Original Article

Depression in the Elderly: A Descriptive Study of Urban and Semi-Urban Greek Population

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Abstract

Background: Depression in the elderly is the most common mental disorder in old age. The aging of the population is an important public health issue which significantly affects the welfare and quality of life for both the individuals and their families. It is estimated that the geriatric depression rates will increase resulting in financial demands increase on the health care system and financial burden at the local or national level.
Aim: The study aims to examine the prevalence of depressive symptomatology among the elderly in urban and semi-urban Greek population and investigate risk and protective factors for the disorder.
Material and Methodology: The sample consisted of 300 subjects (171 women and 129 men), aged ≥60 years, members of the Open Care Centers for Older People (OCCFOP; KAPI in Greek) of Prefectures of Attica (Municipality of Agios Dimitrios) and Fokida, during July-December 2012 period. A questionnaire for demographic data was administered and depression was evaluated using the Geriatric Depression Scale Short Form (GDS-15), which has been standardized in Greek elderly population.
Results: Results demonstrate that 84.3% of the sample shows depressive symptoms (79.9% moderate and 5.03% severe depression). Depressive symptomatology appears to be more common prevalent among the elderly living in Athens compared those living in semi-urban areas (24% difference in both sexes). Moreover, it was observed that the sex (B= -0.131, 95% CI 0.394-0.656, p=0.035) and the smoking status (B= -0.181, 95% CI 0.505-0.867, p=0.010) were negatively associated with depressive symptomatology in individuals who live Athens.
Conclusions: The high rates of depressive symptomatology demonstrates the need for a strong social support network as an effective intervention to prevent depression and promote healthy aging.

Key words: Depression, elderly, KAPI (Open care centers for older people; OCCFOP; KAPI in Greek), Geriatric Depression Scale-15, urban and semi-urban community population, Greece

Introduction

According to the most recent estimates, the depressive symptoms are the leading cause of disability worldwide, with consequent increase in mortality and morbidity rates until 2020 (WHO/ICD, 2006; European Communities, 2008; Babatsikou, 2007; Kennedy, 1996). Depression among the elderly is a global issue of Public Health (Swaminath, 2009) and has a significant impact on the welfare and quality of life of the elderly, resulting in increasing the demand for health care services and higher health care costs (Babatsikou, 2007; Kennedy, 1996; Wold, 2008; Snowden et al., 2008; Kathleen, 2006).

Geriatric depression is a multifactorial disorder as it is caused by a combination of factors (genetic, biological, psychosocial) which contribute to the occurrence of the disorder at varying degrees (Wold, 2008; Alexopoulos, 1996; Lavretsky et al., 1998). Depression is characterized by a set of clinical symptoms and signs. The frequency, the intensity and the duration of the clinical symptoms may vary among the elderly. These symptoms manifest both body and mental function (Wold, 2008; Alexopoulos, 1996; Lavretsky et al., 1998; Singh and Misra, 2009). If depression is diagnosed early, even in the most severe forms, it can be treated with great success (Chapman and Perry, 2008; Anderson, 2001). The biological, psychosocial and psychotherapeutic interventions are the main treatments of depression (Burke and Preskorn, 1995; UK Ect Review Group, 2003). If it is not treated by proper medication, its prognosis is unfavorable (Parashos et al., 2002; Kupfer et al., 1989).

Depression is more common in people over 65 years old compared to other emotional changes. It is argued that it is accompanied by high mortality rate and pathological comorbidity (European Commission, 2008; Wahlbeck and Makinen, 2008). A number of studies have showed that elderly depressed patients have two or three times higher rate of mortality during the first 1-4 years of the disorder, mainly due to cardiovascular diseases (Murphy et al., 1988; Baldwin and Jolley1986; Notara al., 2016). It is also associated with increased mortality, morbidity and suicide rates resulting in increasing the demand for health care and social services and consequently higher health care costs (Babatsikou, 2007; Snowden et al., 2008; Koening and Blazer, 1992; Conwell et al., 1996; Paykel and Priest, 1992).

