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Association between copayment, medication adherence and outcomes in the management of patients with diabetes and heart failure



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ABSTRACT

Objective: To determine the association between copayment, medication adherence and outcomes in patients with Heart failure (HF) and Diabetes Mellitus (DM).

Methods: PubMed, Scopus and Cochrane databases were searched using combinations of four sets of key words for: drug cost sharing; resource use, health and economic outcomes; medication adherence; and chronic disease.

Results: Thirty eight studies were included in the review. Concerning the direct effect of copayment changes on outcomes, the scarcity and diversity of data, does not allow us to reach a clear conclusion, although there is some evidence indicating that higher copayments may result in poorer health and economic outcomes. Seven and one studies evaluating the relationship between copayment and medication adherence in DM and HF population, respectively, demonstrated an inverse statistically significant association. All studies (29) examining the relationship between medication adherence and outcomes, revealed that increased adherence is associated with health benefits in both DM and HF patients. Finally, the majority of studies in both populations, showed that medication adherence was related to lower resource utilization which in turn may lead to lower total healthcare cost.

Conclusion: The results of our systematic review imply that lower copayments may result in higher medication adherence, which in turn may lead to better health outcomes and lower total healthcare expenses. Future studies are recommended to reinforce these findings.

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1. Introduction

During the last decade pharmaceutical spending has risen by 50% in member states of the Organization of

Economic Cooperation and Development (OECD) [1] and accounts between 7% and 34% of total health care spending [2]. Undoubtedly, several factors are responsible for the drug spending increase. Technological innovation has often been cited as the most influential factor and it is estimated to account for between a half and three quarters of the overall growth of drug spending [3]. However, the precise net

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impact of innovative products is complex and difficult to assess. New technologies can decrease health care costs on the one hand through efficiency gains or health improvements that reduce the need for further and perhaps more costly care, but on the other hand they often generate cost increases by replacing already existing and cheaper technologies [3,4]. Another factor found to have an impact on the continuing rise in spending seems to be the ageing population and the higher prevalence rates of chronically ill patients that result in higher resource consumption [5].

In this context, decision and policy makers have taken several actions in order to control pharmaceutical expenditure such as cost sharing, which is the financial contribution that patients are required to make when they use health care services, amounts that are not reimbursed by their health plan. Cost sharing may be in the form of deductibles, co-insurance or co-payments. However the cost-sharing policy is different from country to country. For instance some countries, such as the United Kingdom Italy and Austria apply a small flat-rate charge per prescription item, while in France, Estonia, Finland, Latvia, Lithuania, Poland, Portugal, Slovakia, Slovenia Spain, Greece and Belgium, a percentage co-payment applies to some prescription items [6]. In Denmark and Sweden operate an annual ceiling on the size of cumulative co-payments for all health services, while in Netherland and Malta, patient co-payments apply in situations where the market price of the medicine is higher than the reference price [6].

Co-payments are understood as the additional payments that insured persons must remit in addition to their insurance premiums when making use of health of health-care services. Copayment is frequently brought up as a possible solution to the steadily increasing cost pressure faced by many health care systems [7]. Slowly more and more countries were pressed to introduce co-payments policies for using health care services to cover public deficits and control health-care spending [7]. Hence, higher copayments have been adopted to curb public drug spending in countries such as US, Canada, Australia, Ireland, South Korea and Greece to offset growing drug bills [8–10].

However, the success of copayment policies depends on the ability of patients to make rational choices about medications they should or should not take. There is a considerable bulk of evidence demonstrating that increased cost sharing leads to reduced medication adherence which in turn may result in poor health outcomes [10–13] and higher health care resource utilization, such as hospital admissions [14,15]. These findings are more pronounced in patients with chronic diseases [13], since the access and adherence to medications is important in the management of many chronic diseases [13]. However, medications are a crucial component of the therapeutic regimen for the chronically ill [16] and the interruption of drug therapy can have negative health consequences [12,17,18]. Patients with chronic diseases are likely to skip or discontinue their medications in response to copayment increases [19,20]. Such cost-related non-adherence may exacerbate chronic conditions, generate adverse health events, and increase health care utilization [12,17,18].

Among chronic diseases, Heart Failure (HF) and Diabetes Mellitus (DM) are major public health issues, since

the prevalence of these chronic diseases are projected to rise markedly in next decades [21,22]. Apart from the humanistic burden of HF [23–27], this chronic disease significantly affects the health systems in economic terms, since the higher hospitalization rates and polypharmacy lead to a subsequent and continuous increase in expenditures attributed to HF [28–32].

DM, according to the World Health Organization, is one of the top ten leading causes of death worldwide, with a global prevalence of 9% in adults in 2014 [33], indicating that DM is one of the most common chronic diseases. The number of DM cases has been increasing worldwide [33] with a corresponding increase in health care budgets [34,35]. It has, thus, become a growing public health burden for patients, health care providers, and society [36,37]. Moreover, it seems that there is a strong link between DM and HF, since HF problem is magnified in individuals with DM, in whom HF incidence rates are two to five times greater than those in the general population [38].

For this reason, our study sought to systematically review and synthesize the available evidence regarding the impact of copayments on resource use, health and economic outcomes, either directly or indirectly, in patients with chronic disease, focusing on HF and DM. To meet this objective we conducted a systematic review in three steps to identify studies that:

- Assess the impact of copayment on resource use, health and economic outcomes, directly.
- Assess the impact of copayment on medication adherence.
- Assess the impact of medication adherence on resource use, health and economic outcomes.

2. Methods

This review was conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria [39,40].

2.1. Search strategy

An electronic search was performed in PubMed, Scopus and Cochrane databases. The search was based on combinations of 4 sets of key words, determined by a group of experts with relevant methodological and clinical expertise and included various terms for: (a) drug cost sharing; (b) resource use, health and economic outcomes; (c) medication adherence; and (d) chronic diseases of interest. The Medical Subject Headings (MeSH) database was used to identify synonyms. To assess all the aspects of our review, the literature search was conducted using three different combinations of these sets of keywords. More details regarding the keywords included in each set and the sets combined each time are presented in Table 1.

The four sets were combined by the Boolean 'AND' and the terms utilized within each set were combined by the Boolean 'OR'. The Supplementary material 1 presents the full search strategy used for PubMed, which was adapted appropriately for the rest of databases. Additionally, the reference lists of all relevant articles originally selected

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