Timing and Persistence of Material Hardship Among Children in the United States

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Abstract

Objective Screening for social determinants of health (SDH) has been widely adopted to identify child health risks associated with exposure to material hardship. Whereas SDH screening typically addresses a 12-month span, we sought to compare the prevalence of exposure to present (within the past year) as compared to recent (2–4 years ago) hardship among children in the United States.

Methods We analyzed the 2014 Survey of Income and Program Participation, a nationally representative survey that interviewed participating households annually between 2014 and 2017. We included data from households with children in all waves. As of 2017, households were categorized as (1) experiencing present hardship (within the last year); (2) experiencing recent but not present hardship (any year between 2014 and 2016); and (3) experiencing no hardship over the 4-year period.

Results Of 2422 households, 27% experienced present hardship and 29% experienced recent but not present hardship. Households presently experiencing hardship were more likely to have Medicaid insurance, less likely to be married, and had more children than families who had experienced recent hardship. However, these groups were similar on caregivers' educational attainment, race/ethnicity, language spoken in the home, and age of the youngest child.

Conclusions Our results suggest that clinical screening tools for SDH that use a 12-month time frame risk missing many children who have recently (within the past 4 years) experienced material hardship and may benefit from interventions to improve social support; a longer time frame could provide clinicians with valuable information for understanding social factors that impact child health and development.

Keywords Social determinants of health · Material hardship · Children · Screening · Poverty

Significance

What is already known on this subject? Screening for material hardship is important to identify social risk factors for poor child and family health. Current screening tools assess hardship over a 12-month time frame.

What this study adds? Material hardship screening over a 12-month time span misses many households who have experienced recent material hardship and may benefit from

social resource assistance. A longer time frame may help physicians better support those children and families who are at higher risk of negative health consequences given their history of experiencing hardship. Expanding the time frame of screening tools from 12 months to 4 years would more than double the number of children with a positive screen for material hardship.

Introduction

Material hardship refers to difficulty meeting basic economic needs, as distinguished from measures of poverty based solely on household income (Fuller et al., 2019; Neckerman et al., 2016; Rodems & Shaefer, 2020). While poverty and household income are associated with exposure to material hardship, material hardship is prevalent even among middle- and high-income households (Neckerman et al., 2016;

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Sullivan et al., 2008). In the United States (US), children represent the age group with the greatest exposure to material hardship and are twice as likely to experience material hardship as to live in poverty (Rodems & Shaefer, 2020). Even when controlling for household income, the experience of material hardship, including housing insecurity, food insecurity, and difficulty paying rent or utility bills, is associated with adverse child developmental and behavioral outcomes, as well as increased risk of unmet health care needs (Fuller et al., 2019, 2020; Goldfeld et al., 2018; Sarathy et al., 2020; Schenk-Fontain & Pancino, 2019).

The detrimental effects of material hardship can be mitigated by social support from family or friends (e.g. provision of financial assistance, housing, food, or other in-kind support), as well as by interventions aiming to identify specific forms of hardship and connect families with community resources (Campbell & Pearlman, 2019; de la Vega et al., 2019). Recognizing material hardship as a significant social determinant of health (SDH), defined as upstream conditions arising from the social distributions of resources and power, which influence people's health (Schickedanz et al., 2019), both primary care and subspecialty clinics have implemented programs to screen for material hardship, refer patients and families to available services, and track subsequent social and health outcomes (Byhoff et al., 2017; Grub et al., 2021). Although such initiatives are limited in their ability to transform the societal systems that are responsible for poverty and hardship, they carry the promise of significant benefit to the families who are served, as well as improved population health and reduction in societal health care costs (Gurewich et al., 2020).

Screening for material hardship in clinical settings has become increasingly important at a time of significant economic challenges secondary to the COVID-19 pandemic (Gautam and Tumin 2021). It is important for health centers to understand how best to screen for material hardship and related SDH (Byhoff et al., 2017). Most commonly, screening questionnaires address material hardship experienced within the past year; for example, the WE CARE intervention tailored for pediatric primary care offices has used questions about food insecurity and housing insecurity experienced in the 12 months prior to the encounter (Garg et al., 2015).

