Journal of Student-Run Clinics
Original Study

Assessing the Social Determinants of Health of Patients from a Student-Run Free Clinic to Improve Appointment Attendance Post COVID-19

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Published: June 19, 2024

Abstract

Background: In clinics offering care to underserved and underinsured populations, patients who do not present for scheduled appointments ('no-shows') constitute a recurrent problem. As student clinicians, we are responsible for working to identify and mitigate contributing barriers to care. The Mollie Wheat Memorial Clinic (MWMC) conducted a qualitative study to better understand the demographics of the population served and evaluate their barriers to care.
Methods: Patients who presented to MWMC (show) were surveyed about demographic information and barriers to care. Over the same time interval no-shows were contacted via phone for brief interviews detailing reasons for absence. A text message reminder system was first implemented for the May 14, 2022, clinic date, and a text message was sent to each patient 24 hours before his or her scheduled appointment. MWMC tracked changes in patient show/no-show rates following reminder implementation.
Results: From January 1st, 2021 to December 31st, 2022, 60 "show" patients were surveyed. 43.64% of patients lived below the poverty line, 59.32% lacked health insurance, 83% owned a reliable car, and 90% felt confident in their ability to attend appointments. No-show rates before and after text message reminder implementation were not significantly different.
Conclusion: Survey demographic data suggests that MWMC patients lack optimal healthcare because of financial reasons and do not struggle with transportation to the degree we expected. Despite text message reminders, no-show rates remained high. Based on these results, we have concluded mechanisms working for other clinics aren't necessarily effective in free, rural-focused clinics such as MWMC. We have proposed further research in community settings such as food pantries as this could potentially reach patients who do not come to the clinic because of logistical or financial reasons.

Introduction

Student run free clinics (SRFCs) provide free primary health care to persons from disadvantaged socioeconomic backgrounds which may prevent them from receiving regular health maintenance. SRFCs function as a safety net to help prevent under/uninsured patients from relying on emergency rooms or urgent care facilities for their primary care needs. By helping to reduce the burden of obtaining care, SRFCs have been shown to improve outcomes in patients.[1] The Mollie Wheat Memorial Clinic (MWMC) is a SRFC that provides a comprehensive and diverse range of primary healthcare services and screenings for under/uninsured persons from a small urban cluster serving extensive rural surroundings.

Due to the combination of lower socioeconomic status, lack of insurance, and scarcity of healthcare resources, many persons that utilize

SRFCs have more than one chronic health care need that should be addressed over multiple visits with semi-consistent follow ups.[1] Patients that regularly utilize and rely on SRFCs have been shown to have multiple barriers to care that may cause them to miss appointments which would prevent them from receiving consistent health maintenance. Previous research has outlined barriers to care including but not limited to: lack of reliable transportation, financial constraints, forgetting appointments, and shortages of health professionals in their region.[1-3]

The goal of this study is to better understand our patients' social determinants of health and their effect on patient's ability to attend appointments at the clinic, with the aim of improving access in the future. We initially hypothesized that many of the patients who visited the MWMC would be living under the poverty line and have no insurance. Without further investigation, we were uncertain of how or if our patient demographics aligned with those of other free clinics. Lack or presence of demographic alignment is indicative of outside research relevance at MWMC. Therefore, we conducted a study in which we surveyed patients about their perceived barriers to care. When completing background research for our study, we found that our relatively small metro area and large rural patient population set us demographically apart from other clinics[1-3] and presented the opportunity to research unique barriers that persons in suburban/rural areas face when trying to receive healthcare. This insight placed MWMC in a unique position to be at the forefront of understanding and advocating for the needs of often overlooked community members.

Methods

Study Design and Setting

After receiving Institutional Review Board (IRB) approval, a survey-based study was conducted at a rural, student-run medical clinic. Data collection occurred between January 1st, 2021, to December 31st, 2022. Eligible participants included first-time patients and patients who did not attend their self-scheduled appointment. All eligible participants were 18 years or older. Patients who stated they had taken the survey previously or who were returning patients were excluded.

Data Collection

On each clinic day, one medical student from the research team was present to administer the online survey regarding socioeconomic factors and demographics ("show" survey). Patients who met inclusion criteria were given a laptop with this survey to complete while waiting for their medical team. All no-show patients were called within one week of their scheduled appointments and asked to participate in our study. Their responses to a shortened version of the "show" survey administered in clinic ("no-show" survey) were recorded. No-show patients who did not answer our phone call were emailed the "no-show" survey if an email address was provided.

