Assessing Social Determinants of Health During Critical Illness

Implications and Methodologies

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KEYWORDS

• SDoH • Disparities • Screening • Neighborhood disadvantage • Equity • Pediatrics • Intensive care unit • Social determinants of health

KEY POINTS

- Social determinants of health (SDoH) have been widely acknowledged as fundamental factors that contribute to a person's overall health and health outcomes.
- Research in pediatrics and pediatric critical care has identified racial/ethnic and socioeconomic disparities in health outcomes for a variety of pediatric conditions.
- The pediatric intensive care unit is an optimal place to identify and address unmet social needs that contribute to health disparities in critical illness using a concerted, multisector approach.
- SDoH screening should occur at the individual level using validated screening tools and the neighborhood level using validated composite measures for research.

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INTRODUCTION

Addressing social determinants of health (SDoH) has emerged as a key approach to achieving health equity in the United States.[1] SDoH are fundamental social and structural factors in a person's environment that affect a wide range of health, functioning, and quality-of-life outcomes.[2] Categorized into 5 domains by the Center for Disease Control (economic stability, education access and quality, neighborhoods and the built environment, health care access and quality, and social and community), SDoH account for about 80% to 90% of modifiable factors contributing to health outcomes and have been extensively linked to health disparities.[3] SDoH can both directly influence disease onset, progression, and outcomes and indirectly affect health through their effect on health care access.[4] On an individual level, inequitable allocation of resources related to the SDoH yields unmet health-related social needs and poses a significant challenge to achieving good physical health, behavioral health, and well-being.[2] However, there is growing evidence that interventions that address individual-level social needs such as housing or food insecurity result in the downstream effect of improved health outcomes.[5] As such, multiple regulatory bodies and initiatives in the United States have recognized the increasing need to invest in social health as a critical approach to improving individual- and population-level health.[6,7] This has led to many calls for action to address SDoH across the health care continuum through social needs screening and interventions such as linkage with resources and a variety of hospital–community partnerships.[8]

Systemic injustices, rooted in structural racism, are the primary drivers of SDoH, and racism plays a fundamental role in a person's SDoH, such that race and ethnicity are strongly predictive of one's access to SDoH, such as housing, income, and education.[8] Racial/ethnic, gender, and socioeconomic disparities have been identified in adult and pediatric patients across organ-specific diseases. Racial and ethnic minoritized patients, individuals who live in rural communities, people with disabilities, and those who identify as lesbian, gay, bisexual, transgender, queer or questioning, intersex, asexual, and more (LGBTQIA+) are noted to have worse outcomes when compared to White, heterosexual, and urban-living individuals.[2] In adult critical illness, Black patients have a higher incidence of conditions necessitating intensive care unit (ICU) care, a higher incidence of sepsis, acute lung injury and acute respiratory failure, and higher age-adjusted rates of cardiac arrest when compared to White individuals. Similarly, racial and ethnic minoritized patients who live in areas with higher rates of poverty have a higher incidence of sepsis and acute critical illness.[9] There are also notable disparities in clinical management for Black adults compared to their White adult counterparts. Black patients have longer wait times when admitted to the ICU from the emergency department, are less likely to be admitted to cardiac care unit, and receive interventions such as tracheostomy, central venous access, and pulmonary artery catheterizations less often after adjusting for severity of illness.[9]

Decades' worth of research has also identified significant racial/ethnic and socioeconomic disparities across a variety of pediatric conditions. The overall risk of admission, length of stay, hospital costs, and outcomes during hospitalization have been shown to vary by socioeconomic status and race/ethnicity.[10] Researchers have demonstrated the association between SDoH and asthma-related hospitalizations,[11–14] poor glycemic control for children with diabetes mellitus,[15,16] and cancer outcomes, including overall survival, incidence, and prevalence.[17,18] More recently, there is increasing awareness that these disparities extend into pediatric critical illness, with the untoward effect of adverse outcomes during and even after critical illness. Health disparities have been documented during the entire course of critical illness and along the care continuum,

