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Case report

Medication adherence in the elderly



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ABSTRACT

Medication adherence is a crucial component in the treatment of chronic diseases. In the elderly, clinicians are faced with a unique set of problems associated with adherence that they may not have been adequately trained for. In this paper, we demonstrate the importance of medication adherence in the elderly through a case study. The different factors affecting medication adherence in the elderly are highlighted: patient, medication, health care providers, health care system, and socioeconomic factors. Lastly, we have proposed various ways to address these factors. In doing so, clinicians can better understand the problems that the elderly face, thus achieving better therapeutic outcomes.

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Mr T is an 80-year-old Chinese man, wheelchair bound with diabetes mellitus, hypertension, chronic kidney disease, peptic ulcer disease, and anemia, presents to the clinic with recurrent admissions for poor diabetes control and hyperkalemia. He is on 17 different medications and tells you that he is having difficulty managing medications at home. How should the physician optimize his medications? Do other health care professionals have a role to play?

1. Definitions

The term *medication adherence* is defined as the extent to which a person's behavior agrees with the agreed medication regimen from a health care provider.¹ An *elderly person* is defined as a person who is aged ≥ 65 years.² The case that is discussed is about Mr T, an elderly gentleman who is nonadherent to his medications.

2. Why is adherence to medications important?

Adherence to medications has always been a problem among patients. As the elderly are prone to multiple comorbidities, they are at higher risk of polypharmacy, and therefore may present with

higher risk of nonadherence to medications compared to the younger population.³ This results in decreased therapeutic benefits for the patient, frequent hospital and physician visits due to the deterioration of their medical condition, increased health care expenditure, and even overtreatment of a condition.^{4,5}

Using diabetic medications as an example: if a patient frequently misses his medications, the drug level may not remain within the therapeutic range. When the levels fall below the therapeutic range, the drug may not be able to reduce optimally the excess glucose that is present in the blood thus resulting in suboptimal glucose control. When the patient comes for follow-up, their blood sugar levels may be suboptimal, prompting the physician to titrate the dosage if adherence to medications was not checked. This unnecessary titration in dosage may predispose the patient to an increased risk of both hypoglycemic and hyperglycemic episodes, which, if not managed well, may be detrimental to the patient.⁶ In the long run, the chronic diseases may not be well controlled and may even result in progression of the disease.⁷

3. What are the reasons for nonadherence in the elderly?

Reasons for nonadherence can be broadly classified into patient factors, medication factors, health care provider factors, health care system factors, and socioeconomic factors as per recommendation from Miller et al⁸ and the World Health Organisation.⁹

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3.1. Patient factors

As adherence to medications very much depends on an individual, many studies have investigated the different patient factors that may affect an individual's willingness and ability to adhere to a medication schedule. In the geriatric population, assessment of the patient factors is similar to doing a comprehensive geriatric assessment of the patient.

These factors from various different studies have been grouped under subcategories such as mental state, physical health, demographics, past medical history, behavior/attitudes/habits, knowledge/beliefs and others, as reflected in Table 1.^{10–36}

3.2. Medication factors

As shown in Table 2, different medication factors such as formulation and packaging, drug regimen, and drug handling, and other factors such as presence of adverse drug reactions, drug interactions, poor labeling instruction, and lack of consequences when missed doses would inadvertently affect adherence to medications, especially in the elderly.^{16,19,23,26,31,37–42} An elderly patient would be more likely to adhere to a medication that has a simpler dosing schedule e.g., every morning dosing, as compared to another medication that has a more complex dosing schedule e.g., twice daily dosing.⁴³ Other important factors such as the cost of medication would be relevant, particularly to the elderly patients who have retired or those from the lower-income groups where concerns for food and shelter have a higher priority than the purchase of medications.

