



DOI: 10.5505/anatoljfm.2023.83030  
Anatol J Family Med 2023;6(2):81–86

## Medication Adherence and its Affecting Factors among Older Adults

Sevinç Sütü

Department of Gerontology, Burdur Mehmet Akif Ersoy University Faculty of Health Sciences, Burdur, Türkiye

### ABSTRACT

**Objectives:** This study aimed to evaluate drug compliance and its affecting factors in people aged 65 and over.

**Methods:** People aged 65 and over living in Burdur between December 2019 and March 2020 were included in this descriptive study. The data were collected using a form seeking the participants' demographic and medication use characteristics and the Morisky Medication Adherence Scale.

**Results:** A total of 348 participants were included in the study, and the mean age was 74.9±7.2 years. It was determined that 256 (73.6%) of the elderly who participated in the study did not have any medication nonadherence, and 92 (26.4%) of them had low medication adherence. It was found that medication nonadherence was higher among those with insufficient/barely sufficient income (OR=1.888, 95%CI=1.114–3.201, p=0.018), not recognizing the medicines they used (OR=1.334, 95%CI=1.072–1.660, p=0.010), and in those believing injectable medicines to be more efficient than other types of medicines (OR=2.016, 95%CI=1.172–3.468, p=0.011).

**Conclusion:** Medication nonadherence is quite common among older adults. Medication nonadherence is known to be a key factor for treatment failure. Therefore, it seems necessary to ensure medication literacy among older adults to eliminate medication non-adherence.

**Keywords:** Drug compliance, elderly, medication adherence



Please cite this article as: Sütü S. Medication Adherence and its Affecting Factors among Older Adults. Anatol J Family Med 2023;6(2):81–86.

**Address for correspondence:**  
Dr. Sevinç Sütü, Department of Gerontology, Burdur Mehmet Akif Ersoy University Faculty of Health Sciences, Burdur, Türkiye  
**Phone:** +90 505 378 14 58  
**E-mail:**  
ssutlu@mehmetakif.edu.tr

**Received Date:** 31.03.2023  
**Revision Date:** 10.04.2023  
**Accepted Date:** 16.08.2023  
**Published online:** 31.08.2023

©Copyright 2023 by Anatolian Journal of Family Medicine - Available online at [www.anatoljfm.org](http://www.anatoljfm.org)

OPEN ACCESS



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

### INTRODUCTION

Aging may bring an increased prevalence of chronic diseases, leading to a dramatic increase in medication compared to other age groups.<sup>[1,2]</sup> In addition to suffering many chronic diseases, older adults become a particular group due to physiological changes, alterations in the absorption, distribution, metabolism, and excretion of medicines in the body, and the inability to adapt to the doses and use of medicines. The treatment success is directly linked with older adults' medication adherence. With aging, the frequency of chronic diseases, physical and cognitive deficiencies, and the number of medications used increase, which causes non-adherence to treatment as an important health problem. Medication or treatment adherence is one's act of doing what is recommended by the physician and avoiding what they should not do during the treatment. In other words, it is the patient's following the prescription medication in a complete, timely, and recommended manner, not ceasing the medication before the recommended time, assuming that they have fully recovered, and acting in accordance with the behaviors that they should or should not do. Increased medication nonadherence among older adults is likely to contribute to the rates of re-admissions, prolonged hospitalization, and health expenditures. Therefore, uncovering medication adherence and affecting factors among older adults seems key to improving their health outcomes.

This present study aimed to evaluate medication adherence and affecting factors among older adults in Burdur province.

## METHOD

The data of the research were collected by face-to-face interview technique between December 2019 and March 2020. The target population of this descriptive study consisted of 36,809 individuals aged 65 years and older in Burdur province.<sup>[3]</sup> The sample size was calculated using  $n = Nt^2pq/d^2(N-1) + t^2pq$ . Accordingly, the sample size was calculated to be 380 when considering  $n=36,809$ ,  $p=0.50$ ,  $q=1-p$ ,  $t=1.96$ ,  $d=0.05$ . The elderly were reached through family medicine units. By dividing the sampled number by the number of family physicians, the number of elderly per family physician was calculated as 4.8 ( $380/79=4.8$  persons). Five people were selected by random sampling method from all family medicine units in Burdur province, except prison and university family medicine departments.

Nursing home residents were excluded from the study. Moreover, the entire sample could not be reached due to death, migration, and refusal to participate in the research, and 348 (91.6%) individuals were reached.

The participants were administered a questionnaire booklet covering a form for the participants' demographic (gender, age, educational attainment, marital status, social security, and income status) and medication use characteristics (chronic diseases, number and doses of medicines used, recognition of the medicines used, medicine giver, use of alternative treatments, and adherence to prescriptions) and the Morisky Medication Adherence Scale (MMAS-4).

