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Brief Report

Title: Health literacy in unauthorized Mexican immigrant mothers and risk of developmental delay in their children

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Suggested Running Head: Health literacy and risk of developmental delay in children of Mexican Mothers

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Abstract:

Background: Developmental delay and Early Intervention (EI) service utilization is not well defined among unauthorized Mexican immigrants, a vulnerable population.

Methods: Individual interviews were conducted in Spanish with Mexican born women receiving maternal health care. Children 12-60 months of age were assessed for risk of developmental delay using the Ages and Stages Questionnaire (ASQ-3).

Results: Among 87 women who completed interviews 12% had children (n=143) at risk for developmental delay. Of those at risk, 38% participated in EI. An additional 26% of the children qualified for further monitoring, of which 59% used EI. Women with low health literacy had nearly four times the odds, adjusted for parity, of having a child with risk of developmental delay (aOR 3.8; 95% CI 1.0-14.3).

Discussion: Developmental delay is associated with low maternal health literacy; however, rates of self-reported EI use in this population are higher than those seen nationally.

Key Words: Immigrants, Child development, Health literacy, Urban

Background

Developmental delay in preschool age children is a critical target for health providers due to the potential negative impact on a child's life course. Evidence suggests early detection and treatment of developmental delays with Early Intervention (EI) services confers maximum benefits [1]. Despite the evidence of benefit, there is a gap between evaluated need and EI service delivery, particularly for vulnerable populations [2]. While approximately 13% of children in the general population show signs of developmental delay by 24 months of age, it is estimated that just 10% of those children receive needed evaluations and about only 3% receive services [2]. A recent evaluation of developmental screening in pediatric practices found that of 438 children in need of assessment, only 254 (60%) were appropriately referred for EI evaluations, and only 170 (38.8%) completed the process [3].

Unauthorized immigrants from Mexico, representing 58% of the total unauthorized immigrant population within the US, or 6.5 million people, are a vulnerable population likely to face difficulties in acquiring EI services for their children [4]. Unauthorized immigrants face access barriers related to their legal status which are compounded by low educational attainment, inadequate literacy, and low English proficiency. Children of foreign born or non-English speaking mothers are less likely to be referred to EI services than children of native born English speaking counterparts, but are just as likely to receive the evaluation and services once referred [5]. This suggests that for immigrants, adherence to recommendations by a medical practitioner is not an obstacle to care [6]. We examined the rates of positive screening for developmental delay and EI service utilization in an unauthorized Mexican immigrant community and factors associated with each.

Methods

Participants & Data Collection

Participants were recruited from a gynecologic clinic for uninsured Spanish speaking women and post-partum wards at an academic medical center in Philadelphia. Data were collected from June, 2012 to February, 2013. Women who were born in Mexico, over 18 years old and either pregnant or had a child age 0-66 months were eligible to participate. Following a discussion of informed consent, participants were interviewed in Spanish. Participants received an incentive. The study protocol was approved by the Institutional Review Board of the University of Pennsylvania and supported by a community advisory board (MUST – Mujeres Unidos por Salud Temprano, or Women United for Early Health) which met regularly to review study measures, protocols, and results, as well as to provide guidance for the research.

Measures

For children aged 11-66 months, developmental screening was conducted using the Spanish version of the Ages and Stages Questionnaire-3, which has nationally representative norm based scoring (ASQ-3; Paul H. Brookes Publishing Company, 2009). Based upon the ASQ standardized score, a child is considered positive for risk of developmental delay if the total sub score is less than two standard deviations (SD) for age in any of 5 domains. Participants were also asked about the characteristics of their youngest child's pediatric services including; availability of translation services, parental satisfaction with pediatric care, and quality of overall experience.

Maternal health literacy was measured using the Parental Health Literacy Activities Test (PHLAT-8-Spanish version) and two validated Single Item Literacy Screener (SILS) questions, each independently intended to be used as single item screening questions with a score of 2 or less indicating risk of low health literacy [7, 8]. Maternal depression symptomology was measured using the Spanish version of the Patient Health Questionnaire (PHQ-9). The interview protocol also collected demographic variables, location of pediatric care sites, social supports, perceived discrimination and mothers' perceptions of the neighborhoods in which they live.

Data Analysis

Specific outcomes for analysis were: 1) percentage of children with a regular pediatric care site, 2) percentage of children screening positive for risk of developmental delay, and 3) percentage of those children at risk of developmental delay who receive EI services by parental report. For all variables, we calculated means and frequencies and bivariate analyses to examine correlations between outcome variables and those hypothesized to influence the use of services.

Detecting high rates of low maternal health literacy, bi-variate analyses were conducted to investigate the association between low maternal literacy and the outcomes listed above. Candidate control variables for multiple regression analyses included: education level, maternal depression, insurance status and length of time in the US. Our criterion for evidence of confounding, and thus inclusion into the regression model was a P-value of 0.25 or less for association with both the independent and dependent variables. The number of children under age 66 months for each woman assessed for health literacy was included in regression models because the risk for developmental delay attributable to these women would otherwise be falsely inflated among those with more children. Analyses performed with SPSS version 20.

