

Review Article

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A Review on Medication Adherence in Post-Myocardial Infarction Patients

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ABSTRACT

Medication adherence is extremely low among post-myocardial infarction patients worldwide. Despite significant improvements in diagnosis and treatment, Globally, acute myocardial infarction continues to be a leading cause of mortality and morbidity. It presents society with significant therapeutic challenges. Enhancing medication adherence is a vital but frequently mysterious goal for healthcare professionals, patients, and the system as a whole. Improved health outcomes, lower healthcare costs, and higher patient satisfaction ratings costs can all result from improved medication adherence. There are several articles that show the advantages of medication adherence in terms of safety, cost, quality of life, or outcome, but there aren't many studies that evaluate the best approaches to seamlessly integrate policies and tools meant to promote medication adherence. An overview of medication adherence in individuals recovering from myocardial infarction is provided in this review study. The researcher focusing on medication adherence would greatly benefit from this comprehensive review paper.

Keywords: Myocardial infarction, medication adherence, Pharmacotherapy, Medication Compliance, Healthcare Interventions.

INTRODUCTION

The purpose of the study was to assess how a structured intervention affected medication “adherence”.in patients following acute coronary syndrome (ACS). Utilizing a randomized control design, 300 patients were enrolled and evenly split into Intervention and Standard Care (Control) groups. This updated report includes detailed follow-up data at discharge, 6 months, and 9 months, aligning the structure and interpretation on adherence to pharmacotherapy for secondary prevention of CHD.

Numerous subjective and objective methods can be used to evaluate adherence. Subjective measurements include self-reported adherence and evaluations from family members, doctors, and caretakers. Using established techniques, doctors can assess patient adherence during normal clinical visits. Electronic monitoring, pill counts, refill records, directly witnessed therapy, serum drug concentration monitoring, and the use of biological markers or tracers are examples of indirect, objective indicators of adherence. The most popular of these are administrative claims because they make it possible to calculate metrics like medication possession ratios, which track how many days a patient has access to a supply of medication over a given period of time. It is generally accepted that a patient is completely compliant when they have access to their medication for at least 80% of the days.[2].

Medicine adherence is The degree to which a “patient takes” their prescription as directed or course of action as directed. It includes tasks like understanding the instructions, remembering to take medication on time, and filling prescriptions. “Medication adherence is essential for the” management of chronic conditions, the treatment of acute illnesses, and the improvement of health outcomes. The majority of the time, faithfully following a doctor's prescription is a critical first step toward healing from acute or chronic illnesses, but patients frequently aren't

aware of the potential risks associated with inconsistent adherence. The effectiveness of some effective therapies that are known to treat a wide range of conditions can be impacted by patient inability to follow their prescriptions, and drug development might result from passive compliance.resistance that necessitates of treatment modifications. It was discovered that over half of the medications prescribed for patients with long-term health issues like diabetes and “hypertension were not taken as” directed. Adherence is crucial, because it can help clinicians successfully supervise patient evidence-based treatment [3].

A major public health concern is medicine's failure to follow evidence-based recommendations. Long-term noncompliance with recommended medications is estimated to affect up to 80% of patients, leading to considerable disease progression, death, and increased health care costs [4].