from increased risk among certain sociodemographic groups to increased illness severity at ICU admission, worse ICU-based outcomes, and increased risk for adverse outcomes after ICU discharge. However, unlike other pediatric studies, there is limited research on how SDoH contribute to disparities in the risk and outcomes of critical illness in children. Nonetheless, the few studies that exist suggest that social factors, such as poverty, are mediators to health disparities in pediatric critical care outcomes by increasing the risk of worse severity of illness on presentation to the pediatric ICU[19] and overall exposure to the pediatric ICU, which can lead to a diminished quality of life and lower functioning.[20] A more comprehensive understanding of how SDoH impact the risk and outcomes of critical illness across different conditions and among different sociodemographic groups is important and foundational to promoting equity in pediatric critical care. In addition, understanding and addressing the SDoH is a necessary first step in the approach to tackling health disparities in pediatric critical care outcomes. In this article, we discuss the implications of assessing SDoH and provide a methodological approach to screening and addressing SDoH during critical illness.

DISPARITIES IN PEDIATRIC CRITICAL ILLNESS: REVIEW OF LITERATURE

Individual-Level Disparities

Differences in SDoH contribute to persistent health disparities among racial, ethnic, and socioeconomic groups of children. These disparities are potentiated by inequitable distribution of societal resources and exclusionary public policies.[21] Several studies highlight racial and socioeconomic disparities in risk and outcomes of critical illness in children. Observed socioeconomic disparities include higher disease severity,[19] higher mechanical ventilator use,[22,23] and higher mortality in the pediatric ICU (PICU) among critically ill children without health insurance.[22,24] Disparities by race and ethnicity vary. Some studies describe higher disease severity[23] and more in-hospital arrests[25–27] for Latino and Black children compared to White children, while other studies describe no difference in disease severity or mortality between races and ethnicities.[28] Regarding disease-specific outcomes, several studies have shown differences in admission, length of stay, and mechanical ventilation for Black children with asthma,[29,30] differences in mortality and length of stay for minority children with sepsis,[31,32] and greater severity of injury, morbidity, and mortality for Black and Hispanic children with critical injury.[33,34] Racial and ethnic disparities have also been demonstrated in pediatric patients with oncologic disease and patients with other illnesses who interface with the PICU.[35]

Despite this growing body of literature on disparities in critical illness, only few have examined the relationship between specific SDoH and the spectrum of critical illness as an approach to understanding why the observed disparities exist[36] and identifying targets for interventions. In a single-center observational study of critically ill children, Black families reported a higher prevalence of food insecurity than White families.[37] In another study, 60% of families screened in the PICU reported at least one unmet social need, among which difficulty with utilities and living costs, housing instability, and food insecurity were the most identified needs.[38] These findings suggest that critically ill children are at significant risk of exposure to negative outcomes related to SDoH. Therefore, pediatric critical care researchers should include other social factors beyond race and insurance status in their assessment of the impact of SDoH on outcomes in critical illness.

Neighborhood-Level Disparities

Although individual risk factors clearly contribute to the condition of one's health, the contextual factors within one's environment or neighborhood contribute significantly

to health status at the individual level and ultimately at the population level.[39] Disadvantaged neighborhoods have a higher proportion of uninsured individuals, lower literacy levels, higher rates of household poverty, and higher rates of minority children living in poverty.[40–42] Area-level socioeconomic factors, which are shaped by structural and political factors such as discriminatory housing policies, residential segregation, and neighborhood disinvestment, affect health through restriction of education and employment opportunities, disruption of neighborhood and housing quality, reinforcement of unhealthy behaviors, and limited access to higher opportunity areas for low-income families due to the higher housing costs in those neighborhoods.[42,43] These area-level factors have been found to be associated with inequities in pediatric preventive care, which is essential for ensuring healthy child development and early intervention to improve outcomes for several diseases and conditions.[44,45] The lack of public transportation, employment and educational opportunities, healthy foods, green space, and exposure to violence, crime, and pollutants are neighborhood factors potentially placing children at risk for higher severity of illness and need for intensive care services.[38,39]

