

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30

Impact of a screening and resource intervention on social determinants of health outcomes  
among adult mental health patients in the Emergency Department

Denise E. Brennan MSN, RN, CNL

1 Brier Court

Warwick, RI 02886

401-263-5095

[Dbrennan\\_8818@email.ric.edu](mailto:Dbrennan_8818@email.ric.edu)

Rhode Island College

Providence, RI

ENA Rhode Island

31 **Abstract**

32 **Objective**

33 This study evaluated the impact of a social determinants of health (SDOH) screening and  
34 resource connection for adult mental health patients in the emergency department (ED) on  
35 identifying the SDOH needs of the ED mental health community, connecting patients with  
36 resources, and the outcomes of ED utilization and boarding.

37 **Method**

38 A quasi-experimental, pretest - posttest design was employed. Participants were screened by  
39 emergency nurses to identify SDOH needs. Patients who identified a need were connected to  
40 resources. A two-week follow-up was offered to evaluate resource connections.

41 **Results**

42 There were 36 patients who agreed to participate of 51(70.5%) who were screened. The most  
43 prevalent SDOH need identified was transportation (58.3%,  $n=21$ ). More than one need was  
44 identified by 69.4% ( $n = 25$ ). A SDOH resource intervention was received by 91.6% ( $n = 33$ ) of  
45 participants. Participants were difficult to reach for follow-up. Receipt of SDOH services were  
46 reported by 66.6% ( $n= 8$ ) of participants completing follow-up. Participants reported resources  
47 as very helpful (55.5%,  $n = 5$ ) and 100% ( $n = 10$ ) of participants completing follow-up endorsed  
48 continuation of the program. Emergency department visits and boarding hours were significantly  
49 lower in the 3-month post intervention for the participants who received a resource intervention.

50 **Conclusion**

51 Mental health patients have SDOH needs driving health outcomes and ED utilization.  
52 Addressing SDOH needs in the ED may lead to less ED utilization and boarding hours. The ED  
53 is a viable location for SDOH screening and resource interventions.

54 **Keywords**

55 Social determinants of health, Mental health, Emergency department, Screening, Resource  
56 connection

## 57 **Introduction**

### 58 Problem

59           Despite substantive evidence demonstrating the link between SDOH and mental  
60 health,<sup>1-3</sup> optimal screening strategies to identify these needs among mental health patients in  
61 the ED and the impact of interventions to address them have not been well described in the  
62 literature. The lack of standardized screening and deficient coordination or connection to critical  
63 resources among this population contributes to negative outcomes at the patient, nurse, and  
64 system levels. There is limited research describing the effectiveness of a process to screen at  
65 risk mental health patients for social risk and resource needs in the ED or a process to make  
66 vital resource connections for ED patients to address SDOH needs.

### 67 Background and Significance

68           The impact of mental health and substance use on patients, families, communities,  
69 society, and healthcare systems is substantial. According to the 2021 National Survey on Drug  
70 Use and Health,<sup>4</sup> there were 57.8 million people in the United States (U.S.) 18 years of age and  
71 older reporting a mental illness and 14.1 million reporting a serious mental illness in the past  
72 year. This survey further revealed that 46.3 million people aged 12 or older reported having a  
73 substance use disorder within the past year.<sup>4</sup> A considerable proportion of mental health  
74 patients lack access to primary mental health services, and many rely on the ED as their only  
75 point of access to care. Mental health patients are high utilizers of ED services, accounting for  
76 4-15% of ED visits.<sup>5</sup> These patients experience longer wait time and length of stay contributing  
77 to higher cost, overcrowding and lower quality of care.<sup>5</sup> The complex nature of the care of these  
78 patient's present challenges for already overburdened emergency nurses and other ED staff by  
79 increasing their workload, contributing to burnout and turnover. Factors contributing to mental  
80 health patient ED utilization include lack of choice, having received care within the system  
81 previously, being referred to the ED, proximity of the ED to the patients home, ease of access,

82 and reputation.<sup>5</sup> While some mental health patients are experiencing life-threatening  
83 emergencies, the needs of many mental health patients are often more related to a lack of  
84 resources such as food, housing, transportation, access to primary care, and other healthcare  
85 services. These needs often go unrecognized as they are not readily apparent to ED staff and  
86 processes to address these needs are lacking.<sup>2-3</sup> Failure to identify and address these SDOH  
87 needs negatively impacts health outcomes at the patient level. Screening for SDOH needs and  
88 coordinating the connection of patients to appropriate resources is one of the most important  
89 opportunities for improving outcomes for mental health patients in the ED, and related outcomes  
90 at the system-level.

