

Research Article

Associations of adverse social determinants of health with missed well-child visits and the role of caregiver social support

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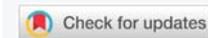
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Abstract

Objective: To examine the association between adverse social determinants of health (SDH) and missed well-child visits and the interaction with the level of caregiver social support.

Methods: This is a secondary data analysis of data collected from a SDH screening program conducted during well-child visits with referral, navigation and follow-up services for patients. We included 573 adult caregivers who accompanied patients aged 0-5 years to well-child visits and completed the screening from August 2017 to May 2018. The caregivers reported financial hardship, food insecurity, housing challenges, childcare difficulty, transportation issues, insurance difficulty, job difficulty, and education needs. Our primary outcome was a no-show (i.e., missed) to a well-child visit. Social support was dichotomized as low or high.

Results: Among 573 patients who completed the screening, 335 patients (76.4%) had at least one social need. Financial hardship ($p = 0.006$), housing instability ($p = 0.002$), and no/poor childcare ($p = 0.03$) were associated with missed well-child visits. In multivariable regression analysis, having Medicaid (aOR = 1.91 [1.17-3.10]) and unstable housing (aOR = 6.79 [1.35-34.70]) were both associated with missed well-child visits. However, when social support was added to the multivariable logistic model, both Medicaid and unstable housing were no longer associated with missed well-child visits.

Conclusion: Adverse SDH such as financial hardship, housing instability, and childcare difficulty were associated with missed well-child visits. However, with the addition of social support, this association was no longer significant. This study supports the hypothesis that high social support may mitigate the association between well-child visits among families experiencing adverse SDH.

Introduction

Well-child visits represent the primary health service delivery model for the promotion of optimal health and development for pediatric patients. During these visits, children receive comprehensive assessments of their physical, behavioral, developmental, socio-emotional health and well-being. Pediatricians utilize this encounter to identify unmet healthcare needs, provide parental guidance, and initiate early

treatment or referral to mitigate adverse health outcomes [1]. Moreover, adherence to well-child visits has been associated with a lower likelihood of preventable hospitalizations and a reduction in avoidable emergency room visits [2-5].

In addition to the surveillance of child health and wellness, pediatric practices have included identification of families with adverse social determinants of health (SDH), which are defined as the social circumstances in which people live and



work that powerfully influence health and development, into well-child visits [6]. These adverse SDH, including socio-economic and material hardship, have been shown to be associated with higher rates of poor health outcomes, including developmental delay and childhood obesity [7-9]. Specific types of material hardship, such as poor housing quality, have been associated with increased risk of chronic disease and mental health issues [10]. In addition, low caregiver psychosocial support has also been associated with worse childhood health outcomes including developmental delay, childhood obesity, and childhood asthma [11-13].

Adverse SDH are linked to decreased use of preventive care services, which is supported by the Behavioral Model of Vulnerable Populations theory [14]. Prior research has identified factors, such as financial strain, to be associated with increased no-show rates in adult ambulatory care visits [15]. Greater neighborhood childhood opportunity, which takes into account measures of educational, environmental, and economic opportunity, has also been associated with lower rates of acute care visits and higher rates of ambulatory care visits [16]. Alternatively, among patients experiencing adverse SDH, social support has been shown to enhance medical adherence among adults and caregiver social support has been implicated in improved management of chronic childhood disease management, such as asthma [17,18]. However, few, if any, studies have examined the relationship between adverse SDH, including various domains of material hardship, on missed preventive care visits and the influence of social support in the pediatric setting [19].

A growing number of pediatric practices have initiated SDH screening, given the positive implications on overall health status [20-22]. Gottlieb, et al. demonstrated that families participating in such programs have reported reductions in social needs and improvements in their child's health status [23]. Given the known independent relationships between SDH, social support, and health outcomes, we examined these factors collectively and investigated their contribution to pediatric healthcare utilization [24]. We examined the association between adverse SDH and missed pediatric well-child visits, as well as the influence of caregiver social support on this association.