In pediatric critical illness, studies have consistently shown that children living in under-resourced neighborhoods are geographically disadvantaged with limited access to PICUs, which are concentrated in urban areas[46], and have increased risk for critical illness and worse PICU outcomes.[9,32,40] Higher PICU admission rates and severity of illness scores have been observed in neighborhoods with higher rates of persons living in poverty.[19] Children living in disadvantaged neighborhoods have higher risk for post-PICU morbidity, such as decreased health-related quality of life and PICU readmissions.[47,48] Furthermore, children residing in lower socioeconomic areas appear to be at higher risk of critical illness and traumatic injury, and Black children residing in these areas have lower rates of bystander out-of-hospital resuscitation for cardiac arrests, compared to children living in more socioeconomically advantaged areas.[41,49] Neighborhoods with high rates of PICU readmissions for asthma have high social vulnerability and higher exposure to environmental toxins such as industrial pollutants, airborne microparticles, and higher ozone concentrations.[42] Disadvantaged neighborhoods may lack resources needed to make the physical and built environment conducive for optimal health. This leaves families underequipped to support children recovering from critical illness or children with chronic conditions who are at high risk for acute exacerbations and critical care hospitalizations. As such, there is an urgent need for clinicians, administrators, researchers, community leaders, and policy makers to understand the mechanisms of how the neighborhood environment may prevent or attenuate the risk of critical illness and injury.

SCREENING FOR SOCIAL DETERMINANTS OF HEALTH IN PEDIATRIC CRITICAL CARE SETTINGS

Given the association between SDoH and health disparities in pediatrics, several organizations, including the American Academy of Pediatrics and the Center for Medicare and Medicaid Services (CMS), recommend screening for the SDoH.[50,51] *Screening* has several implications and extends beyond the assessment of individual factors experienced by patients interfacing with the PICU to neighborhood-level factors that influence health outcomes during critical illness. To better understand the interplay and causal pathways between social factors and disparate health outcomes during critical illness, providers and researchers need to measure the burden of unmet social needs.[52] We focus the remaining discussion on screening for the SDoH during pediatric critical illness.

SCREENING AT THE INDIVIDUAL LEVEL

Appropriateness of Screening for Social Determinants of Health in the Pediatric Intensive Care Unit

A PICU admission provides a feasible and important opportunity for screening for SDoH.[37,52] Implementation of a stakeholder-informed social risks screening tool could be paradigm shifting for the field of critical care where attention to social risks and relationship to health inequities is increasing. However, there remains a lack of universal screening. Furthermore, screening for traumatic experiences/adverse childhood experiences and relationships to critical illness is underexplored. Having a validated instrument with high acceptability among parents who complete it will have high impact for future research to study critical illness in the context of individual- and neighborhood-level social risk indicators.

Existing Screening Tools

Numerous validated screening tools assessing SDoH have been developed for use in the pediatric population.[53–60] These screening tools have been predominantly developed for the primary care setting with very few targeting the inpatient environment. No published screening tools have been created specifically for the pediatric critical care setting. Most of the published screening tools focus on parents of young children (<5 years of age) and are designed to be incorporated into well-child or routine clinic appointments. Available screening tools are markedly heterogeneous in screening domains and methodologies, including in-person and remote screening options. Further, there is significant variability in response to screening, connection to referral networks, presence of targeted interventions, or follow-up. Last, only a few of the published screening tools incorporate psychometric testing in the development and assessment of the screening tool; these tools include the Safe Environment for Every Kid Parent Questionnaire[61]; Income, Housing, Education, Legal Status, Literacy, Personal Safety Questionnaire[62]; and Well Child Care, Evaluation, Community Resources, Advocacy, Referral, Education[63] screening tools (**Table 1**).

Development of a Validated Screening Tool

A validated SDoH screening tool designed for critically ill children and their families does not currently exist. Screening in the PICU should be guided by several factors including (1) provider education on the impact of SDoH and the relevance of screening; (2) universality of screening; (3) utilization of a strength-based approach; (4) training to screen; (5) pairing of identified needs with appropriate resource referrals; (6) using existing systems to build upon; and (7) development of valid and reliable screening tools.[52] To address the last factor, Asp and colleagues sought to create a validated screen to broadly assess for unmet social needs and risks in a PICU-sensitive approach, recognizing the unique context and challenges of a critical care hospitalization. A primary goal in the development of the screening tool was to draw on the strengths of relevant stakeholders to ensure that the tool captured the voice of patients, their families, and their community in addition to health care professionals. Community stakeholders and families engaged in focus group sessions to elicit input on screening for SDoH. Parents reflected on their experiences with SDoH screening in various health care settings and provided recommendations for future screening initiatives. Community stakeholders and leaders shared suggestions for hospital-based screenings, drawing on personal experiences with pitfalls and successes in screening. After broadly assessing parent and stakeholder perspectives on screening, parents of children who have had critical care hospitalizations participated in one-on-one guided

