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DETERMINANTS OF MEDICATION ADHERENCE IN PATIENTS WITH CARDIOVASCULAR DISEASES: A SYSTEMATIC REVIEW

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Maria Julia Hayakawa Angelo Nascimento[1], Vanessa Cristina de Lima Caparelli Sanches[2], Pedro Girotto Lagreca da Silva[3], Daniel Bonillo Mendonça[4], Thais Prado Cambraia Nascimento[5], Franz Marcos Valdez Vargas[6], Mariana de Fátima Melo[7], Layana Patrícia de Paiva Marques[8], Emerson de Lima Borba[9], Roberta Ticiana Rocha Pontes de Castro[10] and Maíra Ferro de Sousa Touso[11]

ABSTRACT

Introduction: Adherence to treatment of chronic cardiovascular diseases is a multifaceted challenge that involves factors related to the patient, treatment, socioeconomic conditions, and the health system. Non-adherence to treatment contributes to the worsening of clinical outcomes and increases the burden of cardiovascular diseases in the population. Objective: This study seeks to identify and understand the factors that influence adherence to drug treatment of chronic cardiovascular diseases, from the perspective of both the physician and the patient, with the aim of developing effective interventions that promote treatment continuity and reduce complications associated with CVD. Methodology: A systematic review was carried out using PubMed databases. The searches included the descriptors combined with the Boolean term "AND": Cardiovascular Diseases, Medication Adherence, Barriers, Facilitators. A total of 315 articles were found, of which 45 were selected after

[1] Undergraduate student in Medicine at the University of Franca – (UNIFRAN)
E-mail: majuhayakawa@gmail.com
[2] Undergraduate student in Medicine at the University of Franca – (UNIFRAN)
E-mail: vanessa_caparelli@hotmail.com
[3] Doctor from the Catholic University of Brasília (UCB)
E-mail: girotto2009@gmail.com
[4] Graduating in Medicine at Universidade do Oeste Paulista - UNOESTE
E-mail: daniel.bonillo@hotmail.com
[5] Doctor from the University of Nove de Julho - UNINOVE
E-mail: Cambraiamed@gmail.com
[6] Medical Doctor, Universidad Catolica Boliviana
And revalidated by the Federal University of Triângulo Mineiro
E-mail: Franzmarcos14@gmail.com
[7] Doctor from the integrated university center
E-mail: marianamelo9999@gmail.com
[8] M.D., Centro Universitário Facid Wyden (UNIFACID)
E-mail: lpatriciamrqs@gmail.com
Lattes: http://lattes.cnpq.br/9643279493424958
[9] Physician from the Faculty of Medical Sciences of Paraíba
E-mail: emersonarquivos2020@gmail.com
[10] Physician from the Faculty of Medicine of Juazeiro do Norte - CE
E-mail: robertaticianarocha@gmail.com
[11] Guidance counselor
Professor of the Medicine Course at the University of Franca (UNIFRAN);
PhD in Health Promotion (UNIFRAN);
E-mail: mtouso@unifran.edu.br

applying the inclusion and exclusion criteria. Of these, 12 studies were used to compose the collection of the discussion. Results: The results highlight that non-adherence to treatment is influenced by a combination of factors, including lack of understanding of the disease, forgetfulness, lack of family support, concerns about side effects, and issues related to the health system. The doctor-patient relationship is crucial in promoting adherence, with effective communication and shared decision-making playing essential roles. The patient's perception of the severity of the disease and the consequences of non-adherence are also important determinants. Conclusion: Integrated approaches, which include continuous patient education, simplification of treatment regimens, financial support, and facilitated access to health services, are key to improving treatment adherence. Understanding the causes and motivations of non-adherence allows the development of effective interventions that promote continuity of treatment and improve clinical outcomes, significantly reducing complications associated with cardiovascular diseases.

Keywords: Treatment Adherence. Cardiovascular Diseases. Barrier to Membership. Membership Facilitators.

