

Role of Social Determinants of Health in Statin Adherence within Community Pharmacy

Abstract:

Background: In the United States, medication non-adherence contributes to at least 100,000 preventable deaths and 100 billion dollars of additional medical expenses. While numerically defining non-adherence is relatively straightforward, the reasoning for non-adherence is often multi-factorial and individualized. Examining patients' social determinants of health (SDOH) can provide insight into factors that may impact their abilities to appropriately take medications and may be an asset to providing individualized medication use support. The objective of this study is to describe the relationship between social determinants of health barriers and the degrees of adherence to statin medications. **Methods:** Statin users from three Jackson County, Missouri pharmacies were separated into three medication adherence groups (low 0-0.79, acceptable 0.80-0.99, and high ≥ 1.00) determined by the dispensing software. They were provided an electronic social determinants of health survey to determine how their current situation affected their ability to take the medications daily. **Results:** A total of 1019 patients were eligible to participate in the survey and 67 patients completed the survey, for a 6.5% response rate. There was a total of 124 responses that indicted the presence of an SDOH problem. Once a confounding question was removed, there were 61 positive responses. In the low adherence group 100% of surveyed individuals had at least one positive response while the acceptable had 76%, and high had 42% ($p < 0.004$). **Conclusion:** Social determinants of health does have an impact on the degree of patient's medication adherence. Those in the low medication adherence rating groups had more positive responses then those in the acceptable or high adherence rating groups. SDOH domains identified in this study population with the greatest barriers to medication adherence are employment, finances, and food.

Background:

In the United States, medication non-adherence contributes to at least 100,000 preventable deaths and 100 billion dollars of additional medical expenses. Medication non-adherence is a common challenge in healthcare¹. Non-adherence has been defined through clinical studies for most drugs as $< 80\%$ when calculating using the Medication Possession Ratio (MPR) model². While numerically defining non-adherence is relatively straightforward, the reasoning for non-adherence is often multi-factorial and individualized. Examining patients' social determinants of health (SDOH) can provide insight into factors that may impact their abilities to appropriately take medications and may be an asset to providing individualized medication use support.

According to the Centers for Disease Control and Prevention, SDOH are "conditions in the places where people learn, work, study, live and play". Five domains are considered: health/healthcare, education, social and community context, economic stability, and neighborhood and built community³. Each domain is connected to an individual's health and wellbeing in a unique way. The following are examples of what is assessed for each domain. Health/Healthcare includes access to healthcare, access to primary care, health insurance coverage, and health literacy. Education includes graduating from high school, enrollment in higher education, language and literacy, and early childhood education and development. Social and community context encompasses topics such as cohesiveness within the community, civic

participation, discrimination, conditions in the workplace, and incarceration. Economic stability includes key issues of poverty, employment, food security, and housing stability. Neighborhood and built community includes quality of housing, access to transportation, availability to healthy foods, air and water quality, and neighborhood crime and violence⁴.

These five SDOH domains can be assessed through a variety of screening tools which can be tailored to the setting in which they are utilized. The results of these tools often point to health inequities a patient may experience and can be an asset to providing individualized patient support. As one of the most accessible healthcare settings and often the last healthcare setting visited by a patient prior to medication administration, community pharmacies are optimal locations to provide SDOH screening owing to identify and overcome barriers to optimal health, including medication adherence⁵.

In addition to optimizing patient health, improvement of medication adherence is financially beneficial for community pharmacies. The Centers for Medicare & Medicaid Services (CMS) created the star rating system that ranks Medicare plans on a one to five scale according to quality metrics to provide patients an easy way to compare plans and choose high-quality plans⁶. Medicare Part D plans incentivize pharmacies with bonuses and year-round enrollment to utilize pharmacists to assist in improving the quality measures relating to medications, including adherence to statins⁷. Several studies have been conducted assessing different techniques used in community settings to improve adherence rates, but less is known about the use of SDOH screening tools to identify barriers to receiving healthcare and the relationship of SDOH problems with medication non-adherence.

Objective: The objective of this study is to describe the relationship between SDOH barriers and the degrees of adherence to statin medications.

Methods:

A survey study was performed from 2/1/2021 to 3/31/2021 at three Balls Food Stores (BFS) in Jackson County, Missouri. BFS is a chain of locally owned supermarkets chain in Kansas City metropolitan area. There are 19 pharmacies under the banners of Price Chopper, Hen House, and Sun Fresh. Jackson County, Missouri was chosen due to its status as a Medically Underserved Area and theorized potential for SDOH barriers⁸. Jackson County is home to approximately 700,000 people with a growing population. The median income is \$55,134, which is \$13,000 less than the U.S. average⁹.