Table 1
Screening tools and domains

Individual-Level Screening Tools	
Validated Screening Tools and Indices	**Included Domains and Constructs**
Safe Environment for Every Kid Parent Questionnaire (SEEK PQ-R)	• Parental depression • Parental substance use • Major parental stress • Intimate partner (or domestic) violence • Food insecurity • Harsh punishment
Safe Environment for Every Kid Parent Questionnaire extended (SEEK PQ-Re)	• Home safety • Child behavior • Parental wellness • Food insecurity • Other needs (transportation, utility company, housing, childcare, immigration, employment, education, health care access, public benefits)
Income, Housing, Education, Legal Status, Literacy, Personal Safety (IHELP/IHELLP) Questionnaire	• Employment • Financial strain • Health insurance • Early childhood education and development • Language • Immigration/refugee status • Safety, crime, and violence • Housing quality and stability • Food security
Well Child Care, Evaluation, Community Resources, Advocacy, Referral, Education (WE CARE)	• Parental education • Employment • Child care • Housing security • Food security • Household utilities (heat and electricity)
The Hunger Vital Sign	• Food security
Adverse Childhood Experiences	• Child abuse • Neglect • Trauma

interviews to understand perspectives on screening for social needs specifically in the PICU.[64]

Following input from PICU parents, Asp and colleagues constructed a screening tool building on an extensive literature review of published social needs screening assessments and by engaging with content experts to identify priority domains to include in a PICU-specific screening tool. An expert panel was assembled to review and refined the screening tool through a modified 3 part Delphi method.[65] The developers are currently assessing the face validity of the proposed screening tool through cognitive interviews with parents of children with recent critical care admissions, following which the tool will be assessed for feasibility and acceptability across multiple PICUs. The goal is to create a validated screening tool, developed in concert with relevant stakeholders and rigorously tested, that will result in the identification and support of unmet social needs for critically ill children and their families. However, while this tool is being developed and tested, pediatric critical care providers can assess the unmet social needs of patients and their families using available screening tools guided by the factors mentioned earlier (see **Table 1**).

SCREENING AT THE NEIGHBORHOOD LEVEL TO EVALUATE HEALTH OUTCOMES IN PEDIATRIC CRITICAL CARE

As highlighted earlier, neighborhood disparities in the risk and outcomes of critical illness in children are prevalent. Assessing the SDoH at the neighborhood-level acknowledges the systemic injustices in the United States that have contributed to disparities across health outcomes and identifies modifiable factors that can be intervened upon. To investigate neighborhood-level associations with health outcomes, a geospatial analysis must be performed. Geospatial analysis includes the creation of maps to visualize local trends in clinical data where children experiencing certain health conditions or requiring certain medical interventions reside. Utilizing geospatial analysis can advance the study of geographic disparities in pediatric intensive care by evaluating the association between an area's given attribute (percentage of high school graduates, concentration of environmental air pollutants, and access to green recreational spaces) and health outcomes in pediatric critical illness. Furthermore, geospatial analysis aids in the overlaying of multiple factors such as census tract properties (eg, median income, percentage of single-parent households) and patient residence onto a single map for efficient visualization of patient clusters by census tract.[20,66–69] In this way, geomapping and geospatial analysis can be used to augment understanding of the cultural, socioeconomic, and built environments that contribute to the SDoH.

The impact of the neighborhood environment on health is mediated through the multiple, yet inter-related physical and social characteristics of a given neighborhood. Because of this complexity, the use of multidimensional, validated measures of neighborhood-level SDoH allows for a more nuanced evaluation of the role contextual factors in one's environment play in critical illness.[70–72] Composite measures of the SDoH consist of several key indicators that reflect different SDoH domains such as an area's educational composition, housing conditions, income, or toxic environmental exposures (**Table 2**). Many of these measures are also publicly available for use and can be used in geomapping and geospatial analysis. Brief descriptions of the area deprivation index (ADI),[73] social vulnerability index (SVI),[74] the child opportunity index (COI) 2.0,[75] and the environmental justice index social vulnerability and environmental burden rank (EJI SER) are discussed in the following sections.[76,77]

