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Relationship between Depression and Antihypertensive Medication Adherence in the Elderly

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ABSTRACT

Aim: This study was conducted to determine the presence of depression in elderly patients with hypertension and to evaluate its relationship with treatment adherence.

Material and Methods: The sample of this descriptive and correlational study consisted of 334 patients with aged 65 and over which using antihypertensive drugs. Data were collected using the hypertension compliance assessment scale and the geriatric depression scale.

Results: 58.4% of the patients participating in the study were evaluated as incompatible according to the score they got from the hypertension compliance assessment scale. The mean score that the patients got from the compliance scale was found as 7.29 ± 2.65. 39.5% of the patients included in the study were found to be mildly depressed compared to the average score they got from the depression scale. The mean score obtained from the depression scale was found to be 6.70 ± 3.44. As the age of the patients participating in the study increased, it was found that the score which they got from the hypertension compliance assessment scale increased, and there was a weakly positive significant relationship between them ($r = 0.113$, $p = 0.038$).

Conclusion: As a result, there is a relationship between treatment compliance and depression levels in the elderly. As the age of elderly patients increases, their level of compliance with treatment decreases and their depressive symptoms increase. Therefore, healthcare professionals should routinely evaluate the symptoms of depression in the elderly with chronic diseases such as hypertension.

Keywords: Depression; hypertension; medication adherence; aged.

Yaşlılarda Depresyon ile Antihipertansif İlaç Uyumu İlişkisi

ÖZ

Amaç: Araştırma hipertansiyonu olan yaşlı hastalarda depresyon varlığının belirlenmesi ve tedaviye uyumu ile ilişkisinin değerlendirilmesi amacıyla yapılmıştır.

Gereç ve Yöntemler: Tanımlayıcı ve korelasyonel nitelikte olan araştırmanın örneklemini antihipertansif ilaç kullanan 65 yaş ve üzeri 334 hasta oluşturmuştur. Veriler, antihipertansif ilaç tedavisine uyum ölçeği ve geriatrik depresyon ölçeği kullanılarak toplanmıştır.

Bulgular: Araştırmaya katılan hastaların %58,4'ü antihipertansif ilaç tedavisine uyum ölçeğinden aldıkları puana göre uyumsuz olarak değerlendirilmiştir. Hastaların uyum ölçeğinden aldıkları puan ortalaması 7,29 ± 2,65 olarak bulunmuştur. Araştırma kapsamına alınan hastaların %39,5'inin depresyon ölçeğinden aldıkları puan ortalamasına göre hafif derecede depresyonda olduğu bulunmuştur. Depresyon ölçeğinden alınan puan ortalaması 6,70 ± 3,44 olarak bulunmuştur. Araştırmaya katılan hastaların yaşı arttıkça antihipertansif ilaç tedavisine uyum ölçeğinden aldıkları puanın arttığı, aralarında zayıf düzeyde pozitif yönde anlamlı bir ilişki olduğu bulunmuştur ($r=0,113$, $p=0,038$).

Sonuç: Sonuç olarak yaşlılarda tedaviye uyum ile depresyon düzeyleri arasında ilişki bulunmaktadır. Yaşlı hastaların yaşı arttıkça tedaviye uyum düzeyleri azalmakta ve depresif belirtileri artmaktadır. Bu nedenle sağlık profesyonellerinin hipertansiyon gibi kronik hastalığı olan yaşlılarda depresyon belirtilerini rutin olarak değerlendirmesi gerekmektedir.

Anahtar Kelimeler: Depresyon; hipertansiyon; ilaç uyumu; yaşlı.

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INTRODUCTION

Aging is the period in which forms and demands of biological and social life undergo a change as a consequent of this specific stage of age (1). 8.9% of the global population is composed of elderly population. Data released from Turkish Statistical Institute revealed that elderly population (age 65 and above) in Turkey soared by 17.1% in the last five years reached to 6 million 895 thousand 385 people in year 2017. Elderly population ratio as per total population increased to 8.5% in 2017 (2). In Turkey, nationwide life expectancy is 78 years; this age is 75.3 for males and 80.7 years for females. Statistics showed that 45.6% of the old people cause of death in 2016 was due to circulatory system disease (2). Hypertension, "the primary circulatory system disease", is a critical health problem with high morbidity and mortality ratios of which prevalence rises each new year. Untreated, hypertension can be a major public health concern leading to myocardial infarction, cardiac failure, stroke, kidney failure and death (3,4).