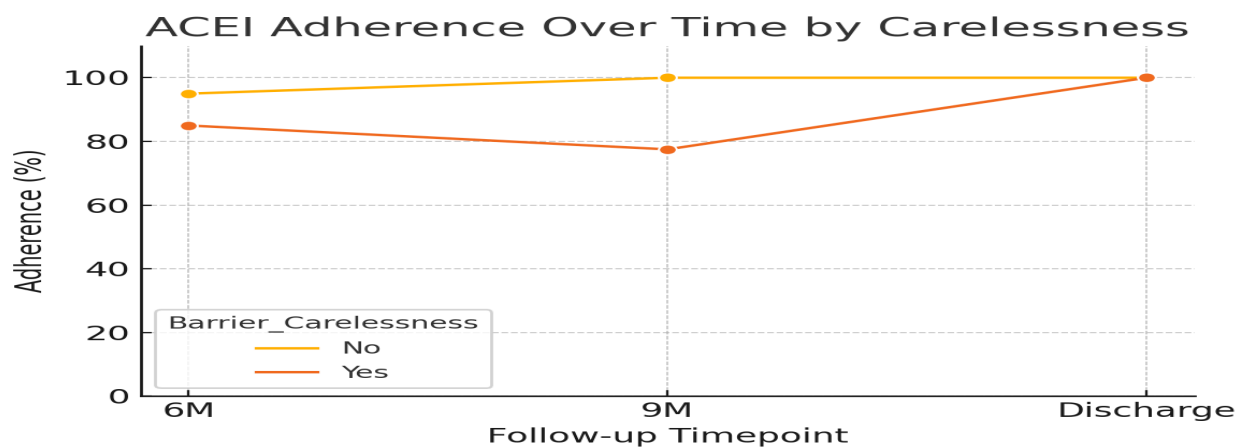
When a patient takes prescribed drugs at the times and dosages that a healthcare professional recommends and that the patient has agreed upon, the patient is said “to be adhering to their medication regimen.”⁹ The word "compliance," which denotes patient passivity in adhering to the prescriber's advice, is being abandoned by the health care community as it embraces the ideas of patient centredness and activation [5]. Coronary artery disease (CAD) is the leading cause of morbidity and mortality in the United States.In 2009, there were more than 1.5 million cases of acute myocardial infarctions (AMI), resulting in direct and indirect healthcare costs exceeding \$500 billion [6].

For the secondary prevention of adverse cardiovascular events, the American Heart Association (AHA) and American College of Cardiology (ACC) have recommended beta-blockers, adenosine diphosphate (ADP) receptor blockers, angiotensin-converting enzyme (ACE) inhibitors, statins or angiotensin II receptor blockers (ARB), and aspirin as Class I recommendations events. A substantial body of evidence supports these interventions.

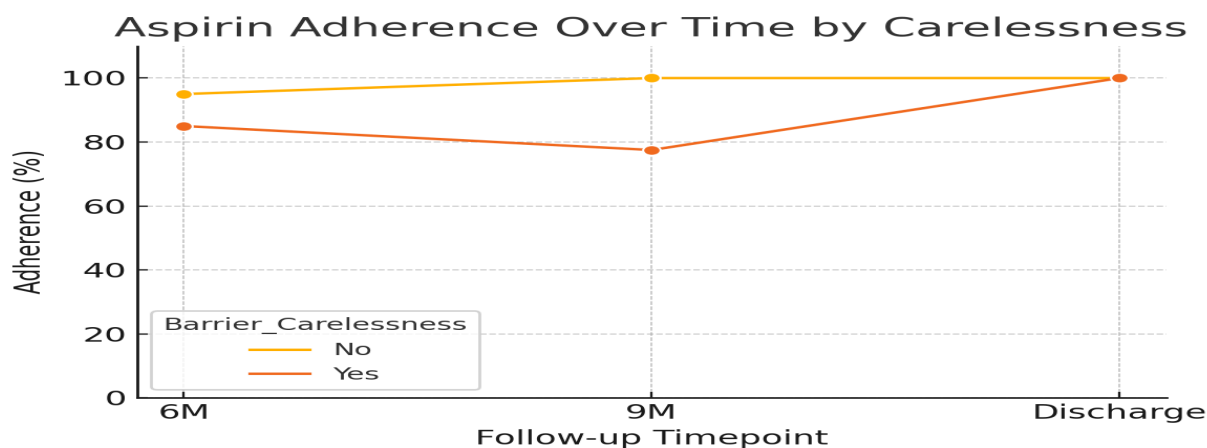
It is estimated that the 50% depletion in CHD mortality over the previous 20 years can be attributed to the use of these guidelines-recommended therapies [7]. It is difficult to overstate the significance of secondary prevention non-adherence given the obvious advantages of guideline-recommended post-myocardial infarction (MI) medications, the prevalence of coronary artery disease, and its financial burden [8].