The Area Deprivation Index

The ADI was created by the Health Resources and Services Administration as a measure of socioeconomic disadvantage in 4 domains, including income, education, employment, and housing quality.[73] The ADI defines a neighborhood as a census block group and ranks neighborhoods by socioeconomic disadvantage at the state or national level using US Census American Community Survey five year estimates as its data source. The ADI ranks each census block from 1 to 100 at the national or state level and then groups each census block into bins representing 1% of the ADI. Group 1 with a ranking of 1 indicates the lowest ADI and the lowest level of disadvantage and group 100 with a ranking of 100 indicates the highest ADI and highest level of disadvantage.[73] The ADI has been used to assess the relationship between poverty and distance to pediatric critical care services[46] and the association between neighborhood-level disadvantage and PICU admission.[78]

The Social Vulnerability Index

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. External stresses include natural disasters

Table 2
Screening tools and indices

Neighborhood-Level Indices	
Validated Screening Tools and Indices	**Included Domains and Constructs**
Area Deprivation Index (ADI)	• Income • Education • Employment • Housing quality
Social Vulnerability Index (SVI)	• Socioeconomic status • Household composition • Minority status • Housing type • Transportation
Child Opportunity Index (COI)	• Child education • Health and environment • Social and economic opportunity

Environmental Justice Index (EJI)	• Environmental burden
	  ○ Air pollution
	  ○ Potentially hazardous and toxic sites
	  ○ Built environment
	  ○ Transportation infrastructure
	  ○ Water pollution
	• Social vulnerability
	  ○ Poverty
	  ○ Employment
	  ○ Education
	  ○ Minority status
	  ○ Housing quality, type, and security
	  ○ Health insurance status
	  ○ Internet access
	  ○ Household composition
	  ○ Disability
	  ○ Language
	• Health vulnerability
	  ○ Prevalence of asthma
	  ○ Prevalence of cancer
	  ○ Prevalence of high blood pressure
	  ○ Prevalence of diabetes
	  ○ Prevalence of poor mental health

(eg, storm damage from tornadoes or flooding from hurricanes), human-caused disasters (eg, toxin release into the environment), and disease outbreaks (eg, influenza, SARS-CoV-2 pandemics, measles epidemics). Socially vulnerable populations are characterized by socioeconomic status, household composition, minority status, housing type, and transportation.[79] The Centers for Disease Control (CDC)/Agency for Toxic Substances and Disease Registry uses 16 US census variables to determine an SVI of every census tract.[80] The purpose of the SVI is to help local health departments and officials identify communities that may need support before, during, and after a public health emergency.[74,79] In response to the disproportionate impact of the COVID-19 pandemic on racial and ethnic minority communities, the CDC/ATDSR SVI was expanded to create a new social vulnerability metric, the Minority Health SVI.[81] Aggregated data that result from combining information about 2 or more minority groups can obscure local-level social risk factors and prevent the identification of communities at

highest risk for unequitable health outcomes during public health emergencies. The Minority Health SVI includes the same socioeconomic status, household composition and disability metrics, and housing type and transportation measures as the SVI; however, it disaggregates minority status into 6 distinct groups (American Indian/Alaska Native, Asian, African American, Native Hawaiian/Pacific Islander, Hispanic or Latinx, and Some Other Race) and expands the native language spoken into 5 separate languages (Spanish, Chinese, Vietnamese, Korean, and Russian). Two additional domains were included: (1) health care infrastructure and access, composed of hospitals, urgent care clinics, pharmacies, primary care physicians, and health insurance and (2) medical vulnerability, composed of cardiovascular disease, chronic respiratory disease, obesity, diabetes, and Internet access.[81] The Minority Health SVI has not been used to study health disparities in children.