According to Turkish Hypertension Prevalence (Paten T2) research, hypertension prevalence in Turkey corresponds to 30.3% (5). Blood pressure is controlled only via medical care, diet, restricting salt intake, cigarette and alcohol ban in tandem with exercise. Key objective in hypertension management is regulating blood pressure in normal threshold and preventing any potential complications. The most significant factor ensuring effective treatment is patient's compliance to medical treatment. Compliance refers to patient's regular intake of prescribed medication, sticking to the diet and following suggested lifestyle changes (4,6). Incompliance, on the other hand, relates to neglecting medication treatment, avoiding prescription, or diverting from the diet (7). Incompliance with medication treatment is a vitally-important factor in not only failure to regulate normal blood pressure but also incidence of hypertension-induced complications. Presence of cognitive-function loss during elderly period and taking longer term and higher doses of medication rise the risk for incompliance. Another common health problem of this stage is elderly-period depression (4,8). This study was conducted to determine the presence of depression in elderly patients with hypertension and to evaluate its relationship with medication adherence.

Research Questions

1.What is the level of medication adherence and depression of ≥ 65 years of age with hypertensive?

2.Is there a relationship between the sociodemographic characteristics and clinical features of individuals with hypertensive patients depression and medication adherence levels?

3.Is there a relationship between depression and antihypertensive medication adherence among elderly patients with hypertensive?

MATERIAL AND METHODS

Design and sample

The descriptive cross-sectional design was used. The research was conducted with individuals resting in the garden of a state hospital between April and December 2018. Convenience sampling methods were used. Twelve patients refused to participate because of limited time (3.5%). The study sample consisted of 334 patients. The inclusion criteria for patients were a person who voluntarily accepted participation in the research, who had been diagnosed with hypertension for at least six months, were literate in Turkish, had no hearing or speaking impairment, were 65 years and older. Factors that disqualified patients from sampling were their diagnosis with any psychiatric and neurological disease, brain surgery and alcohol-drug addiction. The data was acquired by the researcher face-to-face interview method.

Instruments

Demographic characteristics

This form is comprised of 10 questions which regarding patients' sociodemographic characteristics: Age, sex, marital status, educational status, social insurance, income, other chronic illness, smoking status, exercise status and duration of illness.

Hypertension compliance assessment scale

The scale which was developed by Morisky (9) in order to determine the medication adherence levels of individuals is adopted to Turkish as "Hypertension Compliance Assessment Scale" by Demirezen (10). The Cronbach's alpha reliability coefficient of the scale was determined as 0.82. Scale consists of nine items in total. The first 8 questions in the scale are answered as "Yes" and "No" and "Yes" is coded with 1, "No" is coded with 0. In the ninth question patient is required to choose for each item options of 1. "never/rarely", 2. "sometimes", 3. "occasionally", 4. "usually", 5. "always". Total score to receive from this scale varies between 1-13. Definition of compliance and incompliance to antihypertensive medication treatment is scored; receiving 1-7 points from total scale score is compliance to treatment while receiving 8 and higher score is incompliance (10,11). In this study, the reliability coefficient of the scale was determined as 0.70.

Geriatric depression scale

To measure depression, the Geriatric Depression Scale developed by Yesavage et al. (12) and adapted for the Turkish language by Aktürk et al. (13) was used. Of the 15 items, 10 items indicated the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. Scores of 0-4 are considered normal, depending on age, education, and complaints; 5-8 indicate mild depression; 9-11 indicate moderate depression; and 12-15 indicate severe depression (13). In this study, the reliability coefficient of the scale was determined as 0.84.