However, like income poverty, material hardship may be transient in a child's life course, while its adverse effects may be long-lasting. A recent analysis found that among children experiencing poverty while followed by a longitudinal population-based survey, only 29% were chronically poor while 71% were considered transiently poor (Kimberlin & Berrick, 2015). Material hardship experienced in early life may be considered a risk factor for poor health and development outcomes even if it is transient (Crouch et al., 2020; Kimberlin & Berrick, 2015). Moreover, while the American

Academy of Pediatrics recommends annual well-child visits, adherence to this schedule is imperfect, and approximately 1 in 5 school-age children do not have annual well-child visits (Goedken et al., 2014; Gracy et al., 2018; Wolf et al., 2018). This suggests that screening questionnaires that only consider the previous 12 months will fail to identify a substantial number of children who have experienced material hardship within the last few years, leaving physicians with an incomplete understanding of the social factors that may impact a child's health and development. Therefore, we sought to use longitudinal data to characterize persistence or transience of material hardship among a population-based sample of US children. Specifically, we aimed to identify the prevalence and socio-demographic correlates of present (within the past year) as compared to recent (2–4 years ago) material hardship exposure.

Methods

The study used publicly available de-identified data and did not require review by an Institutional Review Board. Data were obtained from the 2014 Survey of Income and Program Participation (SIPP), a 4-year nationally representative panel survey that interviewed participating households annually between 2014 and 2017. Baseline interviews were conducted in-person, and for subsequent interviews, the SIPP attempted to interview all participants in person or by phone. For this study, we included data from households that participated in the final 2017 wave of the survey and had children ages 0–17 years old living in the household (households with children). We excluded households that did not complete one or more of the previous 3 waves (2014–2016) as well as households where children did not live in the household during all 4 waves. We used survey weights provided by SIPP staff to account for differential probability of survey participation and attrition. Because SIPP staff use imputation methods to fill in missing data on specific questions, no study variables had missing data in our analysis (US Department of Commerce 2019).

During each of the four survey waves, the SIPP collected a detailed set of data on material hardships experienced by the household over the past year. We created four separate measures of material hardship: (1) rent or utility hardship, (2) food insecurity, (3) housing problems, and (4) a summary measure of experiencing any of these hardships. Households were coded as experiencing rent or utility hardship if there was a time in the previous year when they were unable to pay the full cost of rent, mortgage, or utilities. Households were coded as having experienced food insecurity if they reported there was ever a time in the previous year when "the food that they bought did not last and they could not afford to buy more," they could not afford to eat balanced

meals, they cut the size of meals or skipped meals because there was not money for food, they ate less than felt they should because there was not money for food, or they were hungry and did not eat because they did not have money for food. Households were coded as having experienced housing problems if they reported any of the following conditions in their home: a toilet, hot water heater, or other plumbing that does not work; holes in the walls or ceiling, or cracks wider than the edge of a dime; holes in the floor big enough for someone to catch their foot; and problems with pests such as rats, mice, roaches, or other insects.

To assess factors associated with children's exposure to material hardship, we extracted the following data points from the SIPP: caregiver educational attainment (measured as the level of education of the most educated person in the household), household income to poverty ratio (expressed as a proportion of the Federal poverty line), race/ethnicity of children in the home (measured as non-Hispanic White, non-Hispanic Black, Hispanic, other race/ethnicity, or multiple race/ethnicities), whether a language other than English was spoken at home, marital status of the household reference person (married, previously married, or never married), number of people under the age of 18 in the home, age of the youngest child in the home, and whether any children in the home had health insurance coverage through Medicaid.