#### 91 Emergency Care and SDOH

92         The National Hospital Ambulatory Medical Care Survey: 2020 Emergency Department  
93 Summary Tables<sup>6</sup> reported 131,297 million visits to our nations ED's in 2020 with 6.2 million of  
94 those visits seeking care for mental, behavioral, and neurodevelopmental health. For many  
95 patients, the ED is the critical link to mental health treatment or other services and may be the  
96 only available option for healthcare or meeting social health needs.<sup>2-3,7-9</sup> Emergency department  
97 visits can represent a critical point for a patient in which their readiness to engage in a  
98 meaningful plan could be optimal, However, the ED focuses on emergent, unscheduled care  
99 concentrating on immediate physiologic disorders, and is not well equipped to address the  
100 needs of the mental health patient. The very nature of emergency care creates a disconnect  
101 between the downstream focus of treating the acute care need versus exposing and treating the  
102 root of a SDOH driver of emergency care. Social determinants play a major role in impacting a  
103 person's physical and mental health, well-being, and quality of life. People with mental health  
104 issues are at a higher risk for poor health related outcomes and carry a higher burden of mental  
105 illness due to the reciprocal nature of the relationship between mental health and social  
106 determinants of health.<sup>1</sup>

## 107 Screening for SDOH

108           There has been a contemporary shift in recent years toward social emergency care with  
109 the literature describing the many possibilities that may lie within the context of an emergency  
110 department encounter related to screening for and linking to interventions to address SDOH.<sup>2,7-</sup>  
111 <sup>8,10</sup> Within this work, there is certain challenge, opportunity, and duty to incorporate the social  
112 context of a patient's emergency care visit into a robust approach that includes screening,  
113 assessment, diagnosis or need identification, referral, navigation assistance, and treatment.<sup>10</sup>  
114 There is growing evidence to support the need for SDOH screening and coordination of related  
115 resources. Researchers agree that the ED serves a vulnerable population with many material  
116 needs.<sup>2-3,8</sup>

117           While some ED's have implemented, piloted or researched SDOH risk and/or needs  
118 screening which is tied to interventions to address them, there is limited evidence of studies  
119 conducted within the ED to support a standardized evidence based SDOH screening tool  
120 specific to ED use or a proven process to link interventions based on this screening in that  
121 practice setting.<sup>2,3,8,11,12</sup> Studies conducted within the ED setting have revealed similarities with  
122 the highest SDOH needs identified for housing, food, transportation, access to a provider,  
123 medication, utilities, interpersonal and neighborhood safety with many patients identified as  
124 having more than one need.<sup>2,3,8,12-13</sup>

125           Studies done in both the ED and primary care settings support the importance of SDOH  
126 screening and establishing resource connections for patients. They also share screening and  
127 resource connection challenges, the need for navigation support, use of a directory of  
128 resources, importance of a follow-up process to assess ability to connect to resources and a  
129 potential for reduced ED utilization when SDOH needs are met.<sup>7,14</sup> Interestingly, most SDOH  
130 tools described in the literature do not screen for access to care.<sup>8,11,13,15</sup> The ED is a unique  
131 care area and access to care is an important SDOH to include in screening for this population.

132 The purpose of this study was to improve SDOH related outcomes among patients with mental  
133 health needs in the ED. Specific aims included implementing a screening tool, implementing a  
134 resource connection intervention, and evaluating outcomes at the nurse, patient, and system  
135 level.

