Improving Primary ASCVD Prevention through Statin Therapy in Patients with Type 2 Diabetes:

A Quality Improvement Initiative

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Abstract

In 40 to 75-year-old patients with type 2 diabetes, a moderate-intensity statin is recommended for primary ASCVD prevention regardless of the 10-year ASCVD risk. Literature has highlighted the suboptimal statin usage. Both clinician and patient-related factors contributed to this suboptimal usage, but non-adherence to a statin is the significant contributing factor among eligible patients. This quality improvement initiative aimed to compare the primary care providers' awareness and the patients' status on statin initiation, sustaining adherence, and the most common reasons for non-adherence. Providers' perceptions and patients' status were evaluated separately through mixed quantitative and qualitative surveys. An MMAS-8 medication adherence questionnaire was incorporated into the patient survey to evaluate statin adherence. Ten out of 13 providers and 18 eligible patients participated in a voluntary, anonymous survey. The survey findings indicated that most providers estimated 71-90% of adherence. This was correlated with the actual patients' adherence rate of 90.9%. However, the actual number of prescriptions written by providers for this patient group was lower than the providers' estimation. Most providers predicted 71-90% prescription in their patients, but the actual statin prescription for the surveyed patients was only 67%. This finding indicated the need to improve statin prescription in patients with type 2 diabetes as recommended by the guideline. Additionally, the surveyed patients' responses indicated inadequate knowledge of the benefits of a statin. This knowledge gap is an area for further improvement. The findings, recommendations to improve statin prescription, and patients' knowledge gap were shared with all providers during a monthly meeting to enhance primary ASCVD prevention in patients with type 2 diabetes.

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Problem Description

Diabetes is one of the fastest-growing global diseases. More than half a billion people are living with diabetes worldwide, and by 2050, 1.31 billion people are projected to have diabetes (GBD 2021 Diabetes Collaborators, 2023). In the United States, 38.4 million people, every one in 11 people, have diabetes (American Diabetes Association, 2021). Type 2 diabetes accounts for 90% of all diabetes and is often associated with a sedentary lifestyle and nutritional mismanagement, among other risk factors (International Diabetes Federation, 2021).

Among people with diabetes, cardiovascular disease (CVD) is one of the leading causes of mortality (Yun & Ko, 2021). Cardiometabolic risk factors, such as hypertension, dyslipidemia, and obesity, synergistically increase the risk of CVD, with a twice higher increase in the risk of cardiovascular mortality in patients with type 2 diabetes compared to healthy individuals (Yun & Ko, 2021).

For the primary prevention of atherosclerotic cardiovascular disease (ASCVD), the American College of Cardiology/American Heart Association (ACC/AHA) (2018) clinical practice guidelines recommend initiating a moderate-intensity HMG-CoA reductase inhibitor (statin) in 40 to 75-year-old patients who have type 2 diabetes and low-density lipoprotein cholesterol (LDL-C) ≥70 mg/dL irrespective of 10-year ASCVD risk (Grundy et al., 2019). However, despite well-documented efficacy and evidence in lowering LDL-C in improving primary and secondary cardiovascular outcomes, data indicates suboptimal statin usage among eligible patients (Drexel et al., 2020). Desai et al. (2023) highlighted that physician and patient factors contributed to this suboptimal usage. However, among eligible patients, non-adherence to lipid-lowering therapy is the major contributor (Desai et al., 2023). The pattern of non-adherence is observable as early as one month, and at six months, nearly 50% of patients on primary prevention stopped taking a statin (Drexel et al., 2020). Adherence is the extent to which the patient's

behavior, such as taking medication to change lifestyle, corresponds with an agreed recommendation from a healthcare professional (Drexel et al., 2020). While non-adherence can compromise treatment outcomes with devastating clinical consequences, it is important to note that adherence is modifiable and, thus, also reversible (Drexel et al., 2020).

This quality improvement initiative planned to improve patients' adherence to statins at the suburban family medicine clinic in the Pacific Northwest by evaluating the primary care providers' perception and actual patients' status of statin therapy. The project focused on primary ASCVD prevention in 40 to 75-year-old patients with type 2 diabetes. The preliminary interview with the clinical pharmacist and the patient care coordinator revealed that the clinic is receiving frequent queries from the insurance relating to some patients' lack of refilling statins. The clinic is not fully aware of how many patients are not adhering to the statin prescription or the extent of the problem and does not fully understand the reason why. While there are proven strategies and tools for overcoming the barriers of poor adherence, a better understanding of the depth of the problem and the reasons for non-adherence will guide the next step to tailor the best strategies to improve statin therapy adherence.