Adherence over time by barrier-

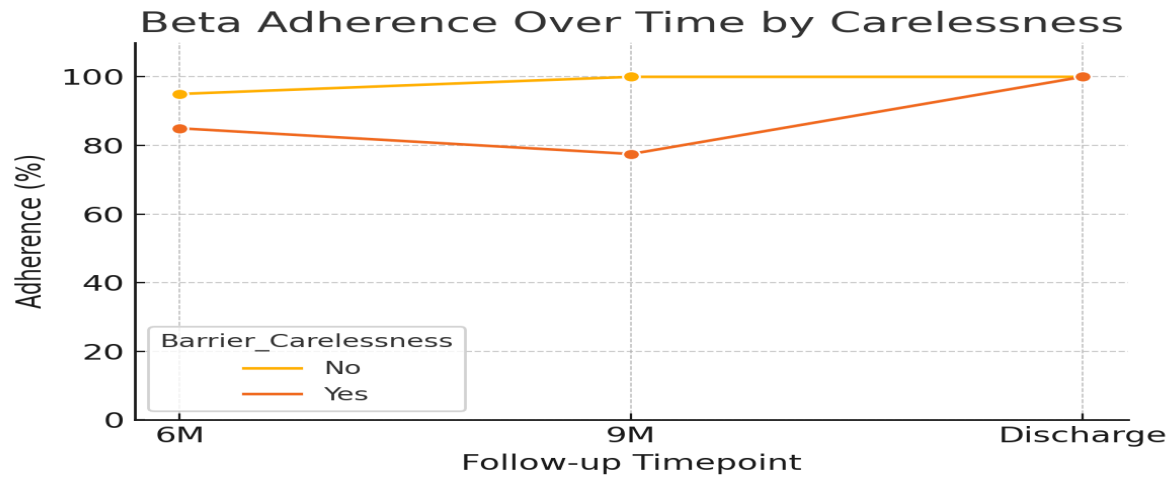
Carelessness, Affordability & Lack of understanding:



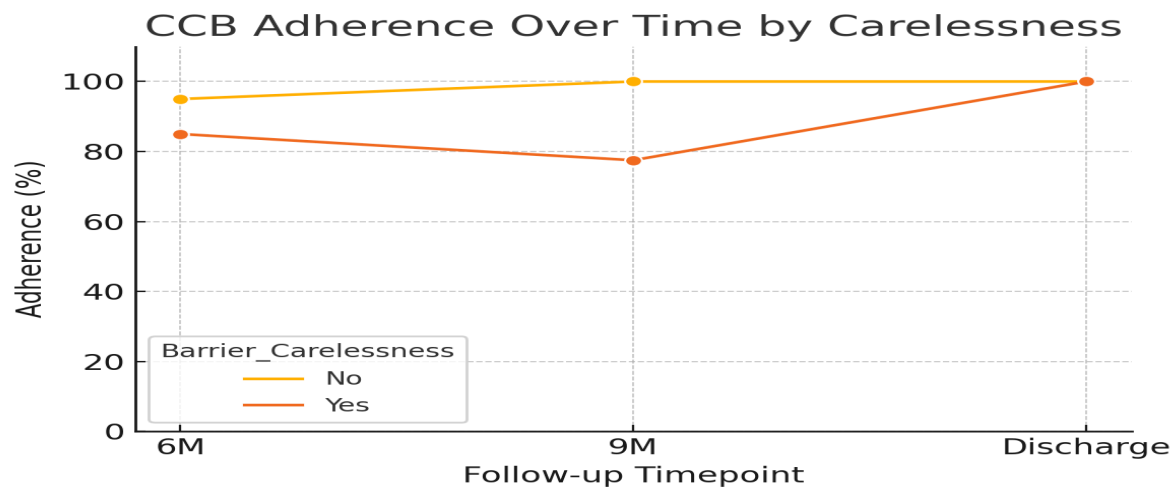
Interpretation: This graph shows how adherence to ACEI changes over time (Discharge, 6M, 9M) based on whether patients had the barrier 'Carelessness'.



