**Introducing a Point-of-Care Tool to Teach Health Science Students about Social Determinants of Health**

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**ABSTRACT**

**Introduction:** Social determinants of health (SDoH) are recognized as modifiable drivers of optimal health and an opportunity to achieve health equity, yet many providers still experience barriers to addressing their patients’ social needs. To help connect patients to supportive resources, the American Academy of Family Physicians developed the Neighborhood Navigator Tool. This study examined the impact of SDoH education in medical and pharmacy students and examined their perceptions of the Neighborhood Navigator tool.

**Methods:** This prospective study of third and fourth year medical and PharmD students included an assessment given before and after a SDoH learning activity. The survey assessment queried attitudes and knowledge of SDoH and the Neighborhood Navigator Tool. Pre- vs post-lecture responses were compared.

**Results:** After the lecture, the responses to the following questions changed significantly: “I have a comprehensive understanding of SDoH.” (p<0.001); “I feel confident in my ability to refer patients to community resources addressing SDoH.” (p <0.001); and “I feel that my medical school training adequately prepared me to assist patients in addressing SDoH” (p=0.005). After the lecture, all participants agreed or strongly agreed that the Neighborhood Navigator tool would be impactful in discharge planning with patients. Transportation services (35.3%), medication cost assistance (17.6%), and medical supplies or home health services (14.7%) were cited as the aspects of the Neighborhood Navigator tool that students felt were most applicable to their patients.

**Conclusion:** Familiarizing medical providers with the Neighborhood Navigator tool should increase provider’s confidence in navigating SDoH and can be accomplished with additional instruction.

INTRODUCTION

Over the last several years, social determinants of health (SDoH) have gained a rightful place in the healthcare spotlight. From this increased attention and research, we know that SDoH must become a priority during patient care visits to improve health equity, and measures to reduce disparities are needed to achieve optimal health. SDoH factors may determine up to 55% of health outcomes,and addressing SDoH has many benefits including increased access to medical care, decreased homelessness, and even decreased 90-day mortality. 1,2,3,4 While many family medicine physicians agree that addressing social needs is as important as addressing medical conditions, very few feel confident doing so. Some primary care providers avoid querying SDoH altogether.5 In response to this discrepancy, the American Academy of Family Physicians (AAFP) formed the Center for Diversity and Health Equity, initiated the EveryONE Project, and developed the Neighborhood Navigator tool. The Neighborhood Navigator is an interactive screening tool that connects patients with supportive resources based on social needs. This tool lists more than 40 000 services (*e.g.* food, housing, transportation) by zip code. 6 Our study sought to examine the impact of SDoH education on third- and fourth-year medical and pharmacy students and determine their perceptions of the Neighborhood Navigator tool.

METHODS

The Charleston Area Medical Center Institutional Review Board approved the survey, which was administered electronically via Research Electronic Data Capture (REDCap), a HIPAA-compliant, secure, web-based online survey tool and database.

We invited all student participants in a lecture titled “Diversity and Health Equity: One Encounter at a Time” to complete an anonymous survey before and after the lecture (**Appendix A**). The educational intervention included a flipped-classroom model of presenting the material in a brief lecture then post-test prior to a small-group session. During the in-person, small-group session, each student identified a patient with SDoH needs, accessed the Neighborhood Navigator, and chose an appropriate community resource to address that patient’s need. Students were then asked to document and discuss the SDoH need and matching resource found in the Neighborhood Navigator.

Consenting participants accessed the survey using an emailed link prior to the lecture and using a QR code at the conclusion of the lecture. The study population included all West Virginia University School of Medicine (WVU SoM) third-year clerkship students, WVU SoM and West Virginia School of Osteopathic Medicine fourth-year sub-internship medical students, and WVU School of Pharmacy fourth-year PharmD students rotating in the WVU Department of Family Medicine from February 22, 2022 through January 4, 2023. The survey instrument assessed knowledge of SDoH needs and the AAFP Neighborhood Navigator Tool utilizing Likert-type (strongly agree to strongly disagree), multiple-choice, and open-ended questions. SAS Studio 3.8 was used to compare pre-and post-test survey responses using Chi-squared and Fisher’s exact tests.

RESULTS

Forty-six pre-tests and 30 post-tests were completed anonymously by the students (**Table 1**). Almost all participants (97.8%) agreed or strongly agreed that SDoH present a barrier to care in some patients, and 90.0% agreed or strongly agreed that they would like to receive more training on health disparities/SDoH. The pre-test revealed that 85% of participants had previous exposure to the topic of SDoH and 34% had heard of the AAFP Neighborhood Navigator Tool prior to the lecture and small-group session.