The prevalence of depression among the elderly ranges from 11% to 16% (WHO, 2009). There is evidence that the occurrence of depressive symptoms increases with age particularly in women, and it appears to be greater in nursing homes, where it can reach 35% (Papadimitriou et al., 2013). The current prevalence of major depression has been estimated to be approximately 20% in women and 10% in men in USA and 14% in women and 9% in men in Europe (Babatsikou, 2007; Ayuso-Mateos et al., 2001; Andrade et al., 2003). It has been found in many studies that the prevalence of depression in the elderly ranges from 13 to 40% for those who visit the hospital outpatient departments and live at home, from 10% to 45% for those hospitalized in medical units and from 30% to 44% for those who receive healthcare at closed structure care (Alexopoulos, 1996; Papadimitriou et al., 2013; Andrade et al., 2003; Charney et al., 2003; Mojtabai and Olfson, 2004; Kessler, 2003; Blazer, 2003; Waugh, 2006). Depressive symptoms are more common in women and occur at a younger age at twice the rate of men (Alexopoulos, 1996; Kessler, 2003; Lepine et al., 1997; Cole and Dendukuri, 2003; Kuehner, 2003).

In Greece, several studies have been conducted so far in urban, semi-urban and in the rural populations in order to define the prevalence of depression. Depending on study design and the population groups studied, the prevalence of depression in people over 65-year-old shows high variability, ranging from 6% to 70% (Babatsikou, 2007; Stylianopoulou et al., 2010; Mamplekou et al., 2010; Papadopoulos et al., 2005; Argyropoulos et al., 2012; Carayanni et al., 2012; Zintrou et al., 2014; Tika et al., 2014; Alefantinou et al., 2016).

The burden of depression is on the rise globally. In Greece, it is estimated that the number of retired people (≥ 65 years) will more than double by 2050 (from 16.6% in 2000 to 32.1% in 2050) meeting the challenge of increased demand on healthcare services (Eurostat, 2008; Babatsikou, 2009).

Aim

The purpose of the present study was to investigate the occurrence of depressive symptoms in the urban and semi-urban Greek

elderly population (≥60 years) who are members of the Open Care Centers for older people (KAPI in Greek). In addition, possible risk factors such as age, sex, education level and multiple pathology in depression were also examined.

Material and Methodology

Study sample

The sample of the study consisted of men and women aged ≥60 years, members of the five (5) Open care centers for older people/KAPI in Attica (municipality Agios Dimitrios) and of the three (3) KAPI in Fokida (KAPI of Galaxidi, Itea and Amfissa). The age range (≥60 years) was based on the age limit for KAPI registration, according to the statute of KAPI operation. Stratified random sampling, based on sex was performed.

Data collection

The present research study was conducted during July-December 2012 period. An informed consent from the Board of Directors of the five KAPI in Attica and of the three (3) KAPI in Fokida and the Ethics Committee of the postgraduate program (Master in "Applied Public Health", National School of Public Health, Athens Greece/ Faculty of Public Hygiene, TEI of Athens) was given to the participants. Study ethics was followed according to the literature (Brink et al., 2016).

All participants in the study after having been informed, given their signed consent, also they were informed that they have the right to terminate their participation any time they want. Structured interviews with questionnaire and self-administered scale were conducted. The hours and the days available for activities were taken into consideration to achieve the best representation of KAPI members. Data were collected in the morning and afternoon hours of all days of the week.

Tools

For data collection were used: a) a questionnaire for sociodemographic, anthropometric, clinical and quality of life data; b) the short version of the Geriatric Depression Scale (Geriatric Depression Scale- GDS-15). Specifically, the questionnaire included 144 questions (closed / open-ended and multiple choice). Age, sex, education level, marital status, occupation, number of children and cohabitation was recorded. Individual medical history, medications and behavioral characteristics such as smoking habits and alcohol consumption were also recorded. Blood pressure (mm / Hg), height and weight (electronic scale) without shoes were also measured.