INTRODUCTION

Cardiovascular diseases (CVDs) continue to be a leading cause of morbidity and mortality worldwide, posing a significant challenge to health systems. Medication adherence is critical to successful treatment of these chronic conditions, but several factors can negatively influence this adherence (Krishnamoorthy et al., 2022). Among the main obstacles are the lack of understanding of the disease, forgetfulness, lack of family support and issues related to the health system. On the other hand, factors such as religious and spiritual beliefs, social and community support, and the integration of digital technologies have shown potential to improve treatment adherence (Krishnamoorthy et al., 2022; Rashidi et al., 2020).

Effective communication between doctor and patient is another crucial aspect that can affect medication adherence. Studies show that robust communication helps to establish trust, educate patients about the importance of treatment, and increase the likelihood that they will follow medical recommendations (Zeng et al., 2024). However, some studies have found no significant associations between physician-patient communication and blood pressure control, highlighting the need for personalized approaches and more extensive interventions to improve outcomes (Zeng et al., 2024).

In addition, mHealth interventions have emerged as promising tools to assist in the management of CVDs. Mobile health apps offer support for both patients and healthcare providers by providing medication reminders, educational material, and real-time feedback (Al-Arkee et al., 2021). While the results are promising, more large-scale studies are needed to robustly confirm the effectiveness of these interventions and standardize the essential components that confer effectiveness and usability to mobile apps (Al-Arkee et al., 2021).

Understanding the factors that influence medication adherence in patients with CVDs is essential to develop effective interventions that promote continuity of treatment and improve clinical outcomes. This study seeks to identify and analyze these barriers and facilitators, providing a comprehensive overview on how to optimize adherence to drug treatment in patients with CVDs.

The objective of our article is to identify and understand the factors that influence medication adherence in patients with cardiovascular diseases (CVDs). We seek to analyze both the barriers and the facilitators of this adherence, in order to develop effective interventions that promote treatment continuity, improve clinical outcomes, and reduce complications associated with CVD. We want to provide a comprehensive view of how to optimize adherence to medication treatment, benefiting both patients and health professionals involved in the care of these chronic conditions.

METHODOLOGY

This systematic review aims to understand the main factors that influence medication adherence in patients with cardiovascular diseases (CVD). The objective is to identify the barriers and facilitators that impact adherence to drug treatment and how these factors affect patients' clinical outcomes. To develop this research, a guiding question was elaborated using the PVO (population, variable and objective) strategy: "What are the main factors that influence medication adherence in patients with CVD and how do these factors impact clinical outcomes?"

Searches were performed in the PubMed databases. Three descriptors were used in combination with the Boolean term "AND": Cardiovascular Diseases, Medication Adherence, Barriers, and Facilitators. The search strategy used was: (Cardiovascular Diseases) AND (Medication Adherence) AND (Barriers), (Cardiovascular Diseases) AND (Medication Adherence) AND (Facilitators). From this search, 315 articles were found, which were later submitted to the selection criteria.

The inclusion criteria were: articles in English, Portuguese and Spanish; published in the period from 2018 to 2023, which addressed the themes proposed for this research; and review, observational and experimental studies, available in full. The exclusion criteria were: duplicate articles, available only in abstract form, that did not directly address the proposal studied or that did not meet the other inclusion criteria.

After associating the descriptors used in the searched databases, a total of 315 articles were found. After applying the inclusion and exclusion criteria, 45 articles were selected. Of these, a total of 12 studies were used to compose the collection of the discussion.