Available Knowledge

PubMed data were searched electronically to identify journal articles published from 2020 to the present. MeSH terms included *medication adherence, medication compliance, hydroxymethylglutaryl-CoA reductase inhibitors, cardiovascular diseases, primary prevention,* and *adult*. All studies designed to demonstrate the significance of adhering to statins in primary prevention and the barriers and improvement strategies for statin adherence were eligible for inclusion. A total of 35 journal articles were reviewed.

Evidence has demonstrated that statin adherence is vital in sustaining cardiovascular protective benefits (Alrais, 2021). Malmborg et al. (2021) and Zhao et al. (2020) demonstrated the benefit of statins in patients without established CVD and found that this primary prevention benefit correlates with high

adherence to statins. A nationwide study in New Zealand found that adherence is poorer in patients receiving statins for primary prevention than in those receiving secondary prevention (Sigglekow et al., 2020). Additionally, the article also demonstrated that late filling of secondary prescriptions is associated with subsequent discontinuation in the first year of therapy. Based on this finding, Sigglekow et al. (2020) highlighted the importance of being aware of probable indicators of poor adherence and to intervene early.

Desai et al. (2023) and Drexel et al. (2020) described the common factors contributing to non-adherence to statin therapy. Patient-related factors leading to non-adherence are poor awareness of the medication's benefits and unintentional non-adherence like forgetfulness or lack of understanding of medical instructions (Desai et al., 2023; Drexel et al.,2020). Mehta (2024) and Zhao et al. (2020) highlighted that inadequate patient knowledge significantly impacts statin adherence due to the lack of symptoms or any visible improvements in patients' health with statin therapy in cardiovascular disease prevention. This inadequacy of patient knowledge is even more significant in patients taking statins for primary prevention, where patients have not experienced prior cardiovascular events (Sigglekow et al., 2020).

In addition to the patient-related factors, fear of actual or perceived side effects, access to medications like cost, inability to easily fill the prescription, and polypharmacy are the therapy-related factors contributing to statin non-adherence (Desai et al., 2023; Drexel et al., 2020). At the same time, healthcare disparities and the lack of standardized metrics for lipid-lowering therapy contributed to healthcare system-related barriers to non-adherence (Desai et al., 2023; Drexel et al., 2020). These findings indicate that clinicians need to be more proactive in identifying non-adherence risks and address them with appropriate interventions to sustain the benefit of a statin, especially in primary prevention.

Grover and Oberoi (2020) demonstrated that Morisky's eight-item medication adherence scale (MMAS-8) is a convenient, reliable, and valid measure to identify statin non-adherent patients. MMAS-8

is a self-reported questionnaire consisting of eight questions (Appendix A). The total score ranges from 0 to 8, and patients are categorized into three levels of adherence: high adherence (score 8), medium adherence (score 6-7), and low adherence (score < 6) (Krousel-Wood et al., 2009). Based on Grover & Oberoi's (2020) finding, the benefit of statin can be reasonably assumed to be extended to a patient when the MMAS-8 score is $\geq$ 6.

In summary, identifying non-adherent patients and understanding the factors leading to non-adherence is a fundamental step in sustaining the cardiovascular protective benefit of statins, particularly in primary ASCVD prevention. Proactively identifying at-risk patients with medication adherence tools like MMAS-8 can identify and quantify the status of adherence problems in patients, thus guiding clinicians to the appropriate intervention strategy.

Rationale

A root cause analysis and the creation of a cause-and-effect diagram were initiated (Appendix B). The limited time and heavy workload of healthcare providers, lack of a medication adherence assessment tool, and lack of an established policy to evaluate patient adherence were identified as some of the factors resulting in inadequacy in identifying non-adherent patients and understanding the barriers to statin. A literature review revealed that proactively identifying non-adherent or at-risk patients in primary ASCVD prevention and awareness of contributing factors to non-adherence facilitates the implementation of appropriate strategies for improving patients' adherence to statins (Desai et al., 2023; Drexel et al., 2020; Mehta, 2024; Sigglekow et al., 2020; Zhao et al., 2020).

This quality improvement project is guided by the Institute for Healthcare Improvement (IHI) Model for Improvement (MFI) (Institute for Healthcare Improvement [IHI], n.d.). IHI uses the model for improvement developed by the Associates in Process Improvement (IHI, n.d.). MFI is compatible with any change model the organization may use and can help accelerate the improvement (IHI, n.d.). It

comprises three fundamental steps: setting an aim, identifying measures of change to ensure improvement, and selecting change for desired outcomes (IHI, n.d.).

Once the change has been identified, as the next step, MFI initiates improvement with the Plan-Do-Study-Act (PDSA) cycle in a local setting (IHI, n.d.). The PDSA cycle allows flexibility to trial and adjust the changes based on the observed results (IHI, n.d.). Through repeated revision, PDSA cycles enable continual improvement (IHI, n.d.).

