

Provider impacts of socioeconomic risk screening and referral programs:

A systematic scoping review



August 2021

The background of the slide features a pattern of interlocking puzzle pieces. The majority of the pieces are white, while a few are a vibrant blue. These blue pieces are scattered across the right side and bottom of the frame, creating a visual metaphor for a puzzle or a missing piece. The word 'INTRODUCTION' is printed in a large, bold, black, sans-serif font, positioned on the left side of the slide. A thin, dark blue horizontal line is placed directly beneath the text.

INTRODUCTION

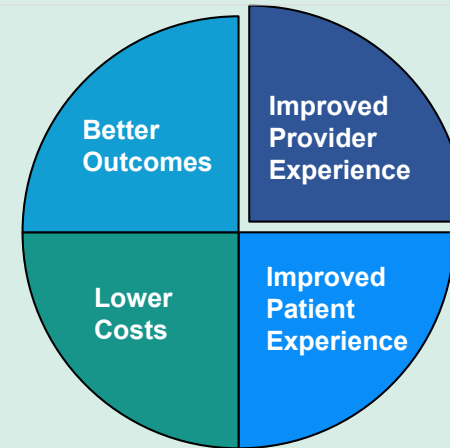
Introduction

Strong and consistent evidence has demonstrated that social determinants of health (SDH)—including socioeconomic factors related to the availability of food, transportation, and housing—are associated with health and wellbeing.¹⁻¹² These associations have led to new “social care” practices and payment models that incentivize intervening on social adversity in the context of clinical care with the goal of improving health outcomes, reducing health spending, and achieving health equity.^{13,14} Health care-based social care practices are diverse and include initiatives to surface patients’ social needs and to intervene using referrals to community and government-based programs; some of these interventions have been shown to contribute to improved health and reduced health care costs.¹⁵⁻¹⁹

Despite growing investment from the health care sector in social care initiatives, little information has been compiled about health care providers’ perceptions of both the need for and capacity to implement screening and referral programs. In an era of increasing documentation demands, time pressures, and provider burnout, understanding the provider impacts of these activities is foundational to program implementation and sustainability and should be weighed alongside other elements of the Quadruple Aim.²⁰ See Figure 1.

We conducted a scoping review exploring research on health care providers’ knowledge, attitudes and beliefs, and behaviors (KABB) about socioeconomic risk screening and referral programs. ***Our aim was to surface both evidence and outstanding evidence gaps in this area.***

Figure 1: Quadruple Aim



What is the Quadruple Aim? The Quadruple Aim is an extension of the original “Triple Aim” framework for health care transformation developed by the Institute of Healthcare improvement. The Quadruple Aim incorporates improving the work life of health care providers (including clinicians and staff) as a fourth aim that complements the original model’s vision of improving patients’ experience of care; advancing the health of populations; and reducing per capita costs of health care.

Source:

Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff (Millwood)*. 2008 May-Jun;27(3):759-69. doi: [10.1377/hlthaff.27.3.759](https://doi.org/10.1377/hlthaff.27.3.759). PMID: 18474969.

Bodenheimer T, Sinsky C. From triple to quadruple aim: Care of the patient requires care of the provider. *Ann Fam Med*. 2014;12(6):573 LP - 576. doi: [10.1370/afm.1713](https://doi.org/10.1370/afm.1713)

Figure adapted from: Willis L, Mital R, Stell P, Sharma R. Discussion: physician-led wellness plan beating burnout. *American Association for Physical Leadership*. September 6, 2017. Accessed August 13, 2021. <https://www.physicianleaders.org/news/discussion-physician-led-wellness-plan-beating-burnout>

METHODS

A black and white photograph of a magnifying glass resting on a surface covered with many small, interlocking puzzle pieces. The magnifying glass is positioned in the center-right of the frame, with its handle extending towards the bottom right. The lens of the magnifying glass is focused on a few puzzle pieces, making them appear larger and more detailed than the others. The overall image conveys a sense of investigation, research, or a search for a solution.

Methods

The complete search strategy for all databases is available in an associated [academic publication](#). In brief, we developed a search strategy in PubMed that we then adapted to three other online databases (Embase, Web of Science, and PsycINFO). The search strategy was peer reviewed by a librarian using the Peer Review of Electronic Search Strategies (PRESS) guidelines.²¹ In addition to these academic databases, we searched the [SIREN Evidence and Resource Library](#) using the pre-set filter “provider outcome.” Searches were designed to capture articles published through June 15, 2019.

Table 1: Search Strategy Terms

Concepts	Search Terms
Social Determinants of Health	<i>social determinants of health, social hardship, social needs, unmet needs, nonmedical needs, psychosocial problems, food insecurity, food security, homeless, homelessness, housing, transportation, legal services, legal needs, childcare, employment, unemployment, poverty, literacy, reading, GED, English as a second language, incarceration, social isolation</i>
Provider Type	<i>clinician, physician, provider, resident, intern, medical student, staff, nurse, medical assistant, medical director, community health worker, social worker, navigator, advocate, primary care, urgent care, emergency department</i>
Intervention	<i>screen, screening, intervention, need assessment</i>
Attitudes	<i>attitude, perception, belief, knowledge, comfort, competence, behavior, opinion, burnout, satisfaction, experience, experience of care, provider patient relationship</i>

Study Inclusion and Exclusion Criteria



Inclusion Criteria

We included in this review studies that examined health care providers' (e.g. physicians, nurses, medical staff, community health workers) skills, knowledge, attitudes and beliefs, or behaviors around identifying or addressing patients' socioeconomic risk factors (e.g. food, housing, or transportation insecurity) in health care delivery settings.

Exclusion Criteria

We excluded studies that did not take place in a clinical setting based in the US; focused on adverse childhood events or interpersonal violence without referencing other socioeconomic risk factors; were not primary research; were not peer reviewed; and manuscripts that were not available in English.

Two reviewers independently completed initial reviews of study titles and abstracts to determine if they met inclusion criteria for full-text review. At least two authors from the review team then reviewed the full texts of each article for inclusion in this analysis and extracted relevant information into a standardized data extraction form cataloging the characteristics presented below.

