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Assessing and addressing social determinants of health in school-based health centers in King County, Washington

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ABSTRACT

Objective: School-Based Health Centers (SBHCs) can reduce barriers to accessing care for school-aged children and adolescents. However, current practices related to screening for and responding to social determinants of health (SDOH) in SBHCs are unknown. Our study sought to understand SBHC staff's knowledge related to SDOH, and their screening and referral practices for addressing SDOH.

Methods: This study was conducted with all SBHCs in King County, Washington (n = 30 clinics operated by n = 8 agencies) between January-March 2022. Data were collected using a web-based questionnaire, distributed to all provider and clinical care staff (n = 222) in these SHBCs.

Results: While respondents had strong generalized knowledge regarding SDOH and how they impact health, they were less confident about the specific SDOH impacting the students they serve. Many health limiting and promoting factors are screened for by respondents; however, there was no standardization related to screening and referral practices across SBHCs or agencies. Respondents had suggestions on how to improve screening methodology and ensure that existing practices adequately assess the SDOH impacting student's lives. There was no clearly identified mechanism for making and following up on referrals. Respondents felt that there were either not or only sometimes enough resources available to meet student's needs.

Conclusion: SBHCs advance health and educational outcomes for students, yet SDOH are inconsistently assessed and addressed within SBHCs in King County. Standardizing processes for SDOH assessment and referral can help SBHCs develop practices that are in the best service of equity for their student populations.

1. Introduction

As a universal program where children and adolescents spend much of their formative years, schools are an opportune place to deliver essential health services (Price, 2016; Francis et al., 2021). School-Based Health Centers (SBHCs) provide medical, behavioral, dental and vision services to students within the school setting, maximizing students' opportunities to learn and grow while also receiving necessary health services. SBHCs are often established in schools serving low income, diverse populations and those experiencing the greatest disparities in health care access and outcomes (Arenson et al., 2019). Accordingly, SBHCs can increase utilization of health services, particularly for underserved youth, and eliminate barriers to access for children -including cost, caregiver time off work, and transportation- and therefore may advance health equity (Arenson et al., 2019; Gibson et al., 2013; Soleimanpour et al., 2010; Koenig et al., 2016; Adams et al., 2020; Knopf et al., 2016; Soleimanpour, 2020; Knopf et al., 2016).

While it is important to increase access to clinical healthcare, health disparities are driven largely by non-healthcare factors, including social determinants of health (SDOH), or "conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning and quality-of-life outcomes

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and risks" (Social Determinants of Health, 2022). SDOH include factors such as access to healthy foods, housing, safe neighborhoods, and exposure to racism and discrimination. Addressing SDOH for school-aged youth and adolescents can reduce and prevent health disparities and negative health outcomes (Nicolau and Marcenes, 2012). In realization of the Whole Child Health model (Rooney et al., 2015), SBHCs provide a strategic opportunity to identify and address SDOH in children: simultaneously influencing a child's physical health, mental health, behavior, and educational attainment (Price, 2016; Seligman et al., 2010). Assessing SDOH among minoritized youth, then, is crucial for reducing disparities and achieving equitable health and academic outcomes (Koslouski et al., 2023).

Because most children attend school, numerous organizations have advocated for SDOH screening in school settings (Koslouski et al., 2023). SDOH screening and intervention in pediatric primary care has been increasing in frequency but is still not universally performed, and best practices remain unestablished (Koslouski et al., 2023; Zook and Green, 2019; Nerlinger and Kopsombut, 2023; Barton et al., 2019). Koslouski et al. performed a scoping review of SDOH screening in schools and found a wide range of suggestions for when, how and by who screening should be conducted (Koslouski et al., 2023). Most of the SDOH screening tools that currently exist have unclear or poor psychometric properties and the measures and level of detail in each screener vary drastically (Koslouski et al., 2023; Barton et al., 2019; Henrikson et al., 2019). Sokol et al. performed a systematic review of SDOH screening in pediatric primary care and found that psychometric properties had only been established for 3 of 11 included tools (Sokol et al., 2019). While best practices on screening remain unestablished, consensus around the importance of requiring SDOH screening is clear (Koslouski et al., 2023; Barton et al., 2019; Henrikson et al., 2019; Sokol et al., 2019). When requiring SDOH screening, it's imperative that measures are tailored for the local setting (Koslouski et al., 2023; Barton et al., 2019).