Specific Aims

This quality improvement initiative aimed to compare the primary care providers' awareness and the patients' status on statin initiation, sustaining adherence, and the most common reasons for non-adherence in 40 to 75-year-old patients with type 2 diabetes. Perceptions from the primary care providers from the clinic were gathered through a mixed quantitative and qualitative online survey (Appendix C). Patients' status was evaluated separately through a printout survey during routine primary care visits (Appendix D). The patient survey incorporated the MMAS-8 medication adherence questionnaire to evaluate adherence. Results and recommendations from these surveys were shared with all providers in the January 2024 providers meeting.

Methods

Context

This quality improvement project occurred in a suburban family medicine clinic in the Pacific Northwest with a team involving a family nurse practitioner and a doctor of nursing practice (DNP) student. The DNP student made an in-person invitation to providers for their participation in an anonymous online survey. A family nurse practitioner supported and reinforced the distribution of survey invitations via clinic email. The front desk and DNP student distributed an on-paper printout survey when surveying patients. Additionally, a consent form was included and verified on paper and with verbal consent if the patient identified as having type 2 diabetes and was between the ages of 40-

75. Medical assistants helped collect the forms back from patients. The signed consent forms and answer sheets were kept in a dedicated folder at the family nurse practitioner's workstation for this project.

Interventions

In the first month of the project, from October 10th to November 11th, providers' perceived awareness of statin initiation, sustaining adherence, and the most common reasons for non-adherence in 40 to 75-year-old patients with type 2 diabetes were gathered through a mixed quantitative and qualitative survey. A brief invitation with a QR code and a link to an online survey was distributed in person to the providers by the DNP student overseeing the quality improvement initiative. The intervention study included reviewing the ACC/AHA 2018 Clinical Practice Guidelines on the Management of Blood Cholesterol to validate the recommended need for a statin among 40 to 75-year-old patients with type 2 diabetes (Grundy et al., 2019). Three questions were included regarding the number of patients in terms of percentages in initiating and sustaining statin therapy and the patients' most common reason for non-adherence.

At the same time, the ordered statin prescription, actual adherence to the prescriptions, and any reasons for non-adherence were evaluated in patients. This was accomplished through a mixed method of quantitative and qualitative surveys over two months, from October 22nd to December 20th, 2024. Survey questions were adapted from the literature review and the MMAS-8 medication adherence questionnaire. The patient consent form developed by the project team was attached to the survey for patients' voluntary consent. The survey timeline, the survey, and consent forms were reviewed with the front desk team before initiating the project. The input from the front desk staff was considered by providing simple verbiage to guide them when communicating with patients. The DNP student instructed medical assistants in person, followed by email reminders to clarify the process.

The first question asked if the patient had been prescribed a statin. If the patient had not been prescribed a statin, they were directed to stop taking the survey after the first question. The second part

of the question was adapted from the MMAS-8 medication adherence questionnaire to evaluate statin adherence. The level of statin adherence, high, medium, and low, was calculated based on MMAS-8 scoring (Krousel-Wood et al., 2009). The third question assessed why patients did not take the statin regularly. The DNP student monitored the process weekly to ensure the needed improvement and the success of the implementation. The ASCVD prevention benefit of statin was interpreted based on the level of adherence from Grover & Oberoi's (2020) findings for the recommendation to the providers.

Measures

The primary outcome measures of this project were the percentage of statin prescriptions presumably written by providers, their presumptive percentage of patient adherence, and the perception of the types of barriers to adherence compared to the actual status of the patients. The types of barriers measured included inadequate knowledge, side effects, forgetfulness, lack of medication benefits, cost, access to healthcare, and polypharmacy. The secondary measure was the level of patient adherence stratified as high, medium, or low, based on MMAS-8 scoring. Balancing measures for this project included the increased workload and time burden of staff involved. The DNP student evaluated this in the first month by conducting a staff interview during the PDSA cycle review.

Analysis

This quality improvement project was implemented from October to December 2024. The provider data collection was completed directly by the DNP student with the support of the family nurse practitioner. Survey data from the providers were collected through Qualtrics and mainly composed of multiple-choice questions. For patients, the data was collected on paper and composed of yes or no and multiple-choice questions. The data was exported into Excel and analyzed with the assistance of a biostatistician. Although the sample size of 10 providers and 18 patient respondents was too small to evaluate for meaningful statistical significance, providers' perceptions and the actual patients' status on statin initiation and sustaining adherence were analyzed based on the results.

The percentage of patients initiated on a statin was calculated based on the total number of patients with type 2 diabetes screened with the survey. The adherence rate was calculated based on the number of patients with the MMAS-8 score $\geq$ 6 versus the total patients initiated on the statin. The level of medication adherence was calculated based on the scores: high adherence (score 8), medium adherence (score 6-7), and low adherence (score < 6). The correlation and trends in the common barriers to statin adherence were analyzed based on the identified reasons stated by the providers and patients. The survey and reporting tools did not collect patient demographic information.

