



PATIENT EDUCATION IN CARDIOVASCULAR DISEASE PREVENTION: A MULTIDISCIPLINARY APPROACH INVOLVING NURSING, MEDICAL RECORDS, PHARMACY, AND EMERGENCY MEDICINE

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ABSTRACT

Background: Inadequate compliance with drug regimens is a notable concern in healthcare, especially among those with cardiovascular conditions. Researchers have investigated many approaches in order to determine the best effective method for promoting adherence. Interventions administered by several healthcare professionals (HCPs) may potentially enhance medication adherence in individuals with chronic illnesses, while the available data remains limited. **Aim of work:** The objective of this study is to examine the effects of treatments provided by healthcare professionals (HCPs) working in a team of various professions, with the aim of enhancing patients' adherence to medicines for cardiovascular disease in community settings. **Methods:** The search technique used the following databases: Google Scholar, PubMed, Medline, Cinahl, Embase, IPA, and Cochrane Library, spanning the years 1994 to 2012. The search was limited to items that were published in the English language. The study includes cluster randomized trials, controlled randomized clinical trials, prospective randomized trials, and nonrandomized research. We evaluated any strategy aimed at improving adherence to medicines prescribed by several healthcare professionals. **Results:** We conducted a comprehensive analysis that included 17 trials examining the effectiveness of three distinct therapies, all of which were overseen by many healthcare professionals. The healthcare professionals (HCPs) underwent diverse training via educational lectures or interactive workshops. Cardiovascular patients received informational, behavioral, and combination therapy. Most research that used just informational therapies or a mix of behavioral and informational interventions shown enhancements in clinical outcomes, such as reductions in blood pressure and total cholesterol levels. Nevertheless, just two investigations assessed enhancements in adherence, although the outcomes did not demonstrate statistical significance. Conversely, all therapies that relied on behavior modification techniques shown improvements in both clinical results and adherence to medication. **Conclusion:** Behavioral therapies administered by a team of professionals from many disciplines seem to have the greatest chance of enhancing clinical results by promoting better adherence. Nevertheless, it has yet to be determined if therapies administered by a multiprofessional team are more clinically successful compared to those administered by a single healthcare professional.

KEYWORDS: *Healthcare Professionals, Cardiovascular Disease, Guidelines, Multidisciplinary Approach, Multiprofessional Team, Compliance.*

INTRODUCTION

Cardiovascular disease (CVD) encompasses a range of heart and blood vessel disorders, including coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, and congenital heart disease. The primary modifiable risk factors for CVD are smoking, high blood pressure, high levels of total cholesterol and low-density lipoprotein cholesterol, low levels of high-density lipoprotein cholesterol, obesity, and diabetes. Prolonged exposure to these risk factors leads to the progression of CVD, resulting in unstable atherosclerotic plaques, narrowing of blood vessels, and

obstruction of blood flow to vital organs such as the heart and brain. The symptoms of these issues include long-lasting chest pain (chronic angina pectoris), sudden inadequate blood supply to the heart (acute coronary insufficiency or unstable angina), identified and unidentified heart attacks (myocardial infarction), stroke, and fatalities related to cardiovascular disease (CVD deaths).^[1,2]

Cardiovascular disease (CVD) is widely regarded as the most significant global health issue due to its widespread occurrence and high rates of death, as well as the

substantial economic burden it places on individuals, communities, and healthcare systems. CVD is responsible for 30% of all deaths worldwide. Approximately 3.7 million people are affected by CVD, making it the leading cause of death in the country. Despite notable progress in reducing CVD-related illnesses and deaths, it continues to be the most pressing health problem in Australia, particularly among older individuals and those in lower socioeconomic groups.^[3,4]

Cardiovascular disease (CVD) management

The majority of cardiovascular diseases (CVDs) may be effectively controlled by appropriate medical interventions and, in some instances, may even be reversed despite a prolonged history of the condition. Both primary and secondary prevention methods are highly effective in managing cardiovascular disease (CVD). Primary prevention focuses on controlling risk factors such as smoking, high blood pressure, high cholesterol, lack of physical activity, unhealthy weight, poor diet, and ensuring full adherence to cardiovascular medications. Secondary prevention involves the use of appropriate pharmacotherapeutic agents, such as antihypertensives, statins, antidiabetic drugs, and antiplatelet agents, to prevent recurring complications like heart attacks and strokes in patients with existing CVD.^[5,6]