Statistical Analysis

Analysis was conducted using descriptive statistics tests using the Statistical Package Social Services SPSS 22.0 (SPSS Inc., Chicago, IL). Descriptive statistics (frequency, mean, standard deviation, minimum, maximum) were used in assessment of the study data. Compliance with the normal distribution of continuous variables was checked with Kolmogorov-Smirnov test. The Homogeneity of groups' variances was checked by Levene's test. Comparisons between groups were performed using the Student's t test and if parametric test

assumptions are not available, Kruskall Wallis test was used for comparisons of more than two independent groups. Correlations between the variables were analyzed by Pearson correlation coefficient. A test of hypothesis with p value of <0.05 was considered significant.

Ethical considerations

Written permission from University Ethical Committee (GO 2018/70) was obtained. The objective of the research was explained to the participants and written permission was received from those who agreeing to participate in the research. And permission has been taken from the authors that make the Turkish validity and reliability of the scale. This research was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

Mean age of patients analyzed within the scope of this study is computed such; 72.27 ± 5.38. 72.2% of patients are female, 73.1% are married, 62% are primary school graduates, 86.2% have social insurance and 58.3% have income level equal to their life expenses. It is reported that 61.4% of patients have an additional chronic illness without hypertension, 77.5% non-smoker and 72.5% not exercising. Participants' average length of being diagnosed with hypertension was measured as 11.93 ± 7.82 years (Table 1). 58.4% of analyzed patients were described as incompliant based on the score received from hypertension compliance assessment scale. Mean score that patients received from hypertension compliance assessment scale was measured as 7.29 ± 2.65. 39.5% of patients in the research were diagnosed with mild depression based on the mean score received from depression scale. Mean score of depression scale was computed as 6.70 ± 3.44 (Table 2).

Table 1. Comparing patients' hypertension compliance assessment scale and geriatric depression scale mean scores based on demographic characteristics

	Mean ± SD	**Hypertension Compliance Assessment Scale**	**Geriatric Depression Scale**
Age	72.27±5.38	r= 0.263 p= 0.000	r=0.383 p=0.000
Disease duration (years)	11.93±7.82	r= -0.065 p=0.234	r=0 .005 p=0.924
	n (%)	**Mean ± SD**	**Mean ± SD**
Gender			
Women	241 (72.2)	7.31 ± 2.65	6.55 ± 3.37
Men	93(27.8)	7.24 ± 2.66	7.10 ± 3.61
t		0.222	-1.313
p		0.824	0.190
Marital status			
Married	244(73.1)	7.07 ± 2.68	6.28 ± 3.43
Single	90(26.9)	7.90 ± 2.49	7.85 ± 3.23
t		-2.529	-3.764
p		**0.010***	**0.000***
Educational level			
Not literate	72(21.6)	8.15 ± 2.50	7.76 ± 3.17
Primary school	207(62.0)	7.14 ± 2.66	6.45 ± 3.52
Secondary school	35(10.5)	6.54 ± 2.52	5.74 ± 3.38
High school and university	20(6.0)	7.15 ± 2.75	7.25 ± 2.84
KW		11.112	12.170
p		**0.011***	**0.007***

Table 1 (continue). Comparing patients' hypertension compliance assessment scale and geriatric depression scale mean scores based on demographic characteristics

Social insurance			
Have	288(86.2)	7.19 ± 2.69	6.43 ± 3.44
Have not	46(13.8)	7.93 ± 2.31	8.41 ± 2.97
t		-1.958	-3.679
p		0.054	**0.000***
Economic status			
Income > expense	110(33.0)	6.96 ± 2.82	6.95 ± 3.52
Income = expense	195(58.3)	7.49 ± 2.60	6.49 ± 3.39
Income < expense	29(8.7)	7.24 ± 2.26	7.24 ± 3.51
KW		2.189	2.434
p		0.335	0.296
Additional Chronic Illness			
Yes	205(61.4)	7.28 ± 2.64	7.18 ± 3.44
No	129(38.6)	7.32 ± 2.69	5.95 ± 3.32
t		-0.143	3.226
p		0.887	**0.001***
Smoking			
Yes	75(22.5)	7.48 ± 2.56	6.54 ± 3.39
No	259(77.5)	7.24 ± 2.68	6.75 ± 3.46
t		0.668	-0.464
p		0.505	0.643
Do Exercise			
Yes	92(27.5)	7.25 ± 2.75	6.65 ± 3.47
No	242(72.5)	7.31 ± 2.62	6.73 ±3.43
t		-0.209	-0.187
p		0.834	0.851

