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Determination of social support status and risk of mental illness in patients using multiple drugs in primary care

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ABSTRACT

Aim: Multiple drug use (polypharmacy) increases the risk of numerous negative health consequences. The aim of this study was to examine the factors that may lead to polypharmacy in adult patients followed in primary care and to determine the social support status and anxiety-depression risk in patients using multiple drugs.

Methods: This cross-sectional study was conducted with 3 family medicine units in the Adana province. A total of 393 adult patients who were receiving two or more drugs daily were included. Sociodemographic data were recorded and risk factors for polypharmacy were questioned. The Multidimensional Scale of Perceived Social Support (MSPSS) and the Hospital Anxiety Depression Scale (HADS) were applied.

Results: Out of 393 participants, 52.9% were female and the mean age was 60.1±11.0 years. The mean number of chronic diseases was 2.7±.2. The mean number of drugs used was 4.7±2.2. Of the participants, 31.3% had risk of depression and 24.2% had risk of anxiety. The number of drugs used increased as age, body mass index (BMI), waist circumference and number of chronic diseases increased. The MSPSS total score decreased as age increased. The risk of anxiety and depression was significantly greater in women, participants with low education and those who had no partner.

Conclusions: Significant physical and mental problems occur in individuals who use multiple drugs, especially in the elderly. The present study revealed that predictors of polypharmacy include age, BMI, waist circumference and number of chronic diseases. Primary care physicians should be aware of these predictors when prescribing additional medication.

Keywords: Polypharmacy, Social Support, Anxiety, Depression

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Introduction

Polypharmacy is a severe global health concern (1,2). Despite the absence of a standard definition for polypharmacy, the definition widely used in the literature is the regular use of at least five medications. The term polypharmacy may also be suggested as more drugs are prescribed and taken than are warranted clinically, or multiple drugs are used or one drug is used unnecessarily (3-5). Although polypharmacy is mostly a problem for the elderly, younger adults with chronic pain, such as fibromyalgia, or with developmental disabilities, especially those with additional chronic medical conditions, may experience polypharmacy. Besides, diabetes, heart disease, stroke, and cancer are the factors that lead to multi-drug use in younger adults (6-8). Polypharmacy has negative consequences for patients and the health care system. While decreased quality of life, increased mobility issues, increased mortality, increased risk of adverse drug events, disability, falls, frailty, inappropriate medication use, long-term care placement, medication non-adherence, increased use of the health care system (clinic visits, emergency department visits, hospitalizations) may be listed as the negative consequences of polypharmacy for patients; decreased physician functionality (workflow impairment, decreased quality of care), decreased physician productivity, increased burden on the health care system and increased medication errors are among its negative consequences for health care system. Being elderly, cognitive impairment, developmental disability, frailty, mental health conditions, multiple chronic conditions, residing in a long-term care facility, seeing multiple subspecialists may be suggested as the patient-related risk factors for polypharmacy (7). The increasing number of the drugs increases the risk of morbidity and mortality through the side effects and drug interactions. The increase in the number of drugs, when combined with treatment failure, brings additional burdens to health care providers and higher costs to health insurances. Besides, the number of potential drug-drug and drug-disease interactions rises exponentially with the number of drugstaken, possibly leading to therapy failure, worsening conditions, and reinforced effects. The excessive branching in medical practice creates a disadvantage for the use of multiple drugs and makes the management of these patients difficult (9,10).

Family physicians provide care for all bodily, emotional and social problems of the patients and also manage the acute and chronic problems concurrentlywithin the context of comprehensive care core competency of family medicine. They address the individuals as a whole and use health sources effectively and efficiently (11). Family physicians take each visit as an opportunity for health promotion and preventive measures (12). Lack of a primary care physician was reported to be a risk factor for polypharmacy (7).

The aim of the present study is to investigate the factors that may lead to polypharmacy and to determine the social support status and the risk of depression and anxiety in patients with polypharmacy.

Methods

This cross-sectional study has been conducted at 3 family medicine clinics in Adana province between January 1, 2018 and February 28, 2018. All consecutive adult patients above 18 years of age, who were registered to these family medicine centers and who have been using 2 or more drugs for longer than 240 days and who had at least one chronic disorder were included in the study. Sociodemographic data of the patients were collected through a form created by the researchers and the participants were divided to two groups as those below or above 65 years of age and those who had a partner or not. Blood pressures

and anthropometric measurements of the patients were recorded and risk factors for general health were questioned. Participants were questioned for chronic disorders, drug use, number of drugs used and duration of drug use. Afterwards, potential risk factors for polypharmacy and whether the patients were using over-the-counter drugs, knowledge level about medications and drug compliance were questioned with 5 Likert type questions (1: minimum and 5: maximum).

