Food for Thought: A Randomized Trial of Food Insecurity Screening in the Emergency Department

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ABSTRACT

BACKGROUND: Despite the growing interest in screening for food insecurity in the clinical setting, little evidence exists regarding screening formats that maximize disclosure and caregiver comfort.

METHODS: In this randomized trial, we asked English-speaking adult caregivers of pediatric patients in the emergency department at an urban, freestanding children's hospital to complete a validated, 2-question screen for food insecurity. Respondents were assigned via block randomization to complete the survey by either verbal interview or electronic tablet. Caregivers reported the perceived importance of the screening questions, comfort level with screening in the emergency department or in their child's primary care site, and their preferred screening modality.

RESULTS: Of the 1818 participants, 20.6% screened positive for food insecurity. There was a significantly higher rate of reported food insecurity for those screened by tablet (23.6%) compared to those screened verbally (17.7%) ($P = .002$). Of those who had a preference of screening modality, 83.2% of all participants and 84.5% of patients reporting food insecurity preferred the tablet-based screen over verbal interview. Overall, more participants reported comfort completing the screen in the emergency department compared to their child's doctor's office; however, comfort in both of these setting was rated highly (86.1% vs 80.2%; $P < .001$).

CONCLUSIONS: Although both verbal interview and tablet-based screening modalities were effective in identifying food insecurity, tablet-based screening had a higher disclosure rate and was the participants' preferred screening method. There is a high level of comfort with screening regardless of clinical setting; it is possible that an added level of anonymity in the emergency department enhanced participants' comfort levels.

KEYWORDS: emergency deparment; food insecurity; screening modality; social determinants of health

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WHAT'S NEW

This study compares food insecurity disclosure rates for face-to-face interviews versus electronic formats and explores caregiver preferences regarding screening modality and location in a large, urban pediatric emergency department.

CHILDREN ARE DISPROPORTIONATELY affected by the rise in poverty rates in the United States. Economic hardships can compromise their development, negatively affect their overall health, and adversely affect their abilities to succeed in school and in life.[1-4] Food insecurity (FI)—the limited or uncertain availability of nutritionally adequate or safe foods—although strongly associated with poverty, is an independent predictor of poor health outcomes for children.[5,6] FI experienced in childhood is associated with poorer overall heath, increased hospitalizations, and increased rates of anxiety, aggression, anemia, asthma, and cognitive delay, among other health outcomes.[7-13] Unfortunately, a large proportion of American children experience FI, and it often goes unnoticed.[14] Currently, food insecurity in Philadelphia County affects 21.7% of children, exceeding the national average of 16.5%.[15,16]

The emergency department (ED) of an academic medical center often serves as a point of care entry for impoverished and high-risk families.[17−19] Despite growing interest in the health care system's ability to address social determinants of health (SDH), little is known about food insecurity screening in the pediatric ED. The American Academy of Pediatrics and the Academic Pediatric Association have recommended FI screening in all pediatric settings.[20,21] The implementation of these recommendations has been difficult, particularly in the ED, because of medical provider concerns with time, limited knowledge of local resources, and the possibility of patient and provider discomfort with screening.[22] Additionally, only limited data are available with regard to how to implement FI screening in practice in a way that maximizes elicitation of social need while ensuring patient and family comfort.[23]

In order to compare modalities for FI screening in the pediatric ED, this prospective randomized study compared face-to-face verbal screening to screening using a tablet computer with an optional audio-assist, applying a validated, 2-question screen for food insecurity. We also collected information regarding caregiver comfort with screening by modality and location.

METHODS

SETTING, PARTICIPANTS, AND ELIGIBILITY CRITERIA

Participants were drawn from a consecutive sample of adult caregivers accompanying pediatric patients in the ED of a large, urban children's hospital in Philadelphia. According to internal review, in 2017 this ED saw 66,952 unique patients over a total of 99,369 encounters. Of these, 55% were African American and 9% Latino; 3% were non-English speaking. Prior to initiation of the study procedures, no food insecurity screening or referral protocol was in place. Eligibility criteria for participation included English-speaking caregivers presenting with patients who were <18 years of age, were in non-critical condition, and were not previously enrolled. Patients who were triaged to the fast-track, low-acuity section of the ED were excluded in order to ensure a representative sample of the general ED patient population.