Methods

Study design, population and setting

We conducted a secondary data analysis from the Family Needs Screening Program (FAMNEEDS), now known as the Social Health Alliance to Promote Equity (SHAPE). The program started in August 2016 at a pediatric ambulatory clinic to identify patients with material and psychosocial hardships through universal screening and assessment at their preventive care visits. Patients who screened positive for social needs were referred to local community resources with follow-up to ensure their social needs were addressed.

Details of the FAMNEEDS and the screening tool can be found in the previous publication [22].

The FAMNEEDS program is based at a large hospital-based pediatric ambulatory practice in Queens, New York. The practice serves over 12,000 patients annually from racially and socioeconomically diverse backgrounds; greater than half from immigrant families and over two-thirds with Medicaid or Medicaid managed care. The practice has an expansive geographic catchment area, including all 5 boroughs of New York City and the entire Long Island peninsula. For this study, eligible caregivers were primary guardians accompanying a pediatric patient aged 0-5 years who arrived for a scheduled well-child visit from August 2017 to May 2018. We excluded patients who did not have a primary care visit within 6 months prior to the initial completion of the screen.

Measures

The SHAPE tool assesses sociodemographic characteristics of the patient and his/her caregiver, social needs (food/energy/housing insecurity, unemployment, childcare, transport, educational need, etc.), substance use, depression, and social support. In addition to traditional demographic factors, it also captures data on nativity of children and parents, country of origin, and limited English proficiency. We also assessed patient social support using the Multidimensional Scale of Perceived Social Support [25]. We dichotomized social support as high versus low; we identified patients to have high social support if their compiled score was greater than 5 and low social support if their compiled score was 5 or less.

Using the practice-based electronic medical record, we retrospectively assessed whether the patient had a no-show status for any well-child visits within the 6 months prior to SDH screening. Missed well-child visits were dichotomized into whether the patient was absent or present for their scheduled well-child visit based on post-appointment status. Furthermore, to examine different gradients in missed well-child visits, we categorized missed well-child visits into 1) not missing any well-child visit, 2) missing one well-child visit, or 3) missing two or more well-child visits.

Analyses

We performed a descriptive analysis of patients' and their caregivers' characteristics, including sociodemographic characteristics and adverse SDH. These characteristics were further examined by whether the patient attended their scheduled well-child visit and the number of missed well-child visits over the prior 6 month period. We performed univariate analyses to compare patient/caregiver characteristics and missed well-child visits. Next, we examined the prevalence of adverse SDH among the entire study sample and by the presence of missed well-child visits. We then examined associations between type of adverse SDH and missed well-child visits. Chi-square tests were calculated to determine statistical significance at p - values equal to or less than 0.05.



Lastly, we used multivariable logistic regression models to identify characteristics associated with missed well-child visits. In model 1, we adjusted for demographic characteristics and SDH needs. In model 2, we additionally adjusted for social support status. Statistical analysis was conducted using SPSS 24.0 software and the study was approved by the Northwell Health Institutional Review Board.

Results

Description of the sample

Of the 952 caregivers who were eligible for the study, 699 caregivers completed the FAMNEEDS (response rate – 73.4%). We excluded 126, patients because they did not have a scheduled primary care visit within 6 months prior to the initial completion of the screen. Of the 573 children in the final study sample, 176 (30.7%) had at least one missed visit and 62 (10.8%) had two or more missed visits. The age of the pediatric population ranged from less than 1 month to 18 years, with a mean age of 21.9 months. The majority of children were nonwhite (94.3%), covered by Medicaid (66.9%), and had at least one special healthcare need (54.3%) (Table 1). Pertaining to the caregivers, most had at least a college education (66.1%) and were immigrants (55.0%). The majority of caregivers (76.4%) reported having at least one adverse SDH, and 29.5% reported having low social support.

Associations between sociodemographic factors and pediatric missed visits

Sociodemographic characteristics associated with pediatric missed well-child visits included child age above 0-6 months ($p < 0.001$), having Medicaid or Medicaid managed insurance ($p = 0.01$), and caregiver’s educational attainment of high school or less ($p = 0.01$) (Table 1). These variables

were significantly associated with multiple missed well-child visits, as well. A greater proportion of children with special healthcare needs experienced multiple (2 or more) missed visits ($p = 0.008$) compared to children without special healthcare needs. Independent variables of race, limited English proficiency, immigrant parents, and single parent households were not associated with missed well-child visits.

