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Measuring Health Variables Among Hispanic and Non-Hispanic Children with Chronic Conditions

RUTH E. K. STEIN, MD
DOROTHY JONES JESSOP, PhD

Dr. Stein is a Professor of Pediatrics and Dr. Jessop is a Visiting Associate Professor of Pediatrics, Albert Einstein College of Medicine. Dr. Jessop is currently manager of research at the Young Adult Institute. Jennifer Lauby, PhD, and Richard Peterson, PhD, of the Albert Einstein College of Medicine, assisted with the statistical analyses.

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Tearsheet requests to Ruth E. K. Stein, MD, Department of Pediatrics, Albert Einstein College of Medicine, 1300 Morris Park Ave., Bronx, NY 10461.

Synopsis

This paper addresses two concerns related to differences in the health status of Hispanic and non-Hispanic children: methodological issues in the measurement of health status across population subgroups and the substantive differences in the health of these subgroups.

Interview data from a study of chronically ill children in a northeastern inner city were collected using carefully translated measures of health and health-related behaviors. The psychometric properties of the scales were assessed across the subgroups to determine if common interpretation of the scales was possible. After determining that this was the case, group means in health and health-related variables were compared.

Despite sociodemographic group differences in variables, there were remarkably few differences among the groups on traditional morbidity measures. However, significant differences were found on four of five scaled health-related measures (the impact of the child's illness on the family, the child's functional status, and the mental health of both mother and child). These findings did not all favor the same group, suggesting that certain areas of function may present more problems for some subgroups. These differences virtually all disappear when multivariate techniques are used to control for variation in important socioeconomic characteristics among the three subgroups. Statements that the health status of one subgroup is better than that of another are too simplistic if they do not indicate the particular aspect of health status being discussed and control for differences among the groups in maternal education, family structure, maternal welfare status, and similar background characteristics.

THE 1980 CENSUS REVEALED that there are 14.6 million Hispanics in the United States representing 6.4 percent of the population (*1*). Since they are the fastest growing minority group in the population,

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there is concern about both the amount and quality of health data on the Hispanic population. This concern is heightened, especially about the children, because over a third of the Hispanics in the United States are less than 15 years of age. This paper addresses two issues: (*a*) the methodology of measuring health status among Hispanics and (*b*) the actual health status of Hispanics in one study of children with chronic illness in the inner city of a northeastern metropolitan area.

A central issue in the measurement of health among minority groups is whether measures developed on general populations are appropriate for assessment of special subpopulations. Obstacles to data collection in subpopulations are numerous. They include difficulties in translating and standardizing questions and in assessing differences in the cultural context of questions. These issues may lead to erroneous interpretation of the data.

The health status of the Hispanic subpopulation is an issue of concern both for methodological reasons and because many Hispanics are found among the socioeconomically less advantaged segments of society. There are large numbers of children with chronic illness in the general population and even more prominently among the disadvantaged who also have less access to health care. The overall health status of Hispanic and black children is reported to be less favorable than that of white children (*2*), and they are far less likely than other subgroups to have health insurance coverage for their children (*3*).

We recently conducted an indepth field study of chronically ill children in a northeastern inner city in which 61 percent of the respondents identified themselves as Hispanic: 51 percent Puerto Rican and 10 percent non-Puerto Rican Hispanic. Some chose to be interviewed in Spanish and others in English. The existence of a large-scale survey provided a unique opportunity to compare the quality of the data across ethnic and language subgroups, as well as to examine the relative health status of English-speaking Hispanics, Spanish-speaking Hispanics, and a non-Hispanic group of mostly black families who met similar eligibility criteria.

Specifically this report (*a*) describes methods used in the preparation of instruments for a cross-cultural field study, (*b*) compares the quality of the data obtained in the study from three subgroups, and (*c*) compares the status of the three subgroups on a series of health and health-related measures in a series of bivariate and multivariate analyses.