RESULTS

Membership Facilitators	Main Collaborations
(AL-ARKEE et al., 2021)	Evaluated the effectiveness of mobile apps in improving medication adherence in patients with CVD, showing that these apps offer meaningful support with reminders and educational material.
(CRUZ-COBO et al., 2022)	Study on the effectiveness of mHealth interventions in controlling cardiovascular risk factors and lifestyle in patients after a coronary event, showing significant improvements in medication adherence and quality of life.
(DUFFY et al., 2021)	It explored communication approaches to improve patient motivation and adherence in the prevention of cardiovascular disease, underscoring the importance of effective doctor-patient communication.
(FUJIWARA et al., 2023)	It evaluated medical telemonitoring in the management of hypertension in elderly patients in Japan, showing improvements in blood pressure control and communication between patients and physicians.
(IHM et al., 2022)	It declared expert consensus on interventions to improve adherence to primary prevention of cardiovascular disease, recommending strategies based on education, social support, and digital interventions.
(KRISHNAMOORTHY et al., 2022)	Qualitative synthesis of patient and provider perspectives on the barriers and facilitators to medication adherence in adult patients with CVDs and diabetes mellitus in India, highlighting the need for personalized interventions and ongoing support.
(LÓPEZ FERRERUELA et al., 2024)	Review on gender inequalities in the secondary prevention of cardiovascular diseases, pointing to the need for more equitable and gender-sensitive approaches to treatment adherence.
(ZENG et al., 2024)	Systematic review on the impact of physician-patient communication on medication adherence and blood pressure control in patients with hypertension, highlighting the importance of effective communication and shared decision-making in improving clinical outcomes.

Obstacles to Adherence	Main Collaborations
(COLLADO-MATEO et al., 2021)	It identified the main factors associated with adherence to physical exercise in patients with chronic diseases, highlighting the importance of social support and motivational strategies.
(KRISHNAMOORTHY et al., 2022)	Qualitative synthesis of patient and provider perspectives on the barriers and facilitators to medication adherence in adult patients with CVDs and diabetes mellitus in India, highlighting the need for personalized interventions and ongoing support.
(RASHIDI et al., 2020)	Review of published qualitative studies on the factors influencing adherence to treatment plans among people with CVD, identifying patient education and social support as crucial factors for adherence.

DISCUSSION

FACTORS THAT HINDER MEDICATION ADHERENCE IN ADULT PATIENTS WITH CARDIOVASCULAR DISEASES (CVD)

Medication adherence is essential for success in the treatment of cardiovascular diseases (CVDs). However, a number of factors can act as barriers, making it difficult for patients to adhere. Let's examine the main challenges.

Lack of Understanding of the Disease: Many patients lack adequate knowledge about the nature of CVDs and the complications resulting from non-adherence to treatment. A lack of understanding about the importance of the medication regimen can cause patients to underestimate the benefits of medications. Without a clear understanding, they may not realize the serious consequences of non-adherence, such as increased risk of cardiac events. Lack of proper education about the disease can result in lax attitudes towards treatment, making patients less likely to follow medical recommendations (Krishnamoorthy et al., 2022).

Forgetting to take medication is a common barrier that affects adherence. Many patients often forget to take their medications regularly, which can be exacerbated by a lack of effective reminder systems. This forgetfulness can be intensified by busy daily routines or a lack of support to remember the correct times to take medications. The absence of an adequate support system, such as reminders via smartphone or assistive devices, contributes to this problem, causing patients to miss important doses (Krishnamoorthy et al., 2022).

Lack of Family Support: Family support is crucial for treatment adherence. When patients do not receive encouragement or assistance from their family members, they may feel unmotivated and isolated. The lack of understanding on the part of family members about the importance of adherence to treatment can result in an environment that does not reinforce the need to strictly follow the medication regimen. Emotional and practical support from the family is critical in helping patients maintain their medication routine (Krishnamoorthy et al., 2022).

Problems Related to the Healthcare System: Issues such as the accessibility and high cost of medicines are significant barriers. In many cases, patients face financial difficulties in acquiring their medicines, especially in low- and middle-income countries. In addition, the lack of adequate infrastructure and the unfavorable attitude of health professionals can discourage patients from following the prescribed treatment. The absence of an efficient and accessible healthcare system can exacerbate these difficulties, resulting in poor adherence to treatment (Krishnamoorthy et al., 2022).