Included patients were adults (≥ 18 years of age) with at least two fills for a statin at a BFS pharmacy in Jackson County within the last six months. Exclusion criteria include those < 18 years of age, those who do not speak/read either English or Spanish, and those who decline to participate in the survey.

A list of patients taking statins was generated from the dispensing software, Pioneer Rx®. Report parameters were set using the inclusion criteria and the output included gender, refill dates, statin name and dose, workflow status, and MPR for each patient. The report was reviewed using the following criteria for inclusion: using MPR with most recent completed fill date, if a prescription was in progress (i.e. waiting for fill, pick up, refill request) the second most recent date with an

MPR was used. If the statin or statin dose changed, it was only included if it had an MPR, and transfers were not included unless they had been filled twice and generated an MPR. Each patient was then assigned to an adherence group based on their MPR. Adherence groups were defined by MPR as follows: low (0.0-0.79), acceptable (0.80-0.99), and high (≥ 1.00). These adherence groups were selected based on the distribution of MPR across the identified patient population of all three stores combined. After the adherence group was determined, a message was placed into each patient's pharmacy dispensing system profile to stop the dispensing process at the point of sale and notify the pharmacy staff that the patient should be offered a survey to be completed anonymously on an electronic tablet using Qualtrics. This notification instructed the pharmacy staff which survey to offer them based on their adherence group. All survey questions were the same. Using different survey links based on adherence groups was exclusively to organize the data collected while keeping the results anonymous.

When the survey was completed or declined, the message in the patient's profile was removed from the dispensing system to prevent duplicate entries. Due to the personal nature of the questions, only the person the medication was prescribed to was able to take the survey. There was an incentive of a random drawing of \$25 gift cards to Price Chopper grocery stores for those who participated in the survey.

The SDOH survey utilized in this study was developed for the EveryONE Project by the American Academy of Family Physicians¹⁰. Permission was granted for use of the instrument by survey developers. The survey is composed of fifteen questions separated into nine categories. Two questions regarding housing, two food, one transportation, one utilities, one childcare, one employment, one education, one finance, four personal safety, and one assistance question asking if help is needed in any of these areas. The final question on assistance was removed since this was an anonymous survey there would be no ability to follow up with assistance. This question was replaced by a second transportation question regarding pharmacy prescription delivery service. Additionally, after each response indicating the presence of an SDOH problem, the question "Does this affect your ability to take your medications?" was presented to better understand the patient's perspective if that SDOH factor affected adherence. A response was deemed positive if they reported the problem occurring to any extent. Demographic data was not collected in the survey to increase patient comfort in providing sensitive information.

Presence of SDOH problems was assessed using descriptive statistics and differences between adherence groups and pharmacy locations were assessed using the Fisher's Exact Test and Chi-square tests.

This study was granted an exemption by the University of Missouri-Kansas City Institutional Review Board.

Results:

A total of 1019 patients at the three pharmacies were identified to be offered the SDOH survey. A total of 67 patients completed the survey, for a 6.5% overall response rate. In the low adherence group, 12 of 194 patients completed the survey for a response rate of 6.1%. In the acceptable group, 41 of 613 patients completed the survey for a response rate of 6.6%. In the high adherence group, 14 of 212 patients completed the survey for a response rate of 6.6%.

There were 124 positive responses total. The low adherence group had 22 positive responses collected from 12 patients. Two patients reported the SDOH barrier affected their ability to take their medication. The acceptable adherence group had 78 positive responses collected from 41 patients. Two patients reported the SDOH barrier affected their ability to take their medication. The high adherence group had 24 positive responses from 14 patients. None of the respondents reported the SDOH barrier affected their ability to take their medication. Once the added question about the prescription delivery was excluded, there were 95 positive responses. The low, acceptable, and high adherence groups had 1.41, 1.49, and 1.29 positive responses per person, respectively. When the added question about prescription delivery and employment were excluded, there were 61 positive responses with MPR groups low, acceptable, and high averaging 1.17, 0.95, and 0.57 positive responses per person, respectively.

We examined adherence groups for number of respondents reporting at least one SDOH barrier. The percentage of patients reporting at least one SDOH barrier were 100%, 76%, and 42% in the low, acceptable, and high adherence groups respectively ($p=0.004$). . When the added question about prescription delivery and employment were excluding, low adherence group had 8 (75%), acceptable had 18 (44%), and high had 3 (21%) providing a p value of 0.067 proving non-statistical significance.

