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A REVIEW ON PATIENT COUNSELLING: IMPORTANCE IN IMPROVING MEDICATION ADHERENCE

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ABSTRACT

A common issue that costs billions of dollars annually is pharmaceutical non-adherence, which happens when patients do not take their prescriptions as prescribed. According to estimates (Ho, Bryson & Rumsfeld, 2009; Costa et al., 2015; Laufs, Rettig-Ewen & Böhm, 2011), the average adherence rate in the industrialised world is between 50 and 80%. Disease progression, hospitalisation of patients when such an outcome might be prevented, increased mortality, and significant financial costs are all consequences of medication non-adherence. Patient education, sometimes referred to as counselling, is a face-to-face discussion between a patient and a chemist, nurse, doctor, or other specialist in which the patient is informed about the rationale for the drug prescription, how to use the medication properly, and the rate of adherence.

The purpose of this review is to summarise the evidence from systematic reviews, randomised controlled trials, and position papers on medication adherence in patients with rheumatoid arthritis, cardiovascular disease, COPD, hypertension, and chronic diseases in general that counselling can improve patient knowledge and adherence to medications.

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1. INTRODUCTION

The successful use of a prescribed therapy depends on medication adherence, which is defined as "the extent to which a person's behaviour, taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" (Sabaté, 2003; Costa et al., 2015). No matter how well a pharmaceutical works in clinical trials, if a patient doesn't take it as prescribed, the treatment won't work in real life. Even in the industrialised world, adherence to prescription drugs for the treatment of chronic illnesses is between 50 and 80%; however, in

developing nations, this percentage is much lower (Ho, Bryson & Rumsfeld, 2009; Costa et al., 2015; Laufs, Rettig-Ewen & Böhm, 2011).

One of the biggest contributing causes to poor health outcomes that can be changed is nonadherence. Ho et al. (2009) discovered that among highly adherent patients, hospitalisation rates and healthcare spending were significantly reduced in a population of about 137,000 individuals with diabetes, hypertension, hypercholesterolaemia, and congestive heart failure. Following myocardial infarction, non-adherence to statin therapy raises the relative risk of death by 12 to 25%, and non-adherence to cardioprotective medications raises the related risk of death by 50 to 80% (Ho, Bryson & Rumsfeld, 2009). According to data cited by Ciliberti and Bonsignore (2025), non-adherence causes treatment failures in half of cases of managing chronic diseases and results in 125,000 fatalities annually in the United States.

In light of this, patient education seems to be one of the most popular low-cost strategies for enhancing drug adherence. Patient education is not the same as simply giving information about a medication because it is an interactive, dialogue process in which a medical professional speaks with the patient to clear up any misunderstandings regarding the reasons for taking the medication, as well as to explain how it should be used and the effects it has (Ciliberti & Bonsignore, 2025; Tan, 2020). Eight primary sources are used in this review: position papers on pharmacist counselling and pictogram-based patient education; systematic reviews in COPD, cardiovascular diseases, and general chronic illness; randomised controlled trials in rheumatoid arthritis and hypertension; and additional open-access literature.

2. Approach to the Review

This review is narrative in nature. A randomised controlled trial on patient education in rheumatoid arthritis (Taibanguay et al., 2019), a current-opinion article on cardiovascular medication adherence (Ho, Bryson & Rumsfeld, 2009), a systematic review of adherence interventions in COPD (Bryant et al., 2013), a brief communication on patient education in hypertension (Tan, 2020), an ethics-based counselling (Ciliberti & Bonsignore, 2025), and a strategy-based review from the European Society of Cardiology (Laufs, Rettig-Ewen & Böhm, 2).

In order to provide the necessary context, the articles are supplemented with other widely cited, open-access materials about definitions and outcomes of adherence (Sabaté, 2003; Osterberg & Blaschke, 2005; Nieuwlaat et al., 2014; Brown et al., 2016), which are already referenced in the provided literature. Because the populations, counselling methods, and adherence metrics employed in the source research varied, the results are presented topically. The literature itself makes regular notice of this shortcoming (Costa et al., 2015; Merks et al., 2021).

3. Adherence, Compliance, Persistence, and Concordance: Clarifying the Terminology

The vocabulary used in this subject has also changed significantly. While "adherence" is better suited for situations where a patient actively participates in his or her own therapeutic plan (Ho, Bryson & Rumsfeld, 2009; Laufs, Rettig-Ewen & Böhm, 2011), "compliance" has been regarded as an outdated term that is still used in some studies and conveys the idea of a passive and paternalistic relationship with a patient passively following his or her prescriber. According to Ho, Bryson, and Rumsfeld (2009), "persistence" refers to how long patients stay in the therapy process as opposed to adherence, which determines its correctness and intensity. "Concordance" refers to the degree of agreement between the doctor and the patient regarding the therapeutic

Non-adherence falls into one of three kinds and is not a consistent activity. According to Tan (2020) and Bryant et al. (2013), there are three types of non-adherence: primary non-adherence, which occurs when a patient fails to obtain a new prescription; intentional secondary nonadherence, which occurs when a person decides to stop treatment or modify it based on their opinion regarding the necessity of taking the medications and the associated risks; and unintentional non-adherence, which includes forgetfulness, misinterpretation of prescribers' instructions, or incapacity to follow them correctly. This distinction is crucial for counselling practice because, whereas inadvertent non-adherence can be resolved by simplifying, reminding patients, and offering packaging aids, intentional non-adherence can only be resolved via discussion (Bryant et al., 2013; Laufs, Rettig-Ewen & Böhm, 2011).