%: Percent, SD: Standard deviation, p value: Probability value, r: Pearson correlation coefficient, KW: Kruskall Wallis, t: Independent Student's t test, Variables of significance; *p<0.05.

Table 2. Patients' hypertension compliance assessment scale and geriatric depression scale scores

		n	**%**
Hypertension Compliance Assessment Scale	Adherence (1-7)	139	41.6
	Not Adherence (8-13)	195	58.4
		Mean ± SD	
	Total (1-13)	7.29 ± 2.65	
Geriatric Depression Scale	Normal (0-4)	96	28.7
	Mild depression (5-8)	132	39.5
	Moderate depression (9-11)	75	22.5
	Severe depression (12-15)	31	9.3
		Mean ± SD	
	Total (0-15)	6.70 ± 3.44	

%: Percent, SD: Standard deviation

Table 3. Relationships between hypertension compliance assessment scale and geriatric depression scale scores

Geriatric Depression Scale	**Hypertension Compliance Assessment Scale**			
	Adherence		**Total**	
	r	p	r	p
Normal	0.202	**0.000***	0.077	0.162
Mild Depression	-0.049	0.373	0.008	0.882
Moderate Depression	-0.120	**0.029***	-0.077	0.159
Severe Depression	-0.061	0.268	-0.022	0.686
Total	0.217	**0.000***	0.113	**0.038***

r: Pearson correlation coefficient, Variables of significance; *p<0.05.

As patients in this study who had higher age ratios, the score received from hypertension compliance assessment scale also increased thus a significant, moderate and positive relation was seen in between age and compliance (r=0.263, p= 0.000). This finding indicates that as patients are older, their compliance levels lowered. Between patients' length of disease and mean score of hypertension compliance assessment scale, there was a negative, weak level and insignificant relation (r= -0.065 p= 0.234). As disease length of patients rose, compliance score got lower; in other terms patients' compliance score was better (Table 1). As socio-demographic features are contrasted with the mean score of hypertension compliance assessment scale for antihypertensive medication, there was a statistically significant difference with respect to patients' marital status and education level ($p < 0.05$). On the other hand, with respect to patients' gender, social security, income level, smoking, exercising and concomitant chronic disease, there was not any identified, statistically significant difference ($p > 0.05$) (Table 1).A moderate, positive and significant relation was observed between score that participant patients received from geriatric depression scale and their age (r=0.383 p=0.000). It was identified that as patients' age increased, the score received from geriatric depression scale correspondingly soared. This finding evidences that as patients got older, depression risk magnified. A comparison between mean score of geriatric depression scale and socio-demographic features revealed that not a statistically significant difference was identified with respect to patients' marital status, education level, social security and presence of a concomitant chronic disease ($p < 0.05$). On the other hand, with respect to patients' gender, income level, smoking and exercising habits, not any statistically significant difference was measured ($p > 0.05$) (Table 1). A weak level, positive and significant relation was observed between score that patients received from geriatric depression scale and total score from hypertension compliance assessment scale (r=0.113, p=0.038). Analysis of sub dimensions demonstrated that a weak level and extremely significant relation with the compliance level of non-depressed patients (r=-0.202, p= 0.000). Besides, a negative and weakly significant relation was measured with the compliance scores of patients having moderate level of depression (r=-0.120, p=0.029) (Table 3).

DISCUSSION

Non-adherence to drug therapy is an effective and important factor in both the failure to maintain normal blood pressure and the increased incidence of hypertension-related complications. Loss of cognitive function in old age and longer and more drug use increase the risk of non-compliance. According to the results of the study in which we evaluated the presence of depression and drug compliance in elderly individuals with hypertension, 58.4% of patients were categorized as incompliant based on the score received from compliance scale for antihypertensive medication.