Overall, the top three SDOH categories with the highest number of positive responses were employment, finances, and food. All three adherence groups had highest positive responses in employment and finances. The top three adherence categories with the highest positive responses and affected the patient's ability to take their medication were food, finances, and housing.

Discussion:

Looking at the primary outcome of the degree of adherence to statin medications in relation to social determinants of health barrier there appear to be statistical significance. The significance has the potential to grow with a higher response rate.

The limitations of this study can be placed in three distinct categories: factors affecting response rate, technology, and the survey itself. Factors that contributed to a low response rate include: when survey participation was declined, someone other than the patient was picking up the medication therefore unable to take the survey, and low staff buy-in to requesting patient participation. The dispensing software had restraints when calculating MPR and the use of iPad were difficult for those not comfortable with electronic technology and needing larger print. Once the survey intake period had concluded, it was clear that the employment question had a high number of positive responses. It sparked the question whether other categories such as "retired" or "unemployed due to disability" should have been included to paint a clearer picture. Since this was an anonymous survey, there was no way for follow up or ability to ask clarifying questions. Each of these limitations have the ability to be refined for future research.

Higher response rates could be achieved by expanding the scope of eligible patient through something other than statin medication fills and/or adjust the collection of the survey. Example of such would be having hard copies available both at the pharmacy counter or mailed to the

patient, larger print options, and/or survey links to take the survey via the internet from any location. Focusing on a specific SDOH domain could also provide a more streamlined data and ability to refine the survey questions to dig deeper into that specific domain. Lastly, having a follow up survey to address each positive response to determine if the barrier has been addressed. This would take away the anonymity, but would also provide both provider and patient to ask follow up questions to make sure both questions and answers were comprehended and answered in the intended manner.

Conclusion:

Social determinants of health does have an impact on the degree of patient's medication adherence. Those in the low medication adherence rating groups had more positive responses than those in the acceptable or high adherence rating groups. SDOH domains identified in this study population with the greatest barriers to medication adherence are employment, finances, and food. Future research is still needed on how to address these barriers. As well as once barriers are overcome, how big the impact was on medication adherence.

References:

1. Kleinsinger F. (2018). The Unmet Challenge of Medication Nonadherence. *Perm. J.* 2018; 22: 18-033. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6045499/#b1-18-033>. Accessed August 31, 2020.
2. Do You Know the Difference Between These Adherence Measures? *Pharmacy Times*. <https://www.pharmacytimes.com/view/do-you-know-the-difference-between-these-adherence-measures>. Updated July 6, 2015. Accessed June 13, 2021.
3. Social Determinants of Health. *Healthy People 2030*. <https://health.gov/healthypeople/objectives-and-data/social-determinants-health>. Accessed September 8, 2020.
4. About Social Determinants of Health (SDOH). <https://www.cdc.gov/socialdeterminants/about.html>. Accessed April 19, 2021.
5. Manolakis P G, Skelton J B. (2010). Pharmacists' Contributions to Primary Care in the United States Collaborating to Address Unmet Patient Care Needs: The Emerging Role for Pharmacists to Address the Shortage of Primary Care Providers. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3058447/#:~:text=Pharmacists%20are%20the%20most%20accessible,and%20preventive%20care%20to%20patients>. Accessed May 13, 2021.
6. American Pharmacy Purchasing Alliance. 2020 Star Ratings- Pharmacies Likely to Feel Pressure for Greater Efficiency and Improved Patient Outcomes. <https://joinappa.com/2020-starratings-pharmacies-likely-to-feel-pressure-for-greater-efficiency-and-improved-patientoutcomes/>. Published December 19, 2019. Accessed August 31, 2020.

7. CMS. Fact Sheet - 2020 Part C and D Star Ratings.
<https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/Downloads/2020-Star-Ratings-Fact-Sheet-.pdf>.
Published October 9, 2019. Accessed September 8, 2020.
8. MUA Find. Data.HRSA.gov. <https://data.hrsa.gov/tools/shortage-area/mua-find>.
Accessed June 4, 2021.
9. Quick Facts: Jackson County, Missouri. U.S. Census Bureau.
<https://www.census.gov/quickfacts/jacksoncountymissouri>. Accessed April 26, 2021.
1. Social Needs Screening Tool. AAFP.
https://www.aafp.org/dam/AAFP/documents/patient_care/everyone_project/hops19-physician-form-sdoh.pdf. Accessed September 8, 2020.