Associations between unmet social needs and pediatric missed visits

Children of families with reported adverse SDH were more likely to have missed well-child visits compared to those that had no adverse SDH ($p = 0.028$) (Table 2). Financial hardship ($p = 0.006$), housing instability ($p = 0.002$), and lack of childcare ($p = 0.03$) were associated with missed well-child visits. A similar trend was noted for having two or more missed visits as well. A greater percentage of patients with caregivers who reported low social support had any missed visits compared to those with high social support ($p = 0.02$).

Predictors of missed well-child visits

In multivariable logistic regression analyses (Table 3), children aged 7-24 months had almost 3.76 [95% CI 2.07 – 6.85] times the odds of having a missed visit while children aged 25 months or older had 2.35 [1.25 – 4.41] times the odds of having a missed visit compared to children aged 0-6 months, adjusting for all significant demographic and material hardship variables (Model 1). Children covered by Medicaid were almost twice (aOR = 1.91 [1.17 – 3.10]) as likely to have a missed visit compared to those not on Medicaid, and children living in unstable housing had 6.79 [1.35 – 34.71] times the odds of having a missed visit compared to children with stable housing (model 1). Financial hardship, lack of

Table 1: Patient demographic characteristics by no-show status to well-child visits.

Characteristic	Category	All ^a n (%)	No-Show n (%)	p - value ^b	0 missed n (%)	1 missed n (%)	2 + missed n (%)	p - value ^c
Overall		573	176 (30.7)		397 (69.3)	114 (19.9)	62 (10.8)	
Race	White	30 (5.7)	4 (13.3)	0.20	26 (86.7)	4 (13.3)	0 (0)	0.24
	Black	177 (33.8)	60 (33.9)		117 (66.1)	34 (19.2)	26 (14.7)	
	Latino	129 (24.7)	39 (30.2)		90 (69.8)	26 (20.2)	13 (10.1)	
	Asian	118 (22.6)	31 (26.3)		87 (73.7)	23 (19.5)	8 (6.8)	
	Other	69 (13.2)	21 (30.4)		48 (69.6)	12 (17.4)	9 (13.0)	
Education	High school/GED or less	177 (33.9)	67 (37.9)	0.01*	110 (62.1)	38 (21.5)	29 (16.4)	0.01*
	College or greater	345 (66.1)	93 (27.0)		252 (73.0)	64 (18.6)	29 (8.4)	
Medicaid	No	187 (33.1)	44 (23.5)	0.01*	143 (76.5)	32 (17.1)	12 (6.4)	0.03*
	Yes	378 (66.9)	128 (33.9)		250 (66.1)	82 (21.7)	46 (12.2)	
Special Healthcare Need	No	258 (45.7)	68 (26.4)	0.06	190 (73.6)	53 (20.5)	15 (5.8)	0.008*
	Yes	306 (54.3)	103 (33.7)		203 (66.3)	61 (19.9)	42 (13.7)	
Single parent household	Both Parents	332 (62.8)	99 (29.8)	0.78	233 (70.2)	64 (19.3)	35 (10.5)	0.60
	One Parent	197 (37.2)	58 (31.0)		129 (69.0)	33 (17.6)	25 (13.4)	
Immigrant Parent	No	236 (45.0)	71 (30.1)	0.99	165 (69.9)	47 (19.9)	24 (10.2)	0.79
	Yes	289 (55.0)	87 (30.1)		202 (69.9)	53 (18.3)	34 (11.8)	
Age in Terciles	0-6 months	153 (26.7)	24 (15.7)	0.01*	129 (84.3)	18 (11.8)	6 (3.9)	<0.01*
	7-24 months	232 (40.4)	89 (38.4)		143 (61.6)	59 (25.4)	30 (12.9)	
	25 months +	188 (32.3)	63 (33.5)		127 (66.5)	37 (19.7)	26 (13.8)	
Limited English proficiency	No	407 (76.8)	119 (29.2)	0.39	288 (70.8)	74 (18.2)	45 (11.1)	0.41
	Yes	123 (23.2)	41 (33.3)		82 (66.7)	29 (23.6)	12 (9.8)	

^aNumbers may not add to total (N = 573) due to missing data; ^bChi-square test between patients with and without no-show well-child visits; ^cFisher’s exact test; * p – value < 0.05



Table 2: Prevalence of SDH needs and social support by no-show status to missed well-child visits.