Compliance with cardiovascular disease (CVD) medications

Adherence refers to the degree to which patients comply with prescribed medication, dietary, and lifestyle recommendations provided by healthcare professionals. Persistence, on the other hand, refers to the duration of time that patients maintain adherence to their medication regimen. Maintaining adherence to medication is crucial for achieving positive health outcomes, such as symptom improvement, enhanced quality of life, slower disease progression, and reduced rates of hospitalization, illness, and death. Moreover, research has shown that inadequate adherence to medication in cardiovascular disease is linked to higher rates of hospitalization, poorer medical outcomes, and increased healthcare expenses.^[7,8]

In the community, there is a persistent obstacle in achieving therapeutic goals for patients with cardiovascular disease (CVD) due to suboptimal adherence to long-term therapy for hypertension, dyslipidemia, and coronary heart disease. This includes difficulties in reaching target blood pressure (BP) and lipid levels. Studies have shown that poor adherence to cardiovascular medications is prevalent in over 60% of patients with CVD, although self-reported adherence rates vary depending on the specific medications involved.^[9]

Interventions targeting the enhancement of adherence to cardiovascular medications

Enhancing compliance with medicine necessitates using a variety of tactics that largely concentrate on promoting modifications in behavior.^[10] These tactics aim to motivate the particular patient to acquire, embrace, and maintain a consistent regimen of drug consumption. Researchers have experimented with many treatments to determine the most efficient method of enhancing adherence to medications. These interventions might be categorized as informational, behavioral, or combination interventions.^[11]

These treatments consist of health care professionals (HCPs) offering self-management plans, regular verbal counseling to patients on drugs and lifestyle modifications, as well as giving written educational material, audiotapes, logbooks, and patients' workbooks. Behavioral interventions aim to streamline medication dosing, provide reminders for prescription collection, involve family members in promoting medication adherence, enhance patient motivation, conduct follow-ups via telephone or visits, and offer continuous monitoring of adherence with feedback support. In addition, healthcare professionals (HCPs) utilize motivational interviewing techniques to recognize the patients' readiness to embrace healthy behaviors.^[12,13] These interventions encompass both informational and behavioral elements, along with social support strategies. Recently, there has been a growing emphasis on creating opportunities for HCPs to collaborate in order to enhance clinical outcomes for patients with chronic diseases. One possible approach is to create models of collaborative practice involving pharmacists, physicians, and nurses. These models aim to enhance medication adherence and persistence in patients, particularly those with chronic illnesses. To evaluate the effectiveness of multiprofessional healthcare teams in promoting adherence to cardiovascular medications, we conducted a literature review. Our goal was to identify the most effective types of interventions delivered within collaborative models.

Aim of the work

The main goal of this study was to examine the effects of treatments aimed at enhancing patients' compliance with cardiovascular drugs in primary care, outpatient, and community settings, administered by healthcare professionals within a multidisciplinary team. Another goal was to examine the training methods used to educate healthcare professionals (HCPs) on delivering collaborative therapies to patients with cardiovascular disease (CVD).

METHODS

The search approach used the following databases: Google Scholar, PubMed, Medline, Cinahl, Embase, IPA, and Cochrane Library. The selection of references was biased towards the period from 1994 to December 2012 since it was believed that this time frame would

include the most important research and represent the current state of the literature on the issue. The search strategy utilized key terms such as "adherence," "compliance," and "persistence" in relation to "medications," "drugs," and "medicines." Additionally, the search included terms related to "cardiovascular diseases," "hypertension," "dyslipidemia," "hyperlipidemia," "chronic heart failure," and "chronic diseases." The search also focused on "health care professionals," including physicians and pharmacists, and explored the concepts of "intervention" and "education." Lastly, the search was limited to articles published in English. In addition, the bibliographies of the retrieved papers were examined to find any relevant articles.

RESULTS

The collection of articles consisted of 17 publications, which included 16 randomized controlled trials [14–22, 24–30] and 1 single group pre–post design.^[23] Out of these 17 articles, 7 focused on describing and evaluating informational interventions,^[14,17,20,21,24,25,29] 3 focused on describing and evaluating behavioral interventions,^[23,27,28] and 7 focused on describing and evaluating combined interventions.^[15,16,18,19,22,26,30]

Out of the seven trials, only two of them^[20,29] showed improvements in assessed adherence to drugs as a result of informative interventions. Nevertheless, the improvements were not substantial. In contrast, the majority of the investigations (5 out of 7) shown a noteworthy influence on achieving desired therapeutic outcomes.^[14,17,20,21,24]

All three behavioral therapies shown improvements in both adherence and clinical outcomes.^[23,27,28] In contrast, none of the combination interventions resulted in enhanced medication adherence, but all seven of them exhibited substantial increases in clinical outcomes. Nevertheless, one research revealed a noteworthy influence on enhancing adherence to a dietary regimen,³⁰ and another study^[15] indicated a rise in the proportion of patients correctly adhering to the prescribed instructions for their prescriptions.