Multi-dimensional Scale of Perceived Social Support (MDPSS) that was developed by Zimet et al. which consists of 12 7-point-Likert type items (1: I do not agree at all - 7: I completely agree), was used to evaluate social support status (13). The scale has 3 sub-scales as "friends", "family" and "special person". While the possible minimum score is 12, maximum is 84. Increasing scores indicate better social support. Turkish validity and reliability study of the scale was conducted by Eker et al. (14).

Hospital Anxiety and Depression Scale (HADS) which was developed by Zigmond and Snaith, and which is applied to patients who admit to primary care with somatic disorders was used to evaluate the risk of anxiety and depression. The scale consists of 14 4 point-Likert type questions scored between 0 and 3. The cut-off point is 7/8 for anxiety and 10/11 for depression. For both sub-scales, while the possible minimum score is 0, maximum is 21. Turkish validity and reliability study of the scale was conducted by Aydemir et al. (15,16).

Statistical Analysis

Descriptive statistics were used for sociodemographic data. Continuous variables were expressed as mean ± standard deviation and minimum-maximum, categorical variables were expressed as number and percent. The Student's t test and One way Anova test were used for continuous variables and the Chi-square test was used for discontinuous variables to compare the groups. Spearman correlation analysis was used to assess independent variables together that could have an effect on social support status and risk of mental illness of the participants. A two tailed p value less than 0.05 was considered significant.

Results

Mean age of 393 participants was 60.1±11.0 (min 21-max 84) years. Of the participants, 149 (37.9%) were above 65 years of age, 208 (52.9%) were females, 279 (71.0%) had partners and 114 (29.0%) did not have partners. Ninety-one (23.2%) participants had low education level, 237 (60.3%) had moderate and 65 (16.5%) had high education level. According to monthly income, 111 (28.2%) had low income, 248 (63.1%) had moderate income and 34 (8.7%) had high income (Table 1).

Mean systolic blood pressure was 131.2±21.9 mmHg and mean diastolic blood pressure was 79.7±13.7 mmHg. Mean body weight was 80.6±14.6 kg, mean height was 164.4±7.8 cm and mean body mass index (BMI) was 29.8±5.5 kg/m^2. According to BMI, 66 (16.8%) participants were normal weight, 135 (34.4%) were overweight, 173 (44.0%) were obese and 19 (4.8%) were morbid obese. Mean waist circumference was below 102 cm in 122 (65.9%) males and above 102 cm in 63 (34.1%) males. For females, mean waist circumference was below 82 cm in 63 (30.3%) and above 88 cm in 145 (69.7%).

Table1. Socio-demographic characteristics of the participants

Socio-demographic characteristics (n=393)		**n**	**%**
Gender	Male	185	47.1
	Female	208	52.9
Education status	No education	91	23.2
	Primary/secondary school	237	60.3
	High school/university	65	16.5
Partner	Yes	279	71.0
	No	114	29.0
Monthly income	Low	111	28.2
	Moderate	248	63.1
	High	34	8.7

Mean number of chronic diseases was 2.7±1.2 (min 1.2-max 8). While 179 (45.5%) had 1-2 chronic diseases, 177 (45.0%) had 3-4 chronic diseases and 37 (9.4%) had 5 or more chronic diseases. Mean number of drugs used by the patients was 4.7±2.2 (min 2-max 15) and they have been using the drugs for mean 9.2±6.2 years (min 1- max 40). While 52 (13.2%) patients were using 2 drugs, 153 (38.9%) were using 3-4 drugs and 188 (47.8%) were using 5 or more drugs (Table 2). The score of using over-the-counter drugs that was evaluated with 5 Likert type questions was found to be 1.9±1.1.

Table2. Classification of the participants according to chronic disease and number of drugs used

Number of chronic diseases and drugs used (n=393)		**n**	**%**
Number of chronic diseases	1-2	179	45.5
	3-4	177	45.0
	5 and above	37	9.4
Number of drugs used	2	52	13.2
	3-4	153	38.9
	5 and above	188	47.8

Comparison of anthropometric measurements, blood pressure values, number of chronic diseases and using over-the-counter medications according to the number of drugs used is presented in Table3. While the number of drugs used increased as age (F=13.01, p=0.001), BMI (F=4.080**,** p=0.044), waist circumference (F=3.740, p=0.050), and number of chronic diseases (F=99.82, p=0.000) increased, and using over-the-counter medications decreased (F=3.925, p=0.021).