Methods

The Pediatric Ambulatory Care Treatment Study (PACTS) was funded in 1977 by the Maternal and Child Health and Crippled Children's Services Research Grants Program, Bureau of Community Health Service, Health Resources and Services Administration, Public Health Service, to evaluate a pediatric home care program in which a multidisciplinary team provides comprehensive primary care, support, coordination, patient advocacy, and education to chronically ill children and their families. The study employed a pretest-posttest experimental design in which children with chronic physical conditions that are diagnostically heterogeneous were randomized either to the Pediatric Home Care Program or to the sources of care traditionally offered in a hospital complex.

The objective was to compare the home care program with standard care on an array of outcome indicators that might be sensitive to comprehensive intervention and that would be common to children with a wide range of diagnoses. Details of this study have been provided elsewhere (*4–6*). It included a number of measures of health and health care for all the 219 families. The data were collected in structured home interviews conducted with the mother by female trained lay interviewers at enrollment, at 6 months, and 1 year later. All data for this report are drawn from baseline interviews conducted at enrollment at the time of randomization and, therefore, prior to any intervention difference that might have occurred later in the study.

All Hispanic families were interviewed by bilingual and bicultural interviewers and were given the option of being interviewed in the language in

which they were most comfortable. Approximately two-thirds of the Hispanic mothers chose to be interviewed in Spanish and one-third in English.

All families were asked, "Which of the following comes closest to describing your family background?" and given a choice of five responses (table 1). Eighty percent of the Hispanics identified themselves as Puerto Rican. The self-designation of ethnic group was cross-tabulated with the language in which the home interview was conducted, creating three categories for purposes of analyses—English-speaking non-Hispanic, English-speaking Hispanic, and Spanish-speaking Hispanic. (Thirteen interviews that included elements in both languages were eliminated from the analyses.) The overwhelming majority of the English-speaking non-Hispanics identified themselves as black.

Table 1. Response to "Which of the following comes closest to describing your family background?" survey of families of chronically ill children

Answer category	Number	Percent
Puerto Rican	111	51
Black, Negro	58	27
Italian	8	3
Hispanic (not Puerto Rican)	22	10
Other	19	9
Total	218	100

Data

An important consideration in the selection and development of measures was the attempt to incorporate concepts and areas of function that would not be systematically biased in favor of one or another subgroup. A series of steps were taken in preparation for the home interviews in an effort to maximize the quality of the data to be collected. The original English interview questions were translated by a professional translator into Spanish and were then independently translated back into English by a bilingual, bicultural member of the research team. In a subsequent step, bilingual bicultural staff members attempted to reconcile any discrepancies in the original and back-translated versions and to check for the idiomatic acceptability of the Spanish version in consultation with the project director who understood the intent of the questions. Where discrepancies or awkward Spanish constructions were found, the English and Spanish instruments were revised to be parallel.

The home interviews themselves consisted of both structured and open-ended questions, and they were tape recorded. Fixed-response category questions including scale-score items were all coded at the time of the interview and were checked against the tape recorded interviews for quality control.

The measures included several single-item measures of morbidity and health care services, an index of health care maintenance, and five scaled variables—child's functional status, child's psychological adjustment, mother's psychiatric symptoms, satisfaction with care, and the impact of the illness on the family. Data are reported subsequently on five major scaled variables and the measures of health care. Each scale has a total score and several subscale scores and used fixed responses for individual items:

1. Functional status measure. The Functional Status Measure, developed specifically for this study, is designed to tap variations in behavioral function among children who have a variety of chronic conditions and to be sensitive to minor differences in function of a given child over time. The goal of this measure is to describe the morbidity status of the sample. Functional status is defined as the capacity to perform age-appropriate roles and tasks. It assesses behavioral responses to illness that interfere with normal social role performance. Stein and Jessop (*8*) have described the development and validation of this measure elsewhere. The score used in this paper is the general health status score for children 9 months or older.