Data were summarized as weighted proportions or means. For each dimension of material hardship, we categorized households with children into 3 groups: (1) those experiencing present hardship (reporting this type of hardship in 2017); (2) those experiencing recent hardship (reporting this type of hardship in any year between 2014 and 2016); and (3) those experiencing no hardship. On bivariate analysis, we compared the characteristics across the three groups using Wald tests. On multivariable analysis, we fit multinomial

logistic regression models, with present hardship set as the reference group of the outcome variable. Using this specification, relative risk ratios (RRRs) for recent hardship described factors associated with experiencing material hardship in 2014–2016 but not in 2017. Likewise, RRRs for the "no hardship" group described factors associated with experiencing no material hardship in any of the 2014–2017 waves, rather than experiencing hardship in 2017. To allow for direct comparison between recent (but not present) hardship and no hardship, we also included an additional set of results in the Appendix with the same multivariable model results rearranged to show no hardship as the base category of the outcome. Data analysis was performed in Stata 16 (College Station, TX: StataCorp LP), and $P < 0.05$ was considered statistically significant.

Results

Of the 16,938 households participating in the wave 4 survey, we excluded 11,797 households without children, and excluded an additional 2719 households that had either missed one or more previous waves (1,995 households) or had children present in wave 4 but not all prior waves (724 households), resulting in an analytic sample of 2422. Of these 2422 households with children, 27% experienced present material hardship while 29% experienced recent but not present material hardship. Nine percent of households experienced hardship in all 4 survey rounds, while 47% experienced hardship in 1–3 of the four rounds (Table 1).

Household characteristics are compared according to present, recent, or no exposure to any material hardship in Table 2. Experiencing present or recent hardship was more common among households where no one graduated from

Table 1 Experiences with material hardship across 4 years

	Rent-utility	Food insecurity	Housing	Any
Weighted proportion of households with children experiencing hardship				
Wave 4 only	0.10	0.10	0.16	0.27
Number of waves				
0	0.72	0.73	0.63	0.44
1	0.13	0.14	0.20	0.22
2	0.08	0.06	0.10	0.13
3	0.05	0.04	0.06	0.12
4	0.02	0.03	0.03	0.09
Mean number of waves experiencing hardship				
Present Material Hardship	1.28	1.29	1.60	2.77
Recent Material Hardship	0.61	0.53	0.81	1.55
None	–	–	–	–

Data: 2014 Survey of Income and Program Participation; N = 2422

Of households experiencing hardship during at least 1 wave, 29 percent experienced recent but not present hardship (i.e. between 2014 and 2016, but not 2017)

Table 2 Weighted descriptive statistics for independent variables

	Full sample	Present hardship	Recent hardship	No hardship	P
Weighted proportion or mean of study variables, according to experience with hardships					
Education					<.001
Less than high school	0.1	0.38	0.37	0.25	
High school	0.22	0.36	0.31	0.34	
Some college	0.29	0.31	0.3	0.39	
College +	0.39	0.16	0.25	0.59	
Race/ethnicity					<.001
Non-Hispanic White	0.5	0.22	0.27	0.52	
Non-Hispanic Black	0.13	0.35	0.32	0.33	
Hispanic	0.23	0.32	0.34	0.35	
Other race/ethnicity	0.12	0.27	0.28	0.45	
Multiple race/ethnicities	0.03	0.33	0.27	0.4	
Language spoken at home					.014
English spoken at home	0.81	0.26	0.28	0.46	
Language other than English spoken at home	0.19	0.3	0.34	0.36	
Marital status					<.001
Married	0.69	0.2	0.28	0.53	
Previously married	0.17	0.3	0.33	0.28	
Never married	0.14	0.46	0.31	0.23	
Number of children in home					.002
1	0.37	0.24	0.31	0.45	
2	0.41	0.26	0.26	0.48	
3	0.16	0.32	0.31	0.37	
4 +	0.07	0.35	0.29	0.37	
Medicaid					
No	0.64	0.17	0.27	0.56	<.001
Yes	0.36	0.44	0.33	0.23	
Age of youngest child (mean)	8.2	7.96	8.05	8.44	.040
Income-to-Poverty Ratio (mean)	4.41	2.93	3.87	5.67	<.001

Data: 2014 Survey of Income and Program Participation; N = 2422

high school or college, compared to households with at least one college graduate; and present or recent hardship was also more common among non-Hispanic Black households and Hispanic households than among non-Hispanic White households. Additionally, experiencing present or recent hardship was more common among households that spoke a language other than English at home, households where parents were not married, households with more than 2 children in the home, and households where any of the children were insured through Medicaid. Households that had present or recent exposure to material hardship had lower average income-to-poverty ratios than households that did not experience any hardships, although the mean income-to-poverty ratio was well above 1 in all groups, suggesting that many households experienced hardship without meeting criteria for income poverty.