4. Scope and Consequences of Non-Adherence

Non-adherence rates are extremely high and vary greatly depending on the condition and measurement technique. 41.3–57% of people with COPD take their oral and inhaled treatments as prescribed (Bryant et al., 2013). DMARD adherence in rheumatoid arthritis has been assessed to be between 16.4 and 76.9% (Taibanguay et al., 2019). Only 35% of Malaysian patients with hypertension have their blood pressure under control when taking antihypertensive medication, with adherence rates ranging from 50 to 70% (Tan, 2020). Laufs, Rettig-Ewen, and Böhm (2011) state that only one-third of the pharmaceuticals provided at the time of hospital discharge are used appropriately, with the remainder going to waste at an annual cost of over €10 billion in Germany. As stated in a landmark quantitative review of fifty years of adherence research, one in four patients does not take prescribed treatment whatever disease he/she suffers from and this proportion has been constant despite a number of interventions introduced during the last decades (DiMatteo, 2004). A meta-analysis based on combining adherence and mortality data in several chronic diseases shows that adherence is significantly related to lower mortality even when other risk factors are taken into account, so the researchers suggest that the improvement of patients' adherence to treatment can compete with discovery of a new therapy as a way of improving public health (Simpson et al., 2006; Cutler & Everett, 2010).

Poor adherence also has important and quantifiable clinical repercussions. Good adherence (>80% of prescribed candesartan) is linked to lower mortality in the CHARM program. Interestingly, adherence to a placebo provides nearly the same survival advantage as adherence to the active drug. As a result, the term "healthy adherer effect" has emerged, which indicates that patients' adherent behaviour reflects their health

consciousness (Laufs, Rettig-Ewen & Böhm, 2011; Ho, Bryson & Rumsfeld, 2009). In cardiovascular illness, COPD, diabetes, and rheumatoid arthritis, non-adherence has also been linked to increased hospital admission rates, increased long-term healthcare expenses, and decreased quality of life (Ho, Bryson & Rumsfeld, 2009; Bryant et al., 2013; Costa et al., 2015; Merks et al., 2021).

5. Measuring Medication Adherence

Measuring adherence is the next stage in using counselling to increase it, albeit there isn't a single, effective way to do this. Adherence-measuring techniques are divided into two categories by Ho, Bryson, and Rumsfeld (2009) and Laufs, Rettig-Ewen, and Böhm (2011): direct (direct observation of patients taking pills, measurement of drug or metabolite levels in blood or urine, biological markers) and indirect (self-reports/questionnaires, pill counts, medication refill records, electronic monitors, and patient diaries). Although direct approaches are the most objective, their high costs and vulnerability to patient deception make them challenging to use in routine practice (Ho, Bryson & Rumsfeld, 2009).

Although indirect methods are more practical, they have certain biases. For example, self-reports are susceptible to social desirability bias and memory errors; pill counts can be manipulated by "pill dumping"; and records of refilling medications cannot demonstrate whether or not they were taken at all (Ho, Bryson & Rumsfeld, 2009; Laufs, Rettig-Ewen & Böhm, 2011).

Table 1. Direct and indirect methods of measuring medication adherence (compiled from Ho, Bryson & Rumsfeld, 2009; Laufs, Rettig-Ewen & Böhm, 2011; Vrijens et al., 2012).

Category	Method	Main limitation
Direct	Directly observed therapy	Resource-intensive; impracti outside hospital/trial settings
Direct	Blood/urine drug or metabolite level	Reflects only very recent dosing; not
Category	**Method**	**Main limitation**
		available for all drugs
Direct	Biological marker assay	Costly; individual metabolic variation can distort results
Indirect	Patient self-report / questionnaire (e.g., MTB-Thai, Morisky scale)	Subject to recall bias and socialdesirability over-reporting
Indirect	Pill count	Can be manipulated (“pill dumping”); does not capture timing
Indirect	Pharmacy refill / prescription-claims data	Confirms dispensing, not ingestion; needs a closed pharmacy system
Indirect	Electronic monitoring (e.g., Medication Event Monitoring System caps)	Expensive; device opening does not guarantee the dose was taken
Indirect	Patient diary	Depends on patient diligence and honesty

As it is impossible to rely only on one measuring tool, several of the reviewed papers include the use of two or more tools. For example, Taibanguay et al. (2019) included pill count along with the MTB-

Thai self-report questionnaire, where the former is considered more objective measure, whereas the latter is used to identify how patient perceive her own adherence behaviour. Combining different methods is currently widely suggested, as improvement in one measure but not in another is informative in itself: in the rheumatoid arthritis trial, only self-report measures increased adherence in the counselling arm, although pill count measures increased in both arms, suggesting that counselling made patient more aware of herself (Taibanguay et al., 2019).

Adherence behaviour is also not evenly distributed over time: data from a large cohort of US cardiovascular patients (cited in Tan, 2020) show that less than 47% are adherent at long-term stage; about 12% never have the prescription filled (primary non-adherence); about 12% have it filled, but do not take it at all; about 29% start taking the prescription, but stop afterwards (secondary non-adherence). The proportions, as presented in Figure 4 below, make a valuable reminder of the need to conduct the counseling at multiple stages of the medication usage process, as each stage requires a different type of intervention.