The pre- and post-lecture survey responses indicated that the learning activity improved understanding of SDoH (**Table 2**). Prior to the lecture, 34.8% of respondents either “agreed” or “strongly agreed” that they had a comprehensive understanding of SDOH as compared with 86.2% afterwards (*p*<0.001). Similarly, more respondents felt confident in their ability to refer patients to community resources addressing SDoH after the learning activity than before (96.5% vs 23.9%, *p* <0.001). When asked whether "Non-compliance may be masked as barriers to fulfilling SDoH”, all participants who responded “disagree” or “neutral” in the pre-test responded “agree/strongly agree” in the post-test (*p*=0.075). This single intervention significantly changed whether the respondents felt that their medical school training adequately prepared them to assist patients in addressing SDoH (37.0% agreed on the pre-test vs 63.0% on the post-test*, p*=0.005). There were no statistically significant changes in responses for other attitude-related survey questions or in responses to knowledge-related survey questions (**Table 2**).

All participants agreed or strongly agreed that the Neighborhood Navigator tool would be impactful in discharge planning with patients. Participants cited ease of use (n=7, 26.9%) and volume of resources (n=10, 38.5%) as the most surprising aspects of the Neighborhood Navigator tool. When the students were asked which features of the Neighborhood Navigator Tool were most applicable to their patients, the top items referenced were transportation services (35.3%), medication cost assistance (17.6%), and medical supplies or home health services (14.7%). (**Table 3**).

CONCLUSIONS

The results of the pre- and post-lecture assessments suggest that while medical and pharmacy students are familiar with the topic of SDoH, very few are confident in their ability to refer patients to community resources addressing barriers to care. SDoH is an area of opportunity in medical and pharmacy curricula as only one-third of participants felt prepared to assist patients in addressing SDoH, and most participants reported they would like to receive additional training. The pre-lecture assessment found that few participants were familiar with the Neighborhood Navigator Tool, and the post-lecture assessment found that all participants thought it would be impactful in discharge planning.

Study limitations include a small number of pharmacy students relative to medical students, making it difficult to infer utility for other professional programs, although the intervention significantly improved the pharmacy students’ understanding of SDoH. The lasting impact of the intervention will need to be assessed by surveying learners later in their clinical training.

While SDoH are major contributors to healthcare outcomes and are of growing interest, many healthcare providers are unsure of how to navigate SDoH. The Neighborhood Navigator Tool is a user friendly, efficient option to assist healthcare providers and patients in overcoming individual barriers to care. Familiarizing medical students with the AAFP tool should increase the number of providers who feel confident navigating SDoH and can be accomplished with a minimum of additional instruction.

**Table 1.** Study Participants

|  |  |  |
| --- | --- | --- |
| **Respondents** | **Pre-Test** | **Post-Test** |
| Total  | n=46 | n=30 |
| 3rd Year Medical Students | 33 (71.7%) | 22 (73.3%)  |
| 4th Year Medical Students | 1 (2.2%) | 0 (0.0%)  |
| PharmD Students  | 10 (21.7%) | 8 (26.7%)  |