Multivariable models of each material hardship outcome are summarized in Tables 3, 4, 5, and 6. Table 3 reports estimates from the model of the composite outcome (any type of hardship). The first column shows relative risk ratios for experiencing no hardship compared to present hardship, and the second column shows relative risk ratios for experiencing recent hardship relative to present hardship. The latter set of estimates addresses whether families who experienced recent hardship are different from families experiencing present hardship, after multivariable adjustment. Families with Medicaid coverage (vs. other coverage types) were less likely to experience recent compared to present hardship (RRR: 0.67; 95% confidence interval (CI): 0.48, 0.92; P = 0.014). Furthermore, families where the caregiver was previously married or never married (vs. currently married) were less likely to experience recent compared to present hardship (RRR for previously married: 0.68; 95% CI 0.18, 0.97; P = 0.035; RRR for never married: 0.64; 95% CI 0.44, 0.94; P = 0.023). Lastly, families with more children in the home were less likely to experience recent but not

Table 3 Multinomial logistic regression model predicting any hardship

	No hardship vs present hardship (ref)		Recent hardship vs present hardship (ref)	
	RRR		RRR	
	(95% CI)	P value	(95% CI)	P value
Medicaid	**0.37**	<0.001	**0.67**	0.014
	(0.27,0.50)		(0.48,0.92)	
Education				
High school	0.99	0.953	0.79	0.225
	(0.63,1.54)		(0.54,1.16)	
Some college	1.03	0.892	0.81	0.308
	(0.66,1.61)		(0.54,1.22)	
College+	**1.81**	0.023	1.03	0.906
	(1.09,3.03)		(0.64,1.67)	
Income-to-poverty ratio	**1.09**	0.013	1.04	0.280
	(1.02,1.16)		(0.97,1.10)	
Race/ethnicity				
Non-Hispanic black	0.76	0.208	0.99	0.950
	(0.49,1.17)		(0.67,1.46)	
Hispanic	0.99	0.965	1.09	0.615
	(0.69,1.42)		(0.77,1.54)	
Other race/ethnicity	0.75	0.183	0.84	0.365
	(0.49,1.15)		(0.57,1.23)	
Multiple race/ethnicity	1.15	0.656	1.01	0.980
	(0.62,2.16)		(0.48,2.14)	
Language other than English spoken at home	0.68	0.059	0.97	0.877
	(0.46,1.02)		(0.66,1.43)	
Marital status				
Previously married	**0.38**	<0.001	**0.68**	0.035
	(0.27,0.53)		(0.48,0.97)	
Never married	**0.42**	<0.001	**0.64**	0.023
	(0.28,0.66)		(0.44,0.94)	
# ofchildren in home	0.88	0.082	**0.84**	0.016
	(0.76,1.02)		(0.73,0.97)	
Age of youngest child	1.00	0.999	0.98	0.332
	(0.97,1.03)		(0.95,1.02)	