The Geriatric Scale for Depression (Geriatric Depression Scale - GDS) designed by Yesavage and colleagues (Yesavage et al., 1983) is the first scale for screening depression symptoms in the elderly. It includes questions about mental disorders and the quality of life.

A shortened form of the GDS-15 has been standardized in Greece screening depression in the elderly and was found to have Sensitivity=92.23(92%) and Specificity=95.24(95%) (Fountoulakis et al., 1999). It a self-administered scale and consists of fifteen (15) enclosed-type (Yes/No) questions in accordance with the scale Geriatric Depression Scale, GDS-15 (Sheikh and Yesavage, 1986). It is a useful and valid screening tool for depression in the elderly. The duration of the GDS-15 administration about 3-5 minutes and it is scored from 0 (normal) to 15 (severe depression). The severity is divided into the following categories: 0-5 no depression (are considered normal), 6-10 moderate depression (score over 6 implies suspicion of mood disorders while over 7 or more suggests the diagnosis of depression) and 11-15 severe depression (Fountoulakis et al., 1999).

Data analysis

Descriptive and analytical statistics were used to evaluate the data, the quantitative data were presented as arithmetic mean (Student's t-test) and the x^2 statistical test was used to test the representativeness of our sample in relation to urban and semi-urban older population. The outputs of regression analysis were presented with 95% Confidence Interval (CI).

For the statistical analysis the IBM SPSS V17 (Statistical Package for Social Sciences-Version 17) software was used.

Results

Descriptive characteristics of the sample

Table 1 presents the socio-demographic characteristics of the sample. In Athens (urban), 90 women (60%) and 60 men (40%) participated. In Fokida (semi-urban) almost the same number

of participants were participated; 81 women (54%) and 69 men (46%). The majority of the participants were ≥75 years old in Athens (by 60%) and in Fokida (47.3%).

The educational level was quite low. Specifically, only 6% of KAPI members in Athens were educated ≥12 years, while the corresponding rate in Fokida was about 9.5%. Moreover, 67% of the sample in Fokida had not graduated from primary school compared to 72% in Athens.

Regarding marital status, the highest percentage were married, but 38% in Athens and 24% in Fokida were individuals who were living alone. Additionally, the majority of two groups have at least 2 children; but in Fokida 25% of the sample had many children compared to 75% in Athens who had on average 1.5 children. Finally, regarding the occupational status the highest percentage of the participants were retired (about 93% in semi-urban and 83% in urban area).

Geriatric depression assessment and sociodemographic characteristics

Table 2 and **Table 3** demonstrates that the highest percentage of the sample shows depressive symptoms in rate of 84.3% (n=253). Specifically, moderate depression (scores: 6-10) is evident in 79% (n=237) and severe depression (scores: 11-15) in 5.3% (n=16) of the sample. Women (56.92%) tend to outweigh men (43.08%) in depressive symptoms. Interestingly, married people did not show any depression symptoms in rate of 74.5%. It has been found that 91.5% of them have children.

Finally, absence of depressive symptoms was found in participants who were living together with other individuals. The participants in Athens compared to Fokida showed higher percentage of depressive symptoms (24% in both sexes - 24% in men and 25% in women respectively).

To further investigate how risk factors affect depressive symptomatology linear regression was applied. It was found that in the sample of Athens sex (B = -0.131, 95% CI 0.394-0.656, p = 0.035) and smoking habit (B = -0.181, 95% CI 0.505-0.867, p = 0.010) negatively associated with the presence of depressive symptoms (**Table 4**).

In Fokida no statistically significant difference regarding the risk factors and the onset of depressive symptoms was found

Discussion

We conducted a study in urban and semi-urban older population of Greece, the presence of depression symptoms in the elderly was 84.3%, very high percentage in relation to other studies (Babatsikou, 2007; Stylianopoulou et al., 2010; Mamplekou et al., 2010; Papadopoulos et al., 2005; Argyropoulos et al., 2012; Carayanni et al., 2012; Zintrou et al., 2014; Tika et al., 2014; Alefantinou et al., 2016). The prevalence of depression in the elderly among community-based Greek studies ranges from 6% to 70%; prevalence rate was reported by Babatsikou 45.90%, Stylianopoulou et al., 30.28%, Argyropoulos et al., 45.2% , Zintrou et al., 44%, Tika et al., 42.2%, Alefantinou et al., 46.2%, Mamplekou et al., 30.2% and Papadopoulos et al., 39%. Perhaps this wide difference in the percentages is largely due to different sample sizes, the population groups, sampling strategies and study setting used in different studies.