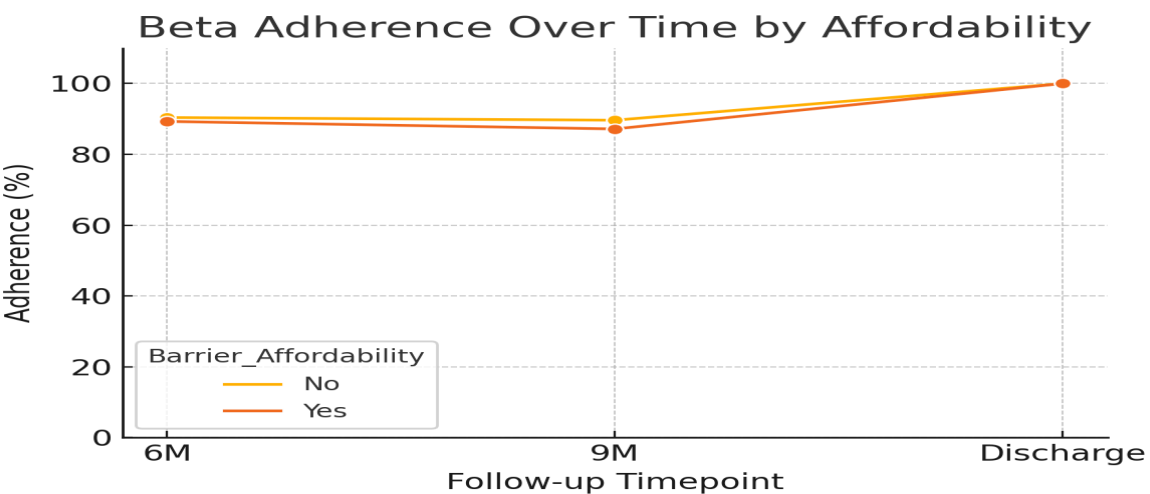
Interpretation: This graph shows how adherence to Aspirin changes over time (Discharge, 6M, 9M) based on whether patients had the barrier 'Carelessness'. Patients without this barrier tend to have higher adherence.



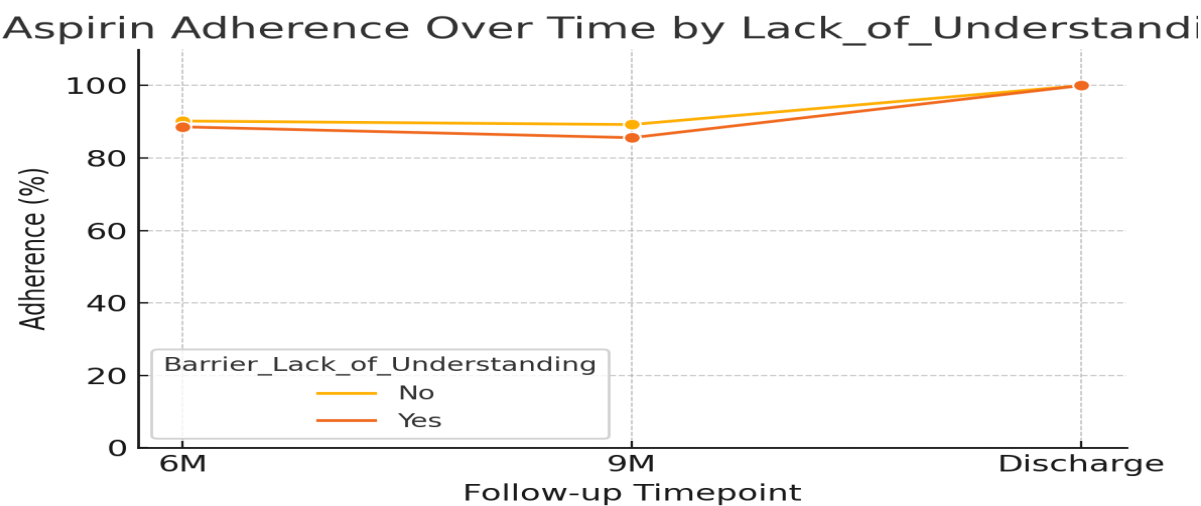
Interpretation: This graph shows how adherence to Beta changes over time (Discharge, 6M, 9M) based on whether patients had the barrier 'Carelessness'. Patients without this barrier tend to have higher adherence.



