



Assessing Medication Adherence of Emergency Medicine Specialists Using the MMAS-8

Acil Tıp Uzmanlarının İlaç Uyumunun MMAS-8 Kullanılarak Değerlendirilmesi

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ABSTRACT

Aim: Although doctors in the emergency medicine department report high career and life satisfaction rates, burnout and stress may occur after working many years, resulting in several incompatibilities and risks. The Morisky Medication Adherence Scale (MMAS-8) is a simple, reliable, verified self-report measure to assess medication adherence. In our study, we planned to evaluate the treatment compliance of emergency medicine specialists with the MMAS-8 scale.

Material and Method: This study employed a cross-sectional descriptive design. The emergency medical experts were contacted online to self-report their medication-taking behaviors using the MMAS-8. The MMAS-8 was evaluated using factor analysis. The treatment combinations of emergency medicine specialists were assessed in terms of chronic disease, the number of night shifts, and the number of medications used.

Results: The MMAS-8 was assessed by KMO and Barlett analyses for structural validity and adequate sampling group evaluation. The average score obtained from the MMAS-8 was found to be 3.99 ± 2.52 . When chronic disease and medication adherence were considered, the MMAS-8 scores revealed low adherence in cases of chronic diseases ($p=0.025$).

Conclusion: The treatment of patients with chronic diseases is very difficult. As found in this study, although the patients were doctors, medication adherence was low. It is known that emergency medical professionals have a high incidence of chronic diseases and mortality. Furthermore, low medication adherence with chronic or acute treatment increases risks.

Key words: emergency medicine specialist; MMAS-8; medication adherence

ÖZET

Amaç: Acil tıp uzmanlığı; yüksek kariyer ve yaşam doyum oranları bildirilmesine rağmen uzun süreli devam edenlerde tükenmişlik ve stres sorunu söz konusudur. Bu stres ve tükenmişlik bir çok uyumsuzluk ve riski de yanında getirmektedir. Tedavi uyumunun değerlendirilmesi için basit, güvenilir ve doğrulanmış bir öz bildirim aracı olarak MMAS-8 ölçeği kullanılmaktadır.

Materyal ve Metot: Çalışmamız, kesitsel tanımlayıcıdır. Online olarak ulaşılan acil tıp uzmanları kendilerini MMAS-8 ile değerlendirdiler. MMAS-8 ölçeği faktör analizi ile değerlendirildi ve acil tıp uzmanların tedavi uyumları kronik hastalık varlığı, gece vardiyası sayısı ve kullanılan medikasyon sayısı açısından değerlendirildi.

Bulgular: MMAS-8 ölçeğinin yapı geçerliliği ve yeterli örneklem grubunun değerlendirilmesi için KMO ve Barlett analizleri ile uyumlu olarak değerlendirilmiştir. MMAS-8 skorlaması ortalama değeri $3,99 \pm 2,52$ olarak değerlendirilmiştir. Kronik hastalık varlığı ve tedavi uyumu değerlendirildiğinde; kronik hastalığı olan vakalarda MMAS-8 skoru düşük uyum olarak değerlendirilmiştir ($p=0,025$).

Sonuç: Kronik hastalığı mevcut olan hastaların tedavi uyumları oldukça zordur. Çalışmamızda gösterdiği gibi hastanın kendisi doktor olsa da tedavi uyumundaki sorun değişmemektedir. Acil tıp uzmanlarının kronik hastalık eğilimlerinin ve mortalitesinin yüksek olduğunu bilinmektedir. Bu durumun üstüne kronik ya da akut tedavilerine uyumlarının düşük olması var olan risklerini daha da artırmaktadır.

Anahtar kelimeler: acil tıp uzmanı; MMAS-8; tedavi uyumu

Introduction

It is a difficult decision to choose a field of medical expertise. Such decisions determine an individual's career and future lifestyle¹. Patient and case diversity were important motivations for specializing in emergency medicine²⁻⁴. Excessive clinical workload, an unhealthy lifestyle, long shifts, and night shifts were related to burnout and stress⁵⁻⁷. Moreover, excessive workload, an unhealthy lifestyle, and night shifts are defined as factors associated with the release of stress in the lives of emergency medicine specialists and the development of burnout^{8,9}. Stress and burnout cause several incompatibilities and risks.

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A simple, reliable, and verified self-report tool can better understand medication adherence and identify new treatment modalities¹⁰. For this purpose, an eight-item Morisky Medication Adherence Scale (MMAS-8) was developed¹¹. The MMAS-8 is simple, and it is the most commonly used self-report method for determining the level of medication adherence¹²⁻¹³.

Hypertension, diabetes, hyperlipidemia, and psychiatric disorders have been examined in inpatient groups, such as chronic obstructive pulmonary disease patients. This study set out to assess whether a group of emergency medicine specialists whose lifestyles were unstable and working under severe stress was adhering to the prescribed medications.