Literature on addressing SDOH in pediatric primary care is also underdeveloped. Of the 17 studies included in the above review, only 3 reported an intervention being delivered after a social need was identified; in the remaining studies, referrals for intervention were either not made or not utilized by families/caregivers (Sokol et al., 2019). Some literature has identified barriers and catalysts of service referrals for adults in community health settings (Lian et al., 2021; Sandhu et al., 2022) but these are likely to differ for children and adolescents. While it has been identified that integrating SDOH screening into schools leads to an increase in referrals (Koslouski et al., 2023), further understanding of how to optimize such pathways is integral to meeting students' needs.

This study's research questions emerged from practice-based knowledge gaps identified by SHBC leadership, managers, and providers that were consistent with gaps in the literature and aligned with topics elucidated in qualitative studies performed by our team. While studies exist on SDOH in schools more broadly, no prior studies, to our knowledge, have investigated SDOH screening or referral practices in SBHCs (Koslouski et al., 2023). Studying the connection between SBHCs and SDOH is an important step in being able to enhance school-based care coordination and improve outcomes. This study seeks to address this knowledge gap by assessing the following questions in a sample of SBHC staff in Seattle/King County:

1) What is the level of knowledge of SBHC staff regarding SDOH and how they influence student health?
2) What are the current SDOH screening practices?
3) What are the current SDOH referral practices?

2. Methods

2.1. Study design and distribution

This study used data collected from a web-based questionnaire using REDCap (Harris et al., 2009; Harris et al., 2019) distributed by email in February 2022. The questionnaire was developed with feedback from local stakeholders including providers, program managers and previous SBHC staff to ensure clarity and relevance of questions and to strengthen the tool's face validity. We also consulted existing questionnaires (e.g., 2020–2021 National Survey of SBHCs, existing SDOH screening tools [PRAPARE, CMS AHC HRSN], Henrikson et al. (2019) article, CDC Health Services School Questionnaire) (Billioux, 2017; CDC, 2014; Henrikson et al., 2019; National, 2016; School-Based Health Alliance, 2021) in addition to an extensive literature review to identify topics that should be included. The final questionnaire was pilot tested with three providers working at different King County SBHCs that had not been involved with the initial creation, design, or revisions of the questionnaire. This study received exempt approval from the University of Washington IRB.

There were 8 healthcare agencies operating 50 school-based clinics in King County offering serving over 10,000 K-12 students annually at the time of study. All 222 providers and clinical care staff working in SBHCs in King County were invited to participate. Respondent roles in the SBHC system included: Medical Providers, Mental Health Providers, Clinic Coordinators, Health Educators, Program Manager/Specialists, and other staff (includes School Nurses). Four reminders were sent.

2.2. Variables

The questionnaire included a mix of 26 open- and close-ended questions in three sections that aligned with study objectives (Appendix A).

1. Knowledge of SDOH. Three questions captured self-rated SDOH knowledge: 1) knowledge about SDOH; 2) knowledge about how SDOH influence student health, and 3) knowledge about the specific SDOH impacting their student population. Respondents were asked to rank their knowledge (response options: "I know a lot", "I know a good amount", "I know some", "I know a little bit", "I am not familiar", "Not sure").

2. Screening Practices. Respondents were asked to rate the adequacy of their existing screening practices using a 5-point Likert Scale (response options: "Strongly Agree", "Somewhat Agree", "Neutral", "Somewhat Disagree", "Strongly Disagree"). Questions about the types of SDOH screened for and logistics of screening (tools used, timing, frequency, designated screeners) all had predefined nominal response options (see Appendix A) created by the study team and refined by the clinical reviewers. Each question included an option for respondents to enter in their own response if none applied.