Variable	Category	Total ^a n (%)	No Show n (%)	p - value ^b	0 missed n (%)	1 missed n (%)	2 missed n (%)	p - value ^b
Overall		573	176 (30.7)		397 (69.3)	114 (19.9)	62 (10.8)	
Any SDH needs	None	104 (23.6)	45 (24.5)	0.03*	139 (75.5)	35 (19)	10 (5.4)	0.009*
	Yes	335 (76.4)	113 (33.7)		222 (66.3)	66 (19.7)	47 (14.0)	
Financial hardship	Yes	154 (29.0)	59 (38.3)	0.006*	95 (61.7)	30 (19.5)	29 (18.8)	< 0.01*
Food insecurity	Yes	105 (19.6)	40 (38.1)	0.07	65 (61.9)	23 (21.9)	17 (16.2)	0.08
Housing instability	Yes	11 (2.0)	8 (72.7)	0.002*	3 (27.3)	4 (36.4)	4 (36.4)	0.003*
Housing insecurity	Yes	31 (5.5)	14 (45.2)	0.07	17 (54.8)	8 (25.8)	6 (19.4)	0.15
Overcrowding	Yes	96 (17.6)	26 (27.1)	0.42	70 (72.9)	11 (11.5)	15 (15.6)	0.05
Poor Housing Quality	Yes	48 (8.4)	14 (29.2)	0.81	34 (70.8)	8 (16.7)	6 (12.5)	0.81
Childcare difficulty	Yes	103 (19.0)	40 (38.8)	0.03*	63 (61.2)	23 (22.3)	17 (16.5)	0.05*
Transportation issues	Yes	45 (8.2)	19 (42.2)	0.06	26 (60.4)	11 (24.4)	8 (17.8)	0.13
Insurance difficulty	Yes	44 (8.2)	11 (25.0)	0.46	33 (75.0)	9 (20.5)	2 (4.5)	0.44
Medication difficulty	Yes	10 (1.9)	1 (10.0)	0.17	9 (90)	1 (10)	0 (0)	0.35
Job difficulty	Yes	68 (12.4)	26 (38.2)	0.10	42 (61.8)	13 (19.1)	13 (19.1)	0.03*
Education difficulty	Yes	131 (24.1)	48 (36.6)	0.06	83 (63.4)	30 (22.9)	18 (13.7)	0.15
Wants help with SDH needs	No	388 (81.2)	105 (27.1)	0.02*	283 (72.9)	78 (20.1)	27 (7.0)	0.001*
	Yes	90 (18.8)	54 (60.0)		54 (60.0)	18 (20.0)	18 (20.0)	
Social Support	High	239 (70.5)	67 (28.0)	0.02*	72 (72.0)	43 (18.0)	24 (10.0)	0.07
	Low	100 (29.5)	41 (41.0)		59 (59.0)	26 (26.0)	15 (15.0)	

^aNumbers may not add to total (N=573) due to missing data; ^bChi-square test examining significance of material hardship and no-show status to well-child visits; *p – value < .05.

Table 3: Predictors of missed well-child visits.

Variable	Model 1: Demographics + SDH needs		Model 2: Model 1 + Social support	
	aOR [95% CI]	p - value	aOR [95% CI]	p - value
Age				
7-24 months vs. 0-6 months	3.76 [2.07 - 6.85]	0.01*	3.73 [1.76 - 7.91]	0.001*
25 months + vs. 0-6 months	2.35 [1.25 - 4.41]	0.008*	2.63 [1.21 - 5.72]	0.02*
Medicaid	1.91 [1.17 - 3.10]	0.009*	1.34 [0.76 - 2.34]	0.31
Education, high school or less vs college or greater	1.52 [0.97 - 2.40]	0.06	1.47 [0.84 - 2.57]	0.18
Financial Hardship	1.46 [0.89 - 2.37]	0.13	1.18 [0.64 - 2.17]	0.60
Unstable Housing	6.79 [1.35 - 34.70]	0.02*	5.75 [0.60 - 55.33]	0.13
Childcare difficulty	1.30 [0.74 - 2.28]	0.36	0.97 [0.46 - 2.04]	0.94
Low social support			1.65 [0.93 - 2.94]	0.09