Information Extracted from Included Studies

1. Study setting

2. Study type and methodology

3. Characteristics of the intervention (e.g., intervention type, duration, and outcome measures)

4. Study population (provider type)

5. Socioeconomic risk factor focus

6. Provider outcomes

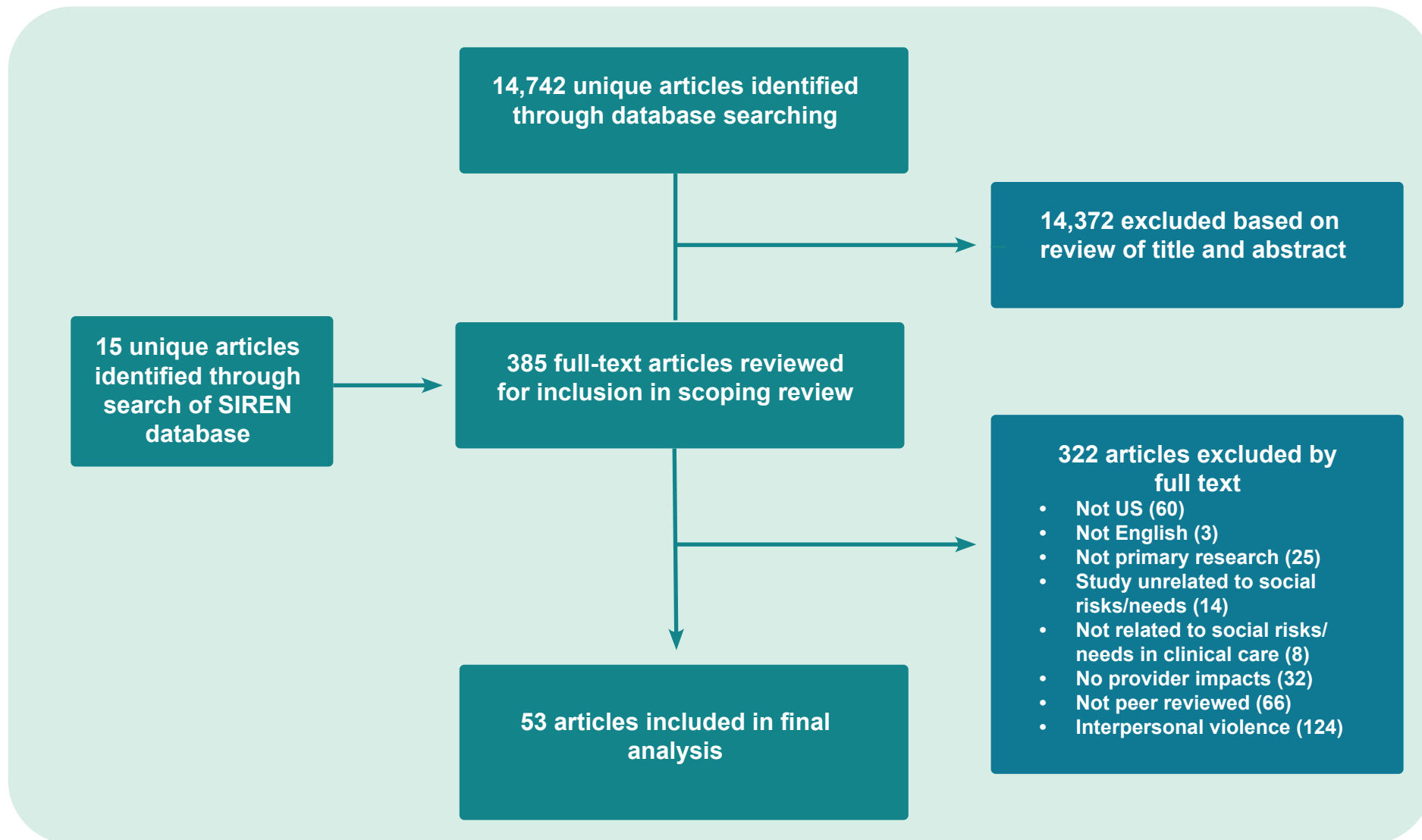


RESULTS

STUDIES IDENTIFIED IN REVIEW

The search identified 14,742 unique articles, 14,372 of which were excluded based on title and abstract review, resulting in 370 articles for full-text review. Fifteen additional studies were identified through searches of the SIREN database. Of these, 53 met inclusion criteria and were included in this analysis. See Figure 2.

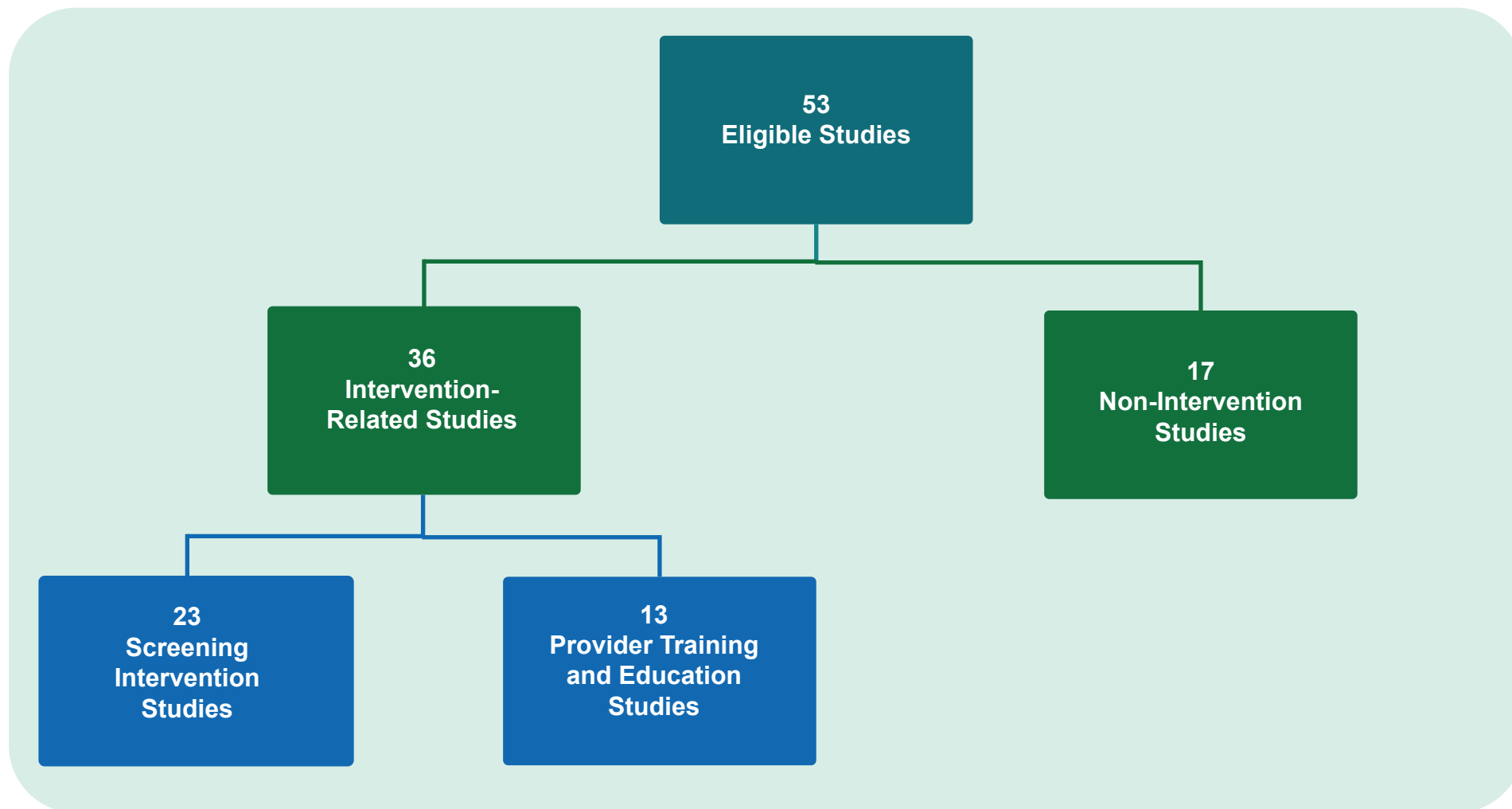
Figure 2: Flowchart of Studies Identified and Included in Scoping Review