3. Referral Practices. Questions about referrals covered three areas: how SBHCs address identified needs, whether there are enough resources available, and whether referrals are followed up on. Each question allowed respondents to select from predefined nominal response options or enter in their own response if none applied.

Open-ended questions in each section allowed respondents to expand on topics such as additional resources needed, how to improve screening practices, and the resources respondents use to address students' needs.

2.3. Data analysis

Following data collection, data were checked for errors, cleaned, and analyzed using R software. Univariate statistics, including number and percentage of responses for each response option were generated for each question. As study aims were descriptive and sample size was prohibitive, we did not test for group differences (e.g., by agency or respondent role), however Appendix B provides responses broken down by respondent role. Dictated by the brevity of responses, open ended questions, were analyzed using a rapid content analysis approach in accordance with the methods described by Gale et al. (2019). Themes were deduced from the open-ended responses and a matrix was generated. Co-authors reviewed the themes and provided feedback. Member checking was completed, where preliminary results from the open-

ended data were presented in aggregate to SBHC providers to ensure correct interpretation.

3. Results

3.1. Respondent characteristics

There were 71 respondents (32 % response rate from n = 222 invited) from 30 campuses (60 % of the n = 50 campuses represented). Several respondents worked at multiple campuses within their agency (see respondent characteristics in Table 1).

3.2. Respondent knowledge

A strong majority of respondents (83.1 %) selected that they either "know a lot" (21.1 %) or "know a good amount" (62.0 %) about SDOH when asked to rate their *SDOH knowledge generally*. A definition of SDOH was provided to respondents in the questionnaire. Additionally, 74.6 % of respondents stated that they either "know a lot" (16.9 %) or "know a good amount" (57.7 %) about *how SDOH can influence a student's health*. Lastly, for knowledge about *how SDOH impact the specific student populations they work with*, 14.1 % of respondents felt they "know a lot," and 43.7 % "know a good amount.".

Table 2 summarizes themes and representative quotes from n = 38 open-ended responses about additional training, education, and support that respondents felt were needed to better understand how SDOH affects their students.

3.3. Screening practices

3.3.1. Factors assessed via screening

At least 29.6 % of respondents reported screening for each health limiting SDOH[1] in Fig. 1. The most common responses were lack of access to food (71.8 %), housing (67.6 %), health insurance (66.2 %), absenteeism (60.6 %), language barriers (59.2 %), and adverse

Table 1
SBHC Staff Respondent Characteristics, King County, Washington, 2022, n = 71.

Respondent Characteristics	n (n = 71)	Percentage
Agency		
Country Doctor CHC	4	5.6
HealthPoint	6	8.5
International Community Health Services	8	11.3
Kaiser Permanente	13	18.3
Neighborcare	19	26.8
Odessa Brown Children's Clinic	5	7
PHSKC	3	4.2
Swedish	7	9.9
Role		
No affiliate	6	8.5
Medical Provider	20	28.2
Mental Health Provider	21	29.6
Clinic Coordinator	8	11.3
Health Educator	3	4.2
Program Manager/Specialist	7	9.9
Other	12	16.9
Mean Years Worked in SBHCs	6.79, range (0.25–30 years)	

[1] *Health limiting SDOH are factors that when present in a student's life negatively impact their health. They either represent a lack of resources such as food insecurity, lack of or limited access to transportation, financial instability or exposure to factors that negatively impact health such as exposure to violence, racism, language barriers, ACEs, etc. When a category says "NA" it means that it was not a designated response option for SDOH screening.*

Table 2
Open-ended Question Responses from SBHC Staff in King County, Washington on Additional Training, Education and Support Needed, 2022, n = 38.