According to the selection criteria, all interventions were supervised by more than one healthcare professional. Health care services were provided to patients by physicians, pharmacists, research nurses, nurse practitioners, cardiologists, CHF nurses, telephone coordinators, and pharmacy technicians.

Education and Development of healthcare professionals

The majority of the studies examined provided a detailed account of the training methods employed to educate healthcare professionals (HCPs), except for three studies that did not specify whether HCPs had received any training.^[16,28,30] The training primarily consisted of workshops, where various techniques were employed to

enhance HCPs' abilities in communication, diagnosis, outcome measurement, and patient adherence to medications. The training techniques included a combination of lectures, slides, presentations, demonstrations, role-playing, and debates. Five studies involved the participation of healthcare professionals (HCPs) in training workshops or sessions led by medical educators, pharmacists, or physicians. These sessions utilized didactic lectures, role-playing, clinical trial evidence, and interactive exercises to provide information on disease physiology, treatment protocols, and communication strategies aimed at improving medication adherence. As part of a research, 17 healthcare professionals (HCPs) were called to a meeting one month after completing a training session. The purpose of the conference was to review the intervention and the development of patients' clinical outcomes. A presentation was given to a group of healthcare professionals (including physicians, pharmacists, and nurses) on how to manage diseases using an evidence-based guideline or algorithm, such as The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7). The presentation included instructions on the reasoning behind and the practical use of treatment algorithms. Research used a computer decision support system with the aim of enhancing the quality of patient care.

Two studies were conducted in which healthcare professionals (HCPs) participated in team building activities to investigate methods for maximizing treatment outcomes and enhancing patient compliance with drug regimens. Furthermore, there were subsequent conversations held to provide healthcare professionals (HCPs) with a detailed analysis of the implementation challenges associated with the intervention. These discussions aimed to debrief the HCPs on the concerns encountered. In a particular study, HCPs did not undergo any training, as it was believed that their 1 to 2 years of residency training in ambulatory medicine was deemed enough. Research nurses underwent training and received quarterly certificates in blood pressure measuring procedures in some trials.^[20,26,29]

Interventions administered by healthcare professionals

The therapies in many trials^[14–17, 19–24, 27–29] were administered by a clinical pharmacist after a consultation with the patients' physician to develop a tailored patient care plan. The clinical pharmacist executed each plan, which might include activities such as prescription pharmacological treatment, modifying medication dose, offering counseling, and suggesting lifestyle adjustments. Furthermore, the clinical pharmacist engaged in patient education, oversaw the ordering and assessment of blood test results, adjusted medication doses gradually and closely monitored patient response and tolerance, evaluated patients' adherence to medication and lifestyle modifications (such as adopting a healthy diet, losing

weight, and engaging in exercise), and provided recommendations for alterations in therapy. The pharmacists presented and deliberated on the outcomes of their patient interviews with doctors. Although the majority of medication treatment recommendations were given by pharmacists to doctors during patient visits, some physicians granted permission for pharmacists to modify dosages and document them in a case report format. The majority of the studies had a follow-up period spanning several months for the participants. With the exception of one research, home care nurses reached out to either the patients' home care case manager or the patients themselves in order to gather crucial health information to be addressed at the next team meeting.

In previous investigations, research nurses were responsible for gathering the patients' demographic information, measuring their height and weight, documenting the details of their antihypertensive drugs (including dosage and dates of last refills), doing pill counts of their blood pressure medications, and inquiring about any potential adverse responses. At each data collecting visit, the patients' blood pressure (BP) was measured, and the requests were sent to the pharmacists and/or doctors.

In a separate trial, a care team was comprised of primary care doctors and nurse practitioners (NPs). At first, Nurse Practitioners (NPs) received training on the reasoning and implementation of treatment algorithms for the management of chronic diseases. Afterwards, the nurse practitioners (NPs) only had conversations with the patient's doctor about management choices or issues that were not originally included in the algorithms. Based on these discussions, a treatment plan was then created. At each subsequent appointment, Nurse Practitioners (NPs) were tasked with creating treatment plans that emphasized evaluating the extent to which patients followed their drug regimen, identifying personal obstacles to adherence, and assessing the level of family support for the treatment.