**Table 2.** Responses to Survey Questions

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Pre-Test (n=46) a** | **Post-Test (n=30) a** |  |
| **Survey Question** | **Agree** | **Disagree**  | **Agree** | **Disagree** | **P-value b** |
| **Knowledge** |  |  |  |  |  |
| I have a comprehensive understanding of SDoH. | 16(34.8%) | 30 (65.2%) | 25(86.2%) | 4 (13.8%) | <0.001 |
| SDoH present a barrier to care in some of my patients. | 45 (97.8%) | 1 (2.2%) | 29(96.7%) | 1 (3.3%) | 0.757 |
| Many of my patients live in areas that lack resources addressing SDoH. | 44(95.6%) | 2(4.4%) | 28(93.3%) | 2(6. 7%) | 0.658 |
| Social needs are related to poor health outcomes. | 44(95.6%) | 2(4.4%) | 29(96. 7%) | 1(3.3%) | 0.824 |
| Many of my patients have more than one SDoH that needs addressed. | 43(95.6%) | 2(4.4%) | 30(100.0%) | 0(0.0%) | 0.242 |
| There is a connection between a patient's home address and access to resources. | 43(93.5%) | 3(6.5%) | 30(100.0%) | 0(0.0%) | 0.153 |
| Patients are often reluctant to reveal SDoH that impact them. | 36(78.3%) | 10(21.7%) | 25(83.3%) | 5(16.7%) | 0.587 |
| "Non-compliance" may be masked as barriers to fulfilling SDoH. | 40(87.0%) | 6(13.0%) | 30(100.0%) | 0(0.0%) | 0.075 c |
| **Attitudes** |  |  |  |  |  |
| I believe it is a physician's responsibility to address SDoH in patient visits. | 38(82.6%) | 8(17.4%) | 29(96.7%) | 1(3.3%) | 0.064 |
| I feel confident in my ability to refer patients to community resources addressing SDoH. | 11 (23.9%) | 35(76.1%) | 28(96.5%) | 1(3. 5%) | <0.001 c |
| There is not enough time in my patient visit to address SDoH. | 20(43.5%) | 26(56.5%) | 15(50.0% | 15(50.0%) | 0.577 |
| Addressing SDoH is better suited to be addressed on an outpatient basis. | 20(43.5%) | 26(56.5%) | 17(56.7%) | 13(43.3%) | 0.260 |
| I feel that my medical school training adequately prepared me to assist patients in addressing SDoH. | 17(37.0%) | 29(63.0%) | 21(70.0%) | 9(30.0%) | 0.005 c |
| I would like to receive more training on health disparities/SDoH. | 40(87.0%) | 6(13.0%) | 27(90.0%) | 3(10.0%) | 0.688 |
| **Neighborhood Navigator tool** |  |  |  |  |  |
| I am likely to incorporate the AAFP Neighborhood Navigator tool into patient visits. | -- | -- | 30(100.0%) | 0(0.0%) |  |
| The AAFP Neighborhood Navigator would be impactful in discharge planning with patients. | -- | -- | 30 (100.0%) | 0 (0.0%) |  |
| The AAFP Neighborhood Navigator would be helpful both in inpatient and outpatient setting. | -- | -- | 30(100.0%) | 0(0.0%) |  |

AAFP, American Association of Family Physicians; SDoH, social determinants of health.

a Survey responses were dichotomized as agreement (“Strongly Agree/Agree”) or disagreement (“Neutral/Disagree/Strongly Disagree”).

b Statistical analysis included chi-square test for pre- and post-test comparisons and Fisher exact test when cells contained less than 5. A p-value < 0.05 was set as statistically significant.

c Fisher exact test

**Table 3.** Qualitative Feedback Regarding Most Applicable Elements of the Navigator Tool **a**

|  |  |  |
| --- | --- | --- |
| **Type of Aid**  | **Number of Responses** | **Percentage of Respondents b** |
| Financial Assistance  | 31 | 45.6% |
| Medication Cost Assistance | 12 | 17.6% |
| General  | 5 | 7.4% |
| Assistance for Chronic Disease Management/Treatment | 5 | 7.4% |
| Nutrition/Food Insecurity | 4 | 5.9% |
| Assistance For Treatment of SUD | 3 | 4.4% |
| Housing Assistance | 1 | 1.5% |
| Financial Assistance for Utilities | 1 | 1.5% |
| Access  | 38 | 55.9% |
| Transportation Services | 24 | 35.3% |
| Medical Supplies and/or Home Health Services  | 10 | 14.7% |
| Vaccine Assistance | 1 | 1.5% |
| Rehabilitation | 1 | 1.5% |
| Meal Delivery Services | 1 | 1.5% |
| Medicare Assistance | 1 | 1.5% |
| Animal Care Assistance | 1 | 1.5% |
| Social Support | 16 | 23.5% |
| Social Support Groups | 4 | 5.9% |
| Education for Chronic Disease Management | 4 | 5.9% |
| Bereavement Support | 2 | 2.9% |
| Nutritional Education | 2 | 2.9% |
| Job Placement Assistance | 2 | 2.9% |
| Caregiver Support | 1 | 1.5% |
| Exercise Resources | 1 | 1.5% |

**a** *After the lecture and in-class application exercise, students were asked to email the instructor and report which features of Neighborhood Navigator Tool they felt were most applicable for their patient population. Participants could cite more than one item in the solicited e-mailed responses.*