Responses to the "show" survey automatically translated to an Excel (v16.86, Microsoft, Redmond, WA) document. The research team completed the survey prior to data collection ensuring its efficacy, and patient responses were monitored after each clinic date. Responses to the "no-show" survey were recorded manually in a word document.

The number of patients who did not attend their scheduled appointments "no-show" was tracked at clinic dates from January 1st, 2021 to December 31st, 2022 on a spreadsheet (2023, Google, Mountain View, CA). A text message reminder system that sent a reminder to each patient's phone 24 hours before his or her scheduled appointment was then implemented in May 2022 and tested prior to implementation by research team members. The number of "no-show" patients were tracked via the same method for clinics following reminder initiation.

Data Analysis

Each question in the "show" survey was individually analyzed by counting the number of times each question option was selected. The selection number for each question option was then divided by 60 (the total number of responses) in order to calculate a percentage. Results of the "no-show" survey were not analyzed.

After each clinic, "no-show" percentage was

Table 1. Distribution of gender, age, and race in patients who presented to MWMC and completed the "show" survey from 2021 to 2023

Characteristic	Percentage % (N)
Gender	
Male	23.3 (14)
Female	75.0 (45)
Prefer not to say	1.7 (1)
Age	
18-24	15.3 (9)
25-34	22.0 (13)
35-44	15.3 (9)
45-54	27.1 (16)
55-64	13.6 (8)
65-74	5.1 (3)
Race/ethnicity	
Caucasian	78.0 (46)
African American	5.1 (3)
Asian	6.8 (4)
Latino/Hispanic	1.7 (1)
Biracial	1.7 (1)
Native American or Pacific Islander	1.7 (1)
Prefer not to say	3.4 (2)

MWMC: Mollie Wheat Memorial Clinic; GED: General Education Development.

calculated by dividing the number of patients. Who did not attend their scheduled appointment by the total number of scheduled appointments. Individual clinic "no-show" percentages were identified as either pre or post text message reminder. Average "no-show" percentages were calculated in these respective groups.

Results

From January 1st, 2021 to December 31st, 2022, 60 patients completed the "show" survey. Though the original intention was to have no-show patients fill out the "no-show" survey via a phone call or email, researchers were frequently unable to contact no-show patients or obtain a reliable email to send the survey. Therefore, zero no-show patients were included in the results. All results are from individuals who attended their scheduled appointment and filled out the "show" survey. Of the patients surveyed, 75.0% identified as female (n=45) and 23.3% as male (n=14) (Table 1). The age ranges most frequently reported were 25-34 (n=13) and 45-54 (n=16). Most patients were under 65 years of age, while only 3 patients reported being in the 65-74 years of age range. Of the patients surveyed, 78.0% identified as Caucasian (n=46), 5.1% African American (n=3), and 6.8% Asian (n=4) (Table 1).

The social determinants of health were divided into categories of transportation, health insurance, employment/socioeconomics, food insecurities and language/literacy. It was found that 83.3% of patients owned a vehicle and that 90.0% of patients were confident they could make it to their work or appointments (Table 2).

When assessed about health insurance, 59.3% of patients did not currently have any health

Table 2. Social determinants of health in patients who presented to MWMC and completed the "show" survey from 2021 to 2023

Category	Question	Yes % (N)	No % (N)
Transportation	Own a reliable car?	83.3 (50)	16.7 (10)
	Confident you can make it to work or appointments?	90.0 (54)	10.0 (6)
	Rely on others for transportation?	18.3 (11)	81.7 (49)
Insurance	Have health insurance?	40.7 (24)	59.3 (35)
Employment	Currently employed?	74.6 (44)	25.4 (15)
Food insecurity	Gone without food because unable to afford it?	20.3 (12)	79.7 (47)
Language/ Literacy	Are physicians able to communicate in a way that makes it easy to understand?	100 (69)	0 (0)
Health Access/Quality	Have a family doctor?	40.0 (24)	60.0 (36)
	Had an ER visit because unable to see a family doctor?	40.0 (24)	60 (36)