Figure 4. Breakdown of medication-taking behaviour among patients prescribed cardiovascular medication

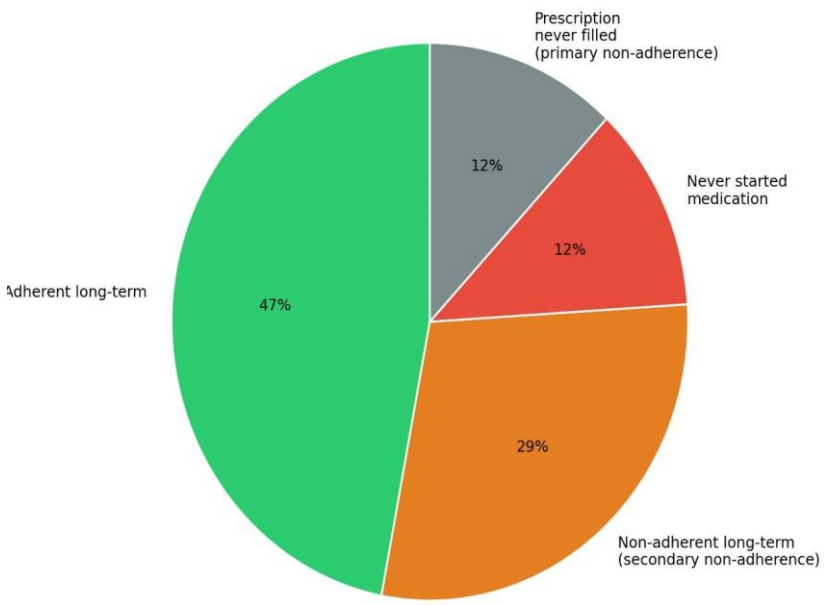


Figure 4. Illustrative proportion of patients' adherence behaviour regarding long-term prescribed cardiovascular medicines (cited in Tan, 2020).

6. Determinants of Adherence: The WHO Five-Dimension Model

According to Costa et al. (2015) and Sabaté (2003), the World Health Organization categorises the determinants of adherence into five interrelated dimensions: social/economic factors (cost of treatment, education, social support), health system factors (patient-doctor relationship quality,

continuity, access), disease-related factors (severity of symptoms, chronicity, comorbidities), therapy-related factors (complexity of the regimen, dosing frequency, adverse effects, duration), and patient-related factors (beliefs, knowledge, health literacy, motivation, cognitive functioning). Single-component interventions typically fail because none of the factors can accurately predict non-adherence on its own (Costa et al., 2015).

Figure 2. WHO's Five Interacting Dimensions of Medication Adherence

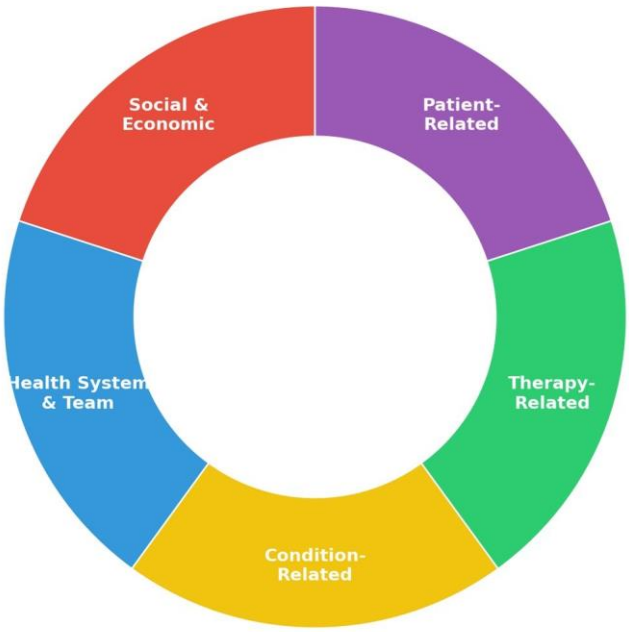


Figure 2. The WHO's five interacting dimensions determining the behavior of patients with medications (adapted from Sabaté, 2003; Costa et al., 2015).

Patient-related determinants are especially amendable to counselling. Higher levels of adherence are seen in patients who accept the severity of their condition, trust their treating clinician, and are convinced in the efficacy of the prescribed medication (Laufs, Rettig-Ewen & Böhm, 2011). Misperceptions of the disease and its management, e.g., the opinion among hypertensive patients that medication is not needed once the blood pressure feels "normal," are significantly associated with lower adherence (Tan, 2020). Comorbidities including neurological disorders, psychological problems (depression, anxiety), and cognitive impairments are also correlated with lower levels of adherence and necessitate adjustments to the process of counseling (Laufs, Rettig-Ewen & Böhm, 2011; Costa et al., 2015).

7. How Patient Counselling Improves Adherence

7.1 Building Knowledge and Correcting Misconceptions

Filling in the gaps between the patient's knowledge and beliefs and the information provided by the treating clinician is one of the simplest ways that counselling increases adherence. Up to 40–80% of the information given during a single medical consultation can be quickly forgotten, according to Ciliberti and Bonsignore (2025). Patients frequently supplement (or even replace) this information with information from non-clinical sources, such as social media and recommendations from family members. This issue is specifically addressed by structured therapy that is repeated at different intervals and enhanced by written and visual materials (Ciliberti & Bonsignore, 2025; Merks et al., 2021).

7.2 Building Trust and a Collaborative Relationship

Apart from providing the information, counselling has a relational function. As explained by Ciliberti and Bonsignore (2025), counselling performed by the pharmacist creates the "space of communication" that is perceived by the patients as less time-constrained and more approachable than a conversation with a physician, allowing disclosing any uncertainties, non-adherence episodes, and side effects that would be otherwise not shared. Indeed, adherence increases in case when patients trust their pharmacist and believe that their beliefs and concerns were taken into account (Laufs, Rettig-Ewen & Böhm, 2011).