3.3. Health care providers factors

With advances in technology, the wealth of information easily accessible via the Internet, and the fact that health care providers

Table 1
Patient factors affecting medication adherence

Factors	Ref	Factors	Ref
Mental state		Behavior/attitudes/habits	
Depression	10,18	Nonadherence to follow ups	29
Lower cognitive function	18	Personality: neuroticism	30
Memory	13	Use of complementary and alternative medicines	24
Executive function	13	Concurrent use of OTC	25
Anxiety	14	Problem drinking	21
Sleep disturbances	15	Lower self-care	26
		Resisting care	21
		Lack of interpersonal relationships	31
Physical health			
Poor dexterity	16		
BMI \geq 25.0 kg/m ²	17	Knowledge/beliefs	
Physical function	18	Beliefs about medication	32
Impaired hearing	19	Lack of perceived benefit of medications	33
Lower self-rated health	28	Lack of medication knowledge	34
		Lack of knowledge about condition	34
Demographics		Health literacy	35
Old age	19	Misunderstanding of verbal instructions	36
Male gender	20	Lack of threatening view of illness	33
Low education level	20	Higher perceived illness burden	33
Married	21		
Language	12	Others	
Culture	12	Living in own home	20
Ethnicity	15	Hospitalization in the past 6 months	15
		Chronic obstructive pulmonary disorder	51
Past medical history			
History of dizziness	22		

BMI = body mass index; OTC = over the counter medicine.

Table 2
Medication factors affecting medication adherence

Factors	Ref
Drug	
Formulation	37
Packaging	38
Drug storage issues	40
Drug handling	
Lack of use of medication boxes	39
Necessity to cut tablets	39
Difficulty opening containers	36
Drug regimen	
Polypharmacy	40
Medication regimen changes	23
Complex dosing regimen	16
Others	
Cost and lack of insurance coverage	17
Adverse drug reactions	39
Drug–drug interactions	42
Poor labeling instructions	36
Short-term medications	50
Lack of immediate consequences of missed doses	31

play an important role in establishing a trusting relationship with a patient, health care providers factors play an increasingly important role in the patient's adherence to medications.⁴⁴

In an ideal health care provider–patient relationship, the patient would trust that the health care provider is acting in their best interests and would be more likely to adhere to the medications given. As shown in Table 3, to form that relationship to improve adherence, there is a need for proper communication, involvement of patients in decision making and professionalism.^{17,21,34,45–47}

3.4. Health care system factors

As shown in Table 4, health care system factors would include issues such as lack of patient education, lack of follow up, lack of medication schedule given, short duration of prescription, and lack of community nursing services to pack medications.^{29,39,48–50}

For example, with a shorter duration of prescription, the elderly could feel inconvenienced as there is a need for more trips to be made to the pharmacy for medication refills, thus increasing the risk of medication nonadherence when medications are not refilled. Also, when there is a lack of patient education, the patient may not understand the importance of taking medications especially for chronic diseases such as hypertension, diabetes, and hypercholesterolemia. They may have the misconception that “I'm well, I've no symptoms, there is no need for me to take medications everyday”. These misconceptions need to be corrected with patient education.

3.5. Socioeconomic factors

As shown in Table 5, factors that could not be placed into either one of the above groups were classified under this category. They

Table 3
Health care providers factors affecting medication adherence

Factors	Ref
Poor communication	17
Lack patient involvement	45
Lack of confidence in health care providers	45
Prescription by nonspecialists	46
Lack of trust	47
Lack of review of medications	21
Dissatisfaction with doctor visits	17

Table 4
Health care system factors affecting medication adherence

Factors	Ref
Lack of patient education	48
Lack of follow-up	48
Lack of medication schedule	49
Shorter duration of prescription	50
Lack of community nursing services to pack medications	39

include issues with caregiver such as the lack of caregivers and large caregiver burden where patients were reported to have a higher degree of nonadherence to medications.^{19,45}