The findings of present study demonstrate the risk and the protective factors affecting the occurrence of depressive symptoms in old age in urban and semi-urban population in Greece. Specifically, it appears old women who live in the urban area are at greater risk. In contrast, cohabitation, living in the province, the existence of children and smoking appear as protective factors in depressive symptoms.

Regarding smoking, the results of this study are in agreement with recent findings that show the "paradox" of the effect of smoking on reducing anxiety and negative emotions at psycho-biological level (Choi et al., 2015).The mechanism by which smoking acts as temporary "antidepressant" includes nicotine. Nicotine activates other neurotransmitters such as dopamine and serotonin, which are known as neurotransmitters of reward (Aubin et al., 2012).

The correlation between depression and sex demonstrates that women were more susceptible in depressive symptoms compared to men. The prevalence of depression was more among women (56.92%) as compared to men (43.08%). The findings are consistent other studies, in which mood disorders are more common in women (European Communities, 2008; Babatsikou, 2007; Stylianopoulou et al., 2010; Argyropoulos et al., 2012; Carayanni et al., 2012; Zintrou et al., 2014; Tika et al., 2014; Lepine et al., 1997).

.Table 1. Sociodemographic sample characteristics in KAPI in Attica (urban) and Fokida (semi-urban)

			ATHENS (urban)		FOKIDA (semi-urban)		TOTAL		*p-value**
			Men (n=60)	Women (n=90)	Men (n=69)	Women (n=81)	Men (n=129)	Women (n=171)	
Age (years)	60 – 64		2 (3.3)	5 (5.6)	5 (7.3)	15 (18.5)	7 (5.4)	20 (11.7)	0.230
	65 – 69		7 (11.7)	13 (14.4)	14 (20.3)	17 (21.0)	21 (16.3)	30 (17.5)	
	70 – 74		13 (21.7)	20 (22.2)	17 (24.6)	11 (13.6)	30 (23.2)	31 (18.1)	
	75+		38 (63.3)	52 (57.8)	33 (47.8)	38 (46.9)	71 (55.1)	90 (52.6)	
Education	≤ 6 years		43 (71.7)	66 (73.3)	48 (69.6)	52 (64.2)	91 (70.5)	118 (69.0)	0.919
	7-12 years		14 (23.3)	18 (20.0)	15 (21.7)	21 (25.9)	29 (22.5)	39 (22.8)	
	>12 years		3 (5.0)	6 (6.7)	6 (8.7)	8 (9.9)	9 (7.0)	14 (8.2)	
Marital status	Single		0	2 (2.3)	4 (5.8)	5 (6.2)	4 (3.1)	7 (4.1)	**<0.001**
	Married		48 (80.0)	35 (38.9)	59 (85.5)	43 (53.1)	107 (82.9)	78 (45.6)	
	Divorced		3 (5.0)	4 (4.4)	0	3 (3.7)	3 (2.3)	7 (4.1)	
	Widower		9 (15.0)	49 (54.4)	6 (8.7)	30 (30.0)	15 (11.7)	79 (46.2)	
Past occupation	Yes		49 (81.7)	65 (72.2)	54 (78.3)	62 (76.5)	103 (79.8)	127 (74.3)	**<0.001**
	No		11 (18.3)	25 (27.8)	15 (21.7)	19 (23.5)	26 (20.2)	44 (25.7)	
Present occupation	Yes		2 (3.3)	3 (3.3)	2 (2.9)	2 (2.5)	4 (3.1)	5 (2.9)	**0.034**
	No	Unemployed	4 (6.7)	1 (1.1)	1 (1.4)	0	5 (3.9)	1 (0.6)	
		Retired	48 (80.0)	76 (84.5)	62 (89.9)	75 (92.6)	110 (85.3)	151 (88.3)	
		Housekeeping	6 (10.0)	10 (11.1)	4 (5.8)	4 (4.9)	10 (7.7)	14 (8.2)	
Children	Yes		58 (96.7)	80 (80.9)	64 (92.8)	73 (90.1)	122 (94.6)	153 (89.5)	0.083
	No		2 (3.3)	10 (11.1)	5 (7.2)	8 (9.9)	7 (5.4)	18 (10.5)	
Living status	Alone		12 (20.0)	45 (50.0)	7 (10.1)	25 (30.9)	19 (14.8)	70 (40.9)	**<0.001**
	With spouse		39 (65.0)	31 (34.5)	53 (76.8)	33 (40.7)	92 (71.3)	64 (37.5)	
	With children		2 (3.3)	12 (13.3)	3 (4.3)	10 (12.3)	5 (3.9)	22 (12.9)	
	With spouse and children		7 (11.7)	1 (1.1)	6 (8.7)	11 (13.6)	13 (10.0)	12 (7.0)	
	With other individuals		0	1 (1.1)	0	2 (2.5)	0	3 (1.7)	