Difficulties in Exercising: Patients with physical comorbidities, such as joint injuries, face limitations in exercising. Symptoms such as fatigue, weakness, and shortness of breath after recovering from cardiac events discourage regular physical activity. In addition, uncertainty about what constitutes safe exercise can lead to inactivity for fear of aggravating symptoms. Lack of clear guidance on safe physical activities for these patients may result in a reduction in adherence to recommended exercises (Rashidi et al., 2020).

Perception of Lack of Support: The perception of lack of continuous support from health professionals and family members negatively affects treatment adherence. Many patients report frustration at the lack of sufficient information and the lack of opportunities to discuss their treatment plans in depth. This lack of support creates a sense of abandonment and uncertainty, making it difficult to adhere. Effective communication and ongoing follow-up are essential to keep patients motivated and committed to their treatment (Rashidi et al., 2020).

Concern about the Efficacy and Side Effects of Medications: Doubts about the usefulness of medications and fear of adverse effects are significant barriers. Patients may discontinue or adapt the use of prescription medications due to concerns about side effects, such as stomach bloating. Concern about the effectiveness of medications can also lead to non-adherence, especially if patients do not notice immediate improvements in their condition. The lack of clear communication between healthcare providers and patients about the benefits and potential side effects of medications can exacerbate these concerns (Rashidi et al., 2020).

Contradictory Lifestyle Information: Conflicting information about healthy diets and other lifestyle changes can confuse patients. Exhaustion caused by the need to make multiple simultaneous changes, such as modifying diet, quitting smoking, and starting to exercise, can lead patients to abandon their efforts. The lack of clear and consistent guidance can make it difficult to adhere to these changes. It is essential that health professionals provide coherent information adapted to the reality of each patient (Patterson et al., 2021).

Family Overprotection: Overprotection by family members can limit patients' autonomy, leading to frustration and a feeling of incapacity. While support is crucial, a lack of balance can result in overreliance and the perception that patients are not able to manage their own health. Promoting patient autonomy, with appropriate support, is key to improving adherence (Rashidi et al., 2020).

Cultural and Social Barriers: Cultural beliefs and religious practices can influence medication adherence. In some cultures, there is a greater reliance on traditional practices and home remedies, which can be seen as safer or more natural alternatives to prescription medications. These beliefs can lead patients to question the need for conventional medication, resulting in non-adherence. Understanding and respect for patients' cultural beliefs is essential to promoting adherence (Krishnamoorthy et al., 2022).

Information Overload: The abundance of information about treatments and therapies, often contradictory, can confuse patients. Information overload makes it difficult to make informed decisions, leading to hesitation and non-adherence. Patients may feel overwhelmed and undecided about which recommendations to follow. It is important for healthcare professionals to filter and provide relevant information in a clear and concise manner (López Ferreruela et al., 2024).

To overcome these obstacles, it is necessary to adopt a multifaceted approach that includes ongoing education, emotional and social support, personalization of treatment, and clear and consistent communication between healthcare professionals and patients. Understanding each patient's specific barriers and working to overcome them is key to improving adherence and, consequently, clinical outcomes in patients with CVDs (Krishnamoorthy et al., 2022; Rashidi et al., 2020; Patterson et al., 2021; López Ferreruela et al., 2024).

FACTORS THAT FACILITATE MEDICATION ADHERENCE AMONG ADULT PATIENTS WITH CARDIOVASCULAR DISEASES (CVD)

Medication adherence is essential for the effective treatment of cardiovascular diseases (CVDs). Non-adherence to the prescribed drug regimen can lead to adverse clinical outcomes and increased mortality rates. Several factors can facilitate this adherence, promoting better clinical outcomes and quality of life. This article explores these facilitators in detail, based on available references.

Fear of Complications: One of the main motivators for medication adherence is the fear of serious complications associated with non-adherence to treatment. Patients who are aware of the risks, such as increased mortality and the occurrence of cardiovascular events, tend to be more diligent in taking their medications (Krishnamoorthy et al., 2022; IHM et al., 2022). Awareness of potential complications can be reinforced through educational campaigns and detailed medical consultations.