7.3 Addressing Intentional Non-Adherence Through Shared Decision-Making

Motivational interviewing counselling has demonstrated a short-term benefit in improving objectively assessed adherence, such as in older type 2 diabetes patients (Costa et al., 2015). This is because intentional non-adherence results from a rational evaluation of risks against benefits. Similarly, while the impact on adherent behaviour is less consistent, decision aids that provide risk information during a counselling session have been shown to be useful in improving patients' accuracy of risk perception (Costa et al., 2015).

Table 3 below provides a map between frequently described counselling techniques and the type of non-adherence they would be best suited for addressing.

Table 3. Counselling techniques mapped to the type of non-adherence they mainly target.

Counselling technique	Primarily addresses	Illustrative source
Structured, one-off verbal explanation of drug/disease	Knowledge gaps; unintentional non-adherence from misunderstanding	Taibanguay et al., 2019; Ciliberti & Bonsignore, 2025
Motivational interviewing	Intentional non-adherence driven by beliefs/concerns	Costa et al., 2015
Teach-back / illustrated pictograms	Low health literacy; recall failure after consultation	Merks et al., 2021
Telephone / remote follow-up counselling	Forgetfulness; loss of momentum after the initial visit	Laufs, Rettig-Ewen & Böhm, 2011; Bryant et al., 2013
Blister-pack / dose-box review at dispensing	Regimen complexity; unintentional dosing errors	Laufs, Rettig-Ewen & Böhm, 2011
Shared decision-making / decision aids	Risk misperception; treatment ambivalence	Costa et al., 2015

8. Evidence From Clinical Studies

8.1 Rheumatoid Arthritis: Pamphlet Versus Directed Counselling

The randomised controlled experiment by Taibanguay et al. (2019) provides a fairly clear illustration of a head-up comparison of counselling intensity. One hundred and twenty patients who showed non-adherence to rheumatoid arthritis treatment were randomly assigned to either a single-intervention arm (which included only a disease-information pamphlet) or a multiintervention arm (which included a thirty-minute counselling session with chemists and nurses in addition to the pamphlet). Although the difference in the improvement rate between the groups (5.38% vs. 3.18%, p = 0.531) was not statistically significant, adherence as measured by pill counting increased significantly in both study arms, from 88.6% to 92.4% in the former group and from 92.2% to 97.6% in the latter. Only the counselling group saw a substantial increase in selfreported adherence (using the MTB-Thai questionnaire).

Authors conclude that the written information alone has demonstrated to be a very good way of improving compliance whereas the thirty-minute additional counselling session did not show any statistically significant extra improvement after 12 weeks though self-report adherence and satisfaction were increased. Taibanguay et al. pointed out that 12 weeks might be too short for seeing the cumulative effects and that neither one of the interventions targeted health literacy which, based on the authors, is a big part for the future design of counselling programs (Taibanguay et al., 2019).8.2 COPD: Where Multi-Component Counselling Outperforms Simple Education

For instance, a comprehensive review of seven controlled COPD trials done by Bryant et al. (2013), showed that only five interventions were effective in boosting medication adherence. The first one was short counselling at a pharmacy which even took the time of just 3-5 minutes, and which led to an increase of theophylline adherence, judged by blood level of the drug and number of refills; a second was Chronolog feedback via the Nebuliser with a short guidance by health workers; and a third one was maybe the strongest case for an integrated intervention that included personal care plan, self-management education session lasting two hours, nurse visit to the home within 72 hours of discharge, plus phone calls which caused the adherence to the inhaled drugs to rise from 37% to 71% in 12 months (p=0.009). Then again, two multi-component interventions that only included group education sessions without individualised follow-up didn't work as far as increasing adherence is concerned, so underlining Really both personalisation and continuity aspects are crucial besides the presence of counselling alone.8.3 Hypertension: Belief, Health Literacy, and the Case for Ongoing Counselling

In turn, Tan (2020) summarises the evidence that adherence in hypertension depends at least as much on patients' beliefs about necessity and concerns as on socio-demographic characteristics, with the latter being relatively rigid and the former being modifiable and therefore suitable for intervention. Poor health literacy and misconceptions related to an asymptomatic condition ("if I feel fine, I don't need the tablet") are among the frequently identified factors responsible for nonadherence. Tan argues that patient education, understood as a systematic and adaptable process rather than a one-time activity, allows empowering patients to become participants in managing their hypertension and suggests that pharmacists, being more

frequently contacted by patients and having more time for communication, are the ones best suited to assume the counselling role.

8.4 Cardiovascular Disease: Telephone Counselling and the Number of Daily Doses

Finally, Ho, Bryson and Rumsfeld (2009) and Laufs, Rettig-Ewen and Böhm (2011) discuss telephonic counselling as a means of extending face-to-face counselling with limited resource needs. In the two-year randomised study involving over a thousand patients with polypharmacy, regularly conducted telephone counselling performed by pharmacy employees (and not physicians) was associated with a dramatic reduction in all-cause mortality (relative risk 0.59, p=0.039) (Laufs, Rettig-Ewen & Böhm, 2011). Complementary data indicate that the number of daily doses itself is an important driver of adherence (independent of counselling) - adherence decreases from 79% (one dose per day) to 51% (four doses per day). Hence, it can be argued that counselling is especially efficient when conducted in conjunction with attempts to make the regimen simpler (for instance, using fixed-dose combinations - "polypills" - or dose-dispensed blister packaging) (Laufs, Rettig-Ewen & Böhm, 2011).