The Child Opportunity Index 2.0

The COI is a relative, composite, multidimensional measure of neighborhood (census tract) factors that promote childhood opportunity and healthy development through many causal pathways.[82] It is composed of 29 direct, contemporary indicators within 3 domains of child education, health and environment, and social and economic opportunity.[82] The COI 2.0 has been used to determine the association of SDoH with the use of heath care services and outcomes.[68,69,71,83–85] The COI 2.0 describes and quantifies neighborhood conditions for US children and provides a ranking on a scale from 1 (lowest opportunity) to 100 (highest opportunity). In the United States, the COI 2.0 ranges from the lowest value of 20 (Fresno, CA) to the highest value of 83 (Madison, WI).[42,86] While there is a wide range of child opportunity scores throughout the United States, there is even wider variation in neighborhood opportunity within a metropolitan area.[42] Along with raw and z-score normalized values and levels for each neighborhood-level indicator, the COI 2.0 domain score rankings are available at the national, state, and metropolitan statistical area child opportunity levels to use in an analysis. Child opportunity levels are divided into 5 categories of neighborhood opportunity, including very low, low, moderate, high, and very high opportunity.[87] There are approximately 72,000 census tracts with data available from 2010 and 2015 across all 3 opportunity domains in the United States. These data can be stratified by race/ethnicity, if desired, to assess changes over time and to determine race/ethnicity opportunity gaps within a metro region. What sets the COI 2.0 apart from the SVI is that it does not include race or ethnicity composition as part of neighborhood opportunity measures. Race and ethnicity are associated with both lack of opportunity and structural racism in the United States; therefore, race and ethnicity were not included as COI factors, but should be considered when stratifying the effects of neighborhood opportunity on health outcomes. In pediatric critical care, the COI has been used to explore disparities in health outcomes. Studies have assessed the relationship between neighborhood opportunity and PICU utilization for patients with traumatic brain injury[88] and have explored the association between neighborhood opportunity and emergent readmissions for patients who survived pediatric critical illness in the preceding year.[48] In addition, the COI has been considered in studies seeking to identify neighborhood hot spots associated with life-threatening asthma[66] and acute respiratory failure requiring mechanical ventilation in critically ill pediatric patients.[67]

The Environmental Justice Index

The CDC recently developed a new composite measure called the environmental justice index (EJI) to quantify and rank the cumulative health effects of air and water

pollution at the neighborhood level using data from the US Census Bureau, the Environmental Protective Agency, the US Mine Safety and Health Administration, and the CDC. The EJI is composed of 3 modules including environmental burden, social vulnerability, and health vulnerability.[76,77] The health vulnerability module is composed of one domain and indicates high levels of 5 preexisting conditions: asthma, high blood pressure, cancer, diabetes, and poor mental health. The full EJI is not intended for use in secondary analyses where a specific disease is the outcome of interest; however, the EJI SER is designed for this purpose.[76] The EJI SER is composed of 2 distinct modules that are the summed percentile ranks of the individual components of the social vulnerability module (4 thematic domains, 14 items) and environmental burden module (5 thematic domains, 17 items).[12] The percentile rank sum of the EJI SER is ordered from a summed score range of 0 to 2, reranked and converted into a final score ranging between 0 and 1 based on this percentile rank.[12] These modules inform an individual participant's exposure to social vulnerability and environmental pollution at the census tract level. The EJI relies on historical census and government-collected environmental data with varying time scales and is intended to be used as a tool to identify and prioritize areas that may require special attention or additional action to improve health and health equity. The EJI SER can help analyze the unique, local factors driving cumulative impacts on health to inform policy and establish meaningful goals to measure progress toward environmental justice and health equity.[13]

Beyond utilizing these tools to measure the association between neighborhood factors and health outcomes, pediatric critical care providers should begin to consider how and when these tools can be incorporated into the electronic medical record and integrated into patient treatment and management plans to help mitigate health disparities.[51]

COUPLING SCREENING WITH REFERRALS AND RESOURCES

Measuring the social factors experienced by children with critical illness and injury is necessary to evaluate their association with health outcomes. However, it is important to acknowledge that screening for SDoH is only one element in the work toward achieving health equity and improving outcomes for children, especially those with a disproportionately high burden of need. Implementing screening tools focused on assessing unmet social needs may cause unintended harm to families given the sensitive nature of certain topics.[89] In addition, inadequate training and expertise on how to appropriately elicit and address social needs, time restraints, and insufficient knowledge of available resources may cause providers to feel uncomfortable addressing the identified family needs, leaving families and physicians frustrated.[3,89,90] As such, screening for the SDoH without coupling it with referrals to the appropriate resources has been described as ineffective and unethical.[90] Screening for SDoH must take place in an environment that is equipped to respond to identified needs while also championing the strengths and desires of families. In addition, the screening environment should be safe, unbiased, and include recognition that unmet needs were created by systemic structures that are out of the control of the patients or families.