Self-Perception of Being Healthy: Self-perception of being healthy is another important facilitator. When patients notice improvements in their health due to regular use of the medication, they feel more motivated to continue treatment. This positive perception not only reinforces the importance of adherence but also promotes a self-care mindset (Krishnamoorthy et al., 2022; IHM et al., 2022).

Digital Reminder Systems: Digital reminder systems, such as alarms on cell phones or wearable devices, are effective tools to help patients remember to take their medications regularly. Such systems are particularly useful in combating forgetfulness, one of the main barriers to adherence. Implementing automatic reminders can be a simple yet powerful strategy to improve adherence (Krishnamoorthy et al., 2022; IHM et al., 2022).

Trust in the Health Professional: The relationship of trust with health professionals is essential to promote adherence to treatment. Patients who trust their physicians and receive empathetic and clear counseling are more likely to follow the prescribed treatment (Krishnamoorthy et al., 2022; IHM et al., 2022). Effective communication between doctors and patients is crucial to building that trust. Detailed counseling on the medication regimen and discussions about possible side effects help reassure patients and encourage adherence.

Participation in Cardiac Rehabilitation Programs: Participation in cardiac rehabilitation programs provides a safe and structured environment for physical exercise. Not only do these programs help create an exercise routine but also offer specialized support and encouragement, which is essential for maintaining patient motivation (Rashidi et al., 2020; IHM et al., 2022). Monitoring and supervision by health professionals during exercise are perceived as important safety factors by patients, encouraging them to continue with physical activities.

Individualization of the Exercise Program: Personalization of the exercise program, adjusting the intensity, frequency, duration and type of physical activity to the individual needs and limitations of the patients, promotes a superior physiological and psychological response. The formation of homogeneous groups, with similar interests and physical abilities, can improve the adjustment of exercise demands and social support among participants (Collado-Mateo et al., 2021; IHM et al., 2022). This ensures that each patient feels comfortable and able to follow the exercise regimen, increasing adherence.

Social and Emotional Support: Ongoing support from healthcare professionals and family members is crucial for adherence to treatment plans. Support received during and after hospital discharge, especially from nurses and physicians, provides patients with the confidence to follow their medical recommendations (Rashidi et al., 2020; IHM et al., 2022). The availability of clear and ongoing information about the care needed is vital for patients to understand the benefits of adhering to treatment.

Religiosity and Spirituality and Medication Adherence in Patients with Cardiovascular Disease: Religiosity refers to the organized practice of worship and adherence to specific doctrines. It is a set of principles and values followed by a community of faith. Spirituality, on the other hand, involves internalizing positive values and the way a person thinks about the world and their soul. These definitions are important for understanding how each can influence medication-taking behavior (Mattis, 2000). Religious and spiritual beliefs can have a significant impact on medication adherence. Medicine is believed to be a means of improving health, and patients should have faith in the effectiveness of medications.

Religion can positively influence the use of medications, helping patients maintain their health practices. Studies show that patients with high religiosity tend to have greater adherence to medication, especially those with hypertension. Medication adherence is a crucial aspect in the treatment of diseases, especially in patients with chronic diseases such as cardiovascular diseases. Religious and spiritual beliefs can significantly influence patients' behavior regarding medication taking. Here are some detailed points about how these influences can manifest themselves:

I. **Faith in Medicine**: Patients who view medicine as a means to improve health and well-being tend to have greater adherence to medication. Religion often strengthens this view by encouraging patients to follow medical recommendations as part of an effort to care for the body, which is seen as a sacred temple.

II. **Religious Beliefs and Practices**: Participating in religious practices, such as prayer and attending religious services, can offer a sense of community and support, which can motivate patients to adhere to medical treatments. Studies show that patients with high religiosity demonstrate greater adherence to medication, especially those with hypertension (Zimmer et al., 2019).

III. **Inner Spirituality**: Spirituality, defined as the internalization of positive values and the search for meaning, can also influence medication adherence. Spiritually engaged patients can find greater meaning in caring for their health by seeing medication as part of their spiritual and self-care journey.