Theme	Open-ended Responses	Respondent Role
Additional support in assessing the level of need and protective resources for students to ensure care is culturally relevant and informed by evidence-based research and practices	"Access to Research Journal database for *meta*-analysis on best practice for particular intersectional experiences."	Mental Health Provider
	"More info and recent studies/data regarding the impact of specific SDOH. Most importantly, more info and recent studies/data regarding the impact of different interventions and protective factors"	Mental Health Provider
	"Updates on emerging research, periodically revisit assessing our biases as individuals and as a larger culture (medical culture, western culture, exploring class differences in interactions with healthcare, racial differences in interactions with healthcare, anti-fat bias in health care)."	Medical Provider
	"More support and information on cultural norms (how is disciple different), cultural beliefs…and challenges"	Mental Health Provider
Ongoing education and training on how to address SDOH for their student population's needs and cultural preferences	"I would love ongoing education about how SDOH affect my specific schools/areas populations"	Health Educator
	"Culturally competent and trauma-informed knowledge about SDOH. How to address SDOH on a community engagement level. How to address SDOH in a more personalized way."	Clinic Coordinator
	"We should have at the very least one annual training looking at these connections and reviewing data for evidence based interventions"	Mental Health Provider
	"I would love a specific learning event, webinar, in-person training on screening and addressing SDOH with students."	Medical Provider
	"Our population experiences racism, religious oppression, issues of discrimination due to immigrant status and language barriers. The language barriers affect learning. I'd love to have training on how to connect children to outside resources i.e. tutors and other community support."	Mental Health Provider
More robust resources and streamlined referral pathways to help connect students and families to resources to address the SDOH impacting their health	"Better systems of support/resources to help students and their families access resources and/or services to help address SDOH."	Program Manager/Specialist
Prioritized community conversations with families, staff, community support networks, and community leaders who can be involved with and inform these efforts	"Community conversations with families, staff, community support networks"	Medical Provider