*b Responses were received from 68 students.*

**REFERENCES**

1. Booske BC, Athens JK, Kindig DA, Park H, Remington PL. County health rankings working paper. Different perspectives for assigning weights to determinants of health. University of Wisconsin Population Health Institute. www.countyhealthrankings.org/sites/default/files/differentPerspectivesForAssigningWeightsToDeterminantsOfHealth.pdf. Accessed November 30, 2021.
2. Andermann A. Taking action on the social determinants of Health in Clinical Practice: A framework for health professionals. *Canadian Medical Association Journal*. 2016;188(17-18). doi:10.1503/cmaj.160177
3. Sterling MR, Ringel JB, Pinheiro LC, et al. Social Determinants of Health and 90‐day mortality after hospitalization for heart failure in the regards study. Journal of the American Heart Association. 2020;9(9). doi:10.1161/jaha.119.014836
4. Lax Y, Bathory E, Braganza S. Pediatric primary care and subspecialist providers’ comfort, attitudes and practices screening and referring for Social Determinants of Health. BMC Health Services Research. 2021;21(1). doi:10.1186/s12913-021-06975-3
5. Gerteis Senior Associate J. Primary care: On the front lines of social determinants of health. Abt Associates. https://www.abtassociates.com/insights/perspectives-blog/primary-care-on-the-front-lines-of-social-determinants-of-health. Published July 16, 2021. Accessed November 30, 2021.
6. American Academy of Family Physicians (AAFP). 2021. AAFP Center for Diversity and Health Equity. EveryONE Project Neighborhood Navigator. [https://www.aafp.org/family-physician/patient-care/the-everyone-project/neighborhood-navigator.html. Accessed November 30](https://www.aafp.org/family-physician/patient-care/the-everyone-project/neighborhood-navigator.html.%20Accessed%20November%2030), 2021.

**Appendix A: Survey used for Pre- and Post-assessment.**

Role (drop-down box: 3rd year, 4th year, PharmD student)

Have you had exposure to this topic (social determinants of health) previously? (Y/N)

Have you heard of the AAFP Neighborhood Navigator Tool previously? (Y/N)

Define Social Determinants of Health (SDoH)

* Non-medical factors that influence health outcomes
* Can be influenced by social policies
* Conditions under which people are born, grow, live, work, and age
* **All the above**

Which of the following is/are **NOT** a SDoH?

* Access to food, safe housing, transportation
* Access to medical supplies, seasonally appropriate clothing, childcare
* Pet care, education, legal aid
* **Access to medical care/insurance, history of alcohol use, language discrepancy**

How common are SDoH/Health Disparities?

* Account for 35% of health outcomes
* Account for 45% of health outcomes
* **Account for 55% of health outcomes**
* Account for 65% of health outcomes

What is the AAFP’s three-step process for addressing SDoH in primary care?

1. **Ask, Identify, and Act**
2. Assume, Act, and Implement
3. Identify, Research, Act
4. Inquire, Search, Implement

What barriers do you foresee in using AAFP Neighborhood Navigator?\*

1. None
2. Not enough time in patient visits
3. Inadequate Wi-Fi/cell phone service
4. Patient’s perception of technology use during patient visits
5. Discomfort in addressing patient’s social determinants of health
6. \_\_\_\_\_\_\_\_\_\_\_\_\_

How could the AAFP Neighborhood Navigator been used to help one of your hospital patients overcome one or more SDoH?\*

What surprises you about the AAFP Neighborhood Navigator?\*

Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

1. I have a comprehensive understanding of SDoH
2. SDoH present a barrier to care in some of my patients
3. Many of my patients live in areas that lack resources addressing SDoH
4. I feel confidence in my ability to refer patients to community resources addressing SDoH
5. Social needs are related to poor health outcomes
6. Many of my patients have more than one SDoH that needs addressed
7. There is a connection between a patient’s home address and access to resources
8. I believe it is a physician’s responsibility to address SDoH in patient visits
9. I am likely to incorporate the AAFP Neighborhood Navigator tool into patient visits\*
10. The AAFP Neighborhood Navigator would be impactful in discharge planning with patients\*
11. The AAFP Neighborhood Navigator would be helpful both in inpatient and outpatient setting\*
12. Patients are often reluctant to reveal SDoH that impact them
13. “Non-compliance” may be masked as barriers to fulfilling SDoH
14. I feel that my medical school training adequately prepared me to assist patients in address SDoH
15. I would like to receive more training on health disparities/SDoH
16. Addressing SDoH is better suited to be addressed on an outpatient basis
17. There is not enough time in my patient visit to address SDoH

\*post-assessment only