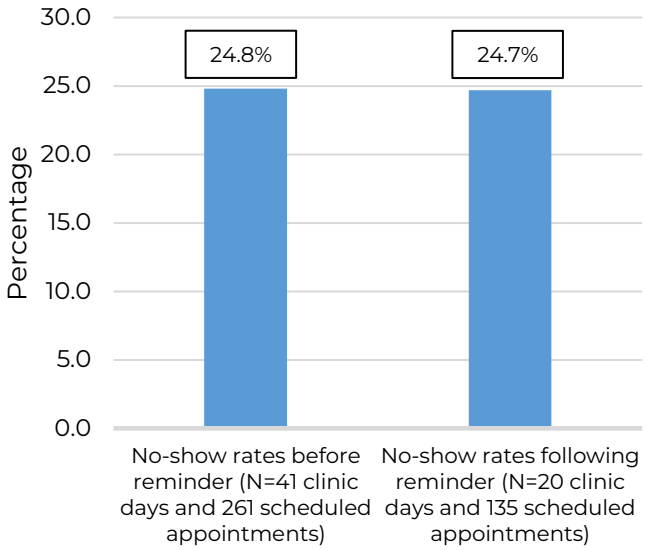
MWMC: Mollie Wheat Memorial Clinic; ER: Emergency room.

Table 3. Salary distribution among patients who presented to MWMC and completed the "show" survey from 2021 to 2023

Salary	Percentage (N)
<$12,140	20.0 (11)
$12,140-$16,460	12.7 (7)
$16,460-$20,780	12.7 (7)
$20,780-$25,100	9.0 (5)
$25,100-$29,420	0.0 (0)
$29,420-$33,740	3.6 (2)
$33,740-$38,060	5.5 (3)
$38,060-$42,380	5.5 (3)
$42,380-$50,000	12.7 (7)
$50,000-$75,000	7.3 (4)
$75,000-$100,000	3.6 (2)
>$100,000	7.3 (4)

MWMC: Mollie Wheat Memorial Clinic.

Figure 1. No-show rates at MWMC prior to and following implementation of an appointment text message reminder system



MWMC: Mollie Wheat Memorial Clinic.

insurance. Among uninsured patients, the most common explanations for being uninsured were "too expensive" (45.2%) and "make too much to qualify for state/national help (but not enough to pay for insurance out-of-pocket)" (22.6%).

When asked about their healthcare, 60.0% of patients did not have a primary care physician, and 40.0% of patients had been to the emergency department because they were unable to see a primary care physician.

Most patients (74.6%) were currently employed. The most reported total household income range among patients was less than $12,140 (20.0%). The household income ranges of $12,140-$16,460, $16,460-$20,780, and $42,380-$50,000 had 7 patients in each range or 12.7% (Table 3). From the reported total household income and among people who reported living in each household, it was found that 43.6% of surveyed patients lived below the poverty line.

When asked about qualification for government benefits, 58.3% of patients did not qualify, 20% did qualify, and 21.7% were uncertain of qualification. With regards to food insecurity, 20.3% of patients have had to go without food because they could not afford it (Table 1).

Patients had variable levels of education. The most reported levels of education were General Education Development (GED)/high school graduate (16.7%), some college (36.6%), and masters/advanced degree (26.7%) (Table 4). All patients agreed with the statement that their doctors can communicate in a way that makes it easy for them to understand.

Prior to implementation of the text message system, no-show rates were tracked at 41 clinic days (261 total scheduled appointments) and averaged to 24.8%. Following text message reminder implementation, no-show rates were tracked at 20 clinic days (135 total scheduled appointments) and averaged to 24.7% (Figure 1).

Discussion

The goal of this study is to better understand the demographics of the population served by a student run free clinic and evaluate their barriers to healthcare. These barriers were defined with a focus on socioeconomic limitations or difficulties with transportation. Though it has been shown that student-run free clinics mainly serve minority groups,[4] the barriers to healthcare these patients face are not well established, especially for a clinic that primarily serves a surrounding rural

Table 4. Education distribution among patients who presented to MWMC and completed the "show" survey from 2021 to 2023

Education Level	Percentage (N)
Did not finish high school	3.3 (2)
GED/high school graduate	16.7 (10)
Some college	36.7 (22)
Associate degree	6.7 (4)
Bachelor's degree	10.0 (6)
Masters/advanced degree	26.7 (16)

MWMC: Mollie Wheat Memorial Clinic; GED: General Education Development.

area. To the authors' knowledge this study is the first of its kind, detailing barriers to healthcare for a rural patient population served in a student-outreach clinic. As detailed in Rural Healthy People 2020, rural populations often live below the poverty level and are more likely to be uninsured when compared to urban populations.[5] The results of our study were consistent with this, as 43.6% lived below the poverty line, and 59.3% did not have health insurance at the time of the "show" survey. These numbers reflect an unfortunate truth for the MWMC patients who do not have optimal healthcare because of financial reasons. Knowing this, the clinic has and continues to serve this population with no cost for our services.