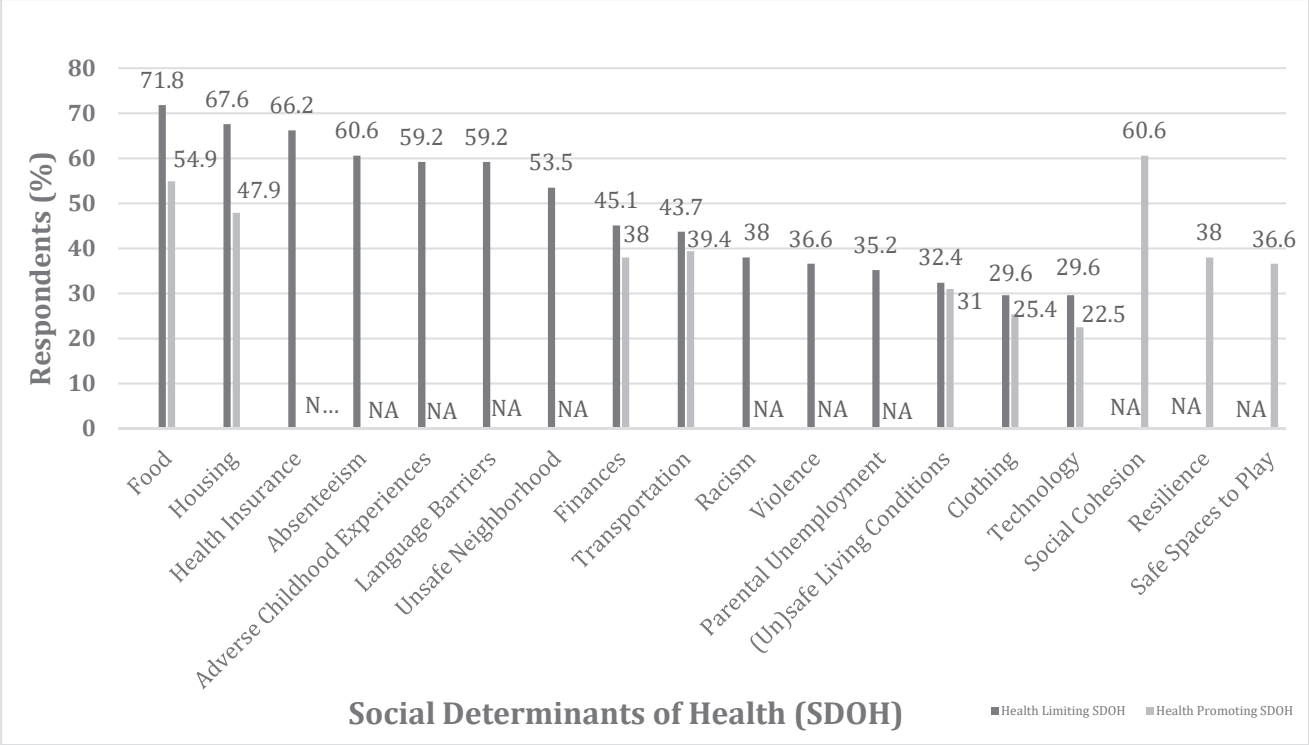

Fig. 1. Proportion of SBHC Staff in King County, Washington Reporting Screening for Health Limiting SDOH and Health Promoting SDOH Factors in their SBHC, 2022, n = 71.

childhood experiences (59.2 %).

Respondents were also asked which health promoting SDOH[2] they screen for in Fig. 1 and over 20 % selected each item.

3.3.2. *Screening processes*

There are many ways that respondents screen for factors influencing student's health: ask their own set of questions (67.6 %); listen for information to come up in conversations (63.4 %); or use standardized screening tools (54.9 %). No clinic appeared to have one consistent way of approaching screening.

Respondents were asked which standardized screening tool they used from a list of commonly used screeners in primary care and pediatric settings. 27.5 % of respondents reported that their SBHC created their own screening tool, 23.75 % were not sure which screening tool their SBHC uses, and 16.25 % use a standardized risk assessment as their screening tool. Of the list of standardized screeners, 6.25 % use RAAPS; 5.0 % use PRAPARE; 3.75 % use PEARLS; 1.25 % use WE CARE, AHC HRSN, and SWYC; and none use iHELP, SEEK, or FAMNEEDS (Billioux, 2017; Dubowitz et al., 2020; Garg et al., 2015; Kenyon et al., 2007; Koita et al., 2018; Lipkin et al., 2020; National, 2016; Salerno et al., 2012; Uwemedimo and May, 2018).

39.6 % of respondents (n = 53) noted that they conduct screenings "every time that one is required," while 34.0 % noted that they "sometimes" conduct screenings. Some answered that somebody else at their SBHC conducts screenings (13.2 %) while others were not sure if someone else does (7.5 %).

In terms of timing, 55 % of respondents (n = 60) noted that they (or someone at their SBHC) will screen during the visit, 13.3 % before visits, and no respondents only screen after visits. For 21.7 %, "it depends" on the time available (e.g., if the student is late, or the provider is behind schedule it may not be done before the visit), the students' current state (e.g., if a student is voicing an SDOH-related concern during the visit, that would be a natural time to screen), who is involved in the conversation (e.g., a family support worker in the school might have a different schedule than the clinic) and other contextual factors.

Respondents (n = 53) were asked how often they (or someone at their SBHC) screen for or assess SDOH. Respondents only had the ability to choose one option and most respondents (35.8 %) noted that screenings are conducted once a year, 15.1 % of respondents only screen on a student's first visit, and 13.2 % screen every visit, while 11.3 % screen once a month and 20.8 % were unsure of screening frequency protocols. 77.5 % of respondents conduct screenings directly with students, while 36.6 % conduct screenings with parents/caregivers.

3.3.3. *Opportunities to improve screening practices*

When asked if their screening practices adequately assess the SDOH impacting students' lives, 5.1 % of respondents (n = 59) strongly agreed that they do, 50.8 % of respondents somewhat agree, 18.6 % are neutral, 16.9 % somewhat disagree, and 8.5 % strongly disagree.

Table 3 summarizes themes and representative quotes from n = 54 open-ended responses about how to improve SDOH screening. Several key themes emerged related to regularly revisiting practices, ensuring universal screening, information sharing, and careful tool selection.