Table3. Comparison of anthropometric measurements, blood pressure values, chronic diseases and over-the-counter drug use according to the number of drugs used

	2 drugs Mean±SD (n=52)	**3-4 drugs Mean±SD** (n=153)	**5 and more drugs Mean±SD** (n=188)	**F***	**p**
Age (year)	**56.5±13,5**	**57.8±10,9**	**62.9±9.6**	**13.01**	**0.000††**
Weight (kg)	78.0**±**12.4	81.4±15.2	80.7**±**14.7	1.061	0.347
BMI (kg/m²)	**28.2±4.7**	**30.2±5.9**	**29.9±5.4**	**4.080**	**0.044†**
Waist circumference (cm)	**91.7±15.6**	**95.9±15.3**	**96.3±15.0**	**3.740**	**0.050†**
Systolic blood pressure (mmHg)	130.2**±**22.3	133.2±21.8	129.7**±**21.9	1.137	0.322
Diastolic blood pressure (mmHg)	79.9**±**11.9	80.9±14.5	78.6**±**13.6	1.171	0.311
Number of chronic diseases	**1.5±0,6**	**2.2±0,8**	**3.5±1,2**	**99.82**	**0.000††**
Over-the- counter medication use	**2.3±1.2**	**2.08±1.2**	**1.8±1.1**	**3.925**	**0.021†**

BMI: Body mass index, SD: Standard deviation. *One Way Anova test was used, †p<0.05, ††p<0.01.

Mean score of the Multi-dimensional Scale of Perceived Social Support (MSPSS) was found to be 55.2±19.9. According to the scale, mean score of 'family support' subscale was 25.3±4.9, means score of 'friend support' subscale was 14.7±9.4 and mean score of support from a special person' subscale was 14.9±9.5. According to Hospital Anxiety and Depression Scale (HADS), mean anxiety score was 6.3±5.3 and mean depression score 5.8±5.3. When results were evaluated according to cut-off values, 95 (24.2%) patients had anxiety risk and 123 (31.3%) had depression risk.

Table4. The correlation between socio-demographic characteristics and MSPSS and HADS

Scales		Gender	Age	Presence of a partner	Education status	BMI	Number of chronic diseases	Number of medications used	Duration of medication use
MSPSS-Family	r	**-0.104***	-0.027	**-0.211****	0.039	0.020	0.000	-0.041	**-0.139****
	p	**0.040**	0.596	**0.000**	0.446	0.695	0.999	0.414	**0.006**
MSPSS-Friend	r	0.038	**-0.181****	-0.037	**0.149****	0.011	-0.082	-0.053	-0.087
	p	0.449	**0.000**	0.461	**0.003**	0.835	0.104	0.292	0.086
MSPSS-Special person	r	0.030	**-0.116***	-0.032	0.067	0.013	-0.072	-0.039	-0.075
	p	0.555	**0.022**	0.526	0.182	0.802	0.154	0.435	0.138
MSPSS-Total	r	0.018	**-0.149****	-0.094	**0.110***	0.019	-0.075	-0.059	**-0.111***
	p	0.721	**0.003**	0.064	**0.029**	0.709	0.137	0.240	**0.028**
HAD-A	r	**0.308****	**-0.243****	**0.230****	**-0.101***	0.056	0.087	0.062	0.005
	p	**0.000**	**0.000**	**0.000**	**0.046**	0.268	0.086	0.219	0.924
HAD-D	r	**0.264****	**-0.186****	**0.289****	**-0.137****	0.013	0.098	0.059	-0.007
	p	**0.000**	**0.000**	**0.000**	**0.007**	0.805	0.053	0.244	0.894

BMI: Body mass index, MSPSS: Multi-dimensional Scale for Perceived Social Support, HADS-A: Hospital Anxiety and Depression Scale-Anxiety, HADS-D: Hospital Anxiety and Depression Scale-Depression. r: Spearman's rho, p: Significance (2-tailed). *Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).

The correlation between socio-demographic characteristics, BMI, the number of chronic diseases, the mean number of medications used, duration of medication use, and MSPSS and HADS was examined. According to MSPSS, 'family support' was low among females (r=−0.104, p=0.040). 'Friend support' (r=−0.181, p=0.000), 'support from a special person' (r=−0.116, p=0.022) and total score (r=−0.149, p=0.003) decreased as age increased. 'Friend support' (r=−0.149, p=0.003), and total score (r=−0.110, p=0.029) increased as level of educational increased. 'Friend support' (r=−0.139, p=0.006) and total score (r=−0.111, p=0.028) decreased as duration of medication use increased. According to HADS, the risk

of anxiety and depression was significantly higher in females (r=0.308, p=0.000 and r=0.264, p=0.000) and who had no partner (r=0.230, p=0.000 and r=0.186, p=0.000). The risk of anxiety and depression was found to decrease as age increased (r=−0.243, p=0.000 and r=−0.137, p=0.007) and as the level of educational increased (r=−0.101, p=0.046 and r=−0.137, p=0.007) (Table 4).