Irmak et al. (3) conducted a study to investigate medication treatment compliance of patients diagnosed with hypertension. They found that patients' mean age was 51.0 ± 9.9 age, 64. 4% were female, 53.3% were elementary school graduates, 84.4% were married and the length of being diagnosed with hypertension was computed as 4.39 ± 4.96 among patients. In our study, it was identified that compliance with medication treatment was very good. In our study, length for diagnosis with a chronic disease among participant patients was longer (11.93 ± 7.82). This may be attributed to the fact that in sampling selection, geriatric patients were chosen and mean age was considerably higher. In our study 72.2% of participant patients were female, 73.1% were married and 62.0% were elementary school graduates. A comparison with the total patient population partaken in our study shows that, unlike previous study, a vast majority of patients (58.4%) were identified to be incompliant. This could be because in sampling selection, geriatric patients were chosen, patients had comorbid case, medication-induced complications were likely to arise and due to the accelerated age level, compliance to treatment could decrease due to cognitive function loss. In the study in which Mert et al. (11) examined the compliance of hypertension patients with treatment, the average age of the patients was 58.76±14.90, 62.6% of examined patients were female and patients received 4.66 ± 2.23 mean score from compliance scale for antihypertensive medication treatment. As a result, it was identified that 86.8% of patients stick to medication treatment while not a significant relation was seen between compliance score and age, gender, education level, marital status, employment level, income level, length of hypertension and concomitant chronic diseases11. In our study, it was found that the score that patients received from antihypertensive compliance scale was higher (7.29 ± 2.65). It may be because mean age of the sampling in our study was higher and as patients' age increased, their compliance level would go down. Turhan et al. (14) conducted a study to examine medication compliance of patients aged 65 and above as well as determinant factors. They designated that 94.9% of elderly patients had a concomitant chronic disease and among females, compared to males, compliance to medication was less disciplined. Among medication taking participants, compliance to treatment was computed as 71.3%. Accordingly, in our study, it was seen that 61.4% of geriatric patients had a concomitant chronic disease and although females were more incompliant to medication treatment, the difference in between was statistically insignificant. Unlike that study, a vast majority of patients in our study (58.4%) was reported to be incompliant to medication treatment. Unlike our study, Abreu et al. (15) in a research that shed light on medication compliance among elderly patients and determinant factors found out that medication compliance of elderly patients equated to 86.9%. In line with our study, Filho et al. (16) examined hypertensive patients' compliance to medication and found out the mean score patients received from compliance scale as 5.8 (± 1.8) and saw that 34% of patients were compliant to the treatment. This result is in line with the findings of our study in which a low ratio of (41.6%) patients were in compliance with the treatment. Yet, obtained mean score shows that, patients maintained a high level of compliance compared to our study. Lee et al. (17) in their study examining compliance level of patients taking antihypertensive medication detected that 65.1% were compliant, while younger patients with a lower health perception had weaker medication compliance. The reason