3.4. *Referrals*

3.4.1. *Addressing identified needs*

The predominant mechanisms through which respondents connect students to resources is in partnership with their school (54.9 %) or by providing information about the resource to the student directly (50.7 %). 40.8 % of respondents partner with community-based organizations (CBOs) and service providers to address needs or connect students to local resources/organization via warm hand offs (i.e. call or email the resource on the student's behalf, bring the student to the resource directly). Only 32.4 % of respondents reported that their SBHC and

[2] *Health promoting factors are SDOH that when present in a student's life have the ability to positively influence their health such as access to food, safe housing, transportation, financial security, safe spaces to play, social cohesion, etc.*

Table 3
Open-ended Question Responses from SBHC Staff in King County, Washington On How to Improve SDOH Screening Practices, 2022, n = 54.

Theme	Representative Open-ended Responses	Respondent Role
Regularly revisit practices to ensure they are in line with best practices and their patient population	"Revisit our form regularly, especially with all of the tools you have listed above in mind"	Medical Provider
	"Reviewing the aforementioned screening measures that I have never heard of or been introduced to see if we might incorporate them into our work"	Mental Health Provider
	"Have a better system or documentation that is universal to all SBHC's"	Clinic Coordinator
Determine a set or list of specific screening tools to use to ensure they are appropriate for student populations and are comprehensive enough to cover the spectrum of SDOH that impact students	"Standardize what questions are asked and how across providers"	Mental Health Provider
	"I think we should use a standard screening tool and implement this as a flow sheet into our EMR to address SDOH"	Medical Provider
	"Incorporate more diverse questions to fit our population"	Clinic Coordinator
	"Continue to refine the tool we use to screen students and come up with a better protocol for screening kids."	Medical Provider
Ensure all students are screened	"More systematic way of ensuring that every student gets our screener that we use"	Medical Provider
Better sharing of information and collaboration across the spectrum of individuals involved in SBHCs (providers, clinical care staff, SBHCs, school and agency)	"Improve communication and collaboration between SBHC and school nurse regarding these screenings and what the care coordination and follow up will look like."	Other

agency addressed needs with in-house resources.

Table 4 summarizes themes and representative quotes from n = 31 open-ended responses about what other resources, linkages to care, or partnerships they use to address student's needs.

3.4.2. Meeting student's needs

In seeking to understand resources available to meet students' SDOH needs, respondents (n = 54) were asked about resource sufficiency: 51.9 % felt there are not enough resources while 44.4 % noted there are only sometimes enough.

Next, respondents (n = 54) were asked in the case of referrals whether their SBHC follows up to see if the student or family connected to and received support. Most respondents (64.8 %) confirmed that referrals are followed up on, while for 25.9 % this is only sometimes done, and 9.3 % were unsure about follow-up practices.

4. Discussion

4.1. Key findings

This study is among the first to explore the SDOH screening and referral practices that exist in SBHCs. While most respondents expressed confidence in knowing what SDOH are and how they might influence students, there was less understanding of the specific SDOH impacting their student population, highlighting the potential need for increased SDOH screening so that SBHC staff have greater awareness of their students' needs. Responses aligned with recommendations in the literature and reflected a strong desire for increased education and training on SDOH, and better connection to local resources specific to

Table 4
Open-ended Question Responses from SBHC Staff in King County, Washington on Additional Resources, Linkages to Care, or Partnerships That Respondents Use or Build Off of to Address Needs, 2022, n = 31.