STUDY DESIGN AND PROCEDURES

This was a prospective, randomized trial designed to compare verbal and tablet-based screening for food insecurity and explore caregiver preferences regarding screening modality and location. Four-hour periods were pre-assigned between the hours of 8 AM and 11 PM, 7 days a week, from June to November 2017, for study recruitment. Caregivers were approached in room order (1 through 47), and an attempt was made to enroll all eligible patients. Because patients are randomly allocated to rooms, the ordinal approach was expected to ensure consecutive sampling while minimizing selection bias. Caregivers meeting eligibility criteria were verbally consented for participation using the language contained in the Appendix. Consenting participants were assigned to a study group using block randomization that was predetermined and allocated by a computer program (REDCap).[24] Participants completed a 2-question validated FI screen either by face-to-face interview or via tablet-based self-completed questionnaire with an optional audio-assist offering text-to-voice functionality. Face-to-face interviews were performed by research assistants with training in medical interviewing techniques. Those randomized to the tablet-based group were given a brief tutorial regarding use of the tablet and text-to-voice functionality. A brief survey assessing comfort and preferences regarding screening location and modality, as well as demographic information, followed the FI screen by the corresponding modality. Questionnaires were completed in individual clinical rooms between medical evaluations, during waiting periods, or after discharge.

Identical surveys were used for both arms and were written at the fifth-grade reading level. All study procedures were conducted on a designated study iPad (Apple Inc.; Cupertino, Calif), and information was recorded directly into REDCap. Following completion of the questionnaire, the research assistant provided all respondents with a paper-based list of food resources that included information regarding federal programs, local emergency food assistance, and free and reduced-price produce. Participants screening positive for FI were also given the option of direct contact by a food resource agency that could assist with enrollment in federal programs and provide navigation to emergency food assistance after the ED visit; this option was provided for positive screens in the same modality as the questionnaire. Per the hospital's routine protocol, a social worker was always available on premises to assist families by request. All study procedures were deemed exempt from review by the hospital's Committee for the Protection of Human Subjects.

MEASURES

PARTICIPANT DEMOGRAPHICS

We collected information on each patient regarding their age and level of acuity based on the 5-level Emergency Severity Index (ESI) system.[25] Respondents self-reported race and ethnicity.

FOOD INSECURITY REPORTING

We measured food insecurity using the validated 2-question Hunger Vital Sign screening tool.[26] Participants responded yes or no to these statements: 1) "Within the past 12 months, we worried whether our food would run out before we got money to buy more," and 2) "Within the past 12 months, the food we bought just didn't last and we didn't have money to get more."

COMFORT WITH SCREENING MODALITY

Respondents rated their comfort with this screening process in the ED and expected comfort level with the same screen in their child's doctor's office. The Likert-scale options were "strongly disagree," "disagree," "neutral," "agree," and "strongly agree." Information was not collected regarding current screening practices in the primary care setting. Participants were asked which modality would make them feel most comfortable and had the following options from which to choose: "on an iPad/tablet," "by talking with a health care provider," or "I would feel just as comfortable with either."

DATA ANALYSIS

Sample size calculation was based on a 2-sided Fisher's exact test comparing 2 independent proportions with a type I error rate of .05. With a targeted sample size of 1808, the study had 80% power to detect a 5% difference in the rate of disclosed FI by screening modality. Likert responses were coded in a binary format ("agree" or "strongly agree" vs any other response) to indicate

comfort with screening. Chi-square tests were used to compare tablet-based and verbal screen groups with regard to their comfort level with screening modality and screening location. We also compared these outcomes for those who reported FI and those who did not. Statistical analysis was performed using SPSS Statistics 21.0 (IBM; Armonk, NY) and Stata 14.2 (StataCorp; College Station, Tex).

RESULTS

Of the 2154 patients who were approached, 130 were excluded because no caregiver was present, and 204 (10%) refused. Ultimately, 1820 caregivers were randomized, 910 to each group. Two tablet-based questionnaires (0.2%) were incomplete, leading to an overall response rate of 89.9% of eligible respondents (Figure). There were no significant differences in age, race, ethnicity, or triage level of acuity between groups (Table 1).

Of the 1818 participants, 20.6% screened positive for FI. A higher rate of FI was reported for those screened by tablet compared to those screened verbally (23.6% and 17.7%, respectively; $P = .002$). There were no significant differences in patient age or level of acuity between FI and non-FI groups. Rates of reported FI were higher among caregivers who identified as Black/African American or as Hispanic or Latino, as well as when race was not listed or if ethnicity was unknown/not reported. Rates of reported FI were lower among caregivers identifying as white and not Hispanic or Latino (Table 2).