## 136 **Methods**

137 This study was conducted at an urban, 247-bed academic teaching hospital with  
138 approximately 70,000 ED visits, during the months of November and December of 2022. A  
139 quasi-experimental, pretest-posttest design was employed to test a SDOH screening and  
140 resource intervention. Participants were patients presenting to the ED during the study period  
141 with a mental health or substance use disorder or patients placed in behavioral health  
142 observation status who were 18 years of age or older. A SDOH screening tool was adapted  
143 from existing tools found in the literature which are available for use within the public  
144 domain.<sup>7,11,15,16,17</sup> The tool was adapted to assess social needs salient to the ED population and  
145 able to be linked to resource interventions from that setting. This tool was used to screen adult  
146 mental health patients for the SDOH needs of access to care, which included primary, follow-up  
147 and mental health care, medications and health insurance access, food insecurity, housing  
148 instability, transportation, and utilities. The screening was linked to resource interventions and  
149 navigation assistance based on responses. This screening tool seen in [Table 1](#) included  
150 questions to help understand access to care needs, potential drivers of ED care and barriers to  
151 accessing healthcare to target the unique needs of ED patients.

152 Emergency Department Behavioral Health Navigator Nurses care specifically for the  
153 mental health population working in collaboration with ED providers, ED nurses, other ED staff,  
154 psychiatry and social work. The focus of their care is mental health patient throughput, safety,  
155 quality, patient, staff, and provider experience. They assist with activities of daily living,  
156 enrichment activities, safety procedures, quality management, de-escalation, provide social

157 support to patients and are a liaison between patients, families, providers and ED staff. They  
158 also assist with facilitating connections to community and/or inpatient resources. Due to their  
159 focus of care and contact with the mental health population, these specialized ED nurses  
160 utilized standard work to guide the process of study inclusion/exclusion, scripting, screening,  
161 consent, resource navigation and follow-up procedures. Based on ED nurse navigator  
162 availability the screening was administered between the hours of 11am-11:30pm, weekdays and  
163 weekends. Eligibility criteria for screening included: (1) aged 18 years or older, (2) emergency  
164 department patients, (3) patients presenting with a mental health or substance use disorder or  
165 placed in behavioral health observation. Exclusion criteria included patients who were  
166 intoxicated, had altered mental status, or a high-acuity medical condition requiring emergent  
167 attention such as intubation or resuscitation. Patients were not screened for SDOH more than  
168 once during a single ED encounter. Patients were consented to participate in the screening and  
169 had the option to receive additional follow-up. The informed consent process defined the study  
170 purpose, procedures, and security protocols. Participation was voluntary. No incentives were  
171 provided for participation, and there were no repercussions for patients who chose not to  
172 participate. All eligible participants were provided with study information, and those who agreed  
173 to participate signed an informed consent. The screening was conducted in-person, verbally,  
174 using the patient's preferred language using professional interpreters or telecommunication  
175 technology as necessary. Patient responses were recorded on a paper screening tool. The  
176 screening took approximately 10-20 minutes and occurred after the ED navigator nurse had  
177 some interaction with the patient and had agreed to participate in the screening. A script,  
178 adapted from the Protocol for Responding to and Assessing Patients' Assets, Risks, and  
179 Experiences (PRAPARE) toolkit was used to introduce the screening.<sup>18</sup> Patients who consented  
180 to the screening had the option to be connected to appropriate resources, with or without  
181 navigation services and receive follow-up. Following the standard screening questions, patients  
182 were asked about their willingness to participate in a brief two-week follow up by phone or email

183 to ask about the ability to connect to resources, resources used, barriers encountered, and the  
184 overall patient experience. A three-month pre and post screening and intervention chart review  
185 was conducted to assess impact of the intervention on ED utilization and mental health boarding  
186 hours.

187           A resource list was compiled from publicly available community resources and internal  
188 hospital resources. These resources were assembled into standard work to guide ED  
189 Behavioral Health Nurse Navigators in addressing each SDOH need based on survey  
190 responses and individualized to each patient's needs. The goal was to address these needs to  
191 the extent possible while the patient remained in the ED. Interventions for access to care,  
192 included assistance to establish the patient with a primary, mental health or follow-up care  
193 provider and making the appointment during the ED encounter or providing a provider list,  
194 assistance with applying for health insurance and/or other organizational financial support  
195 programs for health care, and prescription assistance programs. Interventions for housing  
196 insecurity included resources and assistance to secure immediate, short, and long-term housing  
197 by initiating housing applications or providing shelter information. Interventions for food  
198 insecurity included food access resources (programs, food banks, food pantries and grocery gift  
199 cards) and assistance to apply for food assistance from subsidized government programs.  
200 Interventions for transportation access included resources for and assistance to apply for  
201 transportation support programs or securing transport resources to align with a primary care  
202 appointment. Interventions for utilities included resources to gain access to electricity, phone  
203 and heating services and assistance to apply for these programs. The gift cards used for an  
204 immediate food need were not an incentive to participate in this study. A limited supply was  
205 used to address an immediate food need for which another intervention was not readily  
206 available.