Materials and Methods

This study used a cross-sectional descriptive design. After obtaining IRB approval from Katip Çelebi University, emergency medical specialists were contacted for data collection in the following year. The emergency medicine specialists who were reached online responded to the MMAS-8 items. In addition to this data set, demographic data and chronic diseases were also recorded.

The MMAS-8 is a scale consisting of 8 items. The first seven questions are close-ended with yes/no answers. Question 8 includes four choices: never/rarely, occasionally, sometimes, and usually/always. Scores <6, 6-7, and 8 are classified as low, medium, and high medication adherence. The evaluation of the MMAS-8 takes about 5-6 minutes¹¹. The scale has been translated and adapted into Turkish¹⁴.

Demographic data of emergency medical specialists and average medication adherence scores were analyzed using descriptive statistics. Because the data were not normally distributed, Mann-Whitney U tests were used to analyze the data related to medication adherence.

Factor analysis was conducted to evaluate the data set. The Cronbach Alpha value and the total correlation of the items were assessed to determine whether the psychometric tests could be used. Before starting the factor analysis, Kaiser Meyer Olkinn (KMO) and Bartlett tests were performed to determine the suitability of the factor analysis. The Cronbach Alpha coefficient was used to evaluate the internal reliability. SPSS 22 package program was used for data analysis.

Table 1. Demographic data of emergency medicine specialists

Demographic data		n	%
Gender	Woman	31	43.1
	Man	41	56.9
Chronic disease	Yes	42	58.3
	No	30	41.7
			mean ± SD
Age			36.5±6.3
Number of night shifts			7.26±2.3
Number of drugs used continuously			1.38±1.8

Results

The average age of emergency medicine specialists who participated in this study was 36.5±6.3, and 58% of the participants were male. While 5% of them were not working night shifts, 52% had 7 or 8-night shifts per month. As shown in Table 1, the average number of night shifts per month was 7.26±2.3. 52.5% of the participants had a chronic disease. Thyroid problems (31.8%) were found to be the most common disorder, followed by psychiatric disorders (20.5%) and diabetes (18.2%) (Fig. 1).

KMO and Bartlett tests were performed to assess the structural validity of the MMAS-8 and the adequacy of the sample group. The KMO value was 0.758 and considered appropriate for analyzing the fundamental variables. Similarly, Bartlett tests showed that test results and scale items were correlated, and factor analysis could be performed ($\chi^2 211.480$, $p < 0.05$). The items, factor loads, and reported variants are shown in Table 2. The factor load of the scale items was above 0.40, and the Cronbach Alpha coefficient of the items was 0.793.

The average score obtained from the MMAS-8 was found to be 3.99±2.52. The MMAS-8 scores revealed medication adherence below a score of 6. When the presence of chronic disease and medication adherence were considered, the MMAS-8 scores of 32 cases with chronic diseases (44.4% of the total number of cases) were found as low adherence ($p = 0.025$) (Table 3).

Discussion

This study investigated the medication adherence of emergency medicine specialists using the MMAS-8. The validity and reliability studies of the Turkish

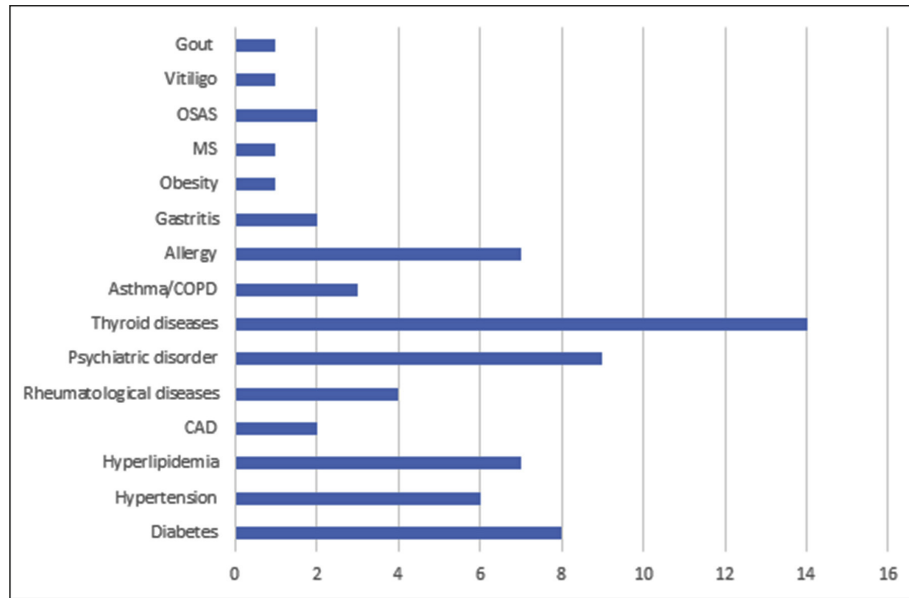


Figure 1. Chronic disease distribution of emergency medicine specialists (OSAS: Obstructive sleep apnea syndrome; MS: Multiple sclerosis; COPD: Chronic obstructive pulmonary disease; CAD: coronary artery disease).