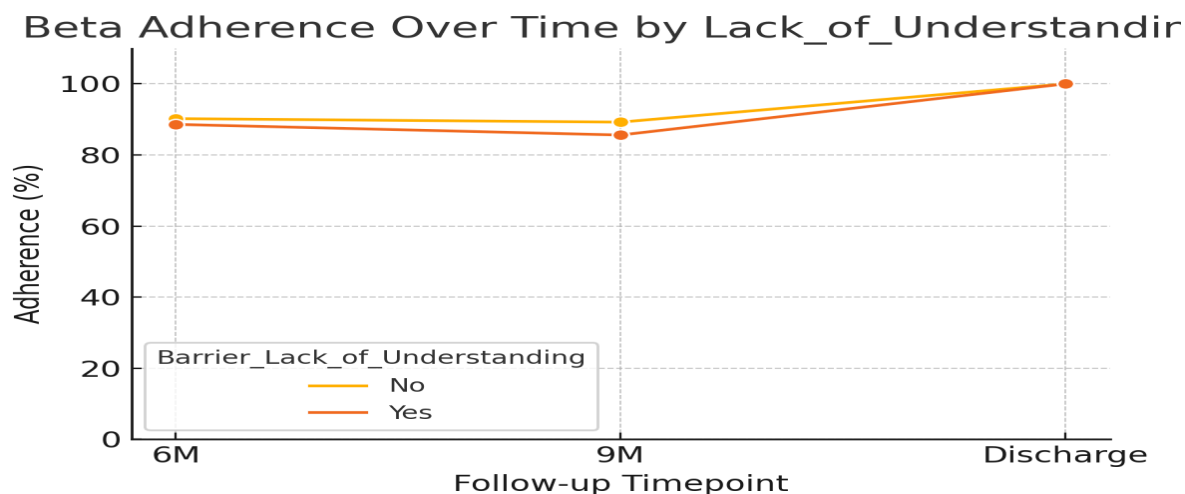
Interpretation: This graph shows how adherence to CCB changes over time (Discharge, 6M, 9M) based on whether patients had the barrier 'Carelessness'. Patients without this barrier tend to have higher adherence.



Interpretation: This graph shows how adherence to Beta changes over time (Discharge, 6M, 9M) based on whether patients had the barrier 'Affordability'. Patients without this barrier tend to have higher adherence.



Interpretation: This graph shows how adherence to Aspirin changes over time (Discharge, 6M, 9M) based on whether patients had the barrier 'Lack of Understanding'. Patients without this barrier tend to have higher adherence.



Interpretation: This graph shows how adherence to Beta changes over time (Discharge, 6M, 9M) based on whether patients had the barrier 'Lack of Understanding'. Patients without this barrier tend to have higher adherence.

We referred some literatures for this investigatory review and collected comprehensive details on medicine adherence in patients who had a myocardial infarction which has been discussed below:

Madhu Giri, Rajani Shakya et. al., published an article in 2023 on **medicine adherence** in Patients Following Myocardial Infarction at the National Heart Institute Shahid Gangalal. The SGNHC in Nepal was the site of a single-center prospective research.

Six weeks after their release, the enrolled patients were seen in an outpatient department (OPD) visit for follow-up in Six weeks after their discharge. To determine medicine adherence, The Morisky Green Levine (MGL) adherence scale questionnaire was used to interview patients.

Taking the “medication” is very important in controlling the disease “such as high blood pressure” for the successful management of the condition. It has been found in one of the

reviews that up to 40% of patients have been shown to be noncompliant with their prescribed anti-hypertension medications globally. Non-adherence to the medication has been associated with the development of CVD, myocardial infarction, stroke, kidney impairment, and mortality in general [11]. The individuals taking medication adherence are more likely to benefit in terms of improved health status, fewer complications and premature deaths, and reduced healthcare service utilisation like emergency visits and inpatient care. The adverse effects of Premature deaths and increased use of medical resources are two consequences of medication non-adherence. Research indicates that it results in almost “200,000 premature deaths and EUR 125 billion” yearly expenditure by European countries on additional healthcare resources “(European Council Policymakers Debate, 2010). In the United States, it costs about USD 105 billion in” extra cost related to hospital stays only. This does not include other additional costs such as long-term care, diagnostic tests and pharmacy cost due to escalation of therapy [12].

This increase in the probability of being hospitalised from poor health outcomes results in substantial additional cost implications. There are substantially high annual healthcare costs in individuals who suffer from chronic illnesses with low medication adherence. In the case of diabetes, those patients who have “low levels of” medication “adherence have” significantly high “annual healthcare cost of USD 16,498,” more than double that of good adherents of USD 8,886. In addition, Roebuck’s research indicates that annual per person cost savings from good adherence were USD 7,823 for congestive heart failure, USD 3,908 for hypertension, USD 3,756 for diabetes, and USD 1,258 for hyperlipidaemia [13-14]. MI is widespread because it increases the risk of death and other consequences. This study revealed that the patients had a high level of drug adherence [15].