8.5 Summary of Comparative Evidence

Condition Study	Counselling format	Adherence outcome	Clinical outcome
Rheumatoid arthritis (Taibanguay et al., 2019)	30-min directed counselling + pamphlet vs pamphlet alone	Both improved (92.2→97.6% vs 88.6→92.4%); between-group difference n.s.	DAS28, QoL, pain unchanged in both arms
COPD (Bryant et al., 2013)	Integrated care: care plan + education + home visit + phone follow-up	Inhaled-treatment adherence 37%→71% at 12 months (p=0.009)	Improved inhaler technique, nutrition, disease knowledge; fewer admissions
Hypertension (Tan, 2020)	Ongoing belief-focused patient education	Adherence linked to necessity/concern beliefs more than demographics	Only ~35% Malaysian patients cited achieved BP control
Polypharmacy / cardiovascular (Laufs et al., 2011)	Regular telephone counselling by pharmacy staff	Adherence-linked mortality fell (RR 0.59, p=0.039)	Reduced all mortality over 2 years
Chronic disease,	Education-only vs multi-	Education alone:	Gains in adherence not
Condition Study	**Counselling format**	**Adherence outcome**	**Clinical outcome**
general (Costa et al., 2015)	component (education+behavioural+case management)	little/no adherence gain; multicomponent: consistent gains	always matched by gains in hard outcomes

n.s. = not statistically significant; QoL = quality of life; BP = blood pressure.

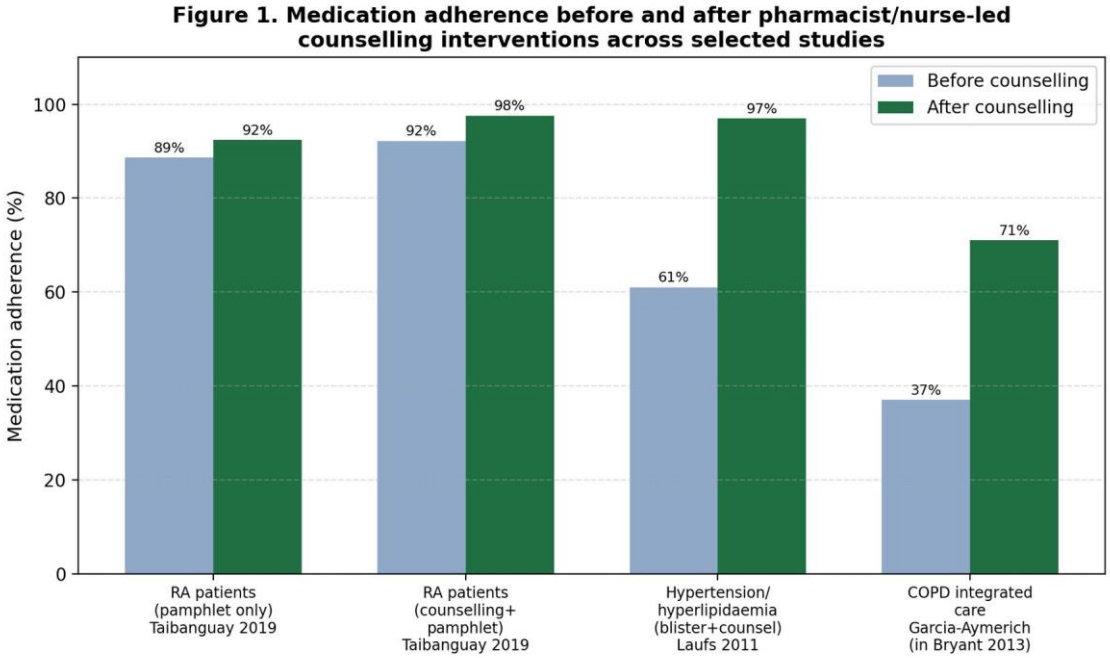


Figure 1. Examples of before/after adherence rates resulting from selected interventions discussed in this review (Taibanguay et al., 2019; Laufs, Rettig-Ewen & Böhm, 2011; Bryant et al., 2013).

9. Single-Component Education Versus Multi-Component Counselling Interventions

A number of the studies cited indicate that a combination of factors is better than a single factor - e.g. counselling/education only - in achieving a sustainable change in non-adherent behaviour. Interventions incorporating behavioural support, regime simplification, adherence reminders, and follow-up meetings appear to be the best at producing more lasting results compared to those which do not have these components (Costa et al., 2015; Bryant et al., 2013; Merks et al., 2021). Costa et al. (2015), Bryant et al., Merks et al.. Costa et al., upon reviewing literature on intervention approaches, stated that when the main objective of the intervention is the improvement of adherence simply through provision of information, it usually leads to failure to attain the said objectives yet multi-faceted medication management programmes, delivered by pharmacists, like MeMemo and DelpH studies, had resulted in a significant drop in the number of patients experiencing adherence problems or discontinuing their prescribed therapeutics.