MMAS-4 is a self-report scale designed by Vural et al. adapted the scale to Turkish.<sup>[4]</sup> The scale consists of four two-choice (Yes/No) closed-ended questions. If all the questions are answered "No," medication adherence is considered high. It is considered moderate when one or two questions are answered "Yes" and low when three or four questions are answered "Yes."

The statistical analyses were performed on the IBM SPSS 23.0 program (IBM Corp., Armonk, NY). Descriptive statistics are presented as frequency, percentage, mean, and standard deviation. Groups were compared using the Chi-square test. Factors affecting medication non-adherence were investigated with a binary logistic regression model created with variables found to be significant in univariate analysis. A  $p < 0.05$  was statistically significant accepted.

## RESULTS

A total of 348 participants were included in the study. The mean age was  $74.9 \pm 7.2$  years, and 190 (54.6%) of the participants had hypertension. The mean number of medicines used was  $4.1 \pm 2.5$ , and 59 (17.0%) of the participants were not using medication. The sociodemographic and drug use characteristics of the participants are summarized in Table 1.

**Table 1.** Sociodemographic and drug use characteristics of the participants

	n (%)
Age group	
65–74 years	179 (51.4)
75–84 years	135 (38.8)
≥85 years	34 (9.8)
Gender	
Female	201 (57.8)
Male	147 (42.2)
Place of residence	
Rural area	163 (46.8)
Urban area	185 (53.2)
Level of education	
Illiterate	171 (49.1)
Primary school and above	177 (50.9)
Marital status	
Married	184 (52.9)
Widowed/divorced	164 (47.1)
Social security	
Yes	271 (77.9)
No	77 (22.1)
Income status	
Sufficient	161 (46.3)
Barely sufficient/insufficient	187 (53.7)
Chronic disease	
Yes	291 (83.6)
No	57 (16.4)
Orthosis use	
Yes	283 (81.3)
No	65 (18.7)
Number of medicines used*	
≤5 medicines	212 (77.8)
>6 medicines	77 (22.2)
Recognition of medicines used	
Recognizes them	296 (85.1)
Never recognizes them	52 (14.9)
Medicine giver*	
Self	254 (87.9)
Caregiver	35 (12.1)
Alternative medication	
Yes	22 (6.3)
No	326 (93.7)
Not buying prescription medicines	
Yes	37 (10.3)
No	311 (89.7)
Continuing to prescription medicines	
Yes	70 (20.1)
No	278 (79.9)
Buying over-the-counter medicines	
Yes	172 (49.4)
No	176 (50.6)
Believing the superiority of injectable medicines	
Yes	206 (59.2)
No	142 (40.8)

Data are presented as n (%).

\*Only participants using drugs were analyzed.

Of 256 (73.6%) of the elderly who participated in the study, there was no medication nonadherence, and 92 (26.4%) of them had low medication adherence levels. Considering the participants' responses to the questions on the MMAS-4, 158 (45.4%) reported forgetting to take their medicines, 114 (32.8%) stated being sometimes careless about taking their medicines, 105 (30.2%) stopped taking their medicines when feeling better, and 194 (55.7%) stopped taking their medicines if they felt worse. The sociodemographic and drug use characteristics of the participants according to medication adherence are summarized in Table 2.

When the factors associated with medication adherence were evaluated, it was found that medication nonadherence was higher among those with insufficient/barely sufficient income, those not recognizing the medicines they used, and those believing injectable medicines to be more efficient than other types of medicines (Nagelkerke R square=0.107,  $p<0.001$ ). Factors associated with medication adherence use are summarized in Table 3.

## DISCUSSION

In 73.6% of the elderly who participated in the study, there was no medication nonadherence, and 26.4% of them had low medication adherence levels according to Morinsky's criteria. Considering the participants' responses to the questions on the MMAS-4, 45.4% reported forgetting to take their medicines, 32.8% stated being sometimes careless about taking their medicines, 30.2% stopped taking their medicines when feeling better, and 55.7% stopped taking their medicines if they felt worse. On the other hand, there were those not buying their prescription medicines 10.3%, rebuying their previous prescription medicines even though they were not recommended to continue 20.1%, and buying over-the-counter medicines 49.4%. The previous research with geriatric age groups reported the rates of medication nonadherence as 5.7%, 3.8%, and 3.6%.<sup>[1,2,5]</sup> Suganthi and Mallika discovered that 44% of the patients rebought their previous prescription medicines despite not being recommended to continue them. In addition, two previous research reported the prevalence of over-the-counter medicine use to be 25.5% and 35%.<sup>[1,6,7]</sup> The previous Turkey-based studies reported it to vary between 28.7% and 77%.<sup>[8,9]</sup> Given the data of international systematic review research, Zelko et al. reported medication nonadherence to range between 6% and 55%. It was between 14.5% and 2.5% in the study by Nielsen in middle- and low-income countries. In addition, two previous studies in the United States revealed medication nonadherence to be 41% and 53%, respectively.<sup>[10-12]</sup>