TYPES OF STUDIES

Studies fell into two groups: 36 intervention-related studies assessed providers' knowledge, attitudes and beliefs, and behaviors (KABB) in the context of a screening and referral program,²²⁻⁵⁷ 13 of these included substantial provider-focused education and training components;^{27-29, 33-35,39-44,54} another 17 non-intervention studies presented findings from surveys, interviews, and focus groups exploring providers' KABB around addressing patients' socioeconomic needs in clinical settings.⁵⁸⁻⁷⁴

Figure 3: Types of Studies Assessing Providers' Knowledge, Attitudes and Beliefs, and Behaviors



STUDY CHARACTERISTICS

Nearly all studies examined providers' knowledge, attitudes and beliefs, and behaviors (KABB) related to multi-domain socioeconomic risk screening and referral initiatives, though some focused more narrowly on only one social need, e.g., food security. Thirty studies (56%) assessed KABB of physicians who had completed medical school and residency training; 21 (40%) included residents; 16 (30%) included RNs and/or NPs; 6 (11%) included medical students. The majority of studies were based in primary care settings (31; 59%). Sample sizes ranged widely across included studies (n=6 to n=1298). Differences in methods, types of interventions, settings, populations, and targeted social and economic risks across the included studies limited study comparisons. Study characteristics are summarized in Table 2.

Table 2: Study Characteristics

Study Design	Study Setting	Target Social Need	Targeted Providers
Intervention Studies - Randomized Controlled Trial²²⁻²⁴ - Quasi-experimental with comparison group^{25-29,40,41} - Quasi-experimental without comparison group^{30-39,42-57} Non-Intervention Studies - Cross-sectional surveys, interviews and focus groups⁵⁸⁻⁷⁴	Primary Care - Adult^{22,25,32,49,66} - Pediatric^{23,24,29,31,36,37,40,41,50,53,55,67,69-71,73} - Mixed/unknown^{30,39,48,51,57,58,62,65,68,74} Inpatient - Adult^{43,45} - Pediatric^{26,30,47} Emergency Department ^{46,60,64} Medical School ^{28,33,34,44} Multiple Settings/Other ^{27,35,42,43,52,56,59,61,63,72}	Multiple Social Determinants of Health ^{23-30,33-37,40,41,43,48,51,53,56-60,62-65,70-74} Food Insecurity ^{31,42,49,50,55,66,67,69} Health Literacy ^{22,38,39,44,45,54,68} Housing ^{32,46} Legal Services ^{47,52} Environment ⁶¹	Physicians ^{22,25,30-32,36,42,47-51,53,55-67,69,72-74} Resident Physicians ^{22-24,26,27,29,36-43,48,52,55,60,63,70,71} Nurses ^{45-47,50,52,54,57,64,72} Nurse Practitioners ^{32,36,49,50,66-68} Social Workers ^{46,47,49,72} Community Health Workers/Community Resource Specialists ^{30,34} Medical Students ^{28,33-35,42,44} Pharmacists ⁷² Other Clinic Staff ^{30,31,52,56,57,60,64,66}

The background of the slide features several interlocking puzzle pieces in a light gray color. The pieces are scattered across the white background, with some overlapping. The text 'KEY FINDINGS' is overlaid on the puzzle pieces.

KEY FINDINGS

PROVIDER KNOWLEDGE

Twenty-six studies (49%) assessed provider knowledge about identifying and addressing patients' social needs in clinical settings. Measures used to assess provider knowledge and key findings from these papers are described below.

Measures of Provider Knowledge

- Awareness of patients' social needs or prevalence of needs^{22,29,32,35,38,39,41,44,56,67,69,72}
- Awareness of health impacts of social needs^{33,38,42, 60,65,68}
- Awareness of resources/referrals^{24,27,40-43,52-54, 56,61,66,69,72}

KEY FINDINGS

- **Providers reported lack of information about how to address patients' needs.** Across both intervention-related and non-intervention studies, providers reported gaps in knowledge about available social services.^{40,52,53,56,61,66}
- **Education and training about screening and referral programs improve providers' knowledge.** Most studies that incorporated provider education and training components documented resulting improvements in provider knowledge about identifying and addressing needs in clinical care settings.^{24,27,40-43}

PROVIDER ATTITUDES & BELIEFS

Forty-two studies (79%) assessed providers' attitudes and beliefs about identifying and addressing patients' social needs in clinical settings. Measures used to assess provider attitudes and beliefs and key findings from these papers are described below.