Discussion

In this cross-sectional study, we have investigated the factors that could be effective on multi-drug use in adult patients who are being followed-up at primary care and also social support and anxiety, depression risk in these patients. The gradually aging population brings increased number of chronic diseases together and thereby multi-drug use. So, most of the previous studies in this issue have been conducted with patients above 65 years of age (7-12). Differently from most previous studies, we have evaluated multi-drug use in all patients above 18 years. Mean age of the participants was 60.1±11.0 years and 244 (62.1%) were below 65 years.

In our study, the mean number of chronic diseases was 2.7±1.2 and the mean number of medications used was 4.7±2.2, 13.2% of the participants were using 2 medications, 38.9% were using 4 medications and 47.8% were using 5 or more medications. In the study of Kostev et al. conducted with patients above 60 years who were admitted to family physicians, mean number of prescribed medications was found to be 4.2 (17). Morin et al. have reported this number as 4.6 in their study conducted with individuals 65 years and over in Switzerland (18). In a study from Thailand, of 2806 patients who were above 65 years of age and who have admitted to primary care, 27.5% were found to have been using ≥5medications and43.7% were found to have been using potentially inappropriate medications (8). In the study of Kutsal et al. investigating multi-drug use in individuals above 65 years of age, 17% of the participants were using 2 medications, 19.2% were using 3 medications and 38.2% were using 4 or more medications (9). In a cross-sectional study conducted with 43 general practitioners and579 patients in Italy, 13.4% of the patients over 75 years of age, were on therapy with ≥8 drugs (19).

Kardas et al. have analyzed national cohort of 38 million Polish citizens, and found that the prevalence ofpolypharmacy was 11.7% in 2018 and 11.6% in 2019. Theprevalence of polypharmacy was detected to increase, reaching 56.0% in those aged 80+ in 2018, and 55.0% in 2019. Altogether, polypharmacy was present in 43.1% in 2018, and 42.1% in 2019 among those aged above 65 years. In the citizens aged below 20 years, polypharmacy was found to be in the ratio of 0.9%, and 0.8% in 2018 and 2019, respectively (20). In our study, 244 of the patients were under 65 of age and the ratio of multi-drug use was found to be 43,0% and 149 of the patients were over 65 of age and the ratio of multi-drug use was found to be 57,7% (χ^2=9,495, p=0,009).

The frequency of chronic diseases which often requires the use of more than one drug, increases with aging. Therefore, multiple co-morbidities are an important etiological factor for polypharmacy. Midao et al. reported that the number of chronic diseases is directly related to polypharmacy (21). Li Min Lim et al. reported in their study conducted with 1256 individuals above 55 years of age who have been using a medication for longer than 3 months that the risk factors associated with increasing medication use were increasing age, Indian ethnicity, male, having a higher number of comorbidities (22). The study of Slater et al. confirms that increasing age and the presence of chronic health conditions are associated with polypharmacy, but also that obesity and lower wealth

are significantly associated with polypharmacy (23). The present study has revealed similar results indicating that increased age, BMI, waist circumference and the number of chronic diseases increased the number of medications used.

In the study of Unsar et al. conducted with 912 patients above 60 years of age who were registered to family medicine clinics in Edirne province, the authors found that the mean number of medications used daily was 2.8±2.5, the mean MSPSS score was 60.6±17.1 and the mean Geriatric Depression Scale (GDS) was 12.2±7.7. There was a significant negative correlation between the age, the numbers of drugs taken daily and MSPSS scores (24). In our study, a negative correlation was detected between total MSPSS score and age, and a positive correlation was detected between total MSPSS score and level of education.

Wongpakaran et al. investigated the prevalence and predictors associated with polypharmacy in the elderly at primary care clinics and psychiatric clinics of tertiary care hospitals within the DAS program (açılımı?) which was funded by National Research Council of Thailand. In this study, anxiety disorder and depressive disorder were found to be associated with higher medication (25). In our study, the risk of anxiety and depression was significantly higher in women and who had no partner. On the other hand, the risk of anxiety and depression decreased as age and level of education increased. There was no correlation between polypharmacy and anxiety-depression risk in our study.

In conclusion, the prevalence of polypharmacy among adult patients in primary care clinics in Turkey is high. Significant physical and mental problems occur in individuals who use multiple drugs, especially in the elderly. Our findings revealed that predictors of polypharmacy include age, BMI, waist circumference and number of chronic diseases. Primary carephysicians play a pivotal role in medication review and prescribing medications. They should be aware of those predictors when prescribing additional medications, the indication should be clearly specified and all the aspects should be taken into consideration.

Ethics approval and consent to participate

This study was approved by the Health Sciences University Adana City Training and Research Hospital Clinical Research Ethics Committee on November 28, 2017 (No 136). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. All participants signed informed consent forms.

Conflict of interest

The authors declare that there is no conflict of interest.

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