IV. **Social and Community Support**: Religious communities often provide support networks that can help patients stay disciplined in their medication use. This social support can include reminders, encouragement, and even practical help in obtaining and taking medication correctly.

V. **Integrating Beliefs into Healthcare Practices**: Healthcare professionals who recognize the importance of their patients' religious and spiritual beliefs can use this information to create more effective and personalized treatment plans. Interventions that include spiritual counseling can be developed to improve medication adherence and health outcomes (McCullough et al., 2000).

VI. **Psychosocial Implications**: Religious and spiritual beliefs can provide psychosocial benefits, such as reduced anxiety and stress, which can improve patients' ability to follow strict medication regimens. Spirituality can offer comfort and hope, factors that are important for maintaining mental and physical health during treatment (Mattis, 2000).

VII. **Barriers and Challenges**: On the other hand, certain religious interpretations may create barriers to medication adherence. For example, some patients may believe that only faith is necessary for healing, neglecting the importance of medical treatments. Therefore, it is crucial for healthcare professionals to address these beliefs sensitively and offer appropriate guidance.

Education and Adequate Information: Educating patients about the benefits of physical exercise and the risks associated with inactivity is critical. Adequate information about realistic expectations of change and awareness of natural feelings during exercise help prevent premature withdrawals (Collado-Mateo et al., 2021; IHM et al., 2022). Patients who are well-informed about the importance of exercise are more likely to adhere to health recommendations.

Mentoring and Counseling: Mentoring by healthcare professionals, such as nurses and counselors, plays an important role in supporting patients. These professionals help patients better understand their conditions, develop healthy routines, and navigate treatment challenges. The presence of a mentor who offers ongoing encouragement and personalized guidance is a critical factor for treatment adherence (Rashidi et al., 2020; IHM et al., 2022).

Value of Taking Medications: Realizing the value of taking medications as prescribed is essential. Patients who understand the benefits of medications and fear the consequences of missed doses are more likely to follow their prescriptions (Rashidi et al., 2020; IHM et al., 2022). Developing routines for taking medications regularly, such as associating them with other daily activities, helps ensure consistent adherence.

Lifestyle Modification: Lifestyle modification, including dietary changes and smoking cessation, is critical for adherence to treatment plans. Guidance from health professionals on healthy diets and the importance of physical activity is essential for patients to understand the benefits of these changes (Rashidi et al., 2020; IHM et al., 2022). The fear of recurrence of cardiovascular events motivates many patients to adopt and maintain healthy habits.

Personalized Communication Approaches: Communication approaches that increase individual motivation, including emotional, psychological, and economic aspects, may be more effective in promoting adherence to health recommendations (Duffy et al., 2021). Incorporating the health of loved ones into conversations and discussing the financial impact of cardiovascular disease are strategies that can motivate behavior change. Personalizing cardiovascular risk discussions and highlighting values relevant to each patient makes communication more meaningful and effective.

Effect of Physician-Patient Communication on Adherence to Cardiovascular Treatment: Most of the included studies highlighted the positive impact of physician-patient communication on blood pressure control. Effective communication empowers doctors to educate patients, equipping them with a deeper understanding of various aspects pertaining to hypertension. This includes instruction on how to measure blood pressure, the importance of blood pressure control, and the health implications of hypertension (Zeng et al., 2024). All these aspects contribute to better blood pressure management by patients.

Additionally, robust doctor-patient communication helps establish trust, increasing the likelihood that hypertensive patients will accept and adhere to medical recommendations. Physicians' ability to offer encouragement and demonstrate empathy are essential factors in cultivating trust (Zeng et al., 2024).

However, some studies have found no significant associations between doctor-patient communication and blood pressure control. For example, the study sample by Cho et al. (2007) consisted of U.S. veterans, almost all of whom were men, which may limit the overall applicability of the study's findings. In addition, many veterans gave their primary care providers the highest possible scores in the PDM style, potentially leading to a ceiling effect that decreases the relationship between the PDM style and outcomes (Zeng et al., 2024). In the study by Manze et al. (2015), two educational workshops were conducted for clinicians in clinics, but they may have been oversimplified, lacking sufficient practical changes to impact blood pressure control in a meaningful way (Zeng et al., 2024).