Measures of Provider Attitudes & Beliefs

- Perceptions of links between social conditions and health^{27,28,32,41,42,58,59,62,64,70,72-74}
- Acceptability of social care programs^{22,23,30,45-50,53,55,64,66,67,69,72}
- Opinions about provider role in social care programs^{32,40,42,48,49,56,58-60,64,67,69,70,72}
- Provider comfort identifying/addressing social need(s)^{23,29,34,36,40,42,58,61-65,67,71-74}
- Effects of social care programs on provider-patient relationship^{31,33,49-53,56,67,69,72}
- Perceptions of implementation barriers^{29-32,36,40,49-53,55-61,63,66,67,69,72}

KEY FINDINGS

- **Most participating providers believe that patients' life circumstances significantly impact health.**^{27,42,58-60,64-67,69,70}
- **Screening for social and economic risks in health care settings is acceptable to providers.** Although most providers find screening patients for socioeconomic risks to be an acceptable health care practice and are willing to conduct screenings,^{59,64,66,67,69,70,72,73} provider comfort and confidence with screening practices varied.^{36,40,61,64,65}
- **Intervening to address patients' social and economic needs is within providers' individual and/or collective scope of practice.** Beyond screening, providers agree that related interventions are within their individual and/or collective scope of practice.^{40,42,56,58-60,64,67,70,72}
- **Organizational capacity to address patients' social and economic needs may improve job satisfaction.** Three studies reported positive associations between a clinical setting's ability to address patients' socioeconomic needs and providers' job satisfaction, including feelings of burnout, and perceptions of health care quality.^{58,62,74}
- **Program participation improves provider attitudes toward social care interventions and reduces perceived implementation barriers.**^{29,36,40,42,48,50,52,53}

PROVIDER BEHAVIORS

Thirty-five studies (66%) described provider behaviors related to identifying and addressing patients' social needs in clinical settings. Measures used to assess provider behaviors and key findings from these papers are described below.

Measures of Provider Behaviors

- Social risk screening rates/activities^{23,24,26,29,31,32,36,40-43,45,48,50,52,53,60,61,65-73}
- Referral activities^{23,42,43,52,60,65}
- Clinical care adjustment activities^{22,26,29,39,51,54,56,63,72}
- Documentation of social needs/referrals^{37,55,65}
- Time spent on intervention^{23,36,71}
- Provider productivity²⁵

KEY FINDINGS

- **Providers report screening for a wide range of social and economic needs.**
- **Screening frequency, tools, and approaches vary across studies.** In some cases, screening targets a specific population (e.g., patients with diabetes) while in other cases, providers screen in response to patient-specific factors (e.g. co-morbid conditions) identified only in the context of clinical encounters.^{66,67}
- **Provider characteristics & practice settings influence screening and referral behaviors.** Providers screen and make related social care referrals more frequently in clinical settings where staff are available to connect patients with community resources versus in settings with no or limited on-site social care staff.^{71,73}
- **Pre/post studies show program exposure increases provider screening rates.** All studies assessing screening rates before and after the implementation of a screening and referral program showed statistically significant increases in screening behaviors in at least one SDH domain.^{23,24,26,29,32,36,37,42,43,53}

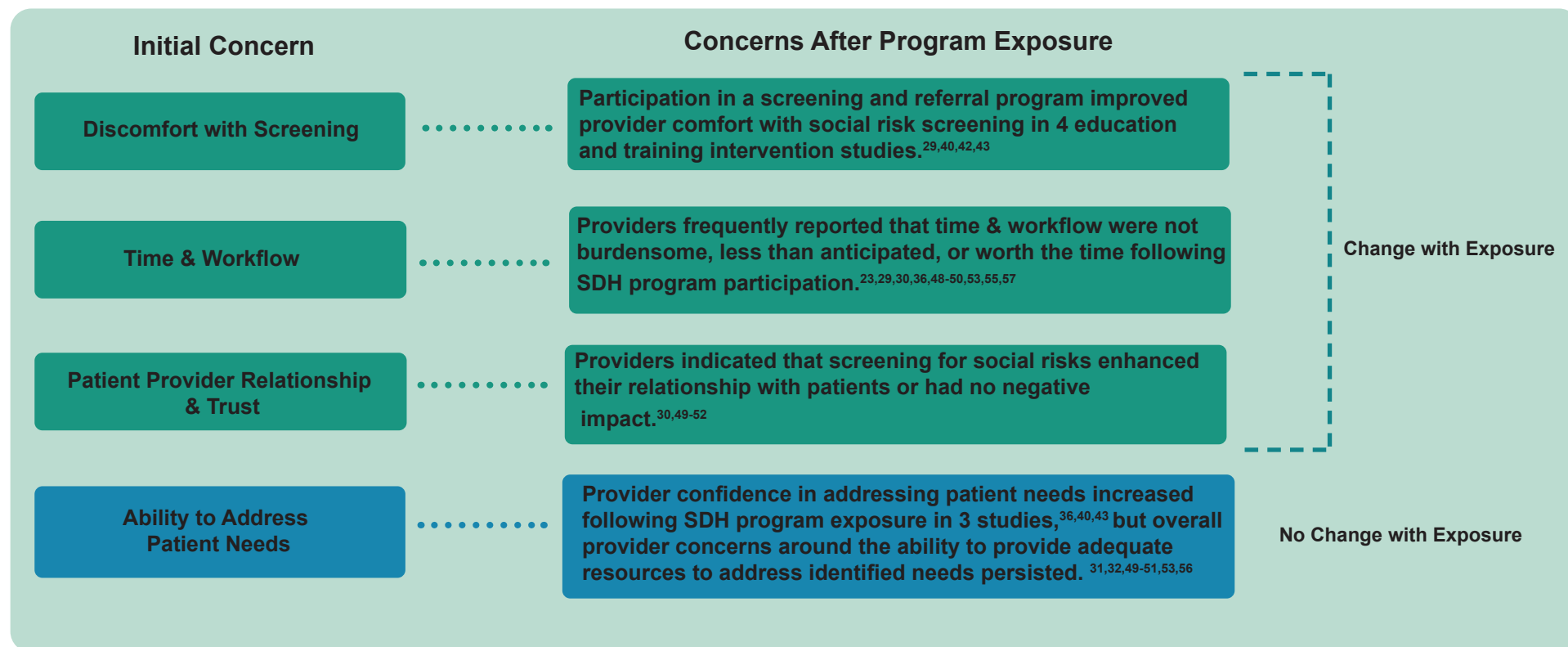
PROVIDER CONCERNS ABOUT SOCIAL RISK SCREENING AND REFERRAL PROGRAMS

Approximately half of the included studies highlighted providers' concerns about the potential negative consequences of program implementation. Providers' concerns included:

- Discomfort with socioeconomic risk screening;^{40,58,61,67,69}
- Insufficient time and workflow disruption;^{29,31,32,36,40,53,56,57,59,60,63,66,67,69,72}
- Patient discomfort and negative impact on the patient-provider relationship;^{30,31,50,52,53,55,57,67,69,72}
- Insufficient knowledge and resources to adequately address screening results.^{31,32,40,49-51,53,56,58-61,63,66,67,69,72,73}

In several intervention studies, many provider concerns abated following program exposure. See Figure 4.

Figure 4: Effects of Program Exposure on Provider Concerns



FACTORS THAT INFLUENCE PROVIDER ATTITUDES

Several studies found that individual-level provider characteristics such as discipline (e.g. primary care vs specialist), role (e.g. physician vs non physician), racial/ethnic identity, and gender were associated with different attitudes about screening and referral programs.