Medication adherence was not substantially correlated with ADR. The study comprised 134 patients in total. According to the study, 92.5% of post-MI patients adhere to their treatment

regimen highly, 5.5% adhere to it moderately, and 2.2% adhere to it slightly. Mathews Robin and colleagues conducted a same trial and found that, six weeks following their MI, only 71% 25% of patients were moderately adherent, 4% were marginally adherent, and a large percentage of patients were very adherent to their medicine. Adherent patients are more likely to have follow-up appointments before to discharge, have been informed about the adverse effects, and participate in regular activity after discharge [16].

The counselling provided by the medical personnel before the patient's discharge can be blamed for the high level of adherence noted in this study in particular. The patients were counselled on diet, taking medication regularly, doing exercise, and following up thoroughly at the first and sixth weeks after discharge. 50.4% post-MI medication adherence reported in previous studies revealed that medication adherence was lower in other countries compared to the present study [17]. It might be because of the limitations of their study, which measured medication adherence solely using self-administered questionnaires. The bulk of the patients in the current study (44.8%) were house workers from lower socioeconomic classes and illiterate, which was comparable to a study done at Dhulikhel Hospital by Gurung RB and colleagues. They found that ischemic heart disease was more common in low socioeconomic groups, with 40% of people living in urban areas and 60% in rural ones [18].

The increased proportion of patients from lower socioeconomic classes and families in the current study may be caused by a lack of routine health examinations, which may reflect a lack of resources and awareness [19]. A lower socioeconomic status is frequently linked to a health-damaging lifestyle that influences smoking and physical activity behaviors in addition to the development of bad food habits [20]. In wealthy nations, low socio-economic status is linked with higher mortality and cardiovascular disease rates. Since cardiovascular illnesses are more prevalent in low-income and middle-income nations, it is uncertain if the same link

exists there. The correlation between cardiovascular health and socioeconomic level has shown inconsistent findings. Determining the type of correlation between cardiovascular disease and socioeconomic position in low- and middle-income nations and identifying why such a relationship exists is important to formulate effective strategies to tackle health inequalities. But socio-economic status is a complex issue that relates to both economic sufficiency and education. Therefore, the impact of socio-economic status on cardiovascular disease could be different depending upon the situation [21].

Patients from low socioeconomic backgrounds may take different medications depending on their monthly income. Medication adherence may also be directly impacted by a job that has an extremely demanding schedule. The most frequent adverse drug reaction (ADR) linked to ACE inhibitors was dry, persistent cough. In the current investigation, there was no significant correlation found between ADR and medication adherence. The study by Palaniappan Muthiah et al. found that the most prevalent adverse drug reactions (ADRs) with aspirin and enalapril were gastritis (20.7%) and dry persistent cough (18.4%) [22].

The study comprised 134 patients in total. According to the study, 92.5% of patients who had a MI adhered to their drug regimen. Medication adherence was not substantially correlated with ADR. Patients took their medications very well, and there was no discernible difference in the impact of ADR on medication adherence. This effort will establish a foundation for future research on long-term medication adherence in people who have had myocardial infarction. Long-term discovery of additional ADRs would assist medical professionals in identifying various ADR subtypes and medication interactions, which are still lacking in underdeveloped nations like Nepal [23].

Nadia Mohamed Taha and Osama Salah Mansour Awad et. al., was published an article in 2022 “on Medications Adherence for Patients with Myocardial Infarction.”

It is vital “for patients with myocardial infarction” to take the recommended drugs as prescribed since doing so will save them from any fatal effects or complications that may arise. The main Measuring the level of medication adherence in individuals with myocardial infarction was the study's goal. The investigation was carried out at the outpatient cardiac clinics of Zagazig University Hospitals in Egypt. The sample size of the study comprised one hundred patients with MI. Two instruments were used in the study; Tool I included the use of an interview questionnaire, which would help to collect demographic and medical information of the selected patients, while Tool II consisted of a medication and refill adherence scale. Based on this study, it was found out that 65% of the study sample was male with an average age of 58.75 ± 10.4 , 70% had an education, 87% had low incomes, 52% smoked, and the average annual duration of the illness was 4.2 ± 3.5 . of patients suffered from hypertension, 65% of patients were diabetic, 50% followed up the outpatient clinic every 82% of the patients took their cardiovascular medications as directed for three months or less (mean $\pm$ SD: 21.66 ± 5.4). The study's MI patients took their cardiac meds as prescribed. Medication adherence was correlated with factors such as gender, education level, and length of illness [24].