Table 2. Factor distributions of MMAS-8 score

1. Do you sometimes forget to take your medicine?	0.762
2. People sometimes skip taking their medication for reasons other than forgetting. Thinking about the past two weeks, were there any day (s) when you didn't take your medicine?	0.860
3. Have you ever interrupted or stopped taking your medicine without telling your doctor because you felt bad when you took it?	0.450
4. Do you sometimes forget to carry your medicine with you when you travel or leave home?	0.494
5. Did you take all your medicines yesterday?	0.528
6. Do you sometimes stop taking your medication when you feel like your symptoms are under control?	0.592
7. Taking medication every day is a real hassle for some people. Do you ever have trouble sticking to a treatment plan?	0.677
8. How often do you have difficulty remembering to take all your medications?	0.574

Explained variance: 61.8

translation of the MMAS-8 were conducted with emergency medical specialists¹⁴. The KMO value was 0.58 and was considered suitable for analyzing fundamental variables. Similarly, Bartlett tests showed that the test results and scale items were correlated and could be evaluated by factor analysis (χ^2 211.480, $p < 0.05$). The factor load of the items was above 0.40, and the Cronbach Alpha coefficient was 0.793. These values show that the MMAS-8 can be used and evaluated with the study group.

Table 3. Medical adherece distribution of emergency medicine specialists

MMAS-8	Chronic Disease			
	Yes	%	No	%
Low adherence	32	44.4	17	23.6
Moderate adherence	8	11.1	6	8.3
High adherence	2	2.7	7	9.7

MMAS-8 score Mean \pm SD: 3.99 \pm 2.52 (range 0–8)

The MMAS-8 is a widely used scale for medication adherence. It is especially used to assess adherence to the treatment of hypertensive patients. Hacıhasanoğlu Aşilar et al. found that in the study which validated the Turkish translation of the MMAS-8 that medication adherence was low in hypertensive patients¹⁵. The treatment of patients with chronic diseases is very difficult.

Studies have been conducted on assessing medication adherence and the MMAS-8 in cases of hypertension. In the compilation and meta-analysis, in which 28 studies from 15 countries were evaluated, the number of comorbidities and the number of prescribed drugs were correlated¹⁶. In our study, the medication adherence of the group with a chronic disease was lower. When looking at the number of chronic diseases in people with chronic diseases, those with a low number of chronic diseases were found to have worse treatment combinations. This can be because patients are

often not familiar with treatment methods, or those with poor medication adherence may lack a complete diagnosis.

The use of oral anticoagulants in patients with atrial fibrillation was evaluated. It was found that the presence of the patient's emotional reactions (such as anger, grief, and depression) was associated with poor medication adherence¹⁷. Working in emergency medicine causes tiring and stressful lifestyles, leading to burn-out and emotional reactions, increasing medication adherence.

Hypertension, heart failure, atrial fibrillation, type 2 diabetes, ulcerative colitis, and several other similar disease groups were examined for medication adherence^{18–20}. In general, a chronic disease reduces medication adherence; however, when we examined the sub-group without a chronic disease in our study, medication adherence was not high.

Although many studies have been conducted with disease groups, there is a lack of research on medication adherence of a physician group or health worker group. Emergency medical specialists are different from other branches of medical specialization. They continue to live a life that disrupts the circadian rhythm, which affects all spheres of life. For this reason, just as the likelihood of having a chronic disease has increased, so may the lifestyle and treatment combinations. Since the routine of doctors specializing in emergency medicine regularly includes night shifts, and the participants in this study reported a similar number of night shifts per month, no assessment could be made between the number of night shifts and the treatment combinations. In our study, emergency medical specialists received an average score of 3.99 ± 2.52 from the MMAS-8. Values below 6 points reveal a low medication adherence. This study did not investigate the impact of gender, several night shifts, and age on medication adherence. We found that the treatment of patients with chronic diseases was more problematic. However, the number of chronic diseases or the number of medications used does not change the low level of medication adherence.

Emergency medical specialization is a department that works in shifts during the assistant period. It is known that this form of professional training is the cause of chronic sleep problems, chronic hypertension, and increased cardiovascular mortality²¹. However, after the

years spent as an assistant, which increases the risk of disease, emergency experts continue to work an average of 7–8 night shifts per month. These shifts contribute to ongoing risks. In addition, as in our study, the medication adherence of emergency medical specialists with chronic diseases is low. Therefore, there is an increased risk of chronic disease. The mortality and morbidity of emergency medical specialists with low medication adherence and chronic disease will increase. The night/day routine may contribute to delays in or irregular medication use, including missing scheduled medication hours.

As shown in this study, even if the patient is a doctor, the problem with medication adherence does not change. Although they gave rational answers to questions 3 and 6 because of their profession, it did not affect the overall results obtained from the MMAS-8 scores of emergency medical specialists. The results show that the medication adherence of emergency medical specialists is low.

We know that emergency medical specialists' chronic disease and mortality rates are higher than those of other specialization branches. The findings from this study suggest that low medication adherence with chronic or acute treatment increases risks.

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