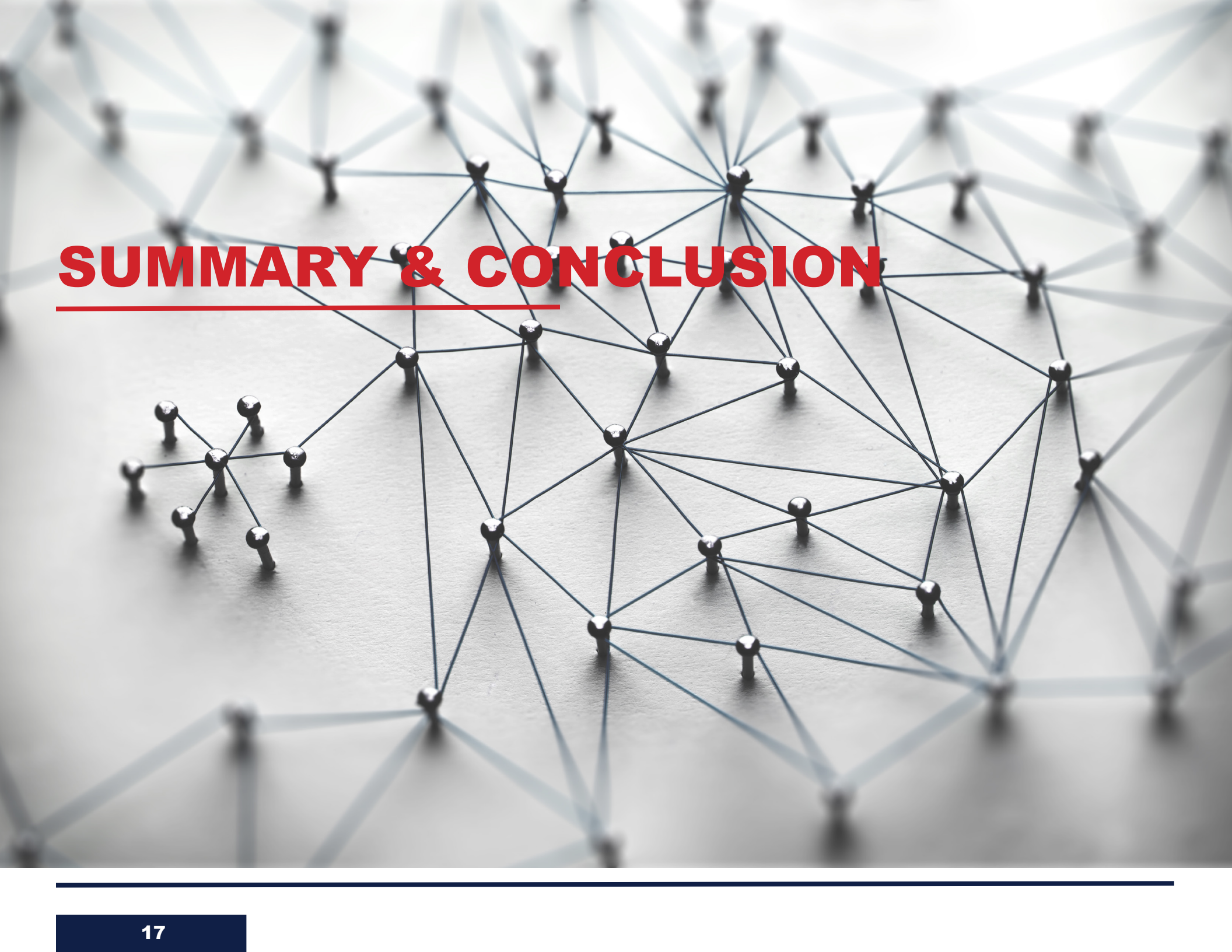
In one study of 240 faculty physicians:⁵⁹

- Primary care physicians (PCPs) were more likely than specialists to think that the benefits of collecting patients' socioeconomic risk information outweighed negative consequences, though all physician groups reported that lack of clinic and health system infrastructure was the primary barrier to program adoption.
- Non-minority physicians and specialists were more likely than minority physicians and PCPs to be concerned about what to do with socioeconomic risk data once collected. Minority physicians and PCPs were more likely to be concerned about liability related to not addressing identified risks.
- Female physicians were more likely than other physician groups to think it was appropriate to include socioeconomic data in electronic health records.
- While overall 54% of physicians reported believing that PCPs should be primarily responsible for managing socioeconomic risk factors, more specialists than PCPs agreed with this approach.

Other studies also surfaced contrasting attitudes, particularly related to workforce for social care:

- Four studies found that providers wanted ancillary clinical staff to support socioeconomic risk screening and referrals.^{22,48,53,66}
- One large study (n=258) reported that 94% of clinicians thought social workers should conduct socioeconomic risk screening.⁷²
- A study with pediatric emergency medicine providers (n=114) found that a higher percentage of nursing staff (58.1%) than physicians (28.2%) preferred screening to be conducted by physicians.⁶⁴



A background image showing a complex network of nodes and connections. The nodes are represented by small, dark, spherical objects, and the connections are thin, dark lines. The network is dense and interconnected, with many nodes and lines forming a complex web. The background is a light, textured surface.

SUMMARY & CONCLUSION

Summary & Conclusion

The purpose of this scoping review was to explore the research on health care providers' knowledge, attitudes and beliefs, and behaviors (KABB) about screening and referral programs. We found a diverse group of studies exploring providers' KABB related to socioeconomic risk screening and referral programs in clinical settings. Key findings relevant to implementation and sustainability of social care programs include:

- Providers generally believe screening and intervening on patients' socioeconomic risk factors is acceptable and within their scope of practice.
- Participating in social care interventions reduces perceived implementation barriers.
 - Providers exposed to socioeconomic screening and referral programs reported fewer concerns about the potential negative consequences of program implementation. Program exposure improved patient-provider relationships; increased provider comfort with screening and referral practices; and resulted in fewer provider concerns about clinic workflow disruption.
 - Provider concerns regarding the capacity to adequately address patients' socioeconomic needs persisted even after program exposure. Future work in this area should clarify both patient and provider expectations about addressing patients' socioeconomic needs.
- Provider education and training initiatives can positively impact provider behaviors and attitudes. Characterizing core training components and assessing more longitudinal outcomes are important areas for future research.
- The majority of education and training related studies identified in this review focused on physicians or physician trainees.^{27-29,33,40-44} In future studies, more attention should focus on meeting the training needs of a more diverse workforce.