Data: 2014 Survey of Income and Program Participation; N = 2422

Bolded coefficients are statistically significant at *p < .05*

RRR relative risk ratio

Table 4 Multinomial logistic regression model predicting rent-utility hardship

	No hardship vs present hardship (ref)		Recent hardship vs present hardship (ref)	
	RRR		RRR	
	(95% CI)	P value	(95% CI)	P value
Medicaid	**0.32**	<0.001	0.64	0.085
	(0.20,0.51)		(0.38,1.06)	
Education				
High school	0.73	0.234	0.84	0.546
	(0.43,1.23)		(0.48,1.47)	
Some college	**0.54**	0.020	0.86	0.599
	(0.32,0.91)		(0.49,1.51)	
College+	1.19	0.633	1.05	0.901
	(0.59,2.40)		(0.50,2.22)	
Income-to-poverty ratio	1.14	0.053	0.96	0.609
	(0.998,1.30)		(0.84,1.11)	
Race/ethnicity				
Non-Hispanic Black	**0.50**	0.015	1.05	0.876
	(0.29,0.87)		(0.57,1.94)	
Hispanic	1.03	0.874	1.44	0.150
	(0.68,1.57)		(0.88,2.36)	
Other race/ethnicity	0.78	0.350	**0.52**	0.045
	(0.47,1.31)		(0.28,0.99)	
Multiple race/ethnicity	0.47	0.055	0.57	0.227
	(0.22,1.02)		(0.22,1.43)	
Language other than English spoken at home	0.76	0.211	0.90	0.721
	(0.50,1.17)		(0.51,1.59)	
Marital status				
Previously married	**0.57**	0.007	1.04	0.874
	(0.38,0.86)		(0.65,1.66)	
Never married	0.71	0.168	0.77	0.312
	(0.44,1.15)		(0.46,1.29)	
# of children in home	0.84	0.070	0.94	0.501
	(0.70,1.02)		(0.77,1.13)	
Age of youngest child	0.97	0.170	0.98	0.228
	(0.94,1.01)		(0.94,1.02)	

Data: 2014 Survey of Income and Program Participation; N = 2422

Bolded coefficients are statistically significant at *p < .05*

RRR relative risk ratio

present hardship (RRR for each additional child: 0.84; 95% CI 0.73, 0.97; *P* = 0.016).

Based on Table 3, among families exposed to hardship over the 4-year period of the survey, those presently experiencing any type of hardship were more likely to have Medicaid insurance, less likely to be married, and had more children than families who were no longer

experiencing hardship. However, experiencing present vs. recent hardship was not associated with caregivers' educational attainment, race/ethnicity, language spoken in the home, or the age of the youngest child. Tables 4, 5, and 6 repeat this analysis separately for each type of hardship. In Table 4 (rent-utility hardship), there are no demographic factors differentiating which families experience

Table 5 Multinomial logistic regression model predicting food insecurity

	No hardship vs present hardship (ref)		Recent hardship vs present hardship (ref)	
	RRR		RRR	
	(95% CI)	P value	(95% CI)	P value
Medicaid	**0.34** (0.23,0.50)	<0.001	0.79 (0.48,1.31)	0.364
Education				
High school	0.87 (0.54,1.42)	0.581	0.68 (0.39,1.19)	0.177
Some college	0.89 (0.52,1.50)	0.653	0.87 (0.48,1.58)	0.650
College +	1.89 (0.998,3.58)	0.051	0.96 (0.46,2.01)	0.919
Income-to-poverty ratio	**1.46** (1.28,1.67)	<0.001	**1.24** (1.06,1.45)	0.008
Race/ethnicity				
Non-Hispanic Black	1.10 (0.65,1.88)	0.714	**1.81** (1.02,3.20)	0.043
Hispanic	0.92 (0.60,1.43)	0.722	1.39 (0.86,2.23)	0.179
Other race/ethnicity	0.67 (0.38,1.18)	0.161	0.79 (0.40,1.57)	0.500
Multiple race/ethnicity	0.95 (0.41,2.25)	0.914	1.04 (0.36,3.00)	0.949
Language other than English spoken at home	1.38 (0.85,2.24)	0.189	1.08 (0.64,1.82)	0.775
Marital status				
Previously married	**0.40** (0.27,0.58)	<0.001	**0.62** (0.40,0.96)	0.031
Never married	0.72 (0.45,1.15)	0.168	0.71 (0.41,1.21)	0.205
# of children in home	0.98 (0.80,1.19)	0.830	0.87 (0.70,1.09)	0.221
Age of youngest child	1.00 (0.96,1.04)	0.910	0.99 (0.95,1.04)	0.738