Of the 614 (33.8%) caregivers who expressed any preference of screening modality, 83.2% preferred the tablet-based screen over verbal interview; 84.6% of those with FI reported a similar preference (Table 3). A slightly greater proportion of participants reported comfort completing the screen in the ED compared to their child's doctor's office; however, comfort in both of these settings was rated highly (86.0% vs 80.1%; $P < .001$). Similar findings were noted for the subpopulation reporting FI (77.6% vs 70.7%; $P = .03$) (Table 4).

DISCUSSION

With increasing recognition of the importance of FI and other SDH, there is a growing need for evidence regarding how to most effectively and efficiently identify social risk within medical settings. Maximizing the caregiver comfort and acceptability of screening mechanisms may enhance the accuracy of information collected. Specifically, the perceived anonymity of screening—such as occurs with the use of electronic tablet-based self-reporting—may improve disclosure and serve to enhance participant comfort. This study found that there is an overall high rate of acceptability with FI screening in a pediatric ED and that caretaker comfort levels and disclosure of social risk are higher with tablet-based screening compared to verbal screening.

Because FI is a potentially stigmatizing condition, it may elicit concerns regarding social desirability in responses depending on format of screening. In agreement with our study findings, previous studies on intimate partner violence and substance use have shown that electronic-based screening is acceptable to caregivers and results in equal or greater disclosures.[27,28] Caregivers have reported discomfort with discussing social risk in front of their children and concerns about the potential involvement of Child Protective Services upon disclosure of FI. Discomfort with disclosure has been shown to be most prevalent among those with the highest social risk.[29] Similarly, prior literature has explored provider-level concern regarding FI screening, including patient discomfort or stigmatization and the time and ability to address social risk, once identified.[30] Providers have also reported the time required for screening as a barrier.[31] Tablet-based screening may help ameliorate these concerns, provide similarly accurate responses, and align well with both participant and provider preferences.

Although the majority of the literature regarding social risk screening focuses on routine medical visits, our study demonstrates that the ED is an acceptable screening location and may in fact be preferred by
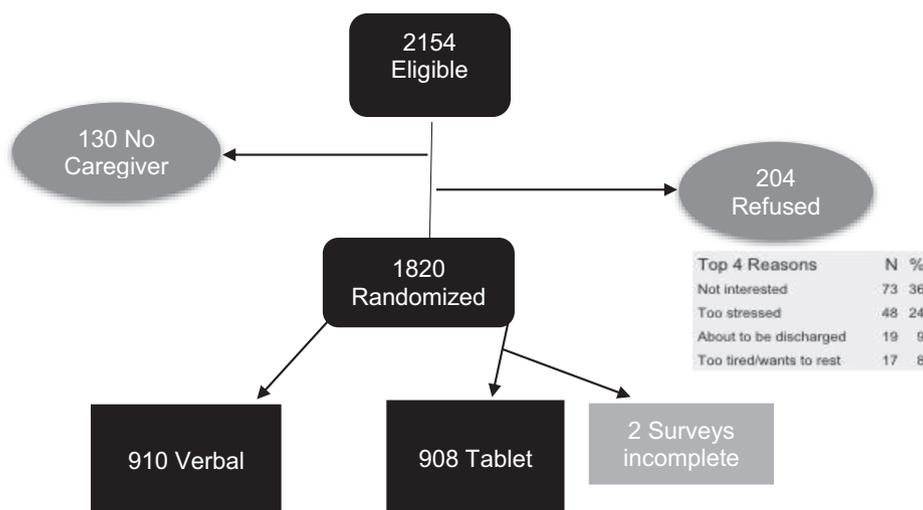

Top 4 Reasons	N	%
Not interested	73	36
Too stressed	48	24
About to be discharged	19	9
Too tired/wants to rest	17	8