The conclusion drawn in the previously cited review of interventions to address non-adherence at chronic illness setting is that educational interventions alone are not effective in improving adherence. In contrast, the combination of counselling + behavioural support as two components in complex multiple interventions can bring a higher success rate, although these may have limitations or they might not always yield the desired results (Kripalani, Yao & Haynes, 2007). Adherence and persistence, in fact, have been studied so intensively over the years through different lenses such that no single tool will suit all patients; that means, individual barriers to each patient should be identified

through thorough assessment and the counselling strategy adapted so for that patient - whether it is a cognitive, a behavioural, or a logistic barrier (Krueger, Berger & Felkey, 2005). Merk et al. (2021) reported a Cochrane review that confirmed that low-bias studies used multifaceted interventions - different components of tailored long-term pharmacist/nurse support, intensive education, motivational interviewing, cognitive-behavioural methods, and daily assistance during treatment and sometimes family or peer involvement. Despite that, these interventions were not always tied to better adherence and clinical outcomes and showed that counseling, while crucial, is not a magic bullet for adherence improvement (Merks et al., 2021).

10. Tools That Extend the Reach of Counselling

10.1 Pictograms and Visual Aids

Counselling, it's clear to me, isn't the most efficient measure when it comes to patients' limited health literacy. These reports estimate that limited health literacy rate is 47% in the USA, 60% in Canada and 62% some countries of Europe (Merks et al., 2021). Patients should forget 40-80% of the information communicated to them during consultation. The health literacy level in different high-income countries can be discerned from figure 3.

Figure 3. Proportion of adults with limited health literacy across selected countries/regions (Institute of Medicine, 2004; Canadian Council on Learning, 2008; Srensen et al., 2015, as cited in Merks et al., 2021).

The use of pictograms - a collection of simplified, standardised images that communicate one single directive ("do not crush", "take with food") - have proved extremely helpful in the recall and understanding of the dosing instructions among HIV-diabetes, asthma, and cardiological patients when accompanied verbal counselling (Merks et al., 2021) but, one important point to keep in mind most of all, is that the pharmacist must also explain to the patient what the pictures represent during the counselling process because patients will not benefit much from this use of pictures without the explanation (Merks ct al 2021) (Merks et al., 2021). This advantage of picture recall for liquid medication administrations among child caregivers was corroborated by a well-defined systematic review (Chan et al., 2015). Table 2 summarises pictogram-based counselling interventions in Merks et al. (2021) .

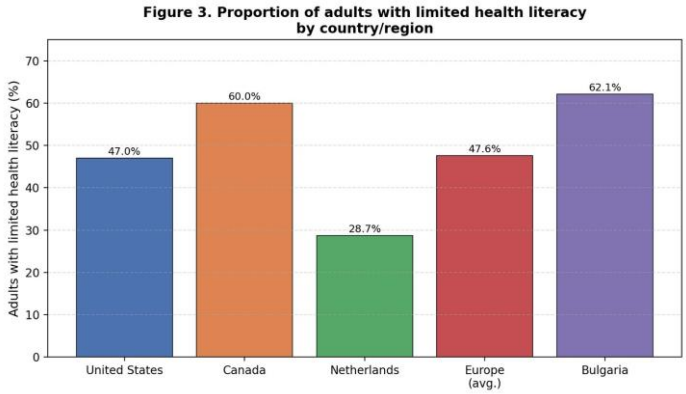


Figure 3. Proportion of adults with limited health literacy across selected countries/regions (Institute of Medicine, 2004; Canadian Council on Learning, 2008; Sørensen et al., 2015, as cited in Merks et al., 2021).

Pictograms, that is simple standardized pictures which usually show one kind of an instruction ("do not crush", "to take together with food"), could be helpful to remember and understand the way a medication should be taken, when used beyond verbal counseling with the patients who are taking medicines for HIV diabetes asthma, and cardiological indications (Merks et al., 2021). Even so, the pharmacist must be very active in explaining the pictures during the counselling session since simply showing these pictures without any explanation does not really help the patient (Merks et al., 2021). It was shown that a systematic review of such use of pictograms was also able to confirm their effectiveness in memory support after reading medication dosing instructions to the caregivers of young children who used liquid medications (Chan et al., 2015). Selected pictogrambased counselings as a part of the Merks et al. (2021) review are given in Table 2.

Table 2. Selected pictogram-based counselling interventions in chronic disease (adapted from Merks et al., 2021)

Condition	Study	Intervention	Key finding
Asthma	Almomani et al., 2018	Verbal counselling + pictogram medals on inhaler devices	5–7× greater odds of improved inhaler technique vs verbal counselling alone
Type 2 diabetes	Negarandeh et al., 2013	Illustrated teach-back education sessions	Significantly higher knowledge and medication/dietary adherence vs usual care
HIV/AIDS	Mansoor & Dowse,	Simple pictogram-based	Adherence 88.3% vs
Condition	**Study**	**Intervention**	**Key finding**
	2006	patient information leaflet	67.7% with no leaflet ($p<0.05$)
Coronary heart disease	Kripalani et al., 2012	Illustrated medication schedule ± refill reminder postcards	Benefit concentrated in patients with >8 medications or low selfefficacy
Heart failure	Hawkins & Firek, 2014	Pictorial medication sheet + pill box with alarms	Significant improvement in adherence among cognitively impaired veterans

10.2 Reminder Packaging and Dose Simplification

The work by Laufs, Rettig-Ewen and Bhm (2011) demonstrated clearly that time-specific blister packaging together with pharmacist counselling at every dispensation visit on indications, dosage and possible side effects of the drugs, can enhance patient adherence from 61% to 97% within six, months. Patient adherence remains on a level of about 95% for patients receiving pharmacy-based counseling and at about 69% for patients who received usual care. In a Danish longitudinal study involving over 19,000 patients, both rates of hospitalisation and length of hospital stay reduced from 7% and 4% respectively, and from 98 to 37 days, due to the introduction of blister packaging (Laufs,