Abbreviation: aOR: adjusted Odds Ratio; CI: Confidence Interval; Models 1 and 2 were built sequentially. All models adjust for age, Medicaid status, financial hardship, nstable housing, childcare, and education; *p – value < .05

childcare, and lower caregivers’ educational attainment were not significantly associated with missed visits in the multivariable analysis. When social support was sequentially introduced in the stepwise, multivariable logistic regression (model 2), having Medicaid or housing instability were no longer associated with missed well-child care visits. High social support was not independently associated with missed well-child care visits (aOR = 1.65 [0.93-2.94]).

Discussion

This study shows that adverse SDH is an important factor contributing to pediatric ambulatory care compliance, given the association between specific adverse SDH and pediatric missed visits. The strongest association was found among patients with housing instability, where the likelihood of a pediatric missed visit was still significant in the logistic regression model when controlling for demographics and other adverse SDH. There is little data surrounding housing instability and pediatric healthcare utilization. However, housing instability has been associated with increased Emergency Department visits and preventable hospitalizations among low-income

adults [26]. Housing instability has also been associated with higher odds of caregiver depression, which is a known risk factor for lower ambulatory healthcare utilization for their children [27].

Financial hardship and childcare difficulties were also significantly associated with more missed well-child visits in our study, although the association was eliminated after adjusting for demographic and other adverse SDH variables. Financial strain has been identified as a major factor affecting adults’ healthcare decision-making, as well as caregiver depression [28,29]. In our study, the effect of these variables may have been reduced by demographics and other SDH needs because of potential correlations of financial hardship [30] and lack of childcare with measures related to low income within our dataset.

While adverse SDH may negatively impact attendance to pediatric well-child care visits, social support may mitigate this effect. In multivariable logistic regressions, the addition of social support diminished the significant effect of unstable housing. Given these results, social support may



be an important factor for interventions geared towards improving attendance for low-income families experiencing adverse SDH. Adequate caregiver social support may improve pediatric ambulatory care attendance in a number of different ways, including reducing caregiver depression, improving caregiver healthcare utilization, and reducing caregiver strain [17,27,28]. However, it is noted that the nature of the social support can affect healthcare utilization as well, as some social support structures may emphasize the avoidance of professional health services due to cultural beliefs or mistrust [29]. To fully understand the effect of social support on healthcare utilization, the nature of the social support provided to caregivers answering the social needs screen would need to be further explored.

In addition to the new findings on adverse SDH and social support, this study supports previous research on pediatric ambulatory care compliance. In particular, the increased likelihood of pediatric missed visits after 6 months has been previously noted, with ongoing hypotheses surmising that care for younger infants is prioritized due to increased parental concern [31]. Previous research has also indicated that nonwhite, poor families, which comprised a sizable portion of our population, are not as satisfied with their child's pediatric care, which, in conjunction with decreased concern, may possibly explain the drop off in ambulatory care adherence after 6 months [5].

Despite the findings from this study, there are limitations to consider. The study sample came from a suburban, primary care practice and findings may not be comparable to other populations. The number of responses affirming SDH need were also low for some variables, lowering the power of bivariate and multivariate analyses. The self-reported nature of the social needs survey may subject the responses regarding material hardship and social support to recall bias. The 6-month pre-screen cutoff for assessment of no-shows may have also caused selection bias, though a longer time period prior to the screen may not have accurately captured the status of familial social needs at the time. Due to the cross-sectional design of this study, causality in the relationship between SDH needs, social support, and pediatric missed visits cannot be inferred.

Conclusion

Adverse SDH can negatively impact pediatric well-child care compliance, highlighting the importance of SDH screening to improve pediatric health-seeking behavior and reduce health disparities. In addition to screening and referral to services that address material hardship, screening for social support may be a potential mechanism to further identify patients at risks for negative pediatric healthcare use outcomes related to adverse SDH. Future research investigating interventions to increase caregiver social support and the effect on pediatric healthcare use are needed.

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