growth Retardation in Mexican Americans

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ABSTRACT

This study evaluated the prevalence of intrauterine growth retardation in Mexican Americans compared with non-Hispanic Whites in the state of Arizona. Data came from all live birth certificates in 1986 and 1987. Rates of intrauterine growth retardation in Mexican-American and non-Hispanic White infants in Arizona were lower than those in White infants in California. Differences in patterns of the 10th percentile growth distribution curves were observed between infants born in Arizona and those born in California. Compared with non-Hispanic Whites, Mexican Americans had lower adjusted odds ratios for intrauterine growth retardation according to several maternal risk characteristics. (*Am J Public Health.* 1994; 84:462–465)

Introduction

Given the heterogeneity of the Mexican-American population, the study of perinatal health problems should not be confined to low birthweight.[1] In the Mexican-American perinatal population, indicators of fetal growth and maturity at birth have not been used to evaluate intrauterine growth retardation. It is quite likely, therefore, that reported prevalence of low birthweight overlooks a proportion of affected infants. Failure to diagnose intrauterine growth retardation at birth in Mexican-American infants, whether or not they fall into the low-birthweight category, has public health significance.[1,2] Evidence is beginning to accumulate in regard to the detrimental effects on morbidity and mortality in newborns with birthweights above 2500 g.[3–5] This study was designed to evaluate the problem of intrauterine growth retardation in a Mexican-American population.

Methods

All singleton births in Arizona for the years of 1986 and 1987 were evaluated for intrauterine growth retardation. The entry of Spanish origin and race of the mother was used to identify Whites versus Hispanics and those of Mexican origin. The total numbers of single births were 23 799 and 67 280 for Mexican-Americans and Whites, respectively. The percentages of births that occurred out of the hospital infirmary or medical center were 1.9% for Mexican Americans and 2.0% for Whites. Approximately 1.3% of the total birth certificates for each ethnic group were discarded because of missing data on birthweight. Similar percentages of missing data in regard to origin or race of the mother were also found (1% of the total population). For Mexican Americans and Whites, 3.9% and 2.5% of the data, respectively, were missing for the month of the last menstrual period. The prevalence of intrauterine growth retardation was estimated for all infants with birthweight data at 24 to 42 weeks of gestation.

Completed weeks of gestation were computed based on the last normal menses and the date of birth of the infant. If the day of the last normal menses was missing, the 15th day of that month was used. For the purpose of classifying intrauterine growth retardation, the cutoff point of the 10th percentile of each of two different fetal growth distributions was used (Williams et al.[6] and Hoffman et al.[7]). The White (non-Hispanic) population of Arizona was used as a comparison group.

Several maternal risk factors were defined from the certificates of live birth to evaluate the variations in classification of intrauterine growth retardation. Chi-square statistics were used to test for differences in prevalences between groups. Adjusted odds ratios and 95% confidence intervals were calculated to

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