2. Child's psychological adjustment. A 28-item version of the Personal Adjustment and Role Skills Scale (PARS) II, developed by Ellsworth, was used to measure the psychological adjustment of the 81 children in the sample who were 5 years or older at entry. In subsequent revisions, the PARS II title is reserved for the adult version, and the child and adolescent version is termed the CAAP (*9*). This measure, designed to be administered to a parent or other significant adult, has good reliability and discriminant validity and has been used with minority populations. It was chosen because of its psychometric properties as well as its distinctiveness in simultaneously including three dimensions of particular interest in the study of chronic illness: dependency, hostility, and withdrawal. It also assesses anxiety-depression, productivity, and peer relations.

The final 28 items used in this study were selected from the original 55-item schedule developed by Ellsworth. The criteria for selection in-

Table 2. Demographics by ethnicity-language (percentages), survey of families of chronically ill children

Variable	Non-Hispanic English (N ≥ 73)	Hispanic English (N ≥ 41)	Hispanic Spanish (N ≥ 77)	Total (N ≥ 192)	Significance		
					X	DF	P
Marital status							
Single, never married	24	17	30	25	9.90	4	<.001
Divorced, separated, widowed	29	31	38	33			
Married	47	52	32	42			
Family type							
Both parents	46	55	43	47	9.23	6	<.001
Mother alone	34	31	46	38			
Mother with other adult	15	9	6	10			
Other	5	5	5	5			
Annual family income							
Less than $5,000	25	32	40	32	10.60	2	<.001
$5,000–$9,999	37	34	40	38			
$10,000 or more	38	34	19	30			
Welfare							
No public assistance	58	52	35	47	11.40	2	<.001
Public assistance	42	48	65	53			
Employment status, mother							
Mother not working	66	86	94	82	28.18	2	<.001
Mother employed	34	14	6	18			
Employment status, other household members							
None working	48	45	66	55	10.36	2	<.001
Other household member working	52	55	34	45			
Father's education							
Less than high school	31	57	57	47	29.52	4	<.001
High school graduate or more	62	41	30	45			
Unknown	7	2	13	8			
Mother's education							
Less than high school	28	52	78	54	50.16	2	<.001
High school graduate or more	72	48	22	46			

cluded judged clinical relevance for a population of chronically ill children, extent of variation and discrimination of response in a pretest sample at our institution, and factor analyses on the pretest sample as well as analyses provided by Ellsworth. The psychometric properties of the scale have been replicated on the present sample, and a factor structure similar to Ellsworth's was obtained.

3. Mother's psychiatric symptoms. For the purpose of this study, the mental health of the mother was defined as the variety and flexibility of emotional responses and was measured by the intensity and frequency of maladaptive behavior using the 29-item Psychiatric Symptom Index (*10*), a shortened version of the Hopkins Symptom Distress Checklist (*11*). Items reflecting groups of symptoms, signs, and dispositions are included. Psychiatric diagnosis is not implied, although the items may be consistent with diagnostic entities. The symptom patterns thought to be of interest were anxiety and depression, anger-hostility (deemed especially appropriate as it may be related to child abuse), and somatization which is especially relevant for Hispanic populations (*12*).

These symptom patterns were selected because they occur with significant frequency in nonpatient samples, and because they are believed to be related to a mother's ability to function in her role. The instrument selected had been used previously with multiethnic urban dwellers who were disadvantaged and it had a factor structure compatible with the concepts of interest in this study. The structure of the Psychiatric Symptom Index was reexamined on data from the current sample and the results replicated the previously obtained findings for a lower class sample (*13*).

4. Satisfaction with care. This variable assesses the extent to which the respondent feels satisfied with the medical care the child is receiving. A schedule based on the work of Ware and colleagues (*14*) was developed with modifications making it suitable for use (*a*) in a municipal hospital setting, (*b*) with children's medical problems, and (*c*) with nurses as well as physicians.

5. Impact on family. The Impact on Family Scale is designed to assess the parent's perception of the effects of a child's illness on the family. Four dimensions were theorized as relevant and defined through factor analysis and psychometric procedures. There is a total score and four subscores (*15*). The instrument also has a subscale assessing the effects on siblings.