LIMITATIONS OF THIS SCOPING REVIEW

- This review was limited to provider perspectives on screening and referral programs related to individual socioeconomic risks, excluding studies of health care activities that might address other social and structural determinants of health and equity, including racism.
- We excluded studies that did not refer to provider outcomes in the abstract. We may have therefore inadvertently excluded relevant studies that assessed provider outcomes, but did not include those outcomes in the abstract.
- The heterogeneity of studies—including different types of socioeconomic risk screening conducted—and lack of standardized outcome measures limited our ability to draw comparisons across studies.
- Many studies in this review were based on nonexperimental designs.

ACKNOWLEDGEMENTS

Authors

Andrea Quiñones-Rivera, MD, MPH¹
Holly E. Wing, MA²
Jill Barr-Walker, MS, MPH³
Megan Yee, BA⁴
Jessica M. Harrison, PhD(c), LCSW⁵
Laura M. Gottlieb, MD, MPH⁶

¹ LAC-USC Department of Emergency Medicine; ² Center for Health and Community, University of California, San Francisco; ³ ZSFG Library, University of California, San Francisco; ⁴ Medical College of Wisconsin; ⁵ Department of Social and Behavioral Sciences, University of California, San Francisco; ⁶ Department of Family and Community Medicine, University of California, San Francisco.

The authors gratefully acknowledge Dylne Gonzalez for editing and formatting this issue brief.

Suggested citation

Quiñones-Rivera A, Wing HE, Barr-Walker J, Yee M, Harrison JM, Gottlieb LM. Provider impacts of socioeconomic risk screening and referral programs: A systematic scoping review. 2021. San Francisco, CA: Social Interventions Research and Evaluation Network. [Available online.](#)

Original manuscript

Quiñones-Rivera A, Wing HE, Barr-Walker J, Yee M, Harrison JM, Gottlieb LM. Provider impacts of socioeconomic risk screening and referral programs: A scoping review. J Am Board Fam Med. 2021;34(4):820 LP - 831. doi:[10.3122/jabfm.2021.04.210039](https://doi.org/10.3122/jabfm.2021.04.210039)

siren

Social Interventions Research & Evaluation Network

The Social Interventions Research and Evaluation Network (SIREN) is located at the University of California, San Francisco. SIREN's mission is to improve health and health equity by advancing high quality research on health care sector strategies to improve social conditions.

REFERENCES

1. Braveman P, Egerter S, Williams DR. The social determinants of health: coming of age. *Annu Rev Public Health*. 2011;32:381-398.
2. Marmot M, Bell R. Fair society, healthy lives. *Public Health*. 2012;126 Suppl 1:S4-s10.
3. Adler NE, Stewart J. Preface to the biology of disadvantage: socioeconomic status and health. *Ann N Y Acad Sci*. 2010;1186:1-4.
4. Larson K, Halfon N. Family income gradients in the health and health care access of US children. *Matern Child Health J*. 2010;14(3):332-342.
5. Victorino CC, Gauthier AH. The social determinants of child health: variations across health outcomes - a population-based cross-sectional analysis. *BMC Pediatr*. 2009;9:53.
6. Kaplan GA, Shema SJ, Leite CM. Socioeconomic determinants of psychological well-being: the role of income, income change, and income sources during the course of 29 years. *Ann Epidemiol*. 2008;18(7):531-537.
7. Koch CG, Li L, Kaplan GA, et al. Socioeconomic position, not race, is linked to death after cardiac surgery. *Circ Cardiovasc Qual Outcomes*. 2010;3(3):267-276.
8. Weinreb L, Wehler C, Perloff J, et al. Hunger: its impact on children's health and mental health. *Pediatrics*. 2002;110(4):e41.
9. Kondo N. Socioeconomic disparities and health: impacts and pathways. *J Epidemiol*. 2012;22(1):2-6.
10. Socioeconomic Status and Health in Industrial Nations: Social, Psychological, and Biological Pathways. Bethesda, Maryland, USA. May 10-12, 1999. Proceedings. *Ann N Y Acad Sci*. 1999;896:1-503.
11. Marmot M. Social determinants of health inequalities. *Lancet*. 2005;365(9464):1099-1104.
12. Cutts DB, Meyers AF, Black MM, et al. US Housing insecurity and the health of very young children. *Am J Public Health*. 2011;101(8):1508-1514.
13. Arnett DK, Blumenthal RS, Albert MA, et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2019;140(11):e596-e646.
14. National Academies of Sciences, Engineering, Medicine. Integrating social care into the delivery of health care: moving upstream to improve the nation's health. Washington (DC): National Academies Press (US). 2019.
15. Vasan A, Morgan JW, Mitra N, et al. Effects of a standardized community health worker intervention on hospitalization among disadvantaged patients with multiple chronic conditions: A pooled analysis of three clinical trials. *Health Serv Res*. 2020;55 Suppl 2(Suppl 2):894-901.
16. Kangovi S, Mitra N, Grande D, Long JA, Asch DA. Evidence-based community health worker program addresses unmet social needs and generates positive return on investment. *Health Aff (Millwood)*. 2020;39(2):207-213.
17. Kangovi S, Mitra N, Norton L, et al. Effect of community health worker support on clinical outcomes of low-income patients across primary care facilities: a randomized clinical trial. *JAMA Intern Med*. 2018;178(12):1635-1643.
18. Berkowitz SA, Delahanty LM, Terranova J, et al. Medically tailored meal delivery for diabetes patients with food insecurity: a randomized cross-over trial. *J Gen Intern Med*. 2019;34(3):396-404.
19. Sadowski LS, Kee RA, VanderWeele TJ, Buchanan D. Effect of a housing and case management program on emergency department visits and hospitalizations among chronically ill homeless adults: a randomized trial. *Jama*. 2009;301(17):1771-1778.
20. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. *Ann Fam Med*. 2014;12(6):573-576.
21. McGowan J, Sampson M, Salzwedel DM, Cogo E, Foerster V, Lefebvre C. PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement. *J Clin Epidemiol*. 2016;75:40-46.
22. Seligman HK, Wang FF, Palacios JL, Wilson CC, Daher CA, Piette JD, Schillinger D. Physician notification of their diabetes patients' limited health literacy: A randomized, controlled trial. *J Gen Intern Med*. 2005 Nov;20(11):1077. doi: 10.1111/j.1525-1497.2005.00309.x.
23. Garg A, Butz AM, Dworkin PH, Lewis RA, Thompson RE, Serwint JR. Improving the management of family psychosocial problems at low-income children's well-child care visits: the WE CARE Project. *Pediatrics*. 2007;120(3):547-558.
24. Feigelman S, Dubowitz H, Lane W, Grube L, Kim J. Training pediatric residents in a primary care clinic to help address psychosocial problems and prevent child maltreatment. *Acad Pediatr*. 2011;11(6):474-480.