Results

A total of 108 women were screened for participation in the study, 89 were eligible and 87 women with children accepted informed consent and completed interviews. Women whose children were less than one week old or living in Mexico did not complete questions about pediatric services, leaving a total of 73 women in the pediatric services subsample.

Demographic characteristics of the women included in our study sample are shown in table 1. On average, women were 28.2 years old (SD 4.1), with 2 children (SD 1.2), had been in the US for 7.6 years (SD 4.2), and had lived in Philadelphia for 6.9 years (SD 3.7). Mean and median incomes were below the

poverty line for a family of four. Nearly two thirds of women (64%) had not completed high school, and nearly all (94%) breast fed. Fifty-eight percent of women received a score of < 4 on the PHLAT-8, indicating lower health literacy.

Pediatric Development

A total of 65 ASQ-3 screeners were completed. ASQ- 3 scores indicated that among the children screened, 8 (12.3%) were found to be at risk for developmental delay and in need of further assessment for EI services. Of these 8 children, 3 (38%) were currently receiving EI services. An additional 17 (26%) scored in the “monitoring zone”, indicating they may benefit from additional monitoring. Of these 17 children, 10 (59%) had at some time received EI services. In the majority of completed ASQ-3s, 36 (55%) mothers, reported concern about some aspect of their child’s development. The most common areas of concern were language/communication and behavior (n=9, 13.8%).

Literacy and pediatric development

Table 2 describes the results from the regression analysis. Low health literacy was associated with a child being at risk for developmental delay on the ASQ-3 ($p=.027$) but was not associated with use of EI services. In the regression model, mothers scoring <4 on the PHLAT had an increased odds of having a child at risk for developmental delay (OR 4.2; 95% CI 1.1-15.3). These increased odds held after adjusting for a mother’s total number of children (aOR 3.8; 95% CI 1.0-14.3). No association was found between health literacy and parental report of difficulties accessing care for children or satisfaction with pediatric services (data not shown).

Discussion

The impact of maternal health literacy on EI has not been well studied in unauthorized immigrants, a vulnerable population with access issues to health services. In this cross sectional study we

found that the rate of risk of developmental delay among the children of unauthorized Mexican immigrant mothers is comparable to national and regional data for the general population [2]. We also found that, despite low health literacy scores among these mothers, the rates of use of EI services for children in our study population (38%) were higher than rates previously reported for the general population (10%) [2]. Finally, we found that mothers with lower health literacy had increased odds of having a child with risk of developmental delay. We are not aware of previous studies which have explored the possibility that maternal health literacy is associated with developmental risk. This finding fits within frameworks of early learning; mothers with lower literacy provide home environments which include less learning materials, shared reading and teaching which could affect children's early language and cognitive development [9, 10].

In this study, EI service use for those at risk of developmental delay is high in this community. This result is different from previous work indicating that the Mexican immigrant community has lower rates of pediatric care utilization. We also found that within this sample of vulnerable women, low health literacy is not associated with EI service utilization. This finding is consistent with previous studies of maternal literacy and pediatric care; preventive child health service use in low income families whose parents have low health literacy is equal to those from the same communities with parents who have higher literacy [5, 6]. Parents overcome health literacy related barriers to acquire recommended health services for their children at the same rate as those who have adequate literacy.

The limitations of this study include a small sample size and reliance on maternal report data for use of EI services. A point for future considerations is the high rate (94%) of two-parent households, which may mitigate a mother's lower health literacy. As with any convenience sample, the women willing to participate in this study may have been women more willing to interact with the health system and thus more likely to access EI services for their children; however the refusal rate for participation in this sample was low, making the chance of selection bias unlikely. Further research is needed to assess screening among children with risk of developmental delay in this community.

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Table 1. Description of Demographic Characteristics of Sample (n=87)	
Characteristics	Mean (SD) or %
Mother's Age (years)	28.2 (4.1)
Age at first pregnancy (years)	21.5 (4.3)
Number of Children	2 (1.2)
Time in US (years)	7.6 (4.2)
Time in Philadelphia (years)	6.9 (3.7)
Annual Income (Mean, SD)	18300 (7821)
Mother speaks English-well or very well	23
Maternal Education	
Primary or less (grades 1-6)	24
Secondary (grades 7-9)	41
Preparatory (grades 10-11)	28
Some College or More	7
Mother's Insurance Status	
Medicaid	11
Private insurance	2
Uninsured	86
Child's Insurance Status n=143	
Medicaid	84
Private Insurance	8
Uninsured	8
Mother Currently Has Partner	94
Mother's concern about having enough money month to month	
Not/little concerned	56
Somewhat concerned	22
Very concerned/Extremely Concerned	22
Health Literacy: (n=73) PHLAT-8 score <4*	56
*Out of 8 possible. Imputed	

Table 2. Regression Models for Risk of Developmental Delay		
Risk for Developmental Delay	Model 1 OR (95% CI)	Model 2 aOR (95% CI)
PHLAT score <4	4.6 (1.4-15.6)	4.4 (1.3-15.4)
Children \leq 66 months of age	3.2 (1.0-10.7)	3.0 (0.8-10.7)
aOR-adjusted for total number of children		