Analysis

Analyses were performed on a VAX computer using the Statistical Package for the Social Sciences (SPSS). First the sociodemographic characteristics of the three subgroups were compared. Second, the psychometric properties of the instruments taken from the literature and the ones newly developed for our study were examined using the enrollment data. The applicability of the instruments across ethnic and language segments of the population was assessed by examining the psychometric properties of each scale for the total sample and then separately for each of the three subgroups using the internal consistency reliability (alpha) of the scales (*16*). Reliability coefficients that are high and, more importantly, consistent across the three segments of the study population reflect measures that behave the same way within each of the three subgroups. On the other hand, big differences in the reliabilities would suggest that the measures do not behave in the same way in all the subpopulations and that common interpretation of the scores would be hazardous. Third, the actual level of well-being for each of three groups on each variable was examined in bivariate analyses and subsequently in multivariate analyses while controlling for differences in the background characteristics of the three subgroups.

Findings

Sociodemographic characteristics. Review of the sociodemographic characteristics of these three subgroups (table 2) demonstrates a tendency for the Spanish-speaking Hispanics to be less frequently married, have lower family incomes, and have a higher likelihood of being on public assistance than the other two groups. English-speaking Hispanics are more likely to be married, not working, and have two parents in the household. Hispanic mothers in both groups are substantially less likely to be working than non-Hispanics. The education of both mothers and fathers shows a gradient across the three subgroups with English-speaking non-Hispanics being more likely to have graduated from high school than English-speaking Hispanics who are in turn more likely to have graduated than the Spanish-speaking Hispanics.

Psychometric properties of the health-related variables. The internal consistency reliabilities for the three subgroups (the English-speaking non-Hispanics, English-speaking Hispanics, and Spanish-speaking Hispanics) are shown for the total scores in table 3 and are quite consistent across subgroups. In general this pattern holds for both the total scores on table 3 and the 20 subscale scores (data not shown).

Bivariate analyses of group differences. Next the scaled dependent variables were examined by comparing the mean values for the subgroups for each variable. Mean scores on enrollment data (table 4) indicate a tendency for Hispanics, regardless of language, to report greater impact of the illness on the family, lower functional status, and poorer mental health of children and mothers than non-Hispanics. These results support previous data showing greater reporting of health problems among Hispanics.

Among the Hispanics, those who speak English report better functional status and psychological adjustment of the child, but more maternal psychiatric symptoms than Spanish-speaking mothers. Based on the post hoc *t*-tests, these differences are significant between the Spanish-speaking Hispanics and the other two groups in the child's functional status and psychological adjustment. Additionally, English-speaking Hispanics report significantly more psychiatric symptoms on the part of the mothers than non-Hispanics, while Spanish-speaking Hispanics report more impact of the illness on the family than non-Hispanics. However, there are many areas, particularly among subscores (data not presented), in which there are no significant differences and some of the differences obtained are very small.

Table 5 shows a series of traditional single-item morbidity measures including days in bed, number of hospitalizations, days hospitalized, and days absent from school. No significant differences were seen in these items among the three groups. Examination of the variables measuring health care maintenance services received by the index child demonstrated no significant differences among mean values for levels of health care, although non-Hispanic children tended to receive slightly more of the recommended services.

Table 3. Internal consistency of scaled scores (Cronbach's alpha), survey of families of chronically ill children

Variable	Non-Hispanic English	Hispanic English	Hispanic Spanish	Total
Satisfaction with care	.86	.88	.78	.83
Child's psychological adjustment	.86	.79	.72	.82
Mother's psychiatric symptoms	.93	.95	.93	.93
Impact on family	.86	.87	.91	.88
Functional status:				
9 months–2 years	.80	.55	.68	.70
2–4 years	.87	.74	.82	.83
5 or more years	.64	.81	.71	.72

Table 4. Means and standard deviations of scaled scores (ANOVA), survey of families of chronically ill children