Theme	Open-ended Responses	Respondent Role
Additional staff & specialists to support building connections	"Internal insurance eligibility specialists, we have a volunteer focused on housing and employment questions at the high school"	Medical Provider
	"Care coordinator connected to SBHC will contact the family if other needs arise. Can also connect to the clinic's Social Workers if further support is needed."	Medical Provider
	"Nutritionist connects families experiencing food insecurity to services (apple bucks/SNAP benefits)"	Mental Health Provider
Connection to resources inside and outside of the school are integral to supporting this work	"We are partnered with Fresh Bucks to help families apply for food assistance. We frequently connect or complete the weekly sign up process for a food delivery program (Plant Based Food Share). We have worked with other clinic social workers to help families/parents apply for charity care at outside medical organizations or apply for assistance with utilities. With the school, we were able to help families access Christmas gifts through a partnership with a nearby church. We also help families sign up for Medicaid through other clinics under our agency. We also use a taxi service to provide free transportation for patients/their families to get to and from appointments at outside facilities/organizations."	Clinic Coordinator
	'Our SBHC staff can refer patients internally to our Client Service Representatives (CSRs) at our larger community sites. CSR's can help connect patient and family to community resources. "	Program Manager/ Specialist
	"The district does have many community partnerships with Community Based Organizations such as preschool/daycare providers, and relationships with Seattle Housing Authority and Mercy Housing. There is no one stop for getting all these needs met"	Other
Funding and supportive resources	"Any and all direct support of clothing, food and assistance."	Mental Health Provider
	"Our school's Parent Teacher Association has funding for students in need, food insecurity weekly food backpacks for students to take home. The PTA also has a clothing bank for students. Amazon has funding for incidental needs we recently used for student's needs."	Other
	"We offer gift cards to grocery stores and local food spots […]. We receive these via donation."	Other

respondents' school communities Andermann, 2016.

Despite advocacy for screening, SDOH screening and intervention in pediatric primary care is still not standardized or universally performed, best practices for when, how and by who screening should be conducted remain unestablished (Koslouski et al., 2023; Nerlinger and Kopsombut, 2023; Barton et al., 2019). As new best practices are identified, respondents in our study requested that workflows be regularly revisited to ensure they are adequate for their diverse student populations. It was not possible to formally test for statistical differences within or across agencies in our sample regarding the timing and frequency of screening administration due to the number of agencies and possible response options. However, there was visible variety in reported practices related to screening and administration, and little consistency that was visible within or across agencies. Some respondents asked their own questions or listened for it to come up in conversation, while others used a standardized screening tool. Many respondents noted that having a single required screening tool or a list of approved screenings tools for their student population would be helpful to improve standardization and ensure that screenings are comprehensive and relevant to their student population. This feedback aligns with existing literature suggesting the value in standardizing screening processes and ensuring screeners are validated (Nicolau and Marcenes, 2012; Koslouski et al., 2023; Zook and Green, 2019; Nerlinger and Kopsombut, 2023; Barton et al., 2019; Henrikson et al., 2019; Sokol et al., 2019). Respondents emphasized that SBHCs should require that all students are screened, however, clear consensus on frequency of screening was not evident in our results or existing literature (Koslouski et al., 2023; Barton et al., 2019; Chung et al., 2016). In the wider scientific literature, several pediatric organizations have also proposed a surveillance approach to SDOH screening in children, making it a routine and universal component of care; (Chung et al., 2016; Koslouski et al., 2023; Andermann, 2016) however, whether this is feasible or not may depend on the setting.

Deciding which SDOH screening questions to use is a challenge in diverse populations like the schools represented in our sample (Koslouski et al., 2023; Nerlinger and Kopsombut, 2023; Barton et al., 2019). However, as noted by respondents, the workflow or processes could be standardized even while the specific screening tools or referral mechanisms remain tailored. The US has a highly varied sociopolitical landscape and thus each school community has unique challenges which may warrant tailored situation-specific questions (Koslouski et al., 2023; Barton et al., 2019). Constraints in time and resources will cause certain issues that arise in the clinical encounter to take priority over others so this must be accounted for in any planned systems change initiatives (Koslouski et al., 2023; Barton et al., 2019; Chung et al., 2016; Schickedanz and Coker, 2016; Barton et al., 2019; Rouder et al., 2021).

Integrating SDOH screening into schools leads to an increase in referrals (Koslouski et al., 2023), which provides additional support for universal screening, but screening without an established process for referral to appropriate resources and treatment is arguably unethical (Rouder et al., 2021). Ensuring adequate linkages to resources are in place is an essential component of clinical care in SBHCs. The majority (96.3 %) of respondents felt that there were not always enough resources to meet the needs of students, highlighting the need for more robust systems to address identified needs. Respondents elevated the need for additional staff to help in connecting students with needed services and in identifying new and existing resources. Respondents also voiced the importance of partnerships between community organizations, support services, schools, and healthcare to improve referrals, which aligns with recommendations in the literature stating the importance of developing partnerships and networks within the community to help support the referral process (Andermann, 2016; Garg et al., 2016).

