

Impact of gender on adherence to therapy

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Educational aims

- To briefly explore the findings of studies relating to the impact of gender on treatment adherence
- To provide insight into how the findings of such studies should be interpreted and their potential value.

Key words

Medication adherence, non-adherence, patient compliance, gender, sex

Abstract

Non-adherence to prescribed medications has been the focus of much interest in the literature owing to the poor treatment outcomes and increased healthcare burden which ensue as a consequence. In order to develop targeted interventions to address treatment non-adherence, it is necessary to first understand the factors which may influence patients' medication taking behaviour. It has been suggested that patient gender may be one such factor, where knowledge of its impact can have the potential to assist researchers and clinicians in pre-empting instances of non-adherence and allowing them to monitor patients more closely and intervene in a timely fashion if required. In this article, we explore the issue of gender and non-adherence by examining the findings of studies related to three key disease states. It is apparent that there are variations in research evidence on this topic and that it is likely that other factors such as regimen complexity and patient knowledge interplay and may also demonstrate a larger role in impacting adherence to therapy.

Introduction

As once famously noted by former US surgeon-general, C Everett Koop, "Drugs don't work in patients who don't take them".¹ Indeed over the last four decades, researchers and clinicians alike have arrived at the understanding that patient adherence to clinically appropriate therapies is fundamental to positive therapeutic outcomes.² However, it has been well documented that patients do not necessarily take their medications as prescribed, or even at all in some cases, with symptomatic deterioration or medical exacerbations often ensuing as a consequence.² Non-adherence not only affects the patients themselves, but it also contributes to increased societal disease burden and healthcare costs.²

When presented with estimates that 50% of chronic disease patients are not adherent to their prescribed treatment regimens², it is clear to see why the field of patient adherence has become the focus of much interest in the literature. There is particular interest amongst researchers to identify the factors that contribute to treatment non-adherence and develop strategies to tackle these.³ The purpose of this article is to provide an overview of research exploring the impact of gender on treatment adherence across a few key chronic disease states.

It is important to note that to our knowledge, few studies have been conducted to explore this specific relationship as a primary research aim, rather the vast majority touch on the link between gender and adherence in a secondary or even incidental fashion. Nevertheless, these studies do shed some light onto the complicated quagmire that is treatment non-adherence and may ultimately provide clinicians and researchers with insight into potential gender-related differences in adherence regarding specific disease states.

Asthma

Studies exploring the relationship between gender and adherence to asthma treatment have provided mixed results.

Despite having a greater number of visits with their physicians and a higher likelihood of possessing an asthma action plan,⁴ female asthma patients have been shown in some studies to have poorer adherence to asthma medications than males.⁵⁻⁷ In the study by Williams *et al*⁵ adherence to inhaled corticosteroids (ICS) was measured by linking prescription refill information with patients' prescribed dosing information. The authors discovered that female asthma patients had significantly lower adherence to ICS than males. Similar findings were found in a study by Chatkin *et al*⁶ who counted the number of dry powder inhaler doses remaining after 90 days to determine patient adherence. Patients who had used $\geq 85\%$ of their prescribed doses were considered adherent. Lower rates of adherence were observed amongst female patients (46.3%) compared to males (65.8%) although this was not a statistically significant difference.

While these results may point towards an increased likelihood of non-adherence amongst females, this is not necessarily true in all instances. To the contrary, the findings of a qualitative study exploring the factors influencing adherence amongst asthma patients highlighted that female gender was a significant factor with respect to medicine-taking.⁸ This was even the case for asthmatic patients who were experiencing exacerbations, as shown in another study utilising self-reported adherence measures.⁹ In this study, females were more adherent than males during maintenance treatment of asthma and significantly so during episodes of exacerbations.⁹

Although these findings may suggest that the literature regarding gender and adherence in asthma falls under one of two categories, it is important to recognise that there are in fact numerous studies which have failed to find any significance to this relationship altogether.^{4,10,11}

Diabetes

As with the asthma-related research, studies exploring the relationship between gender and adherence in patients with diabetes are also discordant.