* The x^2 test was used to calculate the p value

Table 2. Prevalence of depression symptoms in KAPI in Attica (urban) and Fokida (semi-urban)

GDS-15	ATHENS (urban)		FOKIDA (semi-urban)		TOTAL	
	Men (n=60)	Women (n=90)	Men (n=69)	Women (n=81)	Men (n=129)	Women (n=171)
0 - 5 normal	2 (3,3)	3 (3,3)	19 (27,5)	23 (28,4)	21 (16,3)	26 (15,2)
6 - 10 moderate	54 (90,0)	83 (92,2)	47 (68,1)	53 (65,4)	101 (78,3)	136 (79,5)
11 – 15 severe	4 (6,7)	4 (4,4)	3 (4,3)	5 (6,2)	7 (5,4)	9 (5,3)

Table 3. Depression assessment based on Geriatric Depression Scale (GDS-15) (n=300)

	Depression presence		Depression absence	
	N	%	N	%
Depression Score	253	84.3	47	15.7
Severity of depression				
Moderate (score 6-10)	237	79		
Severe (score 11-15)	16	5.3		
Sex				
Men	108	43.08	21	42.56
Women	145	56.92	26	57.44
Marital status				
Married	150	59.3	35	74.5
Widower, Divorced, Alone	103	40.7	12	25.5
Children				
Yes	232	91.7	43	91.5
No	21	8.3	4	8.5
Living status				
Alone	62	24.5	27	57.44
With company	191	75.5	20	42.56

Table 4. Linear regression in depression levels using the Geriatric Depression Scale (GDS-15) in Athens

Linear Model	Beta Coefficient		Confidence interval	
	B	Standard error	95 % Cl	P value
(Constant)	2.260	0.214	(-2.619 , 7.139)	0.000
Sex	**-0.131**	**0.061**	**(0.394 , -0.656)**	**0.035**
Age (60-64)	0.049	0.120	(-0.091 , 0.189)	0.686
Age (65-69)	0.051	0.075	(-0.135 , 0.237)	0.498
Age (70-74)	-0.027	0.064	(0.077 , -0.131)	0.680
Education (≤ 6 years)	-0.088	0.106	(0.183 , -0.359)	0.406
Education (7-12 years)	-0.112	0.115	(0.215 , -0.439)	0.335
Smoking (Former smokers)	-0.083	0.071	(0.227 , -0.393)	0.246
Smoking (Smokers)	**-0.181**	**0.069**	**(0.505 , -0.867)**	**0.010**
Cohabitation	-0.066	0.054	(0.217 , -0.349)	0.224
Cognitive status (absence of cognitive impairment)	0.013	0.179	(-0.018 , 0.044)	0.941
Cognitive status (moderate cognitive impairment)	0.073	0.193	(-0.093 , 0.239)	0.706