Ethical Considerations

The ethical considerations of this project included deidentification of patient information and the privacy of patients' medical records. No identifiable patient information was used for data collection. Patients' autonomy was respected by explaining the project and that their care would not be impacted by the decisions they make for participation in the project. A consent form at the 8th-grade reading level was prepared for the patients to sign if they were willing to participate. All the collected deidentified patient data were electronically saved in a password-protected and encrypted file in a locked computer. Clinic involvement in this project was voluntary. Providers at the clinic were informed of the quality improvement project, and the clinic consented to the project by signing a letter of support. This project was submitted to the Oregon Health & Science University Investigational Review Board for approval. The permission to use MMAS-8 (Morisky Medication Adherence Scale 8 item U.S. Reg. No. TX-8-632-533) was granted from Donald E. Morisky, the original developer and lead co-author of the MMAS adherence tools. The author has no conflict of interest involved in undertaking this QI project.

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Results

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Ten out of 13 providers, including physicians, physician assistants, and nurse practitioners from the clinic, responded to the provider survey. Seventy percent of the providers who participated in the survey estimated that they had prescribed a statin in 71-90% of their 40 to 75-year-old patients with

type 2 diabetes (see Figure 1A). Regarding adherence, 60% of providers estimated that 71-90% of

patients continued adhering to a statin (see Figure 1B). Among the reasons for non-adherence,

"experiencing side effects" and "awareness/concern of side effects" were identified as the first and

second most common reasons, gaining 29.6% and 25.9% of total responses. "Inadequate/poor

knowledge of statin benefit" and the "lack of perceived benefits" ranked third and fourth with 18.5% and

14.8% responses, respectively, followed by "inadequate access to health care" and "forgetfulness"

among six identified reasons for statin non-adherence.

Figure 1

Primary Care Providers' Estimated Prescription & Patients' Adherence to a Statin
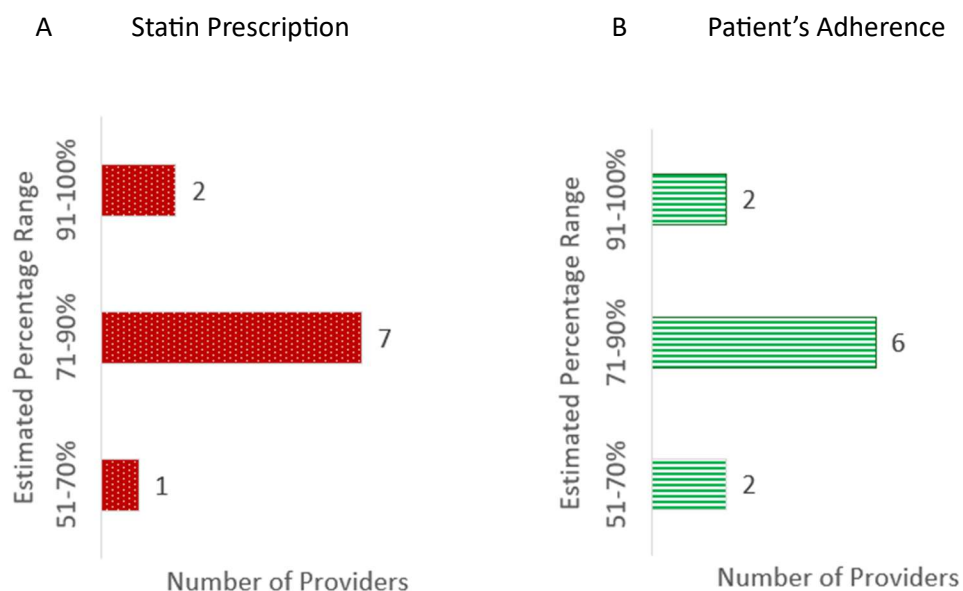

Note. Panel A: 7 out of 10 primary care providers estimated that they prescribed a statin in 71-90% of

patients. Panel B: 6 out of 10 primary care providers estimated that 71-90% of patients continued

adhering to a statin.

Eighteen type 2 diabetes patients consented and took the survey. 67% (12 patients) responded

that they had been prescribed to take a statin, while 33% (six patients) stated no (see Figure 2). Eleven of

the 12 patients on a statin completed the MMAS-8 medication adherence questionnaire. When categorizing the level of adherence, five patients were in high adherence, another five were in medium adherence, and only one patient ended in the low adherence category with an MMAS-8 score below 6 (see Figure 3). The calculated statin adherence rate based on the number of patients scored $\geq$ 6 resulted in 90.9%.