Considering Morisky's criteria, 45.4% of our participants re-

ported forgetting to take their medicines. In the literature, this rate varied between 27.9% and 70.7%.<sup>[1,9,12]</sup> Moreover, it was found that 32.8% of the participants sometimes acted carelessly while taking their medications. The previous research uncovered that 8.9–43.2% of older adults sometimes become careless about taking their medicines.<sup>[1,5,12]</sup> In our study, 30.2% of the participants reported stopping taking their medicines when feeling better. It was previously demonstrated to be 7% as the lowest and 72% as the highest.<sup>[5,9]</sup> Finally, those who stopped taking their medicines if feeling worse were 55.7% of our participants. While 23–74.8% of older adults discontinued medication due to side effects in Türkiye-based research, this rate varied between 11% and 55.2% in the international literature.<sup>[1,5,6,12]</sup>

It was determined that the participants' inability to recognize their medicines led to medication nonadherence. Demirbaş and Kutlu realized that 59.3% of geriatric patients did not know the names of their medicines, while 25.2% did not recognize for what disease they used their medicines.<sup>[1]</sup> In another study, Güneş found that 79.8% of older adults could not recognize the names of their medicines.<sup>[13]</sup> Similar to our study, the relevant literature hosts research indicating that lack of recognition of medicines contributes to medication nonadherence.<sup>[8,11,14-16]</sup> The inability of physicians to spare enough time to inform patients about the drug they prescribe was thought to be the cause of medication nonadherence.

Medication nonadherence was higher among the participants believing injectable medicines to be more efficient than other types of medicines. The World Health Organization describes the use of injectable medicines as irrational medicine use when there is no inconvenience in the use of oral medication.<sup>[17,18]</sup> Although older adults favor injectable medicines more, it should be noted that tissue injuries may be more prevalent during injection among such patients due to decreased tissue elasticity and drug absorption with age.<sup>[6,19,20]</sup> In this regard, previous research in Australia determined that 69% of the patients experienced injection-related injuries in the past.<sup>[21]</sup> In addition, it is known that allergic medicine reactions occur more robustly when administering medicines by injection. Nevertheless, the substantial evidence implies that older adults believe that injectable medicines are more efficient than those with oral administration and are ready to pay extra for such medicines.<sup>[6,22]</sup> It was thought that the patients might have become more inclined to leave medicines with oral administration when not being prescribed with injectable medicines, causing a reduction in medication adherence.

Despite research finding medication adherence to be in-

**Table 2.** Sociodemographic and drug use characteristics of the participants according to medication adherence

	Medication adherence		p
	High/moderate level (n=256)	Low level (n=92)	
Age group			0.340
65–74 years	126 (49.2)	53 (57.6)	
75–84 years	105 (41.0)	30 (32.6)	
≥85 years	25 (9.8)	9 (9.8)	
Gender			0.343
Female	150 (58.6)	51 (55.4)	
Male	106 (41.4)	41 (44.6)	
Place of residence			0.365
Rural area	118 (46.1)	45 (48.9)	
Urban area	138 (53.9)	47 (51.1)	
Level of education			0.377
Illiterate	124 (48.4)	47 (51.1)	
Primary school and above	132 (51.6)	45 (48.9)	
Marital status			0.486
Married	136 (53.1)	48 (52.2)	
Widowed/divorced	120 (46.9)	44 (47.8)	
Social security			0.263
Yes	202 (78.9)	69 (75.0)	
No	54 (21.1)	23 (25.0)	
Income status			0.002
Sufficient	131 (51.2)	30 (30.6)	
Barely sufficient/insufficient	125 (48.8)	62 (69.4)	
Chronic disease			0.040
Yes	220 (85.9)	71 (77.2)	
No	36 (14.1)	21 (22.8)	
Orthosis use			0.336
Yes	210 (82.0)	73 (79.4)	
No	46 (18.0)	19 (20.6)	
Number of medicines used*			0.022
≤5 medicines	154 (71.0)	58 (80.6)	
>6 medicines	63 (29.0)	14 (19.4)	
Recognition of medicines used			0.005
Recognizes them	226 (88.3)	70 (76.1)	
Never recognizes them	30 (11.7)	22 (23.9)	
Medicine giver*			0.175
Self	193 (88.9)	61 (84.7)	
Caregiver	24 (11.1)	11 (15.3)	
Alternative medication			0.197
Yes	14 (5.5)	8 (8.7)	
No	242 (94.5)	84 (91.3)	
Not buying prescription medicines			0.035
Yes	22 (8.6)	15 (16.3)	
No	234 (91.4)	77 (83.7)	
Continuing to prescription medicines			0.181
Yes	48 (18.8)	22 (23.9)	
No	208 (81.2)	70 (76.1)	
Buying over-the-counter medicines			0.164
Yes	122 (47.7)	50 (54.3)	
No	134 (52.3)	42 (45.7)	
Believing the superiority of injectable medicines			0.018
Yes	142 (55.5)	64 (69.6)	
No	114 (44.5)	28 (30.4)	