207



## 208 **Results**

209           Of 51 patients who were eligible for the SDOH screening, 36 (70.5%) consented to and  
210 participated in the study. Demographic characteristics are described in [Table 1](#). Participants  
211 were 63.8% ( $n = 23$ ) male, and most were age 35-44 years ( $n = 10$ , 27.7%). The majority self-  
212 identified their ethnicity as White ( $n = 27$ , 75.0%), followed by Hispanic, Latino or of Spanish ( $n$   
213 = 6, 16.6%), “other” ( $n = 4$ , 11.1%), Black or African American ( $n = 3$ , 8.3%) and American  
214 Indian or Alaska Native ( $n = 2$ , 5.5%). The most prominent mental health diagnoses driving ED  
215 utilization as described in [Table 2](#), were depression ( $n = 18$ , 50.0%), anxiety ( $n = 15$ , 41.6%),  
216 post-traumatic stress disorder ( $n = 13$ , 36.1%) and alcohol use disorder ( $n = 12$ , 33.1%). Most  
217 participants suffered from multiple mental health conditions ( $n = 21$ , 58.3%) or had both a  
218 mental health condition and substance use ( $n = 15$ , 41.2%). The SDOH screening identified the  
219 most common SDOH needs among participants, as described in [Table 3](#), as transportation ( $n =$   
220 21, 58.3%), followed by housing ( $n = 19$ , 52.7%), food ( $n = 14$ , 38.8%), access to a healthcare  
221 provider ( $n = 11$ , 30.5%), access to medications ( $n = 9$ , 25.0%), utilities ( $n = 7$ , 19.4%) and  
222 insurance ( $n = 1$ , 2.7%). Most participants ( $n = 25$ , 69.4%) had more than one SDOH need.  
223 Lack of transportation was found to be a significant driver of emergency department utilization  
224 over visits to established community care providers. Additional drivers included location of the  
225 hospital, preference to ED and/or hospital care and emergency medical service (EMS) use.

226           Navigation assistance was requested by 63.8% ( $n = 23$ ) of participants to make a follow-  
227 up healthcare appointment while in the ED. These requests included established providers or  
228 finding a new provider for primary, mental health and even dental care. A SDOH resource  
229 intervention was received by 91.6% ( $n = 33$ ) of study participants. Participants that received a  
230 SDOH intervention and agreed to a two-week follow-up from the ED Behavioral Health  
231 Navigator Nurse ( $n = 29$ , 87.8%) were assessed for their ability to make resource connections  
232 as seen in [Table 5](#). There were 41.3% ( $n = 12$ ) of participants who were able to be reached for

233 follow-up. Participants who were reached for the two-week follow-up reported difficulty making  
234 resource connections ( $n = 6, 50.0\%$ ); however, the majority ( $n = 8, 66.6\%$ ) were able to make  
235 resource connections. Reasons for difficulty making resource connections included delays  
236 related to hospitalization, resource availability, losing the resource list, and the resource's hours  
237 of operation. Most participants completing follow-up reported resources as being "moderately  
238 helpful" ( $n = 2, 22.2\%$ ) or "very helpful" ( $n = 5, 55.5\%$ ) and 100% ( $n = 10$ ) reported that this  
239 program should be offered in the ED in the future.

240           The number of ED visits and mental health boarding hours were significantly lower in the  
241 3-months following the screening and resource intervention in comparison to 3-months before  
242 for the participants ( $n=33$ ) who agreed to and received a resource intervention. The mean  
243 number of ED visits was 2.79 preintervention and 1.24 post intervention, representing a 55.4%  
244 decrease. The mean number of ED boarding hours was 75.32 preintervention and 41.27 post  
245 intervention, representing a 45.2% decrease. A one-tailed t-test was calculated to determine the  
246  $t$  and  $p$  values of a one directional change, reflecting an improvement in both the ED visit ( $t =$   
247  $-3.87, p = <.001$ ) and mental health boarding hours ( $t = -1.92, p = .03$ ) outcomes at 3-months  
248 post intervention when compared to 3-months preintervention. Both outcomes were found to be  
249 statistically significant at  $p <.05$ .