Rettig-Ewen & Bhm, 2011). This effect can be largely attributed to the dose response relationship - which means that the more times per day a drug is taken, the weaker the adherence. The meta-results of 76 trials show that drug non-adherence decreases linearly with an increase of the drug taken times per day. Also, it is reported in 2005 that compared to taking similar drugs separately, there is 23% fewer chances of non-adherence if the medicines are combined as one single pill with a fixed-dose (Claxton, Cramer & Pierce, 2001; Bangalore et al., 2007). That means, such type of counselling is very effective. A patient will be advised to reduce the number of times he/she has to take the drug by asking the prescriber whether one of the medicines included can be taken at a time and/or a fixed-dose combination product is available. In addition, behavioural support would help as well, to facilitate patient's adherence to the prescription regimen.10.3 Telephone Follow-Up and Reminder Systems

Telephone counselling and reminder calls complement an initial face-to-face counselling session in cases of cardiovascular, endocrine, and respiratory diseases and overcome forgetfulness (which is one of the reasons for unintentional non-adherence) (Costa et al., 2015; Laufs, Rettig-Ewen & Böhm, 2011).

11. Limitations of the Current Evidence Base

- Heterogeneity in the adherence measurement methods: different approaches to assessing patients' adherence to medication include pill counts, self-reporting using special questionnaires, pharmacy refill records and electronic monitoring. However, none of these measures is considered as a gold standard and each of them has certain biases (overreporting bias in case of self-reporting and "pill dumping" bias in case of pill count measures) (Ho, Bryson & Rumsfeld, 2009; Costa et al., 2015; Merks et al., 2021).
- Short follow-up period: 12-24 weeks that is often used in the follow-up periods of many trials, including the one on rheumatoid arthritis (Taibanguay et al., 2019).
- Improved adherence without improved outcomes: several studies showed the improvement in adherence without any improvements in disease activity, quality of life or biomarker levels, so the reasons can be either low sensitivity of outcome measures or adherence should reach a certain level before the clinical benefits will be revealed (Taibanguay et al., 2019; Costa et al., 2015).
- Bias in the literature: risk-of-bias assessments done in studies on COPD and adherence in general have shown a lack of proper randomization concealment, unblinded outcome assessment and small sample size (Bryant et al., 2013; Costa et al., 2015).
- Over-representation of younger and cognitively healthy patients in trials despite this population being more affected by polypharmacy and non-adherence (Costa et al., 2015).
- Absence of unified behavioural theory: interventions are generally conducted intuitively without any support from theoretical models like Health Belief Model or Theory of Planned Behavior, and this can be considered one of the reasons behind varying effect sizes in different trials (Costa et al., 2015).

12. Implications for Practice and Future Research

12.1 Recommendations for Practice

- Make counselling a regular activity in the process of medication dispensing and follow-up consultations rather than a single point intervention upon starting treatment (Ciliberti & Bonsignore, 2025; Laufs, Rettig-Ewen & Böhm, 2011).
- Use verbal counselling together with visuals (pictograms, illustrated medication schedule) for patients with low health literacy and ensure that the patient receives an explanation of how the aid works rather than just being provided with it (Merks et al., 2021).
- If possible, link counselling with regimen simplification (dosage reduction, use of fixed dose combinations and blister/dosage packaging) as the number of doses per day is one of the major independent variables linked to non-adherence (Laufs, Rettig-Ewen & Böhm, 2011).
- Use motivational interviewing approaches to uncover and deal with intentional nonadherence instead of always considering all cases of nonadherence as unintentional (Costa et al., 2015).
- Follow up counselling by phone or remotely after the first session, especially during the critical period after discharge (Bryant et al., 2013; Laufs, Rettig-Ewen & Böhm, 2011).
- Acknowledge and pay for the time devoted to counselling on the part of pharmacists and nurses to facilitate sustainable extended counselling roles (Ciliberti & Bonsignore, 2025).

12.2 Priorities for Future Research

- Use of a standardized and, ideally, multimodal method of adherence measurement to enable comparisons across different studies (Ho, Bryson & Rumsfeld, 2009; Merks et al., 2021).
- Increased follow-up period to measure not only adherence gains but also their sustainability and clinical outcomes (Taibanguay et al., 2019).
- Explicit trials utilizing behavioral change theories (e.g., Health Belief Model, Theory of Planned Behaviour) to better understand the underlying mechanisms behind counseling and adherence (Costa et al., 2015).
- Increased involvement of older people and cognitively-impaired individuals in studies, along with the examination of counseling models that involve caregivers (Costa et al., 2015).
- Systematic cost-effectiveness evaluations of pharmacist/nurse-led counseling programs to ensure financial sustainability and remuneration models (Ciliberti & Bonsignore, 2025).

13. CONCLUSION

Despite the variety of clinical conditions studied (rheumatoid arthritis, COPD, hypertension, and cardiovascular diseases), all the evidence discussed in this review points to the same conclusions about patient counseling: counseling alone is never enough to improve patient adherence, but it is definitely required for success. Counseling increases patients' satisfaction, knowledge level, and adherence, and in some well-conducted randomized trials, it has led to clinically significant

improvements in objectively measured adherence and mortality rate. However, as was mentioned above, the highest and most long-lasting results can be achieved not with the help of isolated single session of counseling, but in case when it is combined with other interventions, such as simplification of therapy regime, use of visual aids for illiterate patients, reminders and follow-ups. Taking into account the current global problem of the growth of chronic conditions prevalence and polypharmacy in health care systems, the recognition of structured patient counseling as a tool and the implementation of financing and integration of counseling into care can be considered one of the most promising solutions to medication adherence issue.