Dependent Variable: GDS -15 (Geriatric Depression Scale), Location= Athens

Additionally, in a study conducted in rural population, the prevalence of depression was higher in women (33%) compared to men (20%) Papadopoulos et al., 2005). One possible explanation may include the higher life expectancy of women compared to men; mental health is affected by hormonal levels (e.g. menopause) in older ages in women whereas testosterone has a protective effect on anxiety and depression in men (Zarrouf et al., 2009; McHenry et al., 2014).

It seems that the place of residence in a semi-urban area is a protective factor in depression symptoms in the elderly. Specifically, the percentage of the sample showed no depressive symptoms in the semi-urban area reached 28% compared to 3.3% in Athens. Lifestyle, habits and activities of people in the semi-urban area are significantly different from the lifestyle and habits of people in large urban areas. Since early 80s it has been noticed that the elderly people in the cities are more alienated and they have much many activities in their daily life (Mueller, 1981). Similar results were found in a more recent study in which the difference in urban and semi-urban areas is attributed in inequalities to mental health services access and limited health care structures in semi-urban areas (Wang, 2004). It has been also reported that these differences may be attributed to socio-economic factors that differ between urban, semi-urban and rural population such as marital status, social networks / social support, financial situation etc (St John, 2006).

In the present study, it was observed that the elderly who were living with company or had children showed less depressive symptoms compared to the individuals who were living alone. Our results concur with results of other studies for depression among older people (Babatsikou, 2007; Stylianopoulou et al., 2010; Argyropoulos et al., 2012; Carayanni et al., 2012; Zintrou et al., 2014; Tika et al., 2014; Alefantinou et al., 2016).

It appears that cohabitation has positive effects not only in mental health but also in the quality of life of older people with multiple pathology. In particular, recent study has shown that single and divorced patients with diagnosed coronary heart disease had higher scores on the depression scale CES-D compared to married and widowed ones.

Moreover, the individuals belonging to the class of "non-married" cardiovascular patients (single, divorced, widows) had 2% higher risk of recurrence of the second episode for every 1-unit increase in ETUC-D scale and 4% higher risk of this episode to become lethal during the next 10 years (Notara et al., 2015).

Studies conducted in KAPI in Attica showed that widowers, people living alone, people with multiple pathology and informal “caregivers” show significantly higher rates of depressive symptomatology (Babatsikou, 2007; Stylianopoulou et al., 2010).
Many studies have classified these as risk factors for depression among elderly persons aged 60 years and above (Babatsikou, 2007; Stylianopoulou et al., 2010; Argyropoulos et al., 2012; Carayanni et al., 2012; Zintrou et al., 2014). Finally in a study by Babatsikou, significantly lower rate of depressive symptoms was evident in individuals involved in grandchildren care or participated in social activities (Babatsikou, 2007).

Study limitations

This study was performed in KAPI and may have drawbacks and advantages. The study was conducted only in the elderly who receive services in a protective environment such as KAPI. In addition, only ambulatory and socially functional elderly people were participated in the study demonstrating the disadvantage of the strict sample representation. However, the large number of participants (n = 300), the fact that the questionnaires were administered by specially trained investigators and the use of a standardized tool in Greek population demonstrate the advantages of the present study.

Conclusions-Suggestions

The present study showed the significant prevalence of depressive symptoms ("moderate" and "severe" depression) in the population of elderly Greeks, taking into consideration that it was conducted in ambulatory and socially functional elderly people. The impending aging of the Greek population and the prediction that the number of elderly in the coming decades will be doubled is a challenge for Public Health. This challenge is due to the fact that social and cultural factors responsible for the occurrence of depression are modifiable.
Healthy aging is now a financial incentive for societies as the healthcare costs are reduced and efficiency workforce is increased. A psychosocial support network that takes into account the special needs of the elderly would be helpful to upgrade their quality of life.

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