## 250 **Discussion**

251           Transportation was a SDOH that was identified as the greatest need by participants and  
252 was also found to be a significant reason for ED utilization. Participants reported ED utilization  
253 due to no other healthcare option being accessible by EMS, bus or within walking distance to  
254 their location. It is important to consider a transportation resource be arranged with community  
255 provider access to improve utilization. A surprising number of participants had access to health  
256 insurance, prescription medications and a provider. It appears great strides have been made  
257 within healthcare policy to improve insurance availability and affordability. Despite many

258 participants reporting having an established healthcare provider, access to those resources was  
259 reported to be difficult when coupled with other SDOH needs like transportation and access to a  
260 phone. The issue of phone access is possibly linked to the number of participants who sought  
261 navigation assistance to make follow-up appointments and appeared to have impacted the  
262 ability to reach participants for a two-week post-intervention follow-up. This was an important  
263 finding when considering a resource intervention design to benefit specific or universal ED  
264 populations. Mental health patients in this study would not have benefited from a resource  
265 intervention that was delivered following the ED visit. Electronic resource referral platforms  
266 require patients receive phone calls or emails after the ED visit to receive resource referral  
267 services. The resource interventions in this study included community and organizational  
268 resources. The publicly available community resources were often well known to the  
269 participants and viewed as less helpful than the organizational resources. This appeared to  
270 indicate that there is additional healthcare policy work needed to adequately address SDOH.  
271 This would include establishing a transportation program to improve access to community  
272 providers where provider based social services arrange the ride to and from appointments when  
273 the appointment is made, or food bank services that are available in other locations like provider  
274 offices, clinics, and hospitals. Additionally, housing resources are very limited in the area this  
275 study was conducted and impacted the ability to make meaningful housing resource  
276 connections yet was identified as a prominent need. Additional temporary, short-term, and long-  
277 term affordable housing options are needed. Limitations of this study include the small sample  
278 size, single site, and resource availability. Future research should be conducted to include a  
279 larger design in a larger institution or multi-site system which includes universal screening and  
280 resource connection interventions for ED patients.

281

282

## 283 **Implications for Emergency Nursing**

284 What is already known about this topic?

- 285 • Adult mental health patients in the ED have many SDOH related needs but  
286 optimal strategies to screen for SDOH and the ability to make meaningful  
287 resource connections to address them have not been well described in the  
288 literature.

289 What does this paper add to the currently published literature?

- 290 • This paper adds evidence of a SDOH screening and resource intervention  
291 implementation in the ED setting.
- 292 • Improves knowledge of the SDOH needs of the adult ED mental health  
293 population.
- 294 • Provides a roadmap/toolkit for other ED's to implement a SDOH screening and  
295 resource intervention.
- 296 • Evidence of the importance of leveraging an ED visit to address SDOH
- 297 • The participation rate in this study indicates that the ED is an appropriate location  
298 for the screening, patients are willing and able to engage in this setting.
- 299 • Importance of the depth and diversity of resources needed to address SDOH
- 300 • Importance of navigation resources to address SDOH and provide a resource  
301 intervention while patients are in the ED.

302 What is the most important implication for clinical emergency nursing practice?

- 303 • It is important to provide emergency care that is holistic. Emergency nurses must  
304 consider the drivers of emergency care, medical and social needs of their  
305 patients to improve health outcomes.

306

**307 Conclusion**

308           Mental health and substance use impacts patients, families, communities, and  
309 healthcare systems. SDOH play a significant role impacting a person's physical and mental  
310 well-being. The mental health population are at considerable risk for poor health outcomes  
311 which are exacerbated by the reciprocal nature between SDOH and mental health.  
312 Overcrowding in emergency departments is a national concern with mental, behavioral and  
313 substance use disorders contributing. As the safety net to health care, the ED delivers care to  
314 patients with a wide range of SDOH needs that are driving health outcomes, ED utilization and  
315 boarding. The ED can play a key role in addressing SDOH through a SDOH screening and  
316 resource intervention which can impact outcomes at the nurse, patient, and system level.  
317 Investment in navigation services to assist patients to make vital resource connections from the  
318 ED setting and transportation resources could hold promise to shift the paradigm toward the use  
319 of community resources instead of the ED. Emergency nurses are well positioned to lead and  
320 contribute to this important work.