The findings indicate a promising connection between effective doctor-patient communication and improved medication adherence. Some studies, such as the one by Manze et al. (2015), have shown that two educational workshops were conducted with clinicians in clinics, but may have been too brief and lack sufficient changes to impact medication adherence (Zeng et al., 2024).

In addition, exposure to the intervention for physicians was limited to single administration, and for patients, it was limited to a single personal contact. Baseline adherence rates were relatively high, ranging from 58.2% to 68.5% in the four patient groups (Zeng et al., 2024). Future interventions may require more extensive provider training and broader systematic changes to improve patient outcomes (Zeng et al., 2024).

The adoption of the shared decision-making style: is increasing, allowing patients to actively participate in their medical decisions (Zeng et al., 2024). This model may lead to better medication adherence, especially among Black individuals who may benefit from more effective communication (Zeng et al., 2024). Shared decision-making involves providing patients with information about their medical conditions, allowing them to participate in their own decisions (Zeng et al., 2024).

A cross-sectional survey conducted with hypertension physicians in Hunan Province, China, indicated that "heavy clinical work" and "poor doctor-patient communication" are the main obstacles to improving medication adherence (Zeng et al., 2024). Targeted measures, such as improving communication education for medical students and providing focused training programs, are recommended to improve physician-patient communication (Zeng et al., 2024).

Health Apps: Use of Mobile Apps to Improve Medication Adherence in Patients with Cardiovascular Disease: Cardiovascular disease (CVD) causes nearly one-third of global deaths, resulting in approximately 17.9 million deaths annually. Continuous use of cardiovascular medications significantly reduces morbidity and mortality, but the complete effectiveness of these medications depends on patients' adherence to medical prescriptions (Al-Arkee et al., 2021). It is crucial to develop interventions to combat medication non-adherence, and among the most promising are mobile health applications (mHealth). These apps offer support for both patients and healthcare providers in managing illness, including medication reminders, educational material, and intuitive interfaces (Al-Arkee et al., 2021).

Several studies, including randomized controlled trials (RCTs), have investigated the effectiveness of mobile apps to improve medication adherence in patients with CVD. These studies were summarized in systematic reviews and meta-analyses to assess the effects of these interventions on adherence and health-related outcomes. A meta-analysis that included 16 RCTs from the last 6 years showed that most reported significant improvements in adherence rates when compared to control groups (Al-Arkee et al., 2021).

In addition to medication adherence, mobile apps have shown benefits in clinical outcomes, such as reducing systolic and diastolic blood pressure, as well as total cholesterol and LDL-C levels. These positive effects were especially observed in trials that evaluated apps with mixed functionalities, including reminders and educational material, often with the participation of health professionals to ensure the effectiveness of the intervention (Al-Arkee et al., 2021).

The usability and acceptability of mobile applications were important evaluation factors. Most participants found the apps easy to use and helpful in managing their health conditions. Validated questionnaires, such as the System Usability Scale, demonstrated positive user acceptance, which is essential to ensure continuity of use and adherence to medication (Al-Arkee et al., 2021).

While the results are promising, there is a need for more large-scale studies to confirm the effectiveness of mobile apps more robustly. Heterogeneity in study designs, adherence measures, and app characteristics makes it difficult to make conclusive recommendations. Future studies should focus on identifying the essential components that confer effectiveness and usability to mobile apps (Al-Arkee et al., 2021).

Health apps can provide medication reminders, monitor physical activity, and offer personalized feedback to patients. The integration of self-monitoring devices, such as activity trackers and heart rate monitors, can increase the effectiveness of these interventions. Studies show that smartphone app use is associated with significant increases in physical activity and treatment adherence in patients with CVD (Patterson et al., 2021).