It is well established that transportation is a barrier to healthcare for both community and student-run free clinics,[5-6] so we hypothesized MWMC patients had difficulty attending scheduled appointments because of lack of transportation. It was found that 83.3% of patients responding to the "show" survey owned a reliable car and 90% felt confident they could make it to their appointments. Only 18.3% of respondents said they felt a need to rely on others for transportation. Mause et al. (2022) conducted a similar study at their Student-Run Free Psychiatry Clinic and similarly found that transportation was not a significant barrier to care.[2] One possible explanation is that patients without reliable transportation did not make it to appointments and therefore, were not given the opportunity to fill out this "show" survey. Another explanation could be the geographic location of clinics. It is possible that dependable forms of transportation are hard to establish for medical clinics that are in a city but predominately serve the surrounding rural area. Heckman et al. (1998) found that rural individuals had more issues with transportation than those from urban communities.[8] It is possible that patients rely on others for transportation. Being responsible for others' transportation may have impacted their ability to attend appointments despite having reliable transportation for themselves.

When comparing the demographics of our rural free clinic to those of an urban free clinic in Milwaukee, we observed similarities in patient reported salary and age but discrepancies in the primary gender and race served. Our population demographic was 75.0% female and 23.3% male, while theirs was 55.0% male and 45.0% female. The majority of our patient population was Caucasian (78.0%), while the majority of their patient population was African American (60%). Similarities were observed when comparing the age of individuals as the majority of their patient population is 45-64 (40%), and the majority of our patient population was also 45-64 (40.7%). A direct salary comparison was challenging as only individuals without insurance participated in their study while individuals with and without insurance participated in ours. However, we were surprised to still find similarities in income percentages. Of those surveyed by the urban clinic, 39% self-reported income of less than $12,140 a year, and 61% reported making $12,140-$48,560 a year. In our survey, 19.3% made less than $12,140 a year while 59.64% made between $12,140-$50,000 a year.[8]

One of the largest limitations to this study is the absence of survey input from patients who didn't attend their scheduled appointment ("no-show" survey). Lack of feedback prevents us from better understanding no-show demographics and ways to help individuals attend appointments. Another limitation was the lack of research questions to explain the higher no-show rate since reopening after the Coronavirus disease 2019 (COVID-19) pandemic. Despite introducing a text messaging system that reminds

patients of appointments, the no-show rate remains high. As this is contrary to a large meta-analysis highlighting increased appointment compliance following text message reminder implementation, compliance could be dependent on location and demographic served. The MWMC is in the city but based on an outcome report filled out with each appointment, primarily serves the rural, under/uninsured population in the surrounding area. Additionally, the population we're serving may not have access to technology that allows them to receive reminders.[9] Perhaps the results of dependable forms of transportation are due to setting and could be drastically different if serving a more urban population. Lastly, our results may have been different if this "show" survey had been implemented before the COVID pandemic as the hypothesis of this study was based on the understanding of how healthcare functioned prior to the pandemic. Since the COVID pandemic, healthcare settings have been drastically different. This may have created changes in the MWMC patient demographics and the patient population served.

By understanding the social determinants of health for patients, this study helps determine methods to improve attendance. The results have provided insight into a student-outreach clinic patient population but have also raised more questions. Lack of change in our no-show rate following text message reminder implementation suggests technological reminders that work in other clinics aren't necessarily effective in free, rural-focused clinics. Mause et al. (2022) also reported lack of text message effectiveness in their free clinic but found increased appointment communication through meetings with case managers. Similarly, the patients at MWMC have medical conditions managed over multiple visits, and now MWMC is evaluating ways to organize consistent meetings with patients in a similar manner.[10] Further research in community settings like the homeless shelters or food pantries could potentially get to those patients who do not come to the clinic because of logistical, financial, or other reasons. The Committee on Health Care for Homeless People reported that regular, direct communication with homeless populations improved the ability to provide for populations, but specialized approaches are necessary in rural areas.[11] More research amongst a rural patient population could provide additional information on how to best serve this patient group if they have needs unique to or different from urban populations. Insight into these factors could continue to improve our clinic while increasing the at-risk population that the MWMC continues to proudly serve.

Acknowledgements

We thank Indiana University School of Medicine and Landsbaum Center for Health Education for allowing us to conduct this study in their facilities.

Disclosures

The authors have no conflicts of interest to disclose.

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