321

322

323

324

325

326

327

328

329

330 **References**

- 331 1. Shim RS & Compton MT (2018). Addressing the social determinants of mental health: If Not  
332 Now, When? If Not Us, Who? *Psychiatric Services*, 69(8). 844-846.  
333 <https://doi.org/10.1176/appi.ps.201800060>
- 334 2. Malecha PW, Williams JH, Kunzler NM, Goldfrank LR, Alter HJ & Doran KM  
335 (2018). Material needs of emergency department patients: A systematic review.  
336 *Academic Emergency Medicine*. 25(3). <https://doi.org/10.1111/acem.13370>
- 337 3. Ordonez E, Dowdell K Nevajar NM, Dongarwar D, Itani A, & Salihu HM (2020).  
338 An assessment of the social determinants of health in an urban emergency  
339 department. *Western Journal of Emergency Medicine*. 22(4). 890-897.  
340 <https://doi.org/10.5811/westjem.2021.4.50476>
- 341 4. Substance Abuse and Mental Health Services Administration (2022). Key substance use  
342 and mental health indicators in the United States: results from the 2021 national survey on  
343 drug use and health. (HHS Publication No. PEP22-07-01-005, NSDUH Series H-57). Center  
344 for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services  
345 Administration. <https://www.samhsa.gov/data/report/2021-nsduh-annaul-national-report>.
- 346 5. Fleury MJ, Grenier G, Farand L, & Ferland, F (2019). Reasons for emergency  
347 department use among patients with mental disorders. *Psychiatric Quarterly*. 90. 703-716.  
348 <https://doi.org/10.1007/s11126-019-09657-w>
- 349 6. Cairns, C., Kang, K. (2022) National Hospital Ambulatory Medical Care Survey: 2020  
350 emergency department summary tables. DOI <https://dx.doi.org/10.15620/cdc:121911>.
- 351 7. Samuels-Kalow ME, Molina MF, Ciccolo GE, Curt A, Cleveland Manchanda EC  
352 de Paz, N.C., & Camargo, C.A. (2020). Patient and community organization perspectives on  
353 accessing social resources from the emergency department: a qualitative study. *Western*  
354 *Journal of Emergency Medicine*. 21(4). 964-973.  
355 <https://doi.org/10.5811/westjem.2020.3.45932>

- 356 8. Molina MF, Li CN, Manchanda EC, White B, Faridi MK, Espinola JA,  
357 Ashworth H, Ciccolo G, Camargo CA, & Kalow MS (2020). Prevalence of emergency  
358 department social risk and social needs. *Western Journal of Emergency Medicine*. 21(6).  
359 152-161. <https://doi.org/10.5811/westjem.2020.7.47796>
- 360 9. De Marchis EH, Hessler D, Fichtenberg C, Adler N, Byoff E, Cohen AJ, Doran KM, Ettinger  
361 de Cuba S, Fleegler EW, Lewis CC, Tessler Lindau S, Tung EL, Huebschmann AG, Prather  
362 AA, Raven M, Gavin N, Jepson S, Johnson W, Ochoa Jr E, Gottlieb LM (2019). Part I: A  
363 quantitative study of social risk screening acceptability in patients and caregivers. *American  
364 Journal Preventative Medicine*. 57 (6 Suppl 1). 1-21.  
365 <https://doi.org/10.1016/j.amepre.2019.07.010>
- 366 10. Heish D (2019). Achieving the quadruple aim: Treating patients as  
367 people by screening for and addressing the social determinants of health. *Annals of  
368 Emergency Medicine*. 74(58). 19-24. <https://doi.org/10.1016/j.annemergmed.2019.08.436>
- 369 11. Ciccolo G, Curt , Camargo CA, & Samuels-Kalow M (2020). Improving  
370 understanding of screening questions for social risk and social need among emergency  
371 department patients. *Western Journal of Emergency Medicine*. 21 (5). 1170-1174.  
372 <https://doi.org/10.5811/westjem.2020.5.46536>
- 373 12. Wallace AS, Luther B, Guo JW, Wang CY, Sisler S, and Wong B (2020).  
374 Implementing a social determinants screening and referral infrastructure during  
375 routine emergency department visits, Utah, 2017–2018. *Centers for Disease Control and  
376 Prevention*. 17(E45). 1-12. <http://dx.doi.org/10.5888/pcd17.190339>
- 377 13. Murray E, Roosevelt GE, & Vogel JA (2021). Screening for health-related social  
378 needs in the emergency department: Adaptability and fidelity during the COVID-19  
379 pandemic. *American Journal of Emergency Medicine*. Article in Press.  
380 <https://doi.org/10.1016/j.ajem.2021.09.071>