behind different levels of compliance could be the variety of determinant parameters on compliance and their varied reflections on results. In studies; elderly people's medication compliance level and detected that medication compliance of patients were dictated by patients' socioeconomic traits, attitudes of health professionals, and healthcare system (18,19). It is an expected finding that studies examining patients from different countries, different cultures and populations could not present purely identical compliance levels. In our study, with respect to mean score received from depression scale, 39.5% of geriatric patients had mild depression. Only 9.3% of elderly people manifested severe depression signs. Mean score received from depression scale was computed as 6.70 ± 3.44. Tel et al. (20) completed a study to identify ability loss and depression signs among elderly people with a diagnosed chronic physical disease. They concluded that among elderly patients with a chronic disease, a significant relation existed between age, and depression signs and corresponding to increase in age, a rise the in scores of depression signs was evident. Scores of depression signs were higher among female and illiterate elderly patients. Likewise, in our study, depression mean score of illiterate elderly was comparatively higher and the difference was statistically significant. On the other hand, mean scores of female patients were lower than males though this difference was statistically insignificant. In our study males were reported to manifest greater signs of depression. In Kahraman's (21) study that examined the effects of dietary habits of patients aged 65 and above on their cognitive functions, depression and life quality it was identified that among single, female patients' depression scores were significantly higher. In parallel with this study, it was detected in our research that single patients scored high on depression mean score range and manifested a statistically significant difference. Cheung et al. (22) analyzed the relation between hypertension and depression, and identified that a correlation existed between gender and age of patients and risk for depression and that female patients were reported to be more depressive. Parallelism was identified between depression score and smoking and exercising habits of patients. In line with that research, it was detected in our study that as geriatric patients got older a significant relation was measured in relation to geriatric depression scores and as age increased, depression score also climbed. However, unlike their study, we found out that mean depression scores among male patients were comparatively higher. Also not any significant difference was measured in relation to smoking and exercising habits of patients. Yılmaz (23) conducted a study to examine the relation between depression sign level and demographic variables in elderly people residing in a nursing home. They detected that depression level was high (18.53±7.16), 13.3% of residents indicated potential depression signs, 70% demonstrated conclusive depression signs and significant relation was observed between individuals' depression levels and gender. Unlike our study, they identified not a difference between patients' mean depression scores and gender. In our study, 28.7% of patients showed not any depression signs, 39.5% had mild, 22.5% had moderate and 9.3% had severe depression signs. In our study mean score received from depression scale ranged between 6.70 ± 3.44. This finding indicates that participant patients' depression signs were better compared to previous research. This could be attributed to the fact that patients in our study resided in their own homes and had dissimilar sociodemographic features from the patients in aforementioned study. In relevant literature studies, focusing on the relation between compliance to antihypertensive medication and depression showed that patients' compliance levels fluctuated between 29-91%. All of these studies revealed that lower compliance level was predictor of depression (24). In our study a weak level, positive and significant relation was detected between score that patients received from geriatric depression scale and total score received from compliance scale for medication (r=0.113, p=0.038). Analysis of sub dimensions presented a weak level and extremely significant relation with respect to compliance level of non-depressed patients (r=-0.202, p= 0.000). Further to that, a negative and weakly significant relation was observed with respect to compliance scores of patients having moderate depression (r=-0.120, p=0.029). Our study is thus on the same page with relevant literature.

CONCLUSION

To sum up a correlation exists between treatment compliance of the elderly and measured levels of depression. In parallel with the increased age among geriatric patients, compliance levels to treatment lowered while depression signs escalated. It is thus suggested that health professionals routinely checked depression signs among elderly patients with a chronic disease such as hypertension. Such routine control would assist in enacting initiatives to prevent or mitigate negative effects of depression signs on the life quality of old people. Within that scope educating the elderly on medication intake and side effects of medication, identifying determinant factors on compliance level and planning required initiatives would positively change depression level of the elderly patients, thereby increasing medication compliance level of the concerned patients.

REFERENCES

1. World Health Organization; World report on Ageing and Health. WHO Library Cataloguing-in-Publication Data..World Health Organization. [Updated: 2014 April 1; Cited: 2020 June 20] [Internet]. Available from: http://apps.who.int/iris/bitstream/10665/186463/1/9789240694811_eng.pdf?ua=1.
2. Turkish Statistical Institute. [Updated: 2020 January 10; Cited: 2020 June 10] [Internet]. Available from: http://www.tuik.gov.tr
3. Irmak Z, Türkcan Düzöz G, Bozyer İ. Effect of an education programme on the lifestyle change and compliance to drug therapy of hypertensive patients. Journal of Nursing School. 2007; 39–47.
4. Özdemir Ö, Akyüz A, Doruk H. Compliance with drug treatment in geriatric patients with hypertension. Medical Journal of Bakırköy. 2016; 12: 195-201.
5. Turkish society of hypertension and kidney diseases. [Updated: 2020 February 10; Cited: 2020 September 15] [Internet]. Available from: http://www.turkhipertansiyon.org/prevelans_calismasi_2.php.