In the research conducted by Murray *et al.*^[25] a computerized treatment decision support system was used. Following the examination of patients by doctors, requests for medications, tests, nursing services, and consultations were generated utilizing order-writing workstations. The workstation provided therapy recommendations for hypertension for every qualified patient. Afterwards, teaching materials were given to the patients, while all the treatment recommendations were sent to pharmacists via a computerized ordering system. Upon receiving the treatment ideas, pharmacists had three choices: they could either fill the prescriptions exactly as they were written, engage in a conversation about the intervention proposals, or urge further conversations with the patients' doctors. Alternatively, they may contact the physicians either by telephone or via page.

In a separate trial involving individuals with heart failure, 30 telephone nurse coordinators conducted follow-up calls to address the patients' clinical issues without making any adjustments to their medication by telephone. The CHF nurses then conducted monthly meetings with the patients to modify medicines, under the guidance of cardiologists who formulated a treatment regimen for all participants in the trial. The main doctors were regularly updated by the CHF nurses with any aberrant laboratory readings for the patients. Weekly patient care meetings included all team members, with the exception of the patients' main doctors.

DISCUSSION

There has been a scarcity of studies published on treatments aimed at improving adherence, which are administered by teams of healthcare professionals to patients with cardiovascular disease (CVD). Our review indicates that interventions involving physicians, pharmacists, nurses, and other healthcare providers were effective in improving patients' clinical outcomes and enhancing medication adherence. Patients who received these interventions experienced better results compared to control patients. This provides evidence to support the idea that healthcare professionals (HCPs) who operate in teams may successfully enhance patients' clinical results and hence have a favorable influence on their health. Nevertheless, this research did not uncover any data regarding the optimal form of collaborative practice among pharmacists, doctors, and nurses that effectively supports and enhances medication adherence and persistence among patients.

The majority of the research (14 out of 17) shown notable enhancements in clinical results, however just 3 studies indicated substantial improvements in both medication adherence and clinical outcomes. Our analysis revealed that the research we examined showed that behavioral therapies led to improvements in both adherence and clinical outcomes. Conversely, research that used informative and combination treatments seemed to have little or no effect on enhancing medication adherence. Despite the inclusion of both behavioral and informational components, the combined treatments did not lead to enhanced patient adherence to drugs. This may be attributed to several factors, such as the level of training that healthcare professionals (HCPs) received in providing the treatments, their proficiency in actually delivering the interventions, the characteristics of the patient groups, the research design, and the varying degrees of influence that each aspect had on the intervention. Furthermore, the research designs imposed some constraints.

A significant number of these studies did not assess adherence since it was not regarded as a main measure. For instance, in the trials conducted by Tsuyuki *et al*¹⁶ and Bogden *et al*,¹⁴ adherence was not explicitly quantified, despite being a fundamental aspect of the pharmacists' intervention. Enhanced clinical results were

seen when pharmacists made therapy recommendations to accelerate treatment in order to achieve therapeutic goals, while also enhancing adherence to drugs. In addition, several studies did not include a description of the technique used to measure adherence.^[26]

Another factor contributing to the inability to identify any changes in medication adherence is in the methodology used to assess it. The studies used a diverse range of assessment techniques and criteria to assess adherence. The most often used measuring techniques were self-reports and pill counts. Nevertheless, several investigations used validated self-report questionnaires.

Multiple studies have shown that when healthcare professionals collaborate in providing treatment or implementing interventions, it results in enhanced patient clinical outcomes and increased adherence to prescriptions. This might be attributed to the collaboration of healthcare professionals (HCPs) in providing high-quality and enduring healthcare services to patients. From the perspective of patient safety, teams that work effectively have significant potential to provide exceptional care. Conversely, teams that are not performing well, especially those that have poor communication, increase the likelihood of causing injury to patients.^[16]

The majority of healthcare professionals (HCPs) underwent training, which had a beneficial effect on enhancing patient outcomes and to a lesser degree, adherence. This implies that there might be a positive relationship between the extent of training received and the level of impact. However, a one-day training workshop for HCPs may not have been adequate in equipping them with the necessary skills to improve patient outcomes and medication adherence.

Pharmacists had a crucial role in administering the intervention or collaborative care to patients in the majority of trials. They were responsible for adjusting patients' medication, giving counseling, conducting interviews, offering education, detecting obstacles to adherence, and arranging follow-up visits. Most pharmacists provided treatment suggestions during the interventions aimed at enhancing illness management and drug adherence. Typically, judgments were reached via coordinated efforts between doctors and pharmacists. Nevertheless, the majority of doctors agreed with the suggestions made by pharmacists. This agreement stems from physicians' contentment with the collaborative care provided, which has the potential to enhance patients' clinical outcomes. However, it should be noted that the gains in patients' adherence to prescriptions resulting from this collaborative care are only marginal.