- 381 14. Bechtal N, Jones A, Kue J, & Ford JL (2021). Evaluation of the core 5 social  
382 determinants of health screening tool. Public Health Nursing. 1-8.  
383 <https://doi.org/10.1111/phn.12983>
- 384 15. Centers for Medicare and Medicaid Services. (2021). Accountable health communities  
385 model. CMS.gov. <https://innovation.cms.gov/innovation-models/ahcm>
- 386 16. Hager E R, Quigg A M, Black M M, Coleman S M, Heeren T, Rose-Jacobs R,  
387 Cook J T, Ettinger de Cuba, S E, Casey P H, Chilton M, Cutts D B, Meyers F, Frank D A  
388 (2010). Development and validity of a 2-item screen to identify families at risk for food  
389 insecurity. Pediatrics, 126(1), 26-32. <https://doi.org/10.1542/peds.2009-3146>
- 390 17. Creative Commons (CC By 4.0). (n.d.). Attribution 4.0 international.  
391 <https://creativecommons.org/licenses/by/4.0/>
- 392 18. National Association of Community Health Centers (NACHC). (2019). PRAPARE  
393 implementation and action toolkit.  
394 <https://prapare.org/wp-content/uploads/2021/10/Full-Toolkit.pdf>
- 395
- 396
- 397
- 398
- 399
- 400
- 401
- 402
- 403
- 404



405 **Table 1**406 **Screening Tool**

407 <b>Topic</b>	<b>Screening questions</b>
------------------	----------------------------

408 **Access to Care**

409 1. Do you have a primary doctor, clinic, or mental health service?

410 Yes/No

411 2. Is there anything that makes it easier or harder to go there when

412 you need care?<sup>7</sup> Yes/No

413 Describe \_\_\_\_\_

414 3. What made you come to this location today?<sup>7</sup> \_\_\_\_\_

415 4. Would you like resources to help with finding a primary doctor,

416 clinic, or mental health service? Yes/No

417 5. Would you like assistance with making a follow-up appointment?

418 Yes/No

419 6. In the last 12 months, have you had concerns about being able to

420 pay for prescription medication or worried that you would run out

421 before you got money to buy more? Yes/No

422 7. Would you like resources to help with paying for prescription

423 medications? Yes/No

424 8. Would you like resources and/or assistance with applying for health

425 insurance? Yes/No

426 **Housing**

427 9. In the last month, have you had concerns about the condition or

428 quality of your housing, or are you homeless?<sup>11</sup> Yes/No

429 10. Are you worried that in the next month, you may not have stable

430 housing?<sup>11</sup> Yes/No

- 431 11. Would you like resources to help with temporary and/or long-term  
432 housing? Yes/No
- 433 **Food**
- 434 12. In the past 12 months, have you worried that your food would run  
435 out before you got money to buy more?<sup>16</sup> Yes/No
- 436 13. In the past 12 months, has your food run out before you got money  
437 to buy more?<sup>11</sup> Yes/No
- 438 14. Would you like resources and/or assistance to help you with getting  
439 food? Yes/No
- 440 **Transportation**
- 441 15. Is it difficult to get transportation to or from the pharmacy, your  
442 medical, mental health or follow-up appointments? Yes/No<sup>3</sup>
- 443 16. Would you like resources and/or assistance to help with  
444 transportation or pharmacy home delivery programs? Yes/No
- 445 **Utilities**
- 446 17. In the past 12 months, have you worried that your utilities would be  
447 shut off for not paying your bills (heat, electric, gas, or water)?<sup>11</sup>
- 448 18. Yes/No
- 449 19. Would you like resources and/or assistance to help with paying for  
450 utilities? Yes/No
- 451 **Follow-up**
- 452 20. May I or a colleague contact you within 2-weeks to check on you  
453 and see if you were able to connect to the resources we discuss  
454 today? Yes/No
- 455 21. Phone number or email address\_\_\_\_\_