Medical telemonitoring allows for continuous monitoring of patients' health and offers real-time feedback. This approach is effective in managing hypertension in elderly patients, improving communication between patients and physicians, and promoting better blood pressure control (Fujiwara et al., 2023). mHealth interventions have emerged as promising tools to improve treatment adherence in patients with chronic cardiovascular diseases. Adherence to treatment is essential for effective management of these conditions, but many patients face challenges that compromise the continuity and effectiveness of therapies. In this text, we explore mHealth interventions, their applications, benefits, and challenges, based on the reference articles provided.

1. **Improved Treatment Adherence**: Studies show that mHealth interventions can improve adherence to medication treatment and promote positive lifestyle changes. The meta-analysis conducted by Cruz-Cobo et al. (2022) showed that the use of health apps increased medication adherence in patients with cardiovascular diseases, in addition to improving quality of life and reducing hospitalizations.

2. **Physical Activity Promotion**: Smartphone apps have been shown to be effective in increasing physical activity in patients with CVD, showing significant increases in minutes of moderate-to-vigorous-intensity physical activity per week (MVPA mins.week^-1) and steps per day (steps.day^-1) compared to control groups (Patterson et al., 2021).
3. **Continuous Monitoring and Real-Time Feedback**: Medical telemonitoring allows for continuous monitoring of health parameters such as blood pressure and glucose levels, and offers real-time feedback to patients. This monitoring can help reduce non-adherence to antihypertensive medications and promote better management of hypertension in elderly patients (Fujiwara et al., 2023).
4. **Reduced Hospitalizations and Mortality**: mHealth interventions have been shown to reduce hospitalizations for cardiovascular causes and improve clinical outcomes. The systematic review conducted by Sequi-Dominguez et al. (2020) revealed that lifestyle interventions delivered through mobile technologies improved body composition, blood pressure, and glucose levels in patients with metabolic syndrome.

Despite the numerous benefits, mHealth interventions face several significant challenges. Patient adherence and engagement can vary substantially due to technical issues, lack of familiarity with technology, and socioeconomic barriers that impact participation (Patterson et al., 2021). In addition, the heterogeneity of mHealth interventions, including variations in components, duration, and intensity, can make it difficult to assess efficacy, and standardization of multicomponent interventions is necessary to generate robust evidence (Sequi-Dominguez et al., 2020). Access to technology is also a major obstacle, as patients in rural or low-income areas may face difficulties accessing mobile devices and internet connection, limiting the benefits of these interventions (Cruz-Cobo et al., 2022).

Medication adherence in patients with cardiovascular disease is influenced by a variety of factors. Understanding and promoting these facilitators is crucial to improving clinical outcomes and quality of life for patients. Health professionals should focus on effective communication strategies, social and emotional support, and ongoing education to encourage adherence. Personalization of care and the incorporation of digital technologies also play an important role in maintaining treatment adherence.

CONCLUSION

Medication adherence in patients with cardiovascular disease is influenced by a combination of factors that can either facilitate or hinder treatment. Facilitators include the use of digital technologies such as mobile health apps, mHealth interventions, social and community support, effective doctor-patient communication, and the integration of religious and spiritual beliefs into care. These factors have been shown to significantly improve medication adherence and, consequently, patients' clinical outcomes.

On the other hand, lack of understanding of the disease, forgetfulness, lack of family support, concerns about medication side effects, socioeconomic barriers, and issues related to the health system are common obstacles that compromise treatment adherence. The doctor-patient relationship is essential in promoting adherence, with effective communication and shared decision-making playing key roles.

Integrated approaches that include ongoing patient education, simplification of treatment regimens, financial support, and easy access to health services are key to improving treatment adherence. Understanding the causes and motivations of non-adherence allows the development of effective interventions that promote continuity of treatment and improve clinical outcomes, significantly reducing complications associated with cardiovascular diseases.

In short, by identifying and addressing both barriers and facilitators of adherence, we can develop more effective strategies that benefit patients and contribute to improved cardiovascular health in the general population.

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