6. Aşılar R, Gözüm S. Hypertensive individuals' use of complementary health approaches and its effect on adherence with antihypertensive medication treatment. Turkish Journal of Family Medicine and Primary Care. 2017; 11: 235-44.
7. Hacıhasanoğlu R. Treatment compliance affecting factors in hypertension. TAF Prev Med Bull. 2009; 8: 167-72.
8. Sertel M, Tarsuslu Şimşek T, Yümin ET. An analysis of the relationship between cognitive status, depression level and balance in the elderly. Journal of Exercise Therapy and Rehabilitation. 2016; 3: 90-5.
9. Morisky DE, Ang A, Krousel M, Ward HJ. Predictive validity of a medication adherence measure in an outpatient setting. J Clin Hypertens (Greenwich). 2008; 10: 348-54.
10. Demirezen E. Antihypertensive medication compliance in hypertensive Turkish patients living in Turkey and Germany [Doctorate Thesis]. İstanbul: İstanbul University Institute of Health Sciences, Department of Public Health Nursing; 2006.
11. Mert H, Ozcakar N, Kuruoğlu EA. Multidisciplinary special study module research: treatment compliance of patients with hypertension. Turkish Journal of Family Medicine. 2011; 15: 7-12.
12. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M, Leirer VO. Development and validation of a geriatric depression screening scale: a preliminary report. J Psychiatr Res. 1982; 17: 37-49.
13. Aktürk Z, Şahin EM, Dağdeviren N, Özer C. The internal reliability analysis of the geriatric depression scale localized into Turkish. In: V. National Congress of Family Medicine; Congress Programme and Book; 2002. p.442.
14. Turhan Ö, Kibar E, Ekren E, Engin O, Ercan D, Erdal AI, et al. Medication adherence in elderly: A university hospital-based and descriptive study. Nobel Medicus. 2014; 10: 2-10.
15. Abreu DP, Santos SC, Silva BT, Gomes GC, Cruz VD, Tier CG. Prevalence of medication therapy adherence in the elderly and related factors. Rev Bras Enferm. 2016; 69: 313-20.
16. Filho AD, Barreto JA, Neves SJ, Lyra DP. Association between the 8-item Morisky Medication Adherence Scale (MMAS-8) and blood pressure control. Arq Bras Cardiol. 2012; 99: 649-58.
17. Lee U, Ku S, Noh G, Baek S, Choi B, Mashour GA. Disruption of frontal-parietal communication by ketamine, propofol, and sevoflurane. Anesthesiology. 2013;118:1264-75.
18. Frances Yap A, Thirumoorthy T, Heng Kwan Y. Medication adherence in the elderly. Journal of Clinical Gerontology and Geriatrics. 2016; 7(2): 64-7.
19. Atan G, Karabulutlu EY. Investigation of lifestyle, life quality and treatment compliance of the patients with essential hypertension. Journal of Nursing Sciences. 2016; 8: 17-25.
20. Tel H, Tay BN, Canbay M, Akaya İ. Disability and depression among the elderly people with chronic physical disease. Florence Nightingale Nursing Journal. 2014; 22: 69-75.
21. Kahraman C. The effect of malnutrition on cognitive functions,depression and quality of life in patients with geriatric hospitalized. [Master disseratation]. İstanbul: Fatih Sultan Mehmet Education and Research Hospital; 2009.
22. Cheung BM, Au THY, Chan SY, Lam CM, Lau SH, Lee RP. The relationship between hypertension and anxiety or depression in Hong Kong Chinese. Exp Clin Cardiol. 2005; 10(1): 21-4.
23. Yılmaz E. A study on the burnout levels of nursing home staff. International Journal of Social Sciences. 2017; 9: 1-21.
24. Li ZY, Li Y, Chen L, Chen P, Hu Y. Prevalence of depression in patients with hypertension: A systematic review and meta-analysis. Medicine (Baltimore). 2015; 94(31): 1-6.