Figure. *Study flow diagram.*

Table 1. Characteristics of Participants by Study Arm

	Total (N = 1818)	Verbal (n = 910)	Tablet (n = 908)
Patient age, mean (standard deviation)	10.04 yr (6.9)	10.12 yr (6.9)	9.96 yr (6.9)
Race, n (%)			
American Indian/Alaska	16 (0.9)	3 (0.3)	13 (1.4)
Asian	73 (4.0)	39 (4.3)	34 (3.8)
Hawaiian/Pacific Islander	4 (0.2)	2 (0.2)	2 (0.2)
Black/African American	764 (42.0)	397 (43.7)	367 (40.5)
White	783 (43.1)	383 (42.1)	400 (44.2)
More than 1 race	64 (3.5)	29 (3.2)	35 (3.9)
Not listed	111 (6.1)	56 (6.2)	55 (6.1)
Ethnicity, n (%)			
Hispanic or Latino	150 (8.3)	76 (8.4)	74 (8.2)
Not Hispanic or Latino*	1583 (87.1)	817 (90.0)	766 (84.5)
Unknown/not reported*	81 (4.5)	15 (1.7)	66 (7.3)
Level of acuity, n (%)			
1 (sickest)	4 (0.2)	1 (0.1)	3 (0.3)
2	642 (35.3)	332 (36.7)	308 (33.9)
3	925 (50.9)	447 (49.1)	478 (52.6)
4	236 (13.0)	120 (13.2)	116 (12.8)
5 (least sick)	11 (0.6)	8 (0.9)	3 (0.3)

*P < .01.

caretakers. We anticipate—similar to the mechanism described above—that the anonymity inherent to being a patient in the ED may serve as a protective factor for families, improving comfort with reporting social risk. This is particularly valuable, as families presenting to the ED have a higher rate of social risk and lower access to primary care, in addition to an increased wait time, thus increasing the feasibility of screening as compared to other clinical settings.[32,33] Our study showed rates of FI concordant with citywide reports, along with low non-response and refusal rates, further supporting the feasibility of screening in the ED and acute care setting.

To our knowledge, this was the first study of FI or SDH screening to be undertaken with the intention of obtaining a representative sample of caretakers of pediatric ED patients across all levels of acuity. This allowed us to compare the ESI triage level among patients whose caregivers reported FI. Although it is frequently expected that social need such as FI is associated with higher rates of ED utilization for non-urgent complaints,[34] the results of our study do not support this notion as we found no difference in rates of FI based on ESI. This suggests the need for universal screening and intervention rather than targeted screening for patients and families who use the ED for non-urgent complaints.

STRENGTHS AND LIMITATIONS

Our large sample size and randomized design provide rigorous and robust evidence of the relative rates of FI

Table 2. Demographics by Reported Food Insecurity

	Total (N = 1818)	Food Insecure (n = 375)	Not Food Insecure (n = 1443)
Patient age, mean (SD)	10.04 yr (6.9)	9.15 yr (6.9)	10.27 yr (6.9)
Race, n (%)			
American Indian/Alaska	16 (0.9)	5 (1.3)	11 (0.8)
Asian*	73 (4.0)	7 (1.9)	66 (4.6)
Hawaiian/Pacific Islander	4 (0.2)	1 (0.3)	3 (0.2)
Black/African American**	764 (42.0)	236 (69.2)	528 (36.7)
White**	783 (43.1)	74 (19.7)	709 (49.2)
More than 1 race	64 (3.5)	17 (4.5)	47 (3.3)
Not listed**	111 (6.1)	35 (9.3)	76 (5.3)
Ethnicity, n (%)			
Hispanic or Latino**	150 (8.3)	51 (13.6)	99 (6.9)
Not Hispanic or Latino*	1583 (87.1)	298 (79.7)	1285 (89.2)
Unknown/not reported**	81 (4.5)	25 (6.7)	56 (3.9)
Level of acuity, n (%)			
1 (sickest)	4 (0.2)	1 (0.3)	3 (0.2)
2	642 (35.3)	141 (37.6)	501 (34.7)
3	925 (50.9)	173 (46.1)	752 (52.1)
4	236 (13.0)	55 (14.7)	181 (12.5)
5 (least sick)	11 (0.6)	5 (1.3)	6 (0.4)

*P < .05.
**P < .01.

Table 3. Screening Modality Preferences

	Verbal, n (%)	Tablet, n (%)	Significance (*P* Value)
Participants reporting a preference (N = 614)*	103 (16.9)	511 (83.2)	*P* < .001
Food insecure (n = 162)	25 (15.4)	137 (84.6)	*P* < .001
Not food insecure (n = 452)	78 (17.3)	374 (82.8)	*P* < .001

*A preference was reported by 614 out of 1818 (33.8%) participants.