25. Dorr DA, Wilcox A, McConnell KJ, Burns L, Brunker CP. Productivity enhancement for primary care providers using multicondition care management. *Am J Manag Care*. 2007;13(1):22-28.
26. Colvin JD, Bettenhausen JL, Anderson-Carpenter KD, et al. Multiple behavior change intervention to improve detection of unmet social needs and resulting resource referrals. *Acad Pediatr*. 2016;16(2):168-174.
27. Kuo AA, Shetgiri R, Guerrero AD, et al. A public health approach to pediatric residency education: responding to social determinants of health. *J Grad Med Educ*. 2011;3(2):217-223.
28. Girotti JA, Loy GL, Michel JL, Henderson VA. The urban medicine program: developing physician-leaders to serve underserved urban communities. *Acad Med*. 2015;90(12):1658-1666.
29. O'Toole JK, Solan LG, Burkhardt MC, Klein MD. Watch and learn: an innovative video trigger curriculum to increase resident screening for social determinants of health. *Clin Pediatr (Phila)*. 2013;52(4):344-350.
30. Sundar KR. Universal screening for social needs in a primary care clinic: A quality improvement approach using the Your Current Life Situation Survey. *Perm J*. 2018;22:18-089.
31. Knowles M, Khan S, Palakshappa D, et al. Successes, challenges, and considerations for integrating referral into food insecurity screening in pediatric settings. *J Health Care Poor Underserved*. 2018;29(1):181-191.
32. Chhabra M, Sorrentino AE, Cusack M, Dichter ME, Montgomery AE, True G. Screening for housing instability: providers' reflections on addressing a social determinant of health. *J Gen Intern Med*. 2019;34(7):1213-1219.
33. Onyekere C, Ross S, Namba A, Ross JC, Mann BD. Medical student volunteerism addresses patients' social needs: A novel approach to patient-centered care. *Ochsner J*. 2016;16(1):45-49.
34. Kangovi S, Carter T, Smith RA, DeLisser HM. A community health worker-led rotation to train medical students in the social determinants of health. *J Health Care Poor Underserved*. 2018;29(2):581-590.
35. O'Brien MJ, Garland JM, Murphy KM, Shuman SJ, Whitaker RC, Larson SC. Training medical students in the social determinants of health: the Health Scholars Program at Puentes de Salud. *Adv Med Educ Pract*. 2014;5:307-314.
36. Zielinski S, Paradis HA, Herendeen P, Barbel P. The identification of psychosocial risk factors associated with child neglect using the WE-CARE screening tool in a high-risk population. *J Pediatr Health Care*. 2017 Jul-Aug;31(4):470-475. doi: 10.1016/j.pedhc.2016.12.005.
37. Patel M, Bathory E, Scholnick J, White-Davis T, Choi J, Braganza S. Resident documentation of social determinants of health: Effects of a teaching tool in the outpatient setting. *Clin Pediatr*. 2018;57(4):451-456.
38. Wahab A, Ali A, Nazir S, et al. A QI initiative for bridging the health literacy gap by Educating internal medicine residents at a community hospital. *J Community Hospital Internal Medicine Perspectives*. 2018;8(5):260-266.
39. Coleman CA, Fromer A. A health literacy training intervention for physicians and other health professionals. *Fam Med*. 2015;47(5):388-392.
40. Klein MD, Alcamo AM, Beck AF, et al. Can a video curriculum on the social determinants of health affect residents' practice and families' perceptions of care? *Acad Pediatr*. 2014;14(2):159-166.
41. Klein MD, Kahn RS, Baker RC, Fink EE, Parrish DS, White DC. Training in social determinants of health in primary care: does it change resident behavior? *Acad Pediatr*. 2011;11(5):387-393.
42. Smith S, Malinak D, Chang J, Schultz A, Brownell K. Addressing food insecurity in family medicine and medical education. *Fam Med*. 2017;49(10):765-771.
43. Real FJ, Beck AF, Spaulding JR, Sucharew H, Klein MD. Impact of a neighborhood-based curriculum on the helpfulness of pediatric residents' anticipatory guidance to impoverished families. *Matern Child Health J*. 2016;20(11):2261-2267.
44. Primack BA, Bui T, Fertman CI. Social marketing meets health literacy: Innovative improvement of health care providers' comfort with patient interaction. *Patient Educ Couns*. 2007;68(1):3-9.
45. Sand-Jecklin K, Daniels CS, Lucke-Wold N. Incorporating health literacy screening into patients' health assessment. *Clin Nurs Res*. 2017;26(2):176-190.
46. Gabrielian S, Chen JC, Minhaj BP, et al. Feasibility and acceptability of a colocated homeless-tailored primary care clinic and emergency department. *J Prim Care Community Health*. 2017;8(4):338-344.