Figure 2

Status of Statin Therapy in 40 to 75-year-old Patients with Type 2 Diabetes
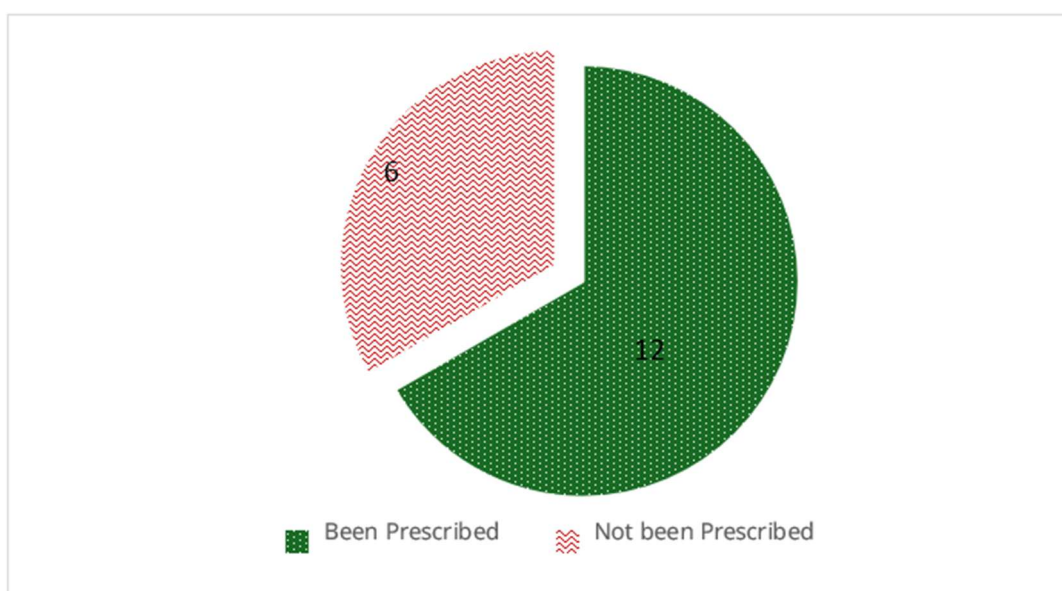

Note. Six out of 18 patients (33%) answered that they were not prescribed to take a statin. Twelve out of 18 patients (67%) responded that they had been prescribed to take a stain.

As an explanation for the reasons for non-adherence, one patient in the medium adherence category chose, "I'm being forgetful." However, three patients from this group chose "not relevant" to state they are taking a statin regularly. The patient with low adherence wrote to explain, "My previous doctor said my cholesterol goes up and down. I don't need it if I change my lifestyle." While it was not mandatory, two out of five patients who had not been prescribed a statin continued to answer this question anyway and chose "I do not think statin medication is necessary" out of the identified reasons.

Figure 3

Status of Statin Adherence Based on MMAS-8 Scoring in 40 to 75-year-old Patients with Type 2 Diabetes.
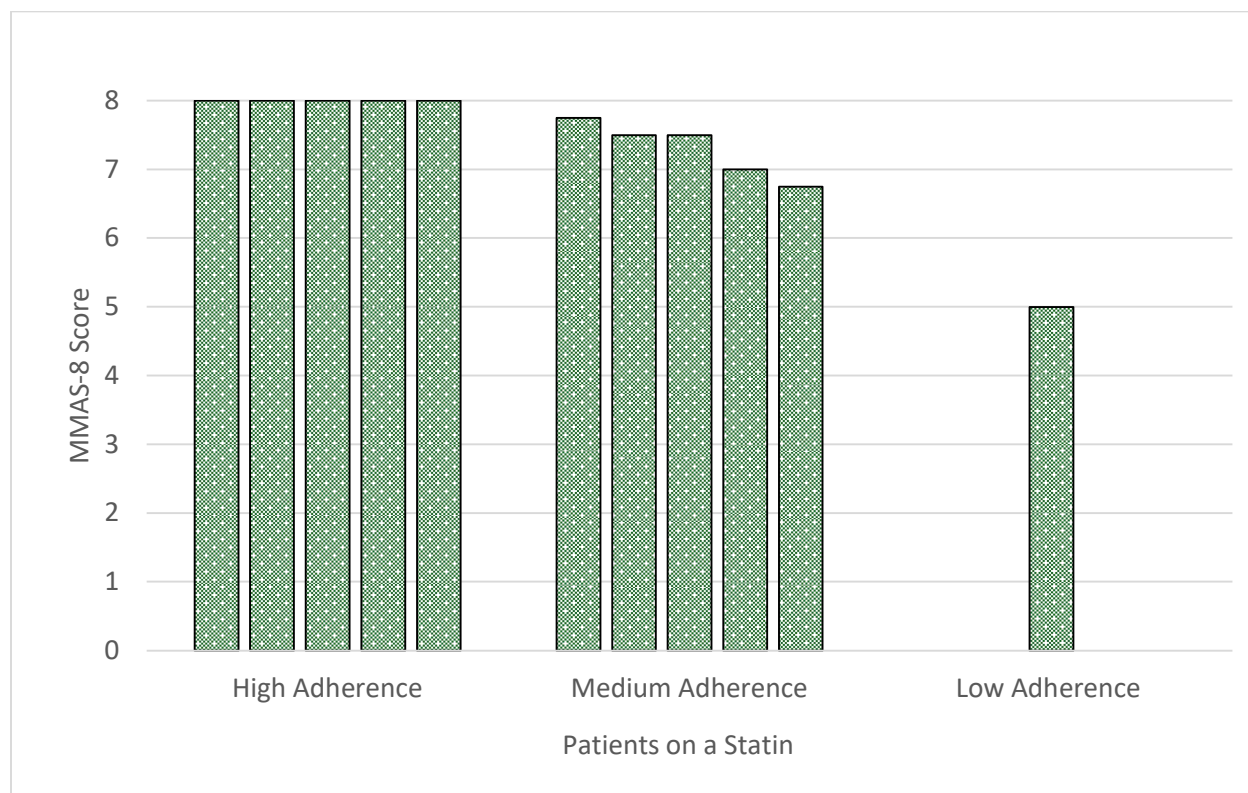
Note. A high statin adherence with an MMAS-8 score of 8, medium adherence with scores below 8 to 6, and low adherence with a score below 6.