Variable	Group 1 non-Hispanic English		Group 2 Hispanic English		Group 3 Hispanic Spanish		Significance of F.
	Mean	SD	Mean	SD	Mean	SD	
Satisfaction with care (− to +)	32	±4	32	±5	32	±4	NS
Child's psychological adjustment (− to +)	69	±9	67	±9	62	±9	[1] .006
Mother's psychiatric symptoms (+ to −)	22	±15	29	±18	24	±15	[2] .08
Impact on family (+ to −)	46	±8	49	±9	50	±8	[3] .03
General functional status (− to +)	79	±17	76	±17	71	±18	[1] .03

[1] Post hoc t-tests indicate Group 3 differs significantly from Groups 1 and 2.
[2] Post hoc t-tests indicate Group 2 differs significantly from Group 1.
[3] Post hoc t-tests indicate Group 3 differs significantly from Group 1.
NOTE: SD = standard deviation; NS = not significant.

Table 5. Means and standard deviations of single item morbidity measures (ANOVA), survey of families of chronically ill children

Variable	Group 1. Non-Hispanic English	Group 2. Hispanic English	Group 3. Hispanic Spanish	Total	Significance of F.
Days in bed	13 ±30	11 ±28	22 ±37	16 ±32	NS
Number of hospitalizations	1.6 ±.9	1.5 ±1.0	1.4 ±.8	1.5 ±.9	NS
Days hospitalized	17 ±20	14 ±20	16 ±17	15 ±19	NS
Days absent	3 ±5	4 ±3	5 ±5	4 ±4	NS
Index child's health care maintenance [1]	31 ±25	37 ±22	37 ±21	35 ±23	NS
Siblings health care maintenance [1]	26 ±21	33 ±20	37 ±24	32 ±22	[2] .03
Mother's health care maintenance [1]	21 ±22	22 ±19	33 ±25	26 ±23	[3] .002

[1] Health Care Maintenance (HCM) expressed as percent of regular HCM which has *not* been provided.
[2] Post hoc t-tests indicate Group 1 and Group 3 differ significantly.
[3] Post hoc t-tests indicate Group 3 differs significantly from Group 1 and 2.
NOTE: NS = not significant.

However, significant differences were found for both a randomly selected sibling's and the mother's health care. The pattern differed somewhat: the Hispanic siblings of both language groups were receiving less health care maintenance, although Hispanics whose mothers spoke Spanish had the least adequate package of services, and English-speaking non-Hispanics received somewhat better care. The differences between non-Hispanics and Spanish-speaking Hispanics were significant in the post hoc *t*-tests. In contrast mothers who speak English, regardless of whether or not they are Hispanic, received significantly more complete care than those who speak Spanish.

Multivariate analyses. Because of the differences of the three subgroups on background variables, further analyses were conducted using both two-way analyses of variance (ANOVA) and multiple regression techniques to control for maternal education, family type (mother-father, mother-other adult, or mother alone) and welfare status.

Initially significant differences on bivariate anal-

yses persist for child's mental health and functional status, as well as for the mother's health care maintenance variables when controlling for either marital status, family type, or welfare status, but these are eliminated when maternal education is controlled. For impact on family, controlling on marital status and family type does not eliminate the significant differences, but controlling for maternal education and welfare status does. Differences in sibling health care maintenance are not eliminated on any of the two-way ANOVAs. However, all the differences among the subgroups disappear entirely when regression analyses are performed controlling for the four background variables simultaneously (results available on request). Thus the multivariate analyses suggest that differences found in bivariate analyses are related primarily to background characteristics, rather than to intrinsic differences in health among the subgroups.

Discussion

The results presented in this paper give clear evidence of procedures that were successful in achieving the stated goal of adequate and comparable psychometric properties across three ethnic subgroups of inner-city families. This occurred in spite of the demographic differences among the subgroups in terms of education, family structure, and employment.