47. Pettignano R, Caley SB, McLaren S. The health law partnership: adding a lawyer to the health care team reduces system costs and improves provider satisfaction. *J Public Health Manag Pract*. 2012;18(4):E1-3.
48. Page-Reeves J, Kaufman W, Bleecker M, et al. Addressing social determinants of health in a clinic setting: The WellRx pilot in Albuquerque, New Mexico. *J Am Board Fam Med*. 2016;29(3):414-418.
49. O'Toole TP, Roberts CB, Johnson EE. Screening for food insecurity in six Veterans Administration clinics for the homeless, June-December 2015. *Prev Chronic Dis*. 2017;14.
50. Palakshappa D, Vasan A, Khan S, Seifu L, Feudtner C, Fiks AG. Clinicians' perceptions of screening for food insecurity in suburban pediatric practice. *Pediatrics*. 2017;140(1).
51. Tong ST, Liaw WR, Kashiri PL, et al. Clinician experiences with screening for social needs in primary care. *J Am Board Fam Med*. 2018;31(3):351-363.
52. Cohen E, Fullerton DF, Retkin R, et al. Medical-legal partnership: collaborating with lawyers to identify and address health disparities. *J Gen Intern Med*. 2010;25 Suppl 2:S136-139.
53. Eismann EA, Theuerling J, Maguire S, Hente EA, Shapiro RA. Integration of the Safe Environment for Every Kid (SEEK) model across primary care settings. *Clin Pediatr*. 2019;58(2):166-176.
54. Stikes R, Arterberry K, Logsdon MC. A nurse leadership project to improve health literacy on a maternal-infant unit. *J Obstet Gynecol Neonatal Nurs*. 2015;44(5):665-676.
55. Adams E, Hargunani D, Hoffmann L, Blaschke G, Helm J, Koehler A. Screening for food Insecurity in pediatric primary care: a clinic's positive implementation experiences. *J Health Care Poor Underserved*. 2017;28(1):24-29.
56. Hamity C, Jackson A, Peralta L, Bellows J. Perceptions and experience of patients, staff, and clinicians with social needs assessment. *Perm J*. 2018;22:18-105.
57. Byhoff E, Garg A, Pellicer M, et al. Provider and staff feedback on screening for social and behavioral determinants of health for pediatric patients. *J Am Board Fam Med*. 2019;32(3):297-306.
58. Olayiwola JN, Willard-Grace R, Dubé K, et al. Higher perceived clinic capacity to address patients' social needs associated with lower burnout in primary care providers. *J Health Care Poor Underserved*. 2018;29(1):415-429.
59. Palacio A, Seo D, Medina H, Singh V, Suarez M, Tamariz L. Provider perspectives on the collection of social determinants of health. *Popul Health Manag*. 2018;21(6):501-508.
60. Losonczy LI, Hsieh D, Hahn C, Fahimi J, Alter H. More than just Meds. National survey of providers' perceptions of patients' social, economic, environmental, and legal needs and their effect on emergency department utilization. *Soc Med*. 2015;9:22-28.
61. Grindler NM, Allshouse AA, Jungheim E, Powell TL, Jansson T, Polotsky AJ. OBGYN screening for environmental exposures: A call for action. *PLoS One*. 2018;13(5):e0195375.
62. Pantell MS, De Marchis E, Bueno A, Gottlieb LM. Practice capacity to address patients' social needs and physician satisfaction and perceived quality of care. *Ann Fam Med*. 2019;17(1):42-45.
63. Purnell TS, Marshall JK, Olorundare I, et al. Provider perceptions of the organization's cultural competence climate and their skills and behaviors targeting patient-centered care for socially at-risk populations. *J Health Care Poor Underserved*. 2018;29(1):481-496.
64. Robinson T, Bryan L, Johnson V, McFadden T, Lazarus S, Simon HK. Hunger: A missed opportunity for screening in the pediatric emergency department. *Clin Pediatr (Phila)*. 2018;57(11):1318-1325.
65. Lewis JH, Whelihan K, Navarro I, Boyle KR. Community health center provider ability to identify, treat and account for the social determinants of health: a card study. *BMC Fam Pract*. 2016;17:121.
66. Pooler JA, Hoffman VA, Karva FJ. Primary care providers' perspectives on screening older adult patients for food Insecurity. *J Aging Soc Policy*. 2018;30(1):1-23.
67. Hoisington AT, Braverman MT, Hargunani DE, Adams EJ, Alto CL. Health care providers' attention to food insecurity in households with children. *Prev Med*. 2012;55(3):219-222.
68. Cafiero M. Nurse practitioners' knowledge, experience, and intention to use health literacy strategies in clinical practice. *J Health Commun*. 2013;18 Suppl 1:70-81.
69. Barnidge E, LaBarge G, Krupsky K, Arthur J. Screening for food insecurity in pediatric clinical settings: opportunities and barriers. *J Community Health*. 2017;42(1):51-57.

70. Garg A, Butz AM, Dworkin PH, Lewis RA, Serwint JR. Screening for basic social needs at a medical home for low-income children. *Clin Pediatr (Phila)*. 2009;48(1):32-36.
71. O'Toole JK, Burkhardt MC, Solan LG, Vaughn L, Klein MD. Resident confidence addressing social history: is it influenced by availability of social and legal resources? *Clin Pediatr (Phila)*. 2012;51(7):625-631.
72. Schickedanz A, Hamity C, Rogers A, Sharp AL, Jackson A. Clinician experiences and attitudes regarding screening for social determinants of health in a large integrated health system. *Med Care*. 2019;57 Suppl 6 Suppl 2(Suppl 6 2):S197-s201.
73. Garg A, Cull W, Olson L, et al. Screening and referral for low-income families' social determinants of health by US pediatricians. *Acad Pediatr*. 2019;19(8):875-883.
74. De Marchis E, Knox M, Hessler D, et al. Physician burnout and higher clinic capacity to address patients' social needs. *J Am Board Fam Med*. 2019;32(1):69-78.
75. Gottlieb LM, Wing H, Adler NE. A systematic review of interventions on patients' social and economic needs. *Am J Prev Med*. 2017;53(5):719-729.
76. Gottlieb LM, Hessler D, Long D, et al. Effects of social needs screening and in-person service navigation on child health: a randomized clinical trial. *JAMA Pediatr*. 2016;170(11):e162521.
77. Pantell MS, Hessler D, Long D, et al. Effects of in-person navigation to address family social needs on child health care utilization: a randomized clinical trial. *JAMA Netw Open*. 2020;3(6):e206445.
78. Gottlieb LM, Adler NE, Wing H, et al. Effects of in-person assistance vs personalized written resources about social services on household social risks and child and caregiver health: a randomized clinical trial. *JAMA Netw Open*. 2020;3(3):e200701.
79. Berkowitz SA, Hulberg AC, Standish S, Reznor G, Atlas SJ. Addressing unmet basic resource needs as part of chronic cardiometabolic disease management. *JAMA Intern Med*. 2017;177(2):244-252.
80. Sege R, Preer G, Morton SJ, et al. Medical-legal strategies to improve infant health care: a randomized trial. *Pediatrics*. 2015;136(1):97-106.
81. Byhoff E, De Marchis EH, Hessler D, et al. Part II: a qualitative study of social risk screening acceptability in patients and caregivers. *Am J Prev Med*. 2019;57(6 Suppl 1):S38-s46.
82. Rogers AJ, Hamity C, Sharp AL, Jackson AH, Schickedanz AB. Patients' attitudes and perceptions regarding social needs screening and navigation: multi-site survey in a large integrated health system. *J Gen Intern Med*. 2020;35(5):1389-1395.
83. Palakshappa D, Doupnik S, Vasan A, et al. Suburban families' experience with food insecurity screening in primary care practices. *Pediatrics*. 2017;140(1).
84. Hunter K, Thomson B. A scoping review of social determinants of health curricula in post-graduate medical education. *Can Med Educ J*. 2019;10(3):e61-e71.
85. Martinez J, Fornari A, VanHuse V, et al. A faculty development graduate medical education retreat to teach and address social determinants of health. *J Med Educ Curric Dev*. 2020;7:2382120520915495.
86. National Academies of Sciences, Engineering, and Medicine. A framework for educating health professionals to address the social determinants of health. Washington (DC): National Academies Press (US);2016.

siren

Social Interventions Research & Evaluation Network