Discussion

Summary

Based on the findings, the actual statin prescriptions written for 40 to 75-year-old patients with type 2 diabetes were lower than the majority of the providers' estimation. However, based on the MMAS-8 scoring, the patient adherence rate correlated with the providers' estimated range of statin adherence. This project aimed to evaluate non-adherence to statins, but these findings indicated that providers were not prescribing a statin as recommended. Additionally, while providers are primarily concerned about the side effects of statins as the common barrier to adherence, the explanation of the patient from the low adherence category reflects the inadequate knowledge of the benefit of statins as

an issue. While the patient survey was not structured to explore additional information in patients who are not on a statin, two voluntary responses from the patients who were not being prescribed a statin again reflected inadequate knowledge of the benefit of a statin as a potential barrier to overcome in initiating a statin.

Therefore, the findings from this data reflected similar results in clinician and patient factors contributing to the suboptimal usage of statins, as stated in Desai et al. (2023). The findings were consistent with the literature, which showed poor awareness of the statins' benefits and inadequacy of patient knowledge is more significant in primary prevention since patients have not experienced prior cardiovascular events (Sigglekow et al., 2020; Zhao et al., 2020). While the side effect of a statin could be one possible barrier, the findings highlighted the need to improve patient knowledge, thus the important role of the provider to be more proactive in understanding individual patient-related concerns in initiation and sustaining the benefit of a statin in primary ASCVD prevention of type 2 diabetes patients.

Limitations

The main limitation of this study is the small sample size representing providers and patients. This makes the statistical comparison between the providers' perceptions and the patients' data impractical. Patients' eligibility when screening patients at routine check-in was also challenging. This additional screening question at check-in impacted the number of patients participating in the survey and the workload of the front desk team.

Conclusions

Despite guideline recommendations to initiate moderate-intensity statin therapy in 40 to 75 year-old patients with type 2 diabetes, the findings of this quality improvement initiative indicated suboptimal statin usage by the clinicians. This project evaluated the primary care clinicians' perceived awareness and the clinic patients' status on statin initiation, sustaining adherence, and the most common reasons for non-adherence in patients with type 2 diabetes to improve primary ASCVD

prevention. The findings indicated that a statin adherence of 90.9% in patients reflected most providers'

estimated range. However, the actual statin prescription, 67%, was lower than the providers' estimated

range. While most providers are concerned about side effects, patient responses indicated that

inadequate knowledge of the benefits of statins was an issue, even among patients who were not being

prescribed a statin. Therefore, this project's findings highlighted the clinicians' need to improve statin

prescription as recommended by the guidelines and to improve patients' awareness of the benefits of

statins. Suggestions and recommendations based on the findings of this project have been shared with

the primary care clinicians at a monthly providers' meeting. Improving clinicians' adherence to guideline

recommendations and implementing appropriate patient-centered strategies to improve patients'

knowledge of the benefits of a statin could be the next step in improving primary ASCVD prevention in

patients with type 2 diabetes.