4. Measures to improve adherence

Going back to the case of Mr T, how can we improve his adherence to medications? We have provided the following example on how to address the different factors using a multilevel approach as suggested by Miller et al⁸ and the World Health Organisation⁹ to individualize therapy and improve outcomes:

4.1. Patient factors

- (1) Assess his mental status. Is he capable of handling his own medications?
- (2) Assess his behavior, attitude and habits. Is he willing to take his medications? Is he adherent to follow ups?
- (3) Assess his knowledge and beliefs about his medications and disease. Is his knowledge about his medications and disease accurate?
- (4) Assess his physical status. As he is wheelchair bound, is he able to serve the medications himself or need a care giver?
- (5) Does the patient have disease such as chronic obstructive pulmonary disorder that may affect adherence?⁵¹
- (6) Was he recently hospitalized? If so, more care needs to be given to ensure adherence.

4.2. Medication factors

- (1) Drug and regimen. Is the packaging user friendly for the him? Has he been counselled on the appropriate storage of insulin? Is it possible to reduce the number of medications and to simplify the regimen?
- (2) Drug handling and others. Does his medications need to be cut? Is he experiencing any adverse drug reactions? Are the instructions labeled appropriately?
- (3) Others. As he is wheelchair bound, does he have an income or insurance to support the purchase of medications? Has the diabetes progressed to optic neuropathy which needs modification of the labels?

4.3. Health care providers factors

- (1) He has approached the health care team for help reflecting the trust that he has for his health care providers.

Table 5
Socioeconomic factors affecting medication adherence

Factors	Ref
Lack of caregiver	45
Large caregiver burden	19

- (2) Communication and interaction. Does the health care team understand what problems he is facing when he is at home?

4.4. Health care system factors

- (1) Was there sufficient patient education?
- (2) Is there a service to help him pack his medications individually for ease of consumption?
- (3) As he is on polypharmacy, is there a medication schedule for him to allow other clinicians to know what is he taking so that they will not add on to his pill burden unnecessarily?

4.5. Socioeconomic factors

- (1) Is he able to care for himself? Does he need a caregiver?

In Mr T's case, we suggest the clinician first assess if he is able to understand his condition and, if he has the right belief and knowledge about his medications and health. Next, we also suggest including the pharmacist to consider doing a medication reconciliation service to assist in reduction of polypharmacy and also to pack his medications in suitable storage containers for ease of consumption. The pharmacist will also provide a medication schedule so that other clinicians will not add on to his pill burden unnecessarily. We strongly suggest Mr T to seek help from the medical social worker to understand his financial and social conditions so that he will not forgo his medications due to financial constraints and has a suitable caregiver to assist him if needed. We recommend that health care providers use his dialect or a translator to better understand his situation. Lastly, as Mr T belongs to a high-risk population with multiple comorbidities, we suggest that a case manager to be assigned to manage his case so that communications between different disciplines are clear and all health care providers will have a better understanding of Mr T's overall health.

The above method is an example of how we will approach a patient such as Mr T. We would like to encourage all physicians, nurses, and pharmacists who interact with the elderly to use the above method to improve adherence. However, this method will take an additional 5–10 minutes on top of your workload keeping in view the possible time saved when the patient has better medication adherence, hence achieving better therapeutic outcome. We will also like to highlight that this method is currently not validated. It may not be workable in every clinical setting and all health care providers are advised to use their clinical judgment to see if this method will be suitable in their clinical context.

5. Conclusion

Adherence to medications is important in ensuring that therapeutic benefits are delivered to patients. However, adherence to medications has always been an issue, especially amongst the elderly. It is important to keep the patient, medication, health care providers, health care system and socioeconomic factors in mind so as to be able to come up with suitable and individualized solutions to overcome these issues. Physicians are not considered to have treated a patient after writing a prescription. There is a need to ensure adherence to the medications prescribed so that the patient would be able to receive maximum therapeutic benefits.

Conflicts of interest

All authors declare no conflicts of interest.

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