Conversely, several instances of collaborative treatment did not provide any discernible improvements in clinical outcomes or adherence. For instance, two investigations^[17,25] found no enhancements in both

patients' adherence and health outcomes. This might be attributed to either the randomization of a limited number of clusters or to the ineffectiveness of the therapies provided. Furthermore, research seemed that doctors did not proactively address every proposal provided by pharmacists, maybe because of the intricate nature of the ideas or the time-consuming process of resolving them.

CONCLUSION

This evaluation assessed the efficacy of multiprofessional programs targeting the enhancement of patients' medication adherence. Behavioral therapies administered by a team of professionals from several disciplines seem to provide the greatest chance to enhance therapeutic results by promoting better adherence. Nevertheless, it has yet to be determined if therapies administered by a multiprofessional team are more clinically successful compared to those administered by a single healthcare professional.

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- التعليم المريض في الوقاية من أمراض القلب والأوعية الدموية: نهج متعدد التخصصات يشمل التمريض، والسجلات الطبية، والصيدلية، والطوارئ**
- الملخص**
- خلفية - إن عدم الالتزام بالأنظمة الدوائية يُعتبر شاغلاً ملحوظاً في الرعاية الصحية، خاصة بين الأفراد الذين يعانون من حالات قلبية وعائية. لقد بحث الباحثون في العديد من الأساليب من أجل تحديد أفضل طريقة فعالة لتعزيز الالتزام. قد تساعد التدخلات المقدمة من عدة متخصصين في الرعاية الصحية (HCPs) في تعزيز التزام الأفراد الذين يعانون من الأمراض المزمنة، بينما تظل البيانات المتاحة محدودة.
- هدف العمل -** هدف هذه الدراسة هو فحص آثار العلاجات المقدمة من متخصصين في الرعاية الصحية (HCPs) يعملون في فريق متعدد المهن، بهدف تعزيز التزام المرضى بالأدوية لعلاج أمراض القلب والأوعية الدموية في المجتمعات.
- الطرق -** استخدمت تقنية البحث القواعد البيانات التالية: جوجل سكولار، وبومبد، وميدلاين، وسينال، وإمباس، وآي بي إي، ومكتبة كوكرين، خلال السنوات من 1994 إلى 2012. تم تحديد البحث ليقتصر على المقالات المنشورة باللغة الإنجليزية. تشمل الدراسة تجارب عشوائية مثيلة مميزة، وتجارب سريرية عشوائية محكمة، وتجارب عشوائية مستقبلية، وبحوث غير عشوائية. قمنا بتقييم أي استراتيجية تهدف إلى

تحسين الالتزام بالأدوية الموصوفة من قبل عدة متخصصين في الرعاية الصحية.

النتائج - أجرينا تحليلًا شاملاً شمل 17 تجربة تبحث فعالية ثلاث علاجات متميزة، جميعها بإشراف العديد من المتخصصين في الرعاية الصحية. تلقى المتخصصون تدريبات متنوعة من خلال محاضرات تعليمية أو ورش تفاعلية. تلقى مرضى القلب معلومات، وسلوكيات، وعلاجات مركبة. أظهرت معظم الأبحاث التي استخدمت فقط العلاجات المعلوماتية أو مزيجًا من التدخلات السلوكية والمعلوماتية تحسينات في النتائج السريرية، مثل انخفاض ضغط الدم ومعدلات الكوليسترول الإجمالية. ومع ذلك، قامت تجربتان فقط بتقييم التحسينات في الالتزام، على الرغم من أن النتائج لم تظهر دلالة إحصائية. وعكس ذلك، أظهرت جميع العلاجات التي اعتمدت على تقنيات تعديل السلوك تحسينات في كل من النتائج السريرية والالتزام بالأدوية.

الخاتمة - يبدو أن العلاجات السلوكية المقدمة من فريق من المتخصصين من عدة تخصصات تتمتع بأكبر فرصة لتحسين النتائج السريرية من خلال تعزيز الالتزام الأفضل. ومع ذلك، لا يزال يتعين تحديد ما إذا كانت العلاجات المقدمة من فريق متعدد التخصصات أكثر نجاحًا سريريًا مقارنةً بتلك التي يقدمها متخصص واحد في الرعاية الصحية.