Data: 2014 Survey of Income and Program Participation; N = 2422

Bolded coefficients are statistically significant at P < .05

RRR relative risk ratio

Table 6 Multinomial logistic regression model predicting housing hardship

	No hardship vs present hardship (ref)		Recent hardship vs present hardship (ref)	
	RRR		RRR	
	(95% CI)	P Value	(95% CI)	P Value
Medicaid	**0.67** (0.48,0.94)	0.022	0.97 (0.66,1.43)	0.894
Education				
High school	1.22 (0.80,1.87)	0.347	0.86 (0.54,1.35)	0.504
Some college	1.24 (0.79,1.93)	0.346	0.90 (0.55,1.50)	0.690
College +	**1.83** (1.11,3.02)	0.019	1.08 (0.62,1.88)	0.799
Income-to-poverty ratio	1.04 (0.98,1.10)	0.230	1.03 (0.96,1.10)	0.407
Race/Ethnicity				
Non-Hispanic Black	1.40 (0.91,2.16)	0.130	1.06 (0.66,1.70)	0.801
Hispanic	1.05 (0.73,1.51)	0.788	0.91 (0.60,1.40)	0.679
Other race/ethnicity	0.87 (0.53,1.41)	0.563	1.04 (0.65,1.66)	0.881
Multiple race/ethnicity	1.17 (0.54,2.56)	0.690	1.36 (0.57,3.24)	0.486
Language other than English spoken at home	**0.67** (0.47,0.96)	0.027	0.90 (0.60,1.36)	0.620
Marital status				
Previously married	**0.44** (0.30,0.63)	<0.001	**0.63** (0.40,0.99)	0.043
Never married	**0.38** (0.25,0.60)	<0.001	0.74 (0.44,1.24)	0.246
# of children in home	0.95 (0.81,1.10)	0.480	0.91 (0.76,1.08)	0.276
Age of youngest child	1.01 (0.98,1.05)	0.451	1.00 (0.96,1.04)	0.957

Data: 2014 Survey of Income and Program Participation; N = 2422

Bolded coefficients are statistically significant at P < .05

RRR relative risk ratio

present vs. recent hardship. In Table 5 (food insecurity), families with higher income and non-Hispanic Black as compared to non-Hispanic White families were more likely to have experienced recent rather than present hardship; while previously married (vs. currently married) caregivers were more likely to have experienced present rather than recent hardship. Lastly, in Table 6 (housing hardship), previously married caregivers were more likely to report present rather than recent hardship, when compared to currently married caregivers.

Discussion

Many SDH screening tools used in clinical settings focus on families' exposure to material hardship within the last 12 months, including screeners for food insecurity, housing insecurity, difficulty paying bills, and transportation barriers (Boch et al., 2020; Cook et al., 2008; Hager et al., 2010). Our analysis of a longitudinal population-based survey indicates that screening for hardship over a longer period of time, up to 4 years, would more than double the number of children known to be affected by material insecurity. Moreover, children affected by recent but not present material hardship are demographically similar in many ways to children experiencing hardship in the last 12 months (including a similar income-to-poverty ratio), indicating that the 2 populations experience many of the same societal disadvantages that pose a risk to child health. Therefore, screening for material hardship experienced over a longer period of time may help identify a greater proportion of children and families who would benefit from interventions to connect them with community resources addressing material hardship; moreover, this would help physicians better support these children and families, who are at higher risk of negative health consequences given their history of experiencing hardship.

According to previous analyses of SIPP data, children represent the age group most likely to experience any form of material hardship (Rodems & Shaefer, 2020). However, estimates of material hardship derived from SDH screening in clinical settings often differ from those based on population studies, and there is significant variation across patient populations (Fox et al., 2016; O'Malley et al.,

2017; Power-Hays et al., 2020; Sandel et al., 2018; Starr et al., 2018). For example, estimates of food insecurity among pediatric patients ranged from 14% in a cohort of patients with epilepsy in Cincinnati (Starr et al., 2018) to over 40% among patients with sickle cell disease in Boston (Sandel et al., 2018). Considering multiple types of material hardship, our analysis found a rate of overall present hardship of 27% and identified an additional 29% of households who experienced recent hardship (in one of the 3 prior survey waves). The total estimate of present and recent hardship, 56%, exceeds many of the material hardship prevalence estimates obtained in clinical settings using 12-month screening tools. Although our data were derived from a population-based survey, it is likely that by extending the time frame of clinical SDH screening questions from 1 to 4 years, the number of children identified to be at risk could increase significantly in many patient populations.

Identifying children who have experienced recent material hardship is important for addressing health care access and healthy development, because hardship poses a persistent and possibly cumulative risk for children's health (Fuller et al., 2019). To date, projects that have used material hardship screening to connect patients with community resources have delivered promising results. Garg et al. conducted a randomized trial in which mothers at four clinics completed a self-report screening instrument for needs such as food and household heating; providers made referrals for patients, and staff contacted mothers by phone each month to follow up on whether needs were met. The intervention effectively reduced the odds of being in a homeless shelter and increased employment, childcare access, and fuel assistance for families (Garg et al., 2015). Simply providing updated information to patients can also help: a randomized trial that provided a high-quality written resource with contact information for social services performed just as well as in-person social services navigation in improving caregiver-reported general and emotional health and reducing family social risks (Gottlieb et al., 2020). Families who have experienced more transient hardship may not have met eligibility criteria for the interventions in these studies, but are still at risk for negative child health outcomes and may benefit from similar interventions as families experiencing present

material hardship. Moreover, given that many children do not attend annual well-child visits (Goedken et al., 2014; Wolf et al., 2018), recording past material hardship could influence patient care.

While previous studies have documented that experiencing material hardship is negatively associated with child developmental outcomes (Fuller et al., 2019, 2020; Goldfeld et al., 2018; Sarathy et al., 2020; Schenk-Fontain & Pancino 2019), less is known about the long-term effects of persistent hardship. Our findings show that approximately 1 in 5 households with children experienced hardship in at least 3 out of 4 years and nearly 1 in 10 households with children experienced hardship in all 4 years. Research on the effects of persistent hardship on long-term health outcomes, and how those effects may differ from the effects of transient hardship, is needed. Past research on adverse childhood experiences (ACEs) and their effects on health documented a dose–response relationship of cumulative exposure to ACEs with negative health outcomes like ischemic heart disease and cancer (Felitti, 2019), and recent studies have documented that the particular timing of ACEs in development matters for psychiatric outcomes like depression (Schalinski et al., 2016) and even epigenetic effects associated with mental health (Dunn et al., 2019), which has spurred calls for additional research on the nuance of ACEs by accounting for their timing, duration, frequency, and severity (Hawes et al., 2021; Lacey & Minnis, 2020). Additional research focused on material hardship experiences may help identify novel patterns of how the timing or persistence of hardship affects children's long-term outcomes.

Our conclusions are limited by several aspects of the data and analytic approach. As with all panel survey data, some respondents were lost to attrition. While we used survey weights in our analyses to adjust for panel attrition, attrition and the restrictions placed on the sample may threaten the generalizability of our results. Additionally, this study did not explicitly analyze the impact of present as compared to recent material hardship on children's health outcomes, and did not assess feasibility of screening for material hardship in health care systems. Building on our results, future research should examine different time frames for assessing material hardship among families in clinical settings, and include a wider array of material hardship types, such as transportation hardship.

This study demonstrates that material hardship screening in its current form may miss many households who have experienced recent material hardship and could benefit from social resource assistance, but screen negative on questions based on the past twelve months. Expanding the timeframe of housing, utilities, and food insecurity screening questions from 12 months to 2 years or 4 years could approximately double the number of patients identified and ultimately supported. As the literature continues to better demonstrate the impact of material hardship on longer term health outcomes for children, clinicians should be diligent to ensure that their screening practices are not causing families to fall through the cracks.

Appendix

See Table 7.

Table 7 Multinomial logistic regression models predicting no hardship vs recent hardship for different hardship measures

	Any hardship		Rent-utility hardship		Food insecurity		Housing hardship	
	RRR (95% CI)	*P* value	RRR (95% CI)	*P* value	RRR (95% CI)	*P* value	RRR (95% CI)	*P* value
Medicaid	**1.81** (1.355,2.423)	0.000	**2.00** (1.432,2.784)	0.000	**2.34** (1.607,3.398)	0.000	**1.45** (1.061,1.988)	0.020
Education								
High school	0.80 (0.514,1.240)	0.315	1.16 (0.729,1.853)	0.525	0.78 (0.497,1.224)	0.279	0.70 (0.461,1.059)	0.091
Some college	0.78 (0.511,1.206)	0.268	**1.61** (1.044,2.476)	0.031	0.98 (0.629,1.538)	0.942	0.73 (0.482,1.102)	0.133
College+	**0.57** (0.358,0.899)	0.016	0.88 (0.531,1.469)	0.632	**0.51** (0.298,0.870)	0.014	**0.59** (0.383,0.904)	0.016
Income-to-poverty ratio	**0.95** (0.915,0.993)	0.022	**0.85** (0.783,0.915)	0.000	**0.85** (0.749,0.965)	0.012	0.99 (0.956,1.027)	0.608
Race/ethnicity								
Non-Hispanic Black	1.30 (0.866,1.963)	0.203	**2.09** (1.343,3.249)	0.001	**1.63** (1.041,2.565)	0.033	0.76 (0.501,1.153)	0.195
Hispanic	1.10 (0.804,1.507)	0.547	1.39 (0.970,1.994)	0.073	**1.50** (1.034,2.172)	0.033	0.87 (0.627,1.208)	0.404
Other race/ethnicity	1.12 (0.766,1.633)	0.559	0.67 (0.403,1.108)	0.118	1.19 (0.741,1.895)	0.477	1.20 (0.807,1.771)	0.372
Multiple race/ethnicity	0.88 (0.435,1.762)	0.709	1.20 (0.520,2.748)	0.672	1.08 (0.530,2.221)	0.824	1.16 (0.571,2.359)	0.679
Language other than English spoken at home	1.42 (0.970,2.089)	0.071	1.18 (0.778,1.801)	0.430	0.78 (0.529,1.151)	0.211	1.35 (0.947,1.927)	0.097
Marital status								
Previously married	**1.80** (1.305,2.492)	0.000	**1.82** (1.316,2.521)	0.000	**1.55** (1.097,2.203)	0.013	**1.43** (1.038,1.972)	0.029
Never married	1.51 (0.992,2.285)	0.054	1.07 (0.679,1.697)	0.762	0.98 (0.654,1.459)	0.908	**1.92** (1.310,2.810)	0.001
# of kids in home	0.96 (0.836,1.107)	0.586	1.11 (0.961,1.292)	0.150	0.89 (0.746,1.061)	0.191	0.96 (0.826,1.117)	0.599
Age of youngest kid	0.98 (0.955,1.015)	0.308	1.00 (0.971,1.034)	0.901	1.00 (0.963,1.028)	0.767	0.99 (0.955,1.017)	0.366

Data: 2014 Survey of Income and Program Participation; N = 2422

Bolded coefficients are statistically significant at *P* < .05

Results are from multinomial logistic regression models with three possible outcomes for each of the different hardship measures: (1) those experiencing present hardship (reporting this type of hardship in 2017); (2) those experiencing recent hardship (reporting this type of hardship in any year between 2014 and 2016); and (3) those experiencing no hardship. In Tables 3, 4, 5, and 6, present hardship serves as the base category, allowing for direct comparisons between present hardship and recent hardship and present hardship and no hardship, but not between recent hardship and no hardship. This table presents the coefficients comparing recent hardship and no hardship, with no hardship serving as the base category. Each set of results is from a separate multinomial logistic regression model

RRR relative risk ratio

Declarations

Conflict of interest The authors declare that they have no conflicts of interest.

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

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