Overall, the differences among the three groups were of small size, but appeared to be of interest. In spite of the fact that they were all eliminated by multivariate procedures, these findings are extremely informative analytically. That is, at the practical level, the demographic differences and differences in health and health-related variables that were found in the bivariate analyses do exist and may be expected to occur in other samples of Hispanics and non-Hispanics.

There are few differences among the three groups on the bivariate level in traditional measures of health status. A notable exception is in the area of receipt of preventive services, where differences are seen between health care maintenance received by Hispanic Spanish-speaking mothers as compared with other mothers, and among the randomly selected siblings of the chronically ill index child. The interesting trends here suggest that siblings of chronically ill Hispanic children may be at special risk of failure to receive preventive health services. This is surprising in view of the recent review by Andersen and coworkers (*17*) suggesting that Mexican American Hispanics are high users of preventive services when compared with other segments of the population.

Our initial findings that Hispanic English-speaking mothers reported their children's psychological adjustment and functional status to be better than Spanish-speaking mothers (and more similar to non-Hispanics), as well as their general tendency to report fewer health-related problems must be interpreted in light of the work by Rogler and coworkers (*18*). They found that more acculturated and more educated Hispanics are more likely to acknowledge less socially desirable characteristics. Their findings come from a study of two-generational Hispanic families in the same northeastern metropolitan area and suggest an overall bias toward greater reporting of problems among English-speaking Hispanics than Spanish-speaking Hispanics. Yet our data suggest that acculturated Hispanics generally report having fewer health-related problems. This leads us to speculate that the burden of chronic childhood illness for the Spanish-speaking Hispanics may be even greater than reflected by the differences in the reported means.

Moreover, the lack of significant differences among the subgroups on more traditional items (days in bed, number of hospitalizations, days hospitalized, or days absent) suggests that the findings cannot be explained by large differences in morbidity among the groups. Rather, it appears to be related to the fewer years of schooling of the Hispanic sample. Our finding with regard to the sociodemographic characteristics of the groups of English and Spanish-speaking Hispanics differ somewhat from those of Ventura and Taffel (*19*) whose analysis of a national sample showed higher levels of education among Hispanics than were found in our sample. Additionally, they reported higher numbers of unmarried mothers among those born on the mainland, who presumably are more likely to be English-speaking. We found higher numbers of unmarried mothers among the Spanish-speaking, who were more likely to be born outside mainland United States.

In our English-speaking sample, Hispanics had significantly more maternal psychiatric symptoms than non-Hispanics and also more than Spanish-speaking Hispanics, though this difference was not significant. Vega (*20*) reports significantly more depression in Spanish-speaking women than in English-speaking Hispanics, a finding that parallels our sample.

There are interesting differences in the pattern of adjustment. Although differences in education

among the subgroups explain the patterns, maternal psychological adjustment is worse for Hispanic English-speaking mothers, while child's adjustment is lowest for children of Spanish-speaking mothers. We speculate that in this sample the findings may depend in part on which individual is the bridge between the indigenous family culture and the outside world. When the mother is the bridge, she may buffer the negative mental health effects on the chronically ill child. But when she remains in her native culture, she reports less stress, while the child who cannot rely on her to serve as the communicator appears to be more at risk.

The fact that different areas of outcome revealed different patterns of results on the bivariate level suggested that the subgroup differences are not global, but they are specific to certain areas of function. It leads us to believe that one cannot assume that Hispanics will always and in all areas report more health-related problems or be certain whether reporting will be higher in English or Spanish-speaking Hispanics.

Most striking, however, is the fact that on the multivariate level all the discrepancies described on a bivariate level are eradicated. This observation underscores the importance of controlling for important differences in background characteristics before falsely concluding that language and cultural differences explain variations in health-related variables. On a three-variable level, the single most powerful variable in accounting for these differences is maternal education. None of the differences continued to be significant when this factor was entered into the equation.

In summary, we describe the application of accepted methods for the successful translation of health indices which resulted in satisfactory retention of psychometric properties of the instruments. These findings suggest the importance of multivariate procedures in assessing the health status of this important and growing subgroup of the population.

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