REFERENCES

1. Taibanguay N, Chaiamnuay S, Asavatanabodee P, Narongroeknawin P. Effect of patient education on medication adherence of patients with rheumatoid arthritis: a randomized controlled trial. Patient Prefer Adherence. 2019;13:119–129. https://doi.org/10.2147/PPA.S192008
2. Ho PM, Bryson CL, Rumsfeld JS. Importance of medication adherence in cardiovascular outcomes. Circulation. 2009;119
3. Bryant J, McDonald VM, Boyes A, Sanson-Fisher R, Paul C, Melville J. Improving adherence to medications in chronic obstructive pulmonary disease: a systematic review. Respir Res. 2013;14:1
4. Tan CS. Need for patient education for improvement in drug adherence in hypertensive patients. Malays J Pharm. 2020;6(1):1-5.
5. Merks P, Cameron J, Bilmin K, Świeczkowski D, Chmielewska-Ignatowicz T, Harężlak T, Białoszewska K, Sola KF, Jaguszewski MJ, Vaillancourt R. The importance of adherence to medications and the function of pictograms in the counseling of medication in chronic
6. Ciliberti R, Bonsignore A. Integrations of new types in patient management: The pharmacist's function from counseling to medication compliance. J Prev Med Hyg. 2025;66:E38-E44.
7. Laufs U, Rettig-Ewen V, Böhm M. Strategien zur Verbesserung der Medikamenteneinhaltung. Europäisches Herzjournal. 2011;
8. Costa E, Giardini A, Savin M, Menditto E, Lehane E, Laosa O, Pecorelli S, Monaco A, Marengoni A; on behalf of the A1 Action Group “Prescription and Adherence to Medical Plans”, European Innovation Partnership on Active and Healthy Ageing. Tools for intervening on improving medication adherence: literature review. Patient Prefer Adherence. 2015;9:1303–1314. https://doi.org/
9. Editor Sabaté E. Adherence to Long-Term Therapies: Evidence for Action. Geneva: World Health Organization; 2003. Available from: http
10. L Osterberg, T Blaschke. Adherence to medication. N Engl J Med. 2005
11. Nieuwlaat R, Wilczynski N, Navarro T, et al. Interventions to improve adherence to medications. Cochrane Database of Systematic Reviews. 201
12. Brown MT, Bussell JJ, Dutta S, Davis KA, Strong SA, Mathew S. Medication adherence: Truth and consequences. Am J Med Sci. 2016;351(4

13. Vrijens B, De Geest S, Hughes DA, et al. A New Taxonomy for the Description and Definition of Medication Adherence. Br J Clin Pharmacol. 2012;73(5):691-70
14. DiMatteo, MR. Patient adherence to medical advice: a quantitative summary of 50 years ofresearch. Medical Care. 2004;42(3):20
15. Medication adherence and persistence: a comprehensive review. Krueger KP, Berger BA, Felkey B. Adv Ther. 2005;2
16. Kripalani S, Yao X, Haynes RB. Improving adherence to medications in patients with chronic illness: a systematic review. Archives of Internal Medicine. 2007;167(6
17. Claxton AJ, Cramer J, Pierce C. A systematic review of the relationships between medication dose regimen and adherence. Clin Ther. 2001;23(8):129
18. Bangalore S, Kamalakkannan G, Parkar S, Messerli FH. Fixed-dose combination therapy improves adherence to medication: a meta-analysis. Am J Med.
19. Simpson SH, Eurich DT, Majumdar SR, et al. A meta-analysis of the association between adherence to drug therapy and mortality. BMJ. 2006;333(7557):1
20. Cutler, DM; Everett, W. Thinking outside the pillbox: medication adherence as a health care priority. New England Journal of Medicine 2010; 362 (17):
21. Chan, HK; Hassali, MA; Lim, CJ; Saleem, F; Tan, WL. Use of pictograms in helping caregivers give liquid medicines: a systematic review. J Clin Pharm Ther. 2015;40(3):2
22. Committee on Health Literacy, Institute of Medicine (US). Health Literacy: A Prescription to End Confusion. Edited by Lenore Nielsen-Bohlman, Alison M. Panzer, David A. Kindig. Washington (DC): National Academies Press (US); 2004
23. Sørensen K, Pelikan JM, Röthlin F, et al. Health literacy in Europe: comparative results from the European Health Literacy Survey (HLS-EU). Eur J Public Health. 2015;25(6):105
24. Almomani BA, Mokhemer E, Al-Sawalha NA, Momany SM. A new method for educating on asthma inhalers through a pharmaceutical picture. Respir Med. 2018;143:103-1
25. R Negarandeh, H Mahmoodi, H Noktehdan, R Heshmat, E Shakibazadeh. Teach back and pictorial image educational interventions for improving diabetes knowledge and adherence to medication/ diet in low health literate patients with type 2 diabetes. Prim Care Diabetes. 2013;7(2):
26. LE Mansoor, Dowse R. Information about medicines and adherence in patients with HIV/AIDS. J Clin Pharm Ther. 2006;31
27. Kripalani S, Schmotzer B, Jacobson TA. Medication adherence improvement via graphic intervention in coronary heart disease (IMAGE-CHD): a randomized controlled study. J Gen Intern Med. 2012;27(12):1609-1617. Free access: https://doi.org/10.1007/s11606-012-2136-z