Łukasz Pietrzykowski Piotr Michalski et. al. published an article in 2020 on Determinant of medicine adherence in patients after myocardial infarction.

One major obstacle to long-term treatment following myocardial infarction (MI) is patient non-adherence to recommended medication, which can have negative effects on health, the social and economic spheres. Enhancing medicine adherence is a challenge for medical professionals. Enhancing drug compliance presents a difficulty for medical professionals. The purpose of this study was to assess the types of adherence variables and how medication adherence varied. patients had at the time of follow-up following myocardial infarction.

This single-centre, cohort observational study included 225 consecutive patients who met the inclusion requirements and were admitted to the University Hospital No. 1 in Bydgoszcz, Poland's Department of Cardiology and Internal Medicine due to MI, between May 2015 and July 2016. Two twenty-five post-MI patients, aged 30-91, who were “treated with primary coronary intervention (PCI) (27% women and 73% men),” participated in the study. Based on completed prescription data from the National Health Fund, The availability of assessed drugs within a year of hospital discharge was considered adherence. Only paid drugs were included in the study of treatment plan realisation. “(adherence” to medicine given at hospital discharge): statins (atorvastatin, rosuvastatin, simvastatin), P2Y12 receptor inhibitors (clopidogrel), and ACEIs (ramipril, perindopril). 80% or above was considered sufficient adherence.

All three medication classes had $64 \pm 25\%$ adherence at 1-year follow-up: $64 \pm 32\%$ for statins, $62 \pm 34\%$ “for P2Y12 receptor inhibitors, and $67 \pm 32\%$ for” ACEIs. Adherence was found to have gradually decreased “from $65\% \pm 26\%$ in the first quarter of follow-up to $51\% \pm 34\%$ in the last quarter ($p < 0.00001$).” During the complete follow-up period, only 29% of patients had sufficient adherence for all drug classes (44% for ACEI, 41% for statins, and 36% for P2Y12 receptor inhibitor). A multivariate analysis revealed that drug adherence was independently predicted by age, past CABG, education level, place of residence, marital status, and economic position. Patients who were over 65 or had a history of previous CABG were more likely to have inadequate medication adherence, whereas married Patients who live in cities, have greater levels of education, and have hypertension levels were more likely to have adequate drug adherence.

After a For all significant drug classes, adherence to medication decreases with time following myocardial infarction. Over time, a number of clinical and socioeconomic factors

have been shown to influence medication adherence [25]. Following a myocardial infarction (MI), patients are treated for the long term by following a therapeutic plan that includes medication and lifestyle modifications [26-28].

According to the European Society of Cardiology's guidelines, patients with acute myocardial infarction should be treated with beta-blockers, statins, dual antiplatelet therapy (DAPT) for a year, angiotensin-converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB) if ACEI is contraindicated, and other medications [29].

The amount of adherence to medication therapy for preventing coronary heart disease was evaluated in “a meta-analysis by Naderi et al.” involving “20 studies.” The findings demonstrated that adherence was 57% overall over a median treatment period of 24 months, with 66% for secondary prevention studies and as low as 50% for primary prevention studies [30]. Thirty days after being discharged from the PREMIER study, 68 patients (13.6%) with MI stopped taking thienopyridine as antiplatelet treatment.

CONCLUSION

An extensive review of post-myocardial infarction medication adherence was conducted in this review paper. “Adherence to medication following myocardial infarction” can occasionally decline “with time for all” significant medication classes administered after myocardial infarction. Over time, a number of clinical and socioeconomic factors have been found to have an impact on drug adherence. After a myocardial infarction, It is necessary to increase patient adherence to treatment. Research indicates that treatment adherence is enhanced by using contemporary technologies and phone conversation with patients. Evidence currently available shows how crucial it is to increase post-myocardial infarction therapy adherence. patients by utilizing telemedicine for both contemporary applications and phone interventions.

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