Data are presented as n (%).

Chi-square test.

\*Only participants using drugs were analyzed.

**Tablo 3.** Factors associated with medication adherence

	B	SE	Wald	OR	95%CI	p
Income						
Insufficient/barely sufficient	0.636	0.269	5.567	1.888	1.114–3.201	0.018
Sufficient (Ref)						
Recognition of medicines used						
Never	0.288	0.112	6.656	1.334	1.072–1.660	0.010
Recognizing them (Ref)						
Believing the superiority of injectable medicines						
Yes	0.701	0.277	6.411	2.016	1.172–3.468	0.011
No (Ref)						

CI: Confidence interval; OR: Odds ratio, SE: Standard error.  
Binary logistic regression analysis.

dependent of income, a plethora of studies highlighted an association between income status and medication adherence.<sup>[6,12]</sup> It was previously reported that medication adherence is better among those with high income, but low income is a risk factor for medication nonadherence.<sup>[11,14,23-25]</sup>

There were some limitations in this study. The research was conducted on elderly people registered in family medicine units. It was not possible to represent people who were not registered with Family Medicine Units. The calculated sample size could not be reached in its entirety.

## CONCLUSION

Medication nonadherence was found to be prevalent among older adults as well as excessive medicine use. New prescriptions were issued to older adults, applying to different physicians with similar complaints, without questioning their adherence to their previously arranged treatments. In their intense working conditions, physicians may skip informing their patients about what medicines they prescribe are for, how long they should be used, and their possible side effects, contributing to medication nonadherence. However, treatment success does not only depend on correct diagnosis and appropriate medicine selection but also on patients' being informed about the purpose of the medicines prescribed and how to use them and their ability to reach their physician in case of any problems with the medicines, i.e., being medication literate.

## Disclosures

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

**Funding:** None.

**Ethics Committee Approval:** This study was approved by the

Non-Interventional Clinical Research Ethics Committee of Burdur Mehmet Akif Ersoy University (Approval date: November 07, 2019 and Approval number:162). Verbal consent was obtained from all participants.

## REFERENCES

- Demirbaş N, Kutlu R. Treatment adherence and self-efficacy levels of adults using multiple drugs. *Ankara Med J* 2020;2:269–80.
- Pesen E. Genel dahiliye polikliniğine başvuran geriatric hastalarda polifarmasi oranları ve ilaç kullanımı ile ilgili uygunsuzlukların irdelenmesi (dissertation). Bursa: Uludağ Uni; 2013.
- Turkish Statistical Institute. Adrese Dayalı Nüfus Kayıt Sistemleri. Available at: <https://data.tuik.gov.tr/Bulten/Index?p=Adrese-Dayali-Nufus-Kayit-Sistemi-Sonuclari-2018.30709#:~:text=T%C3%BCrkiye%20n%C3%BCfusunun%20%18%2C4',ki%C5%9Fi%20ile%20Antalya%20takip%20etti>. Accessed Jun 6, 2019.
- Vural B, Acar ÖT, Topsever P, Filiz TM. Modifiye Morisky ölçeğinin Türkçe geçerlilik güvenilirlik çalışması. *J Turk Fam Phy* 2012;3(4):17–20.
- Öztaş Ö, Korkmaz G. Yaşlı bireylerin ilaç uyumsuzluğu ile vücuttaki ilaç kullanım ömrü ve sağlık okuryazarlığı düzeyi ile ilişkisi. *Hacet Üniv Hemşire Fak Derg* 2019;6(3):132–40.
- Suganthi S, Mallika SV. Adherence of patients towards drugs and injections prescribed in a private medical institution in Chennai. *Int J Community Med Public Health* 2019;6(3):1071–73.
- Özbek S, Kaya E, Tekin A, Doğan Ş. Yaşlılarda tedaviye uyum. *Turk Geriatri Derg* 2006;9(3):177–81.
- Yılmaz F, Çolak M. Evaluation of beliefs about medicines and medication adherence among elderly people with chronic diseases. *Turkiye Klinikleri J Health Sci* 2018;3(2):113–21.