All clinicians have a role in promoting health equity and eliminating health disparities, including those working in intensive care settings. Pediatric critical care divisions and departments are tasked with building infrastructure that supports referral before SDoH screening is implemented. Building the capacity to ensure linkage to "treatment" for unmet social needs requires a multidisciplinary and multisector concerted

approach that includes both institutional and community partnerships.[3] In addition, screening should seek to identify social assets that strengthen families, including social connectivity, resiliency, and potential social and built neighborhood-level factors, which have been associated with positive outcomes.[91] Providers should focus on highlighting and strengthening these factors as a part of the treatment plan for unmet social needs. While there are several benefits to screening for the SDoH, it is imperative that all these aspects are included in the approach to screening and referral.

SOCIAL DETERMINANTS OF HEALTH AND RESOURCE ACCESS, ALLOCATION, AND PROVISION

As described earlier, the health care system is wrought with racial, ethnic, and socioeconomic disparities in the access, allocation, and provision of health care, health care resources, and social resources to at-risk populations. Access to health care, specifically health insurance[92,93] and health care resources (eg, physicians, clinics, and pharmacies),[92,94] is imperative for the health of pediatric patients and is dependent on the SDoH. The association between pediatric critical illness and race, ethnicity, poverty, and rurality further highlights the interconnectedness of SDoH, access to care, and pediatric critical care health outcomes.[20,46,78] To achieve health equity, the health system's focus must shift to include the perspective of equity in access to health care and societal resources that are crucial for health and well-being.[95] The lack of access to health care for pediatric patients and their families is perpetuated by health systems built on the foundation of structural racism and the exclusion of the minoritized, marginalized, and the socioeconomically deprived.[95] While the lack of equitable access to health care is a key driver to inequity within pediatric health, the allocation and provision of health care resources are critical components of access to care. Federal and public health programs, supported by the current administration, have rededicated efforts to collecting SDoH data and improving "whole-of-government" collaborations to minimize health care inequities. Targeted government-sponsored efforts to improve geographic (rural vs urban) allocation of workforce resources and physical resources across geographic domains can minimize health care inequities.[96]

Multilevel efforts ranging from federal-, state-, institutional-, and community-level collaborations are needed to assess the health needs of the pediatric population based on the SDoH, to fund and allocate resources equitably, and to ensure equitable provision to patients/families. This extends to the PICU. Partnerships with federal and state government agencies, such as the CMS Innovation Center, can provide funding for initiatives aimed at addressing unmet social needs.[97] Community organizations may already address unmet social needs and can provide patients with access to nontraditional health-related resources such as housing and food; therefore, creating hospital–community partnerships is imperative. Creating effective and sustainable relationships with community organizations requires a stepwise approach. The Health Research & Educational Trust, supported by the Robert Wood Johnson Foundation, provides a guide to creating new community partnerships focused on (1) identifying the community health needs and common goals, (2) identifying community partners, their assets, and their roles; (3) creating a measurable action plan; and (4) assessing the partnership effectiveness and interventions.[98]

As a health care system, we cannot create targeted interventions without adequate measurement of SDoH, their subsequent inequities, and their impact on pediatric health. Therefore, it is the provider's role to examine the influence of the SDoH on access to and the equitable allocation and delivery of health care and social resources to

pediatric critically ill patients. We implore providers to use sound methodology to examine and measure the impact of SDoH on pediatric critical illness with tested individual-, neighborhood-, and system-level interventions.

SUMMARY

SDoH have been identified as key drivers of health disparities in pediatric critical illness. As such, the field of Pediatric Critical Care Medicine is now tasked with identifying and addressing unmet social needs that are inextricably linked to worse outcomes for critically ill children. To accomplish this, pediatric critical care providers need to screen for individual unmet social needs, explore the implications of neighborhood factors and disparities through research, employ a multisector approach to ensure equitable provision of resources, and make family referrals to community organizations to address unmet social needs. With this approach, screening for the SDoH can potentially help mitigate health disparities for critically ill children.

CLINICS CARE POINTS

- SDoH account for about 80% to 90% of modifiable factors contributing to health outcomes and have been linked to health disparities.
- In pediatric critical care, social factors, such as poverty, are mediators to health disparities in outcome.
- Providers and researchers need to measure the burden of unmet social needs to better understand the interplay between social factors and disparate health outcomes during critical illness.
- Screening should be coupled with referrals to the appropriate resources and must occur in an environment equipped to respond to identified needs whil championing the strengths of families.

DISCLOSURE

The authors have nothing to disclose.

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