456 Table 2

457 **Demographic characteristics**

458	<b>Demographic category</b>	<b>n</b>	<b>%</b>
459	Sex		
460	Female	13	36.1%
461	Male	23	63.8%
462	Age category		
463	18-24	4	11.1%
464	25-34	4	11.1%
465	35-44	10	27.7%
466			
467	45-54	9	25.0%
468	55-64	7	19.4%
469	65-74	1	2.7%
470	75 and over	1	2.7%
471	Race		
472	Hispanic, Latino or of Spanish origin	6	16.6%
473	Ethnicity		
474	American Indian or Alaska Native	2	5.5%
475			
476	Black or African American	3	8.3%
477	White	27	75.0%
478	Other	4	11.1%
479	Insured		
480	Yes	35	97.2%
481	No	1	2.8%
482			
483			
484			

485 Table 3

486 **Demographic characteristics**

487	<b>Demographic category</b>	<b>n</b>	<b>%</b>
488	Type of mental health and/or substance use disorder driving ED care		
489	Attention deficit hyperactivity disorder (ADHD)	3	8.3%
490	Alcohol use disorder	12	33.3%
491	Anxiety	15	41.6%
492	Bipolar disorder	8	22.2%
493	Borderline personality	3	8.3%
494	Cocaine use	3	8.3%
495	Delusional disorder	1	2.7%
496	Depression	18	50.0%
497	Major depression	3	8.3%
498	Marijuana use	4	11.1%
499	Obsessive compulsive disorder (OCD)	2	5.5%
500	Opioid use disorder	2	5.5%
501	Panic attack	1	2.7%
502	Polysubstance abuse	4	11.1%
503	Post-traumatic stress disorder (PTSD)	13	36.1%
504	Schizophrenia	6	16.6%
505	Schizoaffective disorder	2	5.5%
506	Sensory processing disorder	1	2.7%
507	Suicidal	1	2.7%
508	Participants with more than one mental health condition	21	58.3%
509	Participants a mental health condition and substance use	15	41.2%

510

511

512

513

514 Table 4

515 <b>Type of SDOH Need</b>	<b>n</b>	<b>%</b>
516 Access to care		
517       Primary doctor, clinic, or mental health service	11	30.5%
518       Prescription medication	9	25.0%
519       Health insurance	1	2.7%
520 Housing	19	52.7%
521 Food	14	38.8%
522 Transportation	21	58.3%
523 Utilities	7	19.4%
524		
525 Identified more than one SDOH need	25	69.4%
526 Received a SDOH resource intervention	33	91.6%

527

528

529

530

531

532

533

534

535

536

537

538

539

540

541

542

**Table 5**

<b>Resource Referral</b>	<b>n</b>	<b>%</b>
Agreed to 2-week follow-up <sup>1</sup>	29	87.8%
Able to be reached for 2-week follow-up <sup>2</sup>	12	37.5%
Receipt of services at 2-week follow-up	8	66.7%
Difficulty connecting to resources	6	50%
Reasons for difficulty connecting to resources		
Hospitalization	2	33.3%
No resource available	1	16.6%
Lost identification	1	16.6%
Lost resource list	1	16.6%
Resource changed hours of operation	1	16.6%
Helpfulness of the resources <sup>3</sup>		
Not at all helpful	1	11.1%
Moderately helpful	2	22.2%
Very helpful	5	55.5%
Extremely helpful	1	11.1%
Should this program be offered in the future? <sup>4</sup>		
Yes	10	100%
No	0	

1 Of the participants that received a SDOH intervention (n = 33), four did not agree to follow-up thus n = 29

2 Although twelve participants were able to be reached for follow-up, not all participants provided a response for every question

3 Participants who responded to this question (n = 9)

4 Participants who responded to this question (n = 10)

543

544

545