9. Solmaz T, Akin B. Medication use and ability of self-medication use in elderly living at home. *Turk Geriatri Derg* 2009;12(2):72–81.
10. Zelko E, Klemenc-Ketis Z, Tusek-Bunc K. Medication adherence in elderly with polypharmacy living at home: a systematic review of existing studies. *Mater Socio Med* 2016;28(2):129–32.
11. Nielsen JØ, Shrestha AD, Neupane D, Kallestrup P. Non-adherence to anti-hypertensive medication in low-and middle-income countries: a systematic review and meta-analysis of 92443 subjects. *J Hum Hypertens* 2017;31(1):14–21.
12. Sirey JA, Greenfield A, Weinberger MI, Bruce ML. Medication beliefs and self-reported adherence among community-dwelling older adults. *Clin Ther* 2013;35(2):153–60.
13. Güneş D. Yaşlıların ilaç kullanımı konusundaki bilgileri ve etkileyen faktörlerin değerlendirilmesi (dissertation). Erzurum: Atatürk Uni; 2014.
14. Ergün Y, Aykan Altıntaş D. Akılcı ilaç kullanımında genel ilkeler. *Arch Med Res* 2019;28(1):19–27.
15. Alhewiti A. Adherence to long-term therapies and beliefs about medications. *Int J Family Med* 2014;479596:8.
16. Cicolini G, Comparcini D, Flacco ME, Capasso L, Masucci C, Simonetti V. Self-reported medication adherence and beliefs among elderly in multi-treatment: a cross-sectional study. *Appl Nurs Res* 2016;30:131–36.
17. WHO. Promoting rational use of medicines: core components. Available at: [https://apps.who.int/iris/bitstream/handle/10665/67438/WHO\\_EDM\\_2002.3.pdf](https://apps.who.int/iris/bitstream/handle/10665/67438/WHO_EDM_2002.3.pdf). Accessed Jun 6, 2019.
18. Elisabeth Y, Permanasari V. Rational drug use to increase service quality in developing countries: a systematic review. ICPH 2019. The 5th International Conference on Public Health; 2019 February 13-14; Solo, Indonesia, 2019.p.631–45.
19. Hardon A, Brudon-Jakobowicz P, Reeler A. How to investigate drug use in communities. World Health Organization publications WHO/DAP/92.3. Available at: [https://apps.who.int/iris/bitstream/handle/10665/61866/WHO\\_DAP\\_92.3.pdf?sequence=1&isAllowed=y](https://apps.who.int/iris/bitstream/handle/10665/61866/WHO_DAP_92.3.pdf?sequence=1&isAllowed=y). Accessed Jun 6, 2019.
20. Elkin N. Yaşlılarda polifarmasi ve akılcı ilaç kullanımına aile hekimliği yaklaşımı. *İGÜSABDER* 2020;11:279–90.
21. Topp L, Iversen J, Conroy A, Salmon AM, Maher L, Collaboration of Australian NSPs. Prevalence and predictors of injecting-related injury and disease among clients of Australia's needle and syringe programs. *Aust N Z J Public Health* 2008;32(1):34–7.
22. Melku L, Wubetu M, Dessie B. Irrational drug use and its associated factors at Debre Markos Referral Hospital's outpatient pharmacy in East Gojjam, Northwest Ethiopia. *SAGE Open Med* 2021;9:20503121211025146.
23. Stankunas M, Soares JF, Viitasara E, Melchiorre MG, Sundin Ö, Torres-Gonzales F, et al. Factors associated with refraining from buying prescribed medications among older people in Europe. *Australas J Ageing* 2014;33(4):E25–E30.
24. Aydos TR, Emre Aydingöz S, Lux KM, Efe OE, İşli F, Aksoy M, et al. Polypharmacy prevalence among geriatric patients in primary healthcare settings across Turkey: a cross-sectional analysis through the nationwide prescription information system. *Turk Geriatric Derg* 2020;23(2):169–79.
25. Lechevallier-Michel N, Gautier-Bertrand M, Alépovitch A, Berr C, Belmin J, Legrain S, et al. Frequency and risk factors of potentially inappropriate medication use in a community-dwelling elderly population: results from the 3C Study. *Eur J Clin Pharmacol* 2005;60(11):813–9.