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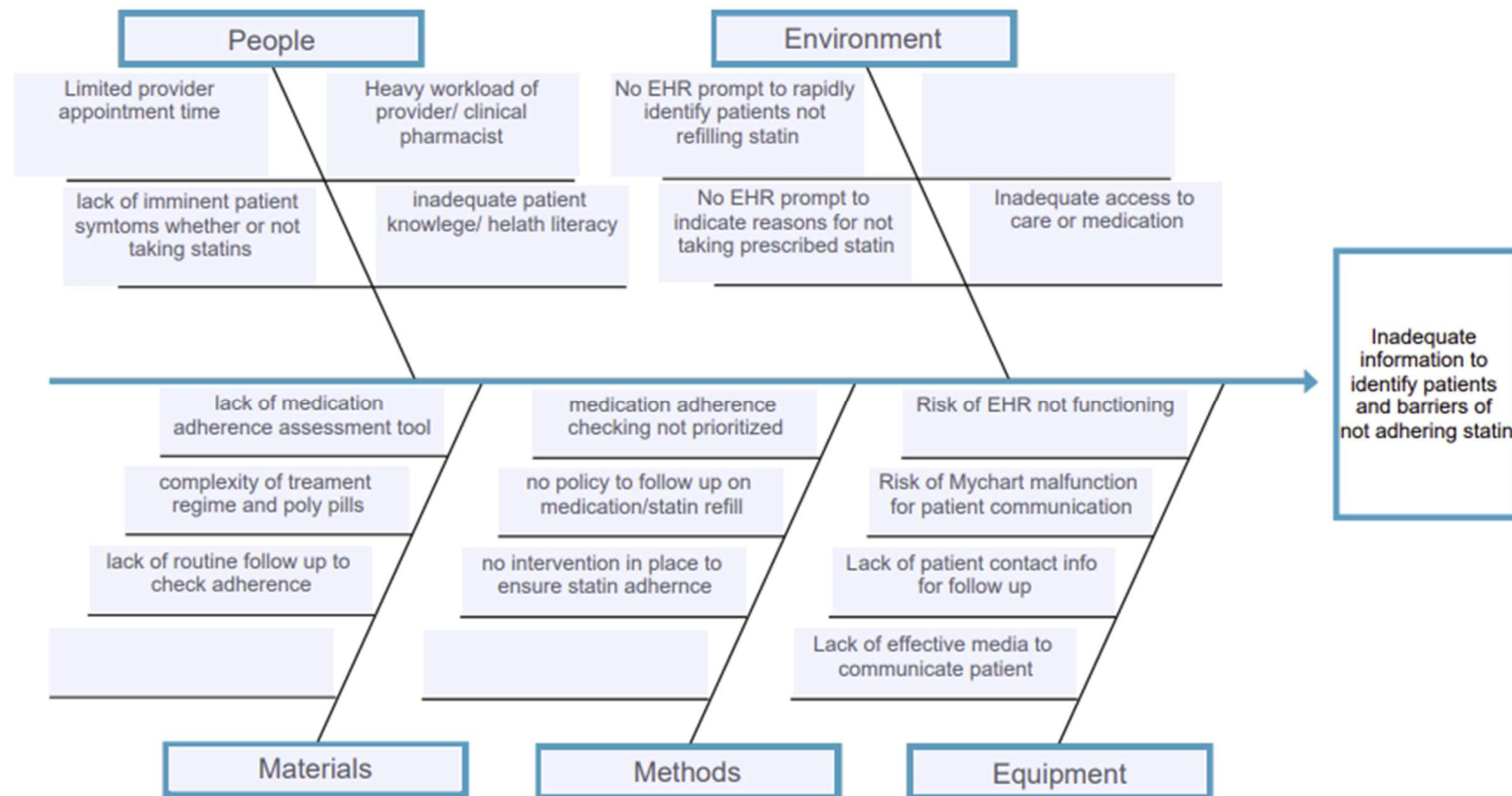https://doi.org/10.1186/s12872-020-01566-2

Appendix A

Morisky Eight-Item Medication Adherence Scale (MMAS-8)

	YES	NO
1. Do you sometimes forget to take your medication?		
2. People sometimes miss taking their medications for reasons other than forgetting. Over the past 2 weeks, were there any days when you did not take your medication?		
3. Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse when you took it?		
4. When you travel or leave home, do you sometimes forget to bring your medication?		
5. Did you take all your medication yesterday?		
6. When you feel like your symptoms are under control, do you sometimes stop taking your medication?		
7. Taking medication every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
8. How often do you have difficulty remembering to take all your medication? Never/Rarely……………............ Once in a while…………….... Sometimes……………………. Usually……………………… All the time…………………..		

Adherence, From *Adherence*, (2006), https://adherence.cc/. ©MMAS 2006. Reprinted with permission.

