Purpose: Diabetes specific numeracy is the set of mathematical skills necessary to effectively self-manage diabetes. Low numeracy scores are strongly related to poorer health outcomes, as evidenced by a higher A1C, in patients with diabetes. The purpose of this study is to examine diabetes-specific numeracy among Hispanic patients with diabetes by 1) examining the scores on a diabetes numeracy test; 2) examining the correlation between numeracy, years of education, and acculturation; and 3) evaluating the level of mathematical skills and numeracy tasks that are most problematic for Hispanic patients with diabetes.

Methods: These analyses are part of a larger descriptive correlational study that will compare scores from two diabetes knowledge questionnaires with diabetes numeracy scores. Participants were recruited from two clinics serving low-income Hispanics, including many immigrants. Inclusion criteria were the following: 1) self-reported Hispanic or Latino ethnicity, 2) treated for type 2 diabetes at one of the two clinics, 3) aged 25-75 years, and 4) English or Spanish-speaking. After informed consent was obtained, participants were interviewed individually. The questionnaires included a measure of personal characteristics, Marin and Marin’s 4-item language-based Acculturation Scale for Mexican Americans, and the 5-item Diabetes Numeracy Test (DNT-5). Data were entered into an SPSS database, checked for accuracy, and cleaned. Measures of central tendency (frequency, percent, ranges, means, and standard deviations) were calculated to describe the sample and overall numeracy and acculturation scores. Acculturation and education level were correlated to the total score on the DNT-5. Each of the DNT-5 items was categorized by the type(s) of diabetes-related skill needed to respond to the question correctly (e.g., counting carbohydrates, reading nutrition labels), and by the numerical skill required (addition, multiplication, fractions, and percentages).

Findings: The majority of patients was male (53.8%), from Mexico (78.5%), had diabetes for 12 or less years and less than a high school education. The overall level of acculturation was low. The average total score on the DNT-5 was 2.276. A small, positive, significant correlation was found between numeracy and the years of education (r = 0.332, p = 0.007). The correlation between numeracy and acculturation was not statistically significant (r = 0.199, p = 0.112.). A moderate, positive, significant correlation between education and acculturation was found (r = 0.484, p < 0.000). The percentage of correct responses for each item is as follows: 53.8% (Item 1), 13.8% (Item 2), 50.8% (Item 3), 55.4% (Item 4), and 53.8% (Item 5). Participants had difficulty with multiple-step problems, problems that require some English proficiency, use of fractions to determine portions or a combination of these skills. The diabetes-related skill that proved to be the most difficult was calculating carbohydrates using a nutrition label.

Conclusions: There is a low level of diabetes-specific numeracy skills in this sample of low-income Hispanic patients with diabetes. Diabetes education should teach skills required for determining portion sizes and using nutrition labels. Future research should focus on culturally competent interventions for Hispanic patients with diabetes who have a low diabetes-specific numeracy level.

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