4.2. Strength and limitations

The inclusion of open-ended questions was a strength, which allowed us to solicit authentic feedback, expand on information provided in close-ended questions, and highlight the diversity of responses or nuances in opinion (Imran et al., 2022). Surveying a variety of SBHC staff in different roles within SBHCs allowed better understanding of existing practices. Sample sizes limited the ability to test for group comparisons, however Appendix B provides numeric responses broken down by provider role. Our study was limited by selection bias—individuals who chose not to respond could have had unique opinions and experiences from those who responded. Familiarity bias may have encouraged respondents who are familiar with the term SDOH to respond to the questionnaire compared to those who are less familiar. Recency bias may have influenced how respondents characterized their SDOH screening practices. Definitions were not provided for the listed SDOH (e.g., Trauma and Adverse Childhood Experiences), and thus without defining terms respondents may have interpreted them differently. Greater representation across regions, roles and agencies could have improved the reliability and generalizability of our study. This study did not include students, an integral voice in understanding SBHC services, therefore their perspectives are not included in our findings and conclusions. Additionally, while we attempted to ensure face validity of our questionnaire through review by professionals working in the field, it was not validated or tested for psychometric properties.

4.3. Implications and future directions

SBHCs improve healthcare access and, as seen in the present study, sometimes conduct SDOH screenings and provide referrals to community resources. Integrating SDOH screening more universally into SBHCs may help to address disparities early in the life course that get exacerbated over time, preventing both current and future negative health outcomes (Nicolau and Marcenes, 2012). While we acknowledge the importance of SDOH screening in SBHCs, more research is needed to optimize SDOH screening in school-based healthcare, including validation of tools for this population, in multiple languages, and clinical implementation.

Efforts to assess and address SDOH in primary care–while limited in their ability to address the larger systemic factors that affect health outcomes–are integral to these efforts to improve health, advance equity and reduce disparities for students who utilize SBHCs (Garg et al., 2016; Drake et al., 2022). While this study focused on the SBHC clinic setting, additional research on and interventions to address the upstream, more systemic SDOH is essential.

Clinical healthcare only impacts a small portion of the factors influencing a student's health. Innovative solutions to integrate clinical care more directly with social services and community resources, per the respondents in our study, is a prerequisite to providing comprehensive whole person care and addressing the full picture of SDOH impacting a student's health. Additionally, elevating voices of the students and families served by SBHCs and ensuring efforts are grounded in the needs and desires of the community is vital to truly advancing equity.

5. Conclusion

Assessing and addressing SDOH is an integral part of care in SBHCs. SBHC respondents expressed a strong desire for increased education and training on SDOH affecting their specific student populations, the consistent use of screening tools across the system, and better connection to local supports for addressing unmet needs. Adding SDOH screening to clinic routines can lead to significant and worthwhile changes (Nicolau and Marcenes, 2012; Koslouski et al., 2023; Barton et al., 2019). We suggest that leadership in schools and healthcare agencies consider system-wide standardization in SDOH screening and intervention practices for children and facilitate stronger connections with community resources and education relevant to addressing student SDOH.

CRediT authorship contribution statement

Victoria Gersch: Writing – original draft, Methodology, Formal analysis, Conceptualization. **Luciano Garofalo:** Writing – review & editing, Visualization. **Sara Rigel:** Writing – review & editing, Supervision. **Kris Johnson:** Writing – review & editing, Methodology. **Samantha T. Yeun:** Writing – review & editing, Conceptualization. **Erin MacDougall:** Writing – review & editing, Conceptualization. **Jenna van Draanen:** Writing – review & editing, Supervision, Software, Project administration, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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Appendix A and Appendix B. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2024.102675.

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