Appendix B

Cause and Effect Diagram

People

Limited provider appointment time

Heavy workload of provider/ clinical pharmacist

lack of imminent patient symtoms whether or not taking statins

inadequate patient knowlege/ helath literacy

Environment

No EHR prompt to rapidly identify patients not refilling statin

No EHR prompt to indicate reasons for not taking prescribed statin

Inadequate access to care or medication

lack of medication adherence assessment tool

complexity of treament regime and poly pills

lack of routine follow up to check adherence

medication adherence checking not prioritized

no policy to follow up on medication/statin refill

no intervention in place to ensure statin adhernce

Risk of EHR not functioning

Risk of Mychart malfunction for patient communication

Lack of patient contact info for follow up

Lack of effective media to communicate patient

Inadequate information to identify patients and barriers of not adhering statin

Materials

Methods

Equipment

Appendix C: Provider Survey

In your patients diagnosed with Diabetes Mellitus type 2 who are in the age range between 40 to 75 years and do not have any contraindications to taking a statin, approximately how many have you prescribed statin therapy?

○ < 50%

○ 51-70%

○ 71-90%

○ 91-100%

How many of those patients continue adhering to statin?

○ <50%

○ 51-70%

○ 71-90%

○ 91-100%

In patients who are not adhering to statin as prescribed, what are the most common reasons for non-adherence? You may choose more than one answer.

- ☐ inadequate/ poor knowledge of the benefits of statin
- ☐ experiencing side effects
- ☐ awareness/ concern about potential side effects
- ☐ forgetfulness
- ☐ lack of perceived medication benefit
- ☐ cost
- ☐ inadequate access to healthcare
- ☐ polypharmacy
- ☐ other (please specify)

Appendix D: Patient Consent & Survey

Informed Consent for Quality Improvement Program

We are asking you to participate in the quality improvement project. We want to learn more about how to help people with type 2 diabetes. This project will help us understand whether patients with type 2 diabetes are taking prescribed lipid-lowering medication (*For example, Atorvastatin (Lipitor), Rosuvastatin (Crestor), Simvastatin (Zocor), Fluvastatin (Lescol), Lovastatin (Mevacor), Pitavastatin (Livalo), Pravastatin (Pravachol) etc.*) and if not, why.

Your participation is entirely voluntary. If you decide not to participate, please rest assured that no one will treat you differently. The care you receive from your provider will remain the same, as we value your right to non-discrimination.

If you agree to participate, please sign this document. We will then provide you with a form containing questions to answer, which will take about 5 minutes.

Your survey answers and this document will be locked in our files. We will not put your answers into your medical record. Your answers will be anonymous, and we will not include any identifiable information when sharing the project results.

If you are not a patient with type 2 diabetes between the ages of 40 and 75 years, do not sign the consent, do not take the survey, and please return the paperwork to the medical assistant or front desk.

I agree to participate in the quality improvement project by answering the survey.

_____

Name   Date

_____

Signature

Please take this survey if you are a type 2 diabetes patient between the ages of 40 and 75. This is intended to be a completely anonymous questionnaire. Do not write your name or sign on this piece of paper.

1. Have you been prescribed to take a cholesterol or lipid-lowering medication commonly known as a Statin? *For example, Atorvastatin (Lipitor), Rosuvastatin (Crestor), Simvastatin (Zocor), Fluvastatin (Lescol), Lovastatin (Mevacor), Pitavastatin (Livalo), Pravastatin (Pravachol) etc.*

    ☐ YES   ☐ NO

If you select YES, proceed to the next question. If you select NO, stop here.

2.	YES	NO
Do you sometimes forget to take a Statin?	☐	☐
People sometimes miss taking their medications for reasons other than forgetting. Over the past 2 weeks, were there any days when you did not take your Statin?	☐	☐
Have you ever cut back or stopped taking your Statin without telling your doctor/provider because you felt worse when you took it?	☐	☐
When you travel or leave home, do you sometimes forget to bring your Statin?	☐	☐
Did you take all your Statin yesterday?	☐	☐
When you feel like your symptoms are under control, do you sometimes stop taking Statin medication?	☐	☐
Taking medication every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?	☐	☐

How often do you have difficulty remembering to take your Statin? **Choose one answer only.**				
Never/rarely	Once in a while,	Sometimes	Usually	All the time
☐	☐	☐	☐	☐

3. Please check the statements that match with you to explain why you cannot take Statin regularly. **You may choose more than one answer.**

☐ I do not think statin medication is necessary.   ☐ I'm having side effects

☐ I'm concerned about side effects   ☐ I cannot afford it

☐ I do not see any health benefit to taking it   ☐ I'm just being forgetful

☐ I have a problem accessing/ getting the medication.   ☐ I have too many medications to take

☐ Not relevant. I'm taking my statin medication regularly

☐ Other: can you explain why you are not taking your statin as prescribed?

_____

Adherence, Adapted from *Adherence*, (2006), https://adherence.cc/. ©MMAS 2006. Adapted with permission.

Appendix E

Project Timeline

	July-Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Finalize project design and approach (703A)	X							
Complete IRB determination or approval (703B)		X						
PDSA Cycle (703B)			X	X	X			
Final data analysis (703B)						X		
Write sections 13-17 of final paper (703B)							X	X
Prepare for project dissemination (703B)								X