Wong *et al*¹² conducted a large cohort study, using prescription data to determine patients' level of adherence to oral

Key points

- Non-adherence to clinically appropriate treatments is associated with symptomatic deterioration, increased societal disease burden and healthcare costs.
- Patients' non-adherence to prescribed treatments has become the focus of much interest in the literature.
- Many factors contributing to treatment non-adherence have been explored in the literature, although the influence of patient gender on treatment adherence has been explored in a secondary or incidental fashion.
- Some studies of adherence to treatment for prevalent chronic conditions have highlighted that females are more adherent than males, while others have revealed the opposite effect.
- While gender may contribute to treatment non-adherence in some cases, it is likely that other factors such as regimen complexity and patient knowledge play a larger role in impacting adherence to therapy.
- It is important to consider the findings of these studies alongside those of studies investigating potential factors contributing to non-adherence more broadly.

hypoglycaemic agents using the medication possession ratio (MPR). The MPR is the ratio of the total days' supply of medication to the total number of days in a defined time period,¹³ with values $\geq 80\%$ indicating an adequate level of adherence.¹⁴ In utilising this metric, the researchers highlighted that male patients were significantly less likely to adhere to their prescribed treatments than females.

This is in contrast with the findings of two other retrospective cohort studies.^{15,16} Also using MPR to estimate adherence to antihyperglycemic medications, Hertz *et al*¹⁵ highlighted that females had poorer adherence than their male counterparts and that the female gender was a risk factor for non-persistence with treatment. This was also the case in the study by Egede *et al*¹⁶, which supported the finding that males had higher MPR levels than females. Female gender was also identified as a predictor of treatment non-adherence in a prospective cohort study of patients with type 2 diabetes receiving insulin therapy.¹⁷

Depression

Not surprisingly, inconsistencies also exist amongst research relating to gender and adherence to antidepressant medications.

In their review of the literature related to factors influencing antidepressant medication adherence, van Servellen *et al*¹⁸ reported that no associations could be conclusively made between gender and its impact on patient adherence. Similarly, Bogner *et al*¹⁹ determined that there was no relationship between gender and adherence to the antidepressant citalopram in their prospective study where pill counts were

used to determine patients' adherence levels. However, a study by Granger *et al*²⁰ highlighted that females were twice as likely as males to be non-adherent to bupropion therapy as determined by the results of a 20-item web based survey of 527 patients on this treatment.

There is a body of literature however, which provides evidence to suggest that female patients are more adherent to antidepressant medications than males.²¹⁻²³ In the retrospective study of a medical claims database by Crown *et al*²¹, it was determined that female gender was associated with a statistically significant higher probability of filling consecutive prescriptions for antidepressants. Using data from a health administration database, Pfeiffer *et al*²² were also able to demonstrate a significant relationship between gender and antidepressant medication adherence, revealing that females were significantly more likely to have adequate adherence. Furthermore, in their cross-sectional prospective study of patients taking antidepressant medications Roca *et al*²³ identified that males were significantly more likely to have poor adherence.

Closing remarks and conclusions

In light of the findings presented in this article, it becomes clear why the relationship between gender and adherence has not been explored in depth in the research literature. While there is evidence to suggest that males and females have different healthcare attitudes and behaviours,^{24,25} it would appear that with regards to treatment adherence specifically,

there may be more pertinent and influential factors than gender that come into play.

The complexity of the field of treatment adherence must be acknowledged and as such, it would be almost impossible to explain the behaviours associated with this phenomenon simply as a function of patient gender. It would be more appropriate to recommend that researchers and clinicians consider these non-modifiable factors such as gender or ethnicity within a broader context of factors that may contribute to patients' medication-taking behaviours. These include but are not limited to the complexity of the treatment regimen, patient education and socioeconomic status and access to appropriate illness and treatment-related information.²⁶

In saying this, it is not our intention to discount the findings of the studies included in this article. In some instances, the studies included here have heralded the superiority of one gender over the other in their adherence to treatment regimens. This may provide clinicians with some level of insight into potential cases of treatment inefficacy that they may come across. However, it is important to acknowledge that it is difficult to compare study findings in this area owing to differences in their aims, methods, populations studied and definitions of adherence. As such, these study findings should be considered in conjunction with the findings of studies approaching this topic from a broader perspective, in order to provide strength and relevance to their conclusions and their applicability to real-world clinical settings.

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