Table 4. Comfort with Food Insecurity Screen by Location

	Emergency Department, n (%)	Primary Care Provider, n (%)	Significance (*P* Value)
Participants reporting a preference (N = 1818)	1563 (86.0)	1457 (80.1)	*P* < .001
Food insecure (n = 375)	291 (77.6)	265 (70.7)	*P* = .03
Not food insecure (n = 1441)	1272 (88.3)	1192 (82.7)	*P* < .001

disclosure for verbal and tablet-based screening. The low literacy level of the questions and the availability of audio-assist increase the generalizability of our findings, although we did not directly assess education or literacy. Enrollment by pre-selected time periods and consecutive sampling were undertaken to limit selection bias; ultimately, the study sample reflected a similar distribution of racial and ethnic diversity of our urban ED population.

Limitations of the study include the inability to verify the self-reported data, including actual FI, as well as self-report of race or ethnicity. Although we interpret the higher rates of self-reported FI in the tablet-based format as being suggestive of more honest responses, we cannot verify this statement. Future studies might consider a crossover design, with caretakers answering in both formats; however, that method may be impractical to perform during a real-time ED visit.

Furthermore, non-English speaking families were excluded from this study due to the low prevalence in our ED population. This patient population may be at particular risk for food insecurity, and we acknowledge that the exclusion of this population limits the generalizability of our results. Further research in a more language-diverse patient population is needed to evaluate screening preferences among non-English speaking families.

Additionally, we acknowledge that FI is only one of many social determinants of health. Given that FI has a validated, highly sensitive and specific screening tool and well-defined local and federal resources (eg, Supplemental Nutrition Assistance Program; Women, Infants, and Children; food pantries), it was our intention to study FI as a proxy for other SDH. Our data cannot provide definitive evidence for any other social determinants.

Finally, this study focuses on the screening process in terms of modality and location, without explicit attention to engagement with resources after screening and referral and the effect on subsequent FI. We acknowledge that the resources available have limitations in their abilities to meet the needs of families.[35] Additional work evaluating the acceptability, feasibility, and effectiveness of interventions to address social needs in clinical settings is needed before we can suggest broad implementation of FI screening practices.

CONCLUSIONS

Although both verbal and tablet-based screening modalities were effective in identifying FI, tablet-based screening had a higher disclosure rate and was the participants' preferred screening method in a pediatric ED. This suggests that written, tablet-based screening is a feasible and effective tool that may allow us to streamline routine inquiry into FI and possibly other SDH while improving detection and enhancing patient and provider comfort. Despite a high level of comfort with screening regardless of clinical setting, it is possible that an added level of anonymity in the ED can enhance participants' comfort levels. We hope that these results help guide the implementation of FI and other SDH screening and interventions, particularly in the ED setting.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at https://doi.org/10.1016/j.acap.2018.11.014.

REFERENCES

1. Douglas-Hall A, Chau M, Koball H. Basic Facts About Low-Income Children: Birth to Age 3. New York: National Center for Children in Poverty, Columbia University Mailman School of Public Health; 2006.

2. Shonkoff J, Phillips DA, eds. From Neurons to Neighborhoods: The Science of Early Childhood Development, Washington, DC: National Academies Press; 2000.

3. Frank DA, Casey PH, Black MM, et al. Cumulative hardship and wellness of low-income young children: multisite surveillance study. *Pediatrics*. 2010;125:e1115–e1123.

4. Rose-Jacobs R, Black MM, Casey PH, et al. Household food insecurity: associations with at-risk infant and toddler development. *Pediatrics*. 2008;121:65–72.

5. Anderson SA, editor. Core indicators of nutritional state for difficult-to-sample populations. *J Nutr*. 1990;120(suppl 11):S1555–S1600.

6. Cook JT, Black M, Chilton M, et al. Are food insecurity's health impacts underestimated in the US population? Marginal food security also predicts adverse health outcomes in young US children and mothers. *Adv Nutr*. 2013;4:51–61.

7. Cook JT, Frank DA, Berkowitz C, et al. Food insecurity is associated with adverse health outcomes among human infants and toddlers. *J Nutr*. 2004;134:1432–1438.

8. Gundersen C, Ziliak JP. Childhood food insecurity in the U.S.: trends, causes, and policy options. *Future of Children*. 2014;24:1–20.

9. Eicher-Miller HA, Mason A, Weaver C, et al. Food insecurity is associated with iron deficiency anemia in U.S. adolescents. *Am J Clin Nutr*. 2009;90:1358–1371.

10. Skalicky A, Meyers A, Adams W, et al. Child food insecurity and iron deficiency anemia in low-income infants and toddlers in the United States. *Matern Child Health J*. 2006;10:177–185.

11. Howard LL. Does food insecurity at home affect non-cognitive performance at school? A longitudinal analysis of elementary student classroom behavior. *Econ Educ Rev*. 2011;30:157–176.

12. Cook JT, Frank D, Levenson S, et al. Child food insecurity increases risks posed by household food insecurity to young children's health. *J Nutr*. 2006;136:1073–1076.

13. Whitaker RC, Phillips S, Orzol S. Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children. *Pediatrics*. 2006;118:e859–e868.

14. Hassan A, Blood EA, Pikcilingis A, et al. Youths' health-related social problems: concerns often overlooked during the medical visit. *J Adolesc Health*. 2013;53:265–271.

15. Coleman-Jensen A, Rabbitt MP, Gregory C, et al. Household Food Security in the United States in 2016. Washington, DC: US Department of Agriculture Economic Research Service; 2017.

16. Gundersen CA, Dewey A, Crumbaugh M, et al. Map the meal gap: a report on county and congressional district food insecurity and county food cost in the United States in 2016. Available at: http://map.feedingamerica.org/. Accessed January 10, 2019.

17. Baker DW, Stevens CD, Brook RH. Regular source of ambulatory care and medical care utilization by patients presenting to a public hospital emergency department. *JAMA*. 1994;271:1909–1912.

18. Pane GA, Farner MC, Salness KA. Health care access problems of medically indigent emergency department walk-in patients. *Ann Emerg Med*. 1991;20:730–733.

19. Hirshon JM, Morris DM. Emergency medicine and the health of the public: the critical role of emergency departments in US public health. *Emerg Med Clin North Am*. 2006;24:815–819.

20. Council on Community Pediatrics. Committee on Nutrition. Promoting food security for all children. *Pediatrics*. 2006;136:e1431–e1438.

21. APA Task Force on Childhood Poverty. A strategic road-map: committed to bringing the voice of pediatricians to the most important problem facing children in the US today. Available at: www.academicpeds.org/public_policy/pdf/APA_Task_Force_Strategic_Road_Mapver3.pdf. Accessed January 10, 2019.

22. Anderson E, Lippert S, Newberry J, et al. Addressing social determinants of health from the emergency department through social emergency medicine. *West J Emerg Med*. 2016;17:487–489.

23. Torres J, De Marchis E, Fichtenberg C, et al. Identifying food insecurity in health care settings: a review of the evidence. Available at: https://sirenetwork.ucsf.edu/tools-resources/resources/identifying-food-insecurity-health-care-settings-review-evidence. Accessed January 10, 2019.

24. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42:377–381.

25. Tanabe P, Gimbel R, Yarnold PR, et al. Reliability and validity of scores on the Emergency Severity Index version 3. *Acad Emerg Med*. 2004;11:59–65.

26. Hager E, Quigg AM, Black MM, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics*. 2010;126:e26–e32.

27. Gottlieb L, Hessler D, Long D, et al. A randomized trial on screening for social determinants of health: the iScreen study. *Pediatrics*. 2014;134:e1611–e1618.

28. Fleegler EW, Lieu TA, Wise PH, et al. Families' health-related social problems and missed referral opportunities. *Pediatrics*. 2007;119:e1332–e1341.

29. Barnidge E, LaBarge G, Krupsky K, et al. Screening for food insecurity in pediatric clinical settings: opportunities and barriers. *J Community Health*. 2017;42:51–57.

30. Palakshappa D, Vasan A, Khan S, et al. Clinicians' perceptions of screening for food insecurity in suburban pediatric practice. *Pediatrics*. 2017;140:e20170319.

31. Bottino CJ, Rhodes ET, Kreatsoulas C, et al. Food insecurity screening in pediatric primary care: can offering referrals help identify families in need? *Acad Pediatr*. 2017;17:497–503.

32. Berry A, Brousseau D, Brotanek JM, et al. Why do parents bring children to the emergency department for nonurgent conditions? A qualitative study. *Ambul Pediatr*. 2008;8:360–367.

33. Piehl MD, Clemens CJ, Joines JD. "Narrowing the gap": decreasing emergency department use by children enrolled in the Medicaid program by improving access to primary care. *Arch Pediatr Adolesc Med*. 2000;154:791–795.

34. Lawson N, Klein MD, Ollberding NJ, et al. The impact of well-child care compliance and social risks on emergency department utilization. *Clin Pediatr (Phila)*. 2017;56:920–927.

35. Gilbert D, Nanda J, Paige D. Securing the safety net: concurrent participation in income eligible assistance